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Extended piano techniques : in theory, history and performance practice

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Extended Piano Techniques

In Theory, History and Performance Practice



Inside of the Steinway grand piano at the International Arts Center *deSingel* in Antwerp (Belgium). The key to the lock of the defense mechanism (at the far left of the board) is in the care of the head technician.

Luk Vaes

2009

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PREFATORY MATTERS

This dissertation is written in partial fulfillment of the requirements for the doctoral degree program DocArtes of the Orpheus Institute and Leiden University. The remaining precondition consists of a demonstration of the research and its findings in the form of three piano recitals.

Abstract

So-called "extended techniques" have suffered a consistent lack of understanding from a theoretical, historical and practical point of view. Although most of them – e.g. playing directly on the strings, cluster- and glissando-techniques – exist in a substantial part of the repertoire for the piano and have done so for more than a couple of centuries now, the use of the techniques on stage still sparks off negative reactions by audiences, composers, performers and tuners as well as owners of pianos. Any one-sided approach towards appreciation has proven to be inadequate: academic analyses do not succeed in handling the matter satisfactorily, endeavors by musicians to teach and advise on the "proper" use of the techniques have come short of applying an in-depth and a historically informed perspective. A comprehensive and exhaustive survey of the extended techniques as a whole can serve to alleviate the risk that the relevant repertoire sinks into oblivion, contributing to a reassessment of the subject, in turn benefitting contemporary professional performance practice, concert programming, composers' interest and musical as well as music-historical education.

The subject and its related terminology are scrutinized and (re)defined where necessary. The acoustical properties of the techniques are explained from the perspective of the performer to ensure proper insight in the way they produce sound. Over 16.000 compositions have been considered to write the history of improper piano playing, comparing manuscripts with first and subsequent editions of solo as well as chamber and concerto music, original compositions as well as transcriptions, from the "classical" as well as the "entertainment" sector. Original preparations collected by John Cage were tracked down and described in minute detail so that alternatives can be considered on the basis of professional information. Historical recordings as well as personal experiences and interviews with composers are used to pinpoint historical performance practices. To help the pianist prepare for concerts with the relevant repertoire, measurements of the internal layout of the most common grand pianos are listed in order to anticipate possible problems in advance.

Usages & abbreviations

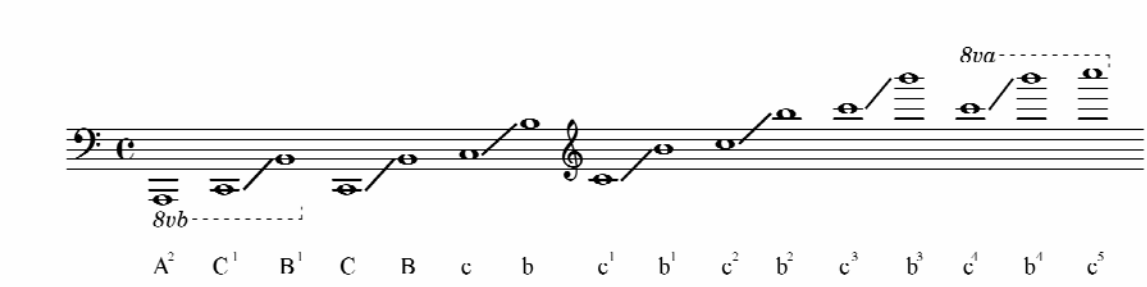
The spelling of composers' and performers' names is as they are found in *The New Grove Dictionary of Music and Musicians* (Second Edition, 2002 reprint), including such arguable transliterations as Tchaikovsky and Skryabin. Basic biographical information such as places and dates of birth will correspond to the information in this dictionary also and without reference, except when other sources contradict.

The orthography and vocabulary are predominantly Anglo-American: whole-, half, quarter- and eight-notes etc. are used instead of the British counterparts. A note refers to a notated pitch, a tone to an acoustically sounding pitch. A "staff" designates a set of

five lines (contrary to the German System); a "system" consists of two or more staves joined together by a brace (cf. German *Akkolade*). Metric units are used to indicate weights and measures, except in some quoted text and in those instances where the conversion from imperial to metric measurements is at issue. Titles and quoted matter are offered in translations by author or from another (named) source with the original offered in the footnotes. In the event of confusion in vocabulary arising from this use of quotes, inconsistencies are explained.

Places in scores are referred to by their bar numbers as they rank in the piece or the movement thereof. Only in references to illustrations of extracts, to certain manuscripts (e.g. notebooks, sketches) or to scores in which measure numbers are absent or cannot be trusted to match other editions (e.g. different versions, transcriptions) a combination of page-, system and measure numbers on that system is preferred: 13/4/2 then means the second measure of the fourth system on page 13. No number is allocated to the upbeat of a movement: 1/1/1 is the first complete measure of a piece. When no bar lines are indicated (e.g. in the *Klavierstücke* by Stockhausen), 4/1 means the top system of the fourth page.

Textual pitch notation is as follows:



In the text, pitches are printed in italics, e.g. *c#* and *b♭²*. Naturals are not typed out unless they are the issue. Generic notes (without reference to a specific place in the keyboard range) are printed as regular capitals, i.e. not in italics. Italics are used for fingerings, citing indications of dynamics (*p, piano*), agogics (*rall.*) and other aspects of conventional playing technique such as are commonly found in scores (*legato*, *rubato, una corda*, etc.).

First, second and third strings (applied to triple strung notes) are counted from left to right. Pedal names used here are una corda pedal, sostenuto pedal (not third pedal) and sustaining or damper pedal.

Common usage dictates abbreviations like established composer catalogues (K.V. = Köchel Verzeichnis of Mozart works, K. = Kirkpatrick's numbering of Scarlatti sonatas) or dynamic indications. Acronyms will be written in full the first time, abbreviated thereafter. Abbreviated source names are explained in the bibliography.

Musical excerpts and tables are numbered per chapter, e.g. 3.259 as example 259 in chapter 3. Where permission to reproduce excerpts is required, the license is indicated with the individual excerpt.

Library sigla:

A-Wgm	Austria, Vienna, *Gesellschaft der Musikfreunde in Wien, Bibliothek*
B-Ac	Belgium, Antwerpen, *Koninklijk Vlaams Muziekconservatorium*
B-Bc	Belgium, Brussels, *Conservatoire Royal de Musique, Bibliothèque / Koninklijk Conservatorium, Bibliotheek*
B-Gc	Belgium, Ghent, *Koninklijk Muziekconservatorium, Bibliotheek*
CH-Zz	Switzerland, Zurich, *Zentralbibliothek*
D-B	Germany, Berlin, *Staatsbibliothek zu Berlin Preußischer Kulturbesitz, Musikabteilung*
D-BNba	Germany, Bonn, *Wissenschaftliches Beethoven-Archiv*
D-MÜp	Germany, Münter, *Diözesanbibliothek*
D-Mbs	Germany, München, *Bayerische Staatsbibliothek, Musikabteilung*
E-Bbc	Spain, Barcelona, *Biblioteca de Cataluña*
F-Pn	France, Paris, *Bibliothèque nationale*
GB-Lbl	United Kingdom, London, *British Library*
I-Bc	Italy, Bologna, *Museo internazionale e biblioteca della musica.*
I-Pac	Italy, Parma, *Biblioteca Nazionale Palatina, Sezione Musicale presso il Conservatorio di Musica ArrigoBoito*
NL-Dhnmi	The Netherlands, The Hague, *Nederlands Muziek Instituut*
N-Oum	Norway, Oslo, *University of Oslo, Norsk Musiksammling*
US-Nyp	United States, New York, *New York Public Library at Lincoln Center, Music Division*
US-Wc	United States, Washington, DC*, Library of Congress, Music Division*
US-NH	United States, New Hampshire, *Irving S. Gilmore Music Library, Yale University*

Tabula Gratulatoria

I could never have written all that follows by myself alone, and gratefully acknowledge the help of the many individuals that assisted me. First of all I want to thank the staff of the libraries I scourged for scores and manuscripts: the Belgian conservatory libraries of Gent, Antwerp and Brussels, the King Albert II Library (Brussels), the music divisions at the Library of the State University of New York (Buffalo), the New York Public Library (Lincoln Center), the Library of Congress (Washington), the Gilmore Music Library at the Yale University (New Haven), the Nederlands Muziek Instituut (The Hague), the Zentralbibliothek (Zurich), the British Library (London), the Bibliothèque Nationale (Paris), the music department of the Staatsbibliothek zu Berlin Preußischer Kulturbesitz (Berlin), the Wissenschaftliches Beethoven-Archiv (Bonn), the John Cage Trust (Annandale-on-Hudson), the Internationale Stiftung Mozarteum (Salzburg), the Grainger Museum (Melbourne), and the Getty Research Institute for the History of Art and the Humanities (Los Angeles).

It is a pleasure to finally express on paper my gratitude to all the colleagues in artistic and historical research who helped me get difficult to find articles or scores, confirmation of information I had merely deduced, who sent me in directions I did not know were there, or who simply solved nagging problems by being there: Charles Ball, Robert Berkman, Brian Brandt, Deborah Campana, Allessandro Cervino, Claude A. Coppens, Jeremy Craycraft, Katherine Duke, Nicolas Gorenstein, Alan Graves, Herbert Henck, Michael Hicks, H. Wiley Hitchcock, Yves Jaffrès, Friedrich Jakob, Emanuele Jannibelli, Rex Lawson, Laura Kuhn, Philip Lambert, Edvar Lieber, Robin Maconie, Leta E. Miller, Kenneth Mobbs, Severo Ornstein, David Patterson, Francesca Piraccini & Damiano Puliti, Godfried-

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The prominence of this list's last place is reserved for Kathleen Torfs, for her unfailing belief in me and in this project, even when she had to compete with it for my attention during the last decade.

1. INTRODUCTION

1.1 Status quaestionis

Approximately 35 years after it had been written, I heard John Cage's concerto for prepared piano and orchestra live for the first time. The piece was still young enough to be considered "new music," and after the concert I joined other new-music fanatics in the then-customary inspection of how the grand piano's insides had been prepared. One of the items that stood out was a credit card woven through a few strings. The performer's comment – that it was the only thing close to the required "plastic bridge" he had been able to come up with – stuck in my mind. The notion of a credit card in a piece written in the 1950s, before credit cards were prevalent, struck me as odd.

A few years later, I came upon what was said to be one of the original boxes of preparations that John Cage had assembled himself for his concerto. I was of course interested to see if there was a credit card in it. Although I later found that the set might not have been original, the "plastic bridge" in the box revealed itself to be so straightforward that I understood why he hadn't bothered describing it in the performance notes. Nevertheless, one needs to have *seen* the piece of wood with a bar of Plexiglas glued on top of it to understand that Cage wanted something that could be pressed in between the soundboard and the strings, acting like the bridge on a violin.

Some time later again, I was asked to play Henry Cowell's famous piano piece "Aeolian Harp" in a concert program specifically designed to present off-the-wall compositional approaches to the piano. It was far from the first time I had performed this piece in public, and I had taken care to ask the organizer for a piano similar to the one on which I had practiced the piece. To my dismay, on the afternoon of the day of the concert, I was confronted with a model from another brand, which made it impossible for me to play the piece: the braces of the inside steelwork were set in such a way that some of the required glissandi on the strings could not be played, not even when transposing the piece up or down. I informed the audience of this handicap and presented Cowell's "The Banshee" instead (which, fortunately, I could play from memory, and on that piano).

These two anecdotes represent the beginnings of the research that led to this study. The difference in sound between a "real" plastic bridge and a credit card leads to the urgent question of how many more prepared-piano indications might be misunderstood, and how only a few decades are enough for an indication to become obscure. The frustration of not being able to play a piece because the piano on stage is not built in the same way as the one at home shows a need for information about the different layouts of piano insides.

Over the years, I have witnessed quite a few instances of such performance requirements suffering either a lack of information about the composer's intentions, or the confrontation on stage with an instrument that was not comparable to the one on which the music was practiced at home. What did George Crumb mean by his apparent differentiation between a piece for electric piano and one for amplified piano? What is a stove bolt? Which clusters are to be played with the elbow and which with the fist? What if I cannot reach a nodal point on a string because some piece of the metal frame is in the way? The idea to put the findings in writing for colleagues looking for help was too compelling to resist.

Despite the pervasiveness of such performance conundrums, little literature is available for the performer to fall back on. At the time of writing this, there are many guidebooks and websites for other instruments' "extended techniques." But there has been no comprehensive effort to give detailed information on "extended techniques" for the piano. To this day two masters theses have been written on the subject (Matthews 1981

and Chun 1982), both limited to the works of George Crumb. One DMA dissertation offers cursory descriptions of a larger number of techniques (Harrel 1976), and another can serve as an introduction to the glissando (Lin 1997). Hudicek 2002 discusses at length those techniques that do not involve the keyboard (but include the prepared piano), giving most of the attention to practical aspects of performance and to trouble-shooting. Some of the material is highly detailed, though unfortunately not without mistakes in the very information that is to help pianists at home study the layout of the piano they will perform on in concert. One German doctoral dissertation (Fürst-Heidtmann 1978) handles technical, acoustical and compositional aspects of John Cage's works for prepared piano. Unfortunately it was never translated into English. To date, one published book treats the performance of John Cage's prepared-piano pieces (Dianova 2008), offering insights based on personal experience in the manner of an earlier and more general (out of print) practical manual for preparing the piano (Bunger 1981). One published overview of new techniques and notations in 20th-century piano music (Roggenkamp 1996[1]) is largely descriptive, with occasional and limited performance-oriented advice. Finally, two excellent German publications treat history, theory and some praxis of the glissando (Henck 1994), as well as the cluster and a few related techniques (Henck 2004).

Styles of treating the subject vary as much as quality and depth of research. Except for Henck 2004 and Fürst-Heidtmann 1978, the theoretical foundations of the techniques and their practical usage are treated only superficially or not at all. There is no overview of the complete history of these kinds of techniques and their compositional application as a whole; moreover, except for Henck 2004 and Lin 1997, virtually every source on extended techniques for the piano asserts their historical context begins no earlier than the first quarter of the 20th century. Except for Henck 1994 and 2004, most of the sources also distinguish extended techniques from what is "traditional," "conventional," "normal" and "usual." Such delineation actually stigmatizes the subject, with negative consequences for musical education as well as public and academic appreciation.[2]

The last decade has seen a lot of good work uncovering and collating music-historical information to help the restitution of music by, for instance, Henry Cowell and John Cage, including particulars like clusters, inside-piano playing and the prepared piano.[3] But apart from one book on Cowell[4], such information is scattered over articles published in an array of musicological magazines that are difficult to obtain outside of the US. Even if online merchants carry some of them, most pianists do not necessarily have the time or research skills to find bits and pieces of a history they have to then paste together themselves. Despite efforts to dig up the early histories of Cowell, Ives, Antheil and Ornstein, there has not been a single attempt at putting them together to unravel the history of the early 20th-century cluster, to name but one aspect of the subject as a whole. The great divide between musicologists specializing in 20th-century music and those interested mostly in older periods has resulted in a widespread lack of understanding and consensus about when and how extended techniques and piano preparation entered history.[5]

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[1] As its title *Schriftbild und Interpretation in neuer Klaviermusik* indicates, the book elaborates on Karkoschka's *Das Schriftbild der Neuen Musik.*

[2] See the article "Down with 'Extended Techniques!'" by Robert Dick as part of the National Flute Association Pedagogy Committee's *Selected Flute Repertoire: A Graded Guide for Teachers and Students* (2001), as quoted on http://www.larrykrantz.com/rdick.htm (accessed on July 13, 2008): "The main points were that 'extended' techniques aren't really new at all and that by such labeling, a clear implication is made about what is 'normal' and thus 'necessary' and what is 'beyond' and thus 'extra' and not necessary, especially for teachers to learn if such concepts and techniques were not covered when they were in school."

[3] See for instance Hicks 1990 on Cowell's clusters or Levitz 2005 on Cage's *Bacchanale.*

[4] Hicks 2002.

[5] It seems to have been a pianist who first bridged the divide by sketching the musicological history of the cluster from the beginning of the 18th century to the end of the 20th (Henck 2004).

1.2 Methodology

A thorough investigation that establishes an integrated overview of the theoretical, historical and performance practical aspects of extended techniques is required. The first step is to define the subject and scrutinize its key terminology, theoretical concepts and acoustical aspects. An in-depth historical study can then show how the piano evolved from a basic "piano-and-forte" keyboard instrument to a multi-functional "extended" piano, along with the chronological line of composers' interest in the performance techniques that both drove and were driven by this evolution. Theoretical and historical aspects will be considered principally from the performance practical perspective; that is, preference will be given to that kind of information that may lead to insights useful for the performer. The theoretical matter may be of value to the interested composer as well as the performer.

The music under consideration includes solo piano music as well as concertos, the accompaniments to Lieder, instrumental chamber music, piano-vocal scores made by the composer, transcriptions, and other forms, all written between 1700 (the approximate beginning of the piano's history) and 2000. For the statistical data, this study considered a single composition until a double bar ending it; for example, the movements or individual parts of a sonata, concerto, suite, set of etudes or character pieces etc. were counted as a separate compositions, while a set of variations or a continuous song cycle was counted as one piece. Two versions of one piece (e.g. an arrangement for another instrument or a second version that was different from the first) were counted as two pieces. Illustrations and exercises in method and instructional books were not included in the count.

The search for scores started with the open stacks of the music library of the State University of New York at Buffalo, the Nederlands Muziek Instituut of the Royal Library (The Hague) and the conservatory library of Antwerp. To complete the picture of certain periods and of certain established or relevant composers' works, open-stack search was complemented with specific searches for scores in other libraries throughout Western Europe and the US (see list in the Tabula Gratulatoria). When available and relevant, manuscripts were compared to subsequent critical and historical editions. More than 17,000 pieces were examined.

Performance practical issues are structured as a guide listing solutions to a number of typical and less-typical problems, both general and applying to specific pieces. The primary focus here is to help the performer determine historically informed performance practice, filling the gaps between the composer's intentions, the score's requirements and the present-day instrument's potential. This information includes insights based the theoretical and historical sections of the study, as well as specific historical performance practice information that did not find its way into published scores or existing performance guides. Detailed measurements of the major brands of grand pianos commonly found in Western European conservatories and concert halls are described to facilitate practical preparation at home for all the techniques examined in this study.

2 IN THEORY: DEFINING THE SUBJECT AND REFINING THE TERMINOLOGY

2.1 Extended Piano Techniques: two perspectives

The term "extended piano" is easily and widely communicated in any Anglo-Saxon musical environment that can rely on practical experience with piano music from the second half of the 20th century. A simple Internet search provides enough references to suggest its meaning.[6] However, a *precise* meaning seems to not exist: no printed dictionary or encyclopedia source contains a lemma for it and only a handful of composers have used the term.

One composition by George Crumb – the 1983 *Processional* – is both revealing and symptomatic with regards to this matter. In the appendix to the score, Crumb suggests an alternate version, "which includes a few 'extended piano' effects."[7] Considering his trademark style, "few" should apparently be taken rather literally: the effects are reduced to an appearance in the *ossia* passages only, and to a surprising minimum at that. Two other incongruities are noteworthy: first, there are the quotation marks encasing "extended piano," as if Crumb is hesitant about the appropriateness of the term; secondly, this is Crumb's only score for piano not carrying any formal dedication to the instrument. The choice of vocabulary[8] feels decidedly awkward for a composer who not only is extremely precise in all aspects of communication in his scores, but who in fact has consciously worked for most of his life towards one "broader concept of piano idiom,"[9] as he has referred to it, and who had, two decades before writing the piece, established a firm reputation and authority[10] regarding "effects" or "special techniques" (as he called them).[11]

It is similarly impossible to pin down definitions and descriptions for the individual characteristics that make up the idiom of Crumb's writing for the extended piano. In his performance notes Crumb writes about "special techniques" and "effects" without any of these actions and sounds having a distinctive and consistent name. They are mostly indicated by imperatives (simple phrases as well as paragraph-long explanations) and by elaborating the musical notation to specify the actual sounds as well as the written instructions. Looking for defining characteristics of the extended-piano idiom in Crumb's writings, we find him referring to "the piano's interior aural possibilities,"[12] "certain timbral possibilities"[13] or "new instrumental effects,"[14] as opposed to "normal playing."[15] The first two kinds of references are too vague to provide anything but an intuitive or associative grasp of the matter, the third is historically incorrect and the last needs a context to mean anything.

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[6] Looking for "extended piano" through different search engines on the Internet (July 13, 2008) provided on average more than eight thousand relevant results.
[7] Peters Edition 66991.
8 Whether or not it was a form of self-awareness that made Crumb revert to an appendix to include his trusted piano idiom in *Processional* is explored in the next chapter.
[9] Gillespie 1986, p.104: Comment on *Five Pieces for Piano* (1962).
[10] The body of public as well as academic writings about George Crumb's music is impressive (Gillespie 1986 pp. 78-103). Also see http://www.georgecrumb.net (accessed July 13, 2008) for lists of academic articles and numerous theses on his works.
[11] In the performance notes for his *Five Pieces for Piano*.
[12] Program note in the score of *A Little Suite for Christmas, AD 1979.*
[13] Annotation to *Eleven Echoes of Autumn* in Gillespie 1986, p. 105.
[14] Gillespie 1986, p. 37.
[15] e.g. the performance note 4) in *A Little Suite for Christmas, A.D. 1979.*

Crumb compared his interest in a "new way of handling sonority and timbre"[16] to Cowell's "experiments"[17]; these experiments had been new and hair-raising in Cowell's own time, well over half a century before Crumb considered the same experiments new or special. Like Crumb, Henry Cowell's interest in "new musical resources" also led to playing directly on the piano strings, but – in contrast to Crumb's "extended piano" – the resulting pieces were "for String Piano." Cowell's most famous student, John Cage, named his early prepared piano pieces "for string piano," although no playing on the strings was involved and no string piano piece by Cowell had ever required the kind of preparation Cage developed.[18]

Crumb also sometimes requires preparations as part of his extended piano, while one composition by Carson Kievman – *The Temporary & Tentative Extended Piano* – is written "for prepared piano." Alcides Lanza's CD *The Extended Piano* consists of completely "conventional" pieces plus a few works for the combination of piano and tape; composer Lucia Dlugoszewski used almost all the techniques common in Crumb's works, but always wrote and talked about the "timbre piano"; in 1997 a New York event, The Extended Piano: A Disklavier Festival, was organized.[19] However, the term "extended piano" as used for the event lacks a precise definition, preventing any serious investigation.

Besides the names that composers gave to the instrument they wrote for, one other term is relevant: "extended techniques." It is used much more widely because it is referred to in the context of virtually all the western musical instruments.[20] There is a plethora of web pages dealing with extended techniques for the flute, clarinet, oboe, bassoon, trumpet, trombone, horn, saxophone, recorder, violin, viola, cello, double bass, percussion, vibraphone, voice, guitar, harp, keyboard, electric bass guitar, piano, even a "virtual instrument."[21] As well, books can currently be ordered concerning extended techniques for the flute[22], horn[23], violin[24] and piano[25]. Nevertheless, defined subject matter is scarce here also.[26] Furthermore, no printed dictionary or encyclopedia contains a definition or even a specific lemma for it.[27] One Internet encyclopedia defines "extended techniques" with imprecise adjectives such as "unconventional" and

[16] Gillespie 1986, p. 36.
[17] Gillespie 1986, p. 36.
[18] Until *Amores* (1943), and except for *Bacchanale* (of which no manuscript survives – Cage later reconstructed it for publication), all pieces requiring preparations were indicated in their manuscript as being for "string piano."
[19] http://www.newalbion.com/artists/cagej/silence/html/1997q2/0045.html. (Accessed on February 24th, 2004): "a digitally-controlled acoustic grand piano that is operated by a remote player using any of a variety of control devices…."
[20] The terms may actually be linked as a result of the difference between spoken and written communication. In spoken language, the term "extended-piano techniques" as Crumb talks about it (Gillespie 1986, p. 36, also in the performance notes to Crumb's 1988 *Zeitgeist*) is interchangeable with "extended piano-techniques" as others sometimes write it (Chun 1982, Davies 2000). The two are essentially different: the former relates to the idea of an extended instrument while the latter elaborates on existing concepts of performance techniques – but this is not noticeable in speech. However, it cannot be traced whether such evolution actually took place.
[21] The sites mentioned here were found in March 2003 and were still online in July 2008.
[22] Dick 1986.
[23] Hill 1996.
[24] Strange 2001.
[25] Chun 1982.
[26] One of them actually announces a "definition of its idiom" in the title, but does not keep the promise (Dempster 1979).
[27] The 1990 print of the 1980 New Grove Dictionary of Music and Musicians still contained no reference to "extended techniques." The 1984 New Grove Dictionary of Musical Instruments mentioned "extended performance techniques" in an article called "Modifications and new techniques," but only described examples and did not offer a definition (Davies 1984). The second edition of the New Grove Dictionary of Music and Musicians took over this article (with mostly an update of examples only) under the heading "Instrumental modifications & extended performance techniques" (Davies 2002).

"unorthodox" or "improper", the latter conspicuously put in between quotation marks to point to its ethical connotation. The list of "techniques" pertaining to the piano only provides links to the prepared piano and the string piano.[28]

Closely related in content to sources covering extended techniques are the many more publications treating such topics as "new instrumentation,"[29] "new directions,"[30] "contemporary techniques,"[31] "non-traditional devices,"[32] "unconventional playing techniques,"[33] "unusual sounds and effects"[34] or the "avant-garde flute,"[35] "modern trombone,"[36], "21st-century voice,"[37] etc. These pseudo-specific terms do not make the subject any clearer and are often plainly incorrect: much of what is demonstrated in these sources is not new, modern or unusual at all.

Comparing the content of such performance practice studies as are available[38] gives rise to a number of observations. Most striking is the apparent absence of consensus. One source gives reasons for excusing instrumental theatre[39] and some accept electronics as part of their survey[40], but the others ignore both. One monograph on the prepared piano considers the use of electronics as well as touching a partial node on a piano string[41] while different publications on extended techniques discuss one or the other[42], though not together and not linked to the prepared piano. Different authors writing about the same instrument or even the same compositions do not always include the same techniques.[43] Secondly, each source in itself seems to lack a clear definition of the subject. It is often impossible to tell why exactly a particular technique for a certain instrument is judged "extended" (e.g. sul ponticello, crescendo tremolos[44]), and some techniques are known to several instruments while only considered extended with regards to a few of them (e.g. the glissando[45]). Thirdly, the vocabulary assigned to the individual techniques is confusingly diverse, often misleading or incomplete, and

[28] http://en.wikipedia.org/wiki/Extended_technique (Accessed July 19, 2008)
[29] An extensive series, edited by Bertram Turetzky and Barney Childs, including volumes on the clarinet (Rehfeldt 1994), violin (Strange 2001), contrabass (Turetzky 1974), flute (Howell 1974), trombone (Dempster 1979), guitar (Schneider 1986), pedal harp (Ingelfield & Neil 1985), oboe (Van Cleve 2004) and voice (Edgerton 2005).
[30] Rehfeldt 1993.
[31] Dick 1989.
[32] Yates 1967, p. 180.
[33] Matthews 1981, p. iii.
[34] Matthews 1981, p. 14.
[35] Howell 1974.
[36] Dempster 1979.
[37] Edgerton 2005.
[38] Bassingthwaighte 2002 and Dick 1986 on the flute, Walker 2001 on the vibraphone, Easton 2005A and Kientzy 1999 on the saxophone; Easton 2005B and Rehfeldt 1993 for the clarinet, Henck 1994 and Roggenkamp 1996 on the piano, Hill 1996 on the Horn, Strange 2001 on the violin.
[39] Strange 2001, p. xii. The reasons given are that instrumental theatre would not be “based on sound” and that visual theatre would not be “the initial intent of the composer.” Strange 2001 seems to exclude a number of works by Mauricio Kagel, LaMonte Young and exponents of the Fluxus movement.
[40] As seen by composer Richard Karpen, quoted in Bassingthwaighte 2002, chapter 3. Also in Strange 2001, chapter 7, Easton 2005A, Easton 2005B, Rehfeldt 1993 and Bunger 1981, p. 38.
[41] Bunger 1981.
[42] Roggenkamp 1996 includes playing on partial nodes as well as the prepared piano but without any link between them. Electronics are treated in the sources mentioned in footnote 23, none of which talks about the prepared piano or piano partials.
[43] Roggenkamp 1996, Harrel 1976 and Chun 1982 include the keyboard cluster; Matthews 1981 does not.
[44] Bassingthwaighte 2002, chapter 7. “These are tremolos (trills of a distance greater than a second) in which not only does the dynamic increase, but also the speed of the tremolo itself.”
[45] For the flute in Dick, not for the piano in Roggenkamp 1996. If it is to be seen as an extended technique, then Henck 1994 (“Experimentelle Pianistik”) should be included in an overview of extant literature on the subject.

sometimes even inappropriate. If many terms logically describe actions[46] or are directly linked to or based upon concepts of sound[47] or musical theory[48], there are also onomatopoeias and game call. A few describe physical phenomena[49], others are more like instructions to the player[50] and still others are a mixture of different categories[51] or ambiguous.[52] One category of writings consists entirely of scavenged Italian(-like) musical vocabulary[53]. Even for musicians, many of these labels are hard to understand without further explanation. It is often unclear whether they refer to a technique, an effect, or a more general concept or even a brand of an instrument, e.g. "dirty flute,"[54] "other flute,"[55] "vox-clarinet,"'[56]"vox-sax,"[57] "hyperpiano."'[58] One well-known and popular effect on the piano – producing an overtone by pressing with a finger on a nodal point of a string – is nameless, while the term that would suite it (*flageolet*) is incorrectly used for something else.[59] The specially devised names suggest that these are extensions of techniques, but this is actually difficult to validate through the way they are named, described or explained.

All the available data shows how two perspectives are at work regarding the subject. On the one hand there is the notion of performance practical techniques that are used to make specific sounds; on the other hand there is the larger concept of an instrument being extended. Both views can be distinguished as "extended piano-techniques" vs. "extended-piano techniques," but other than this nuance, there is no ready concept governing the way the whole topic is treated. The lack of demarcation lines along which to carry out research is most palpable in the existing vocabulary. Whether used among composers, performers or commentators, for the piano or any other instrument, in scores or in secondary sources, the terminology at hand is largely deficient in defining general meaning as well as describing specifics.

To seriously study this subject, it is necessary to exactly define it. Then, a theoretical evaluation of the existing information can serve to explain, complete and correct the vocabulary where necessary, taking into account the recognition factor of some of the existing vocabulary.

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[46] Muted tone, pitch bending, pitch sliding, non-synchronous bowing, sustained bowing, circular breathing, flutter tongue, lip buzzing, percussive tonguing, slap tonguing, activating keys or valves without blowing, teeth-on-reed, hum-and-play, touches blocquées, embouchure alteration, hand pops.
[47] Residual tones, Aeolian sounds, violent industrial steam-vent noise, multiple sonorities.
[48] Difference tones, fifth partial, microtone harmonics, unusual harmonics, microtones, multiphonics, spectrofluctuation, Klangfilterung, Klavierflageolett.
[49] Air across barrel, mouthpiece alone, surface preparation, electronic preparation.
[50] Scoop, fall, ghost notes.
[51] Stopped and pulled harmonics, pizzicato harmonics, harmonic glissandi and harmonic trills.
[52] Color fingering, measured vibrato, throat-tremolo, altississimo fingerings, fingered tremolo, exaggerated tremolo, reed percussion, thud and rattle.
[53] Martellato, pizzicato, glissando, tremolo, sul and sub ponticello, sul tasto, col legno, arpeggio (from "arpeggiare": to play the harp), battuto, varied vibrato, smorzato, bisbigliando ("whispering")
[54] Bassingthwaighte 2002, chapter 3, ‘Extended Techniques’.
[55] Dick 1989.
[56] Easton 2005A.
[57] An effect in Easton 2005B. A Vox Saxophone is also known as a particular brand or model of the instrument.
[58] http://www.pipeline.com/~denman/Hyper.html. (Accessed on July 13, 2008.) An edited version of this article was published in the March 1999 issue of Downbeat Magazine (Maher Publications, Illinois).
[59] Schoenberg’s "Klavierflageolett" has nothing to do with a flageolet, which is the sound of a partial made by manipulating the string directly. Roggenkamp 1996 (p. 22-23, 44-45) does not make a clear distinction, referring to the former as "flageolet" while speaking of Schoenberg’s effect as "pianoflageolet" or "overtones."

2.2 Premise

Despite the chaos that governs references to the subject, one characteristic is common to all descriptions of techniques and sounds: they are all improper to the instrument under consideration–they don't truly or strictly belong to it.[60] For example, if the sound of a piano string struck by a hammer is a *property* of the piano, then the sound of a plucked piano string is not. If it is *proper* to play on the keyboard by using the fingers, then hitting the keys with the forearm constitutes an *improper* piano technique.

The concept of improperness suffers from negative connotations illustrated by the usual synonyms (unlawful, unsuited, ill-judged, wrong, etc.[61]) and by the condemnatory reactions from commentators, instrument builders and technicians.[62] Nevertheless, and despite the antagonistic etymology, the original meaning of the word "improper" represents an ethically neutral concept that allows for objective measuring.

This study will therefore consider the extended piano to be the improper performance practical use of the piano, and the characteristics of this concept, i.e. the individual extensions, to be those improper techniques and sounds that fall under the direct control of the performer during live performance.

2.3 The piano proper

To gauge the improper use of the piano, one needs to determine what its proper use is. In other words: one needs to establish the piano's performance practical identity.

Much has been written about the piano, various perspectives have been available for quite some time now. The technological evolution (Good 1982, Lelie 1995), the physical construction (Reblitz 1993), the social positioning (Loesser 1954), the economical context of the piano manufacturing industry (Ehrlich 1976), the repertory (Rowland 1998 and 2001), the playing methods (Kloppenburg 1951 and 1976) and the early history in particular (Pollens 1995, Restle 1991, Lelie 1995, Rowland 2001) have all been put down on paper in great detail. Besides widely distributed books, innumerable articles and academic theses have been produced on most of the aspects of the piano. However, hardly any such publication really defines the identity of the instrument. Some simply state the piano to be a "struck chordophone";[63] others only add the notion of a keyboard.[64] According to *The New Grove Dictionary of Music and Musicians,* the most essential features of the pianoforte are the keyboard and "the fact that its strings are struck by rebounding hammers rather than plucked (as in the harpsichord) or by tangents that remain in contact with the strings (as in the clavichord)";[65] in the organological classification of the Hornbostel-Sachs system, pianos are listed as stringed instruments consisting of a string bearer shaped like a board, with strings parallel to the

[60] As in the first definition in the *Oxford English Dictionary.*
[61] Some sources use the word "improper" for the actual purpose of pointing to these negative connotations, e.g. http://en.wikipedia.org/wiki/Extended_technique (Accessed July 19, 2008).
[62] See for example the article *Down with "Extended Techniques!"* by Robert Dick as part of the National Flute Association Pedagogy Committee's *Selected Flute Repertoire: A Graded Guide for Teachers and Students* (2001), as quoted on http://www.larrykrantz.com/rdick.htm (accessed July 27, 2008). The point of this article is actually to defend extended techniques against the fact that their labeling implicates that they are not normal and thus beyond what is necessary to be taught at schools. Any pianist playing on a prepared piano or indicating the exact place of the nodal points on the strings knows the worried commentaries of the piano technicians.
[63] Good 1982, p. 3.
[64] Palmieri 1994, p. 283.
[65] TNGII, vol. 19, p. 655.

string bearer, a resonator made from slats, hammers and a keyboard.[66] Even the more elaborate of these definitions do not mention aspects such as the touch-sensitivity of the keyboard, the timbre, the essential concept of the damper, or the almost-always-present devices (pedals or stops) to alter the timbre. Such definitions can also fit the player piano, tack-piano and prepared piano, and the more concise ones would allow the piano-harp or even the cimbalom to be included.

To establish the performance practical identity of the piano, we have to reconsider its defining aspects from the performance practical perspective, i.e. as a tool for making sounds.

2.3.1 The piano as a musical performance tool

The properties of a tool[67] lie in its function (what it is supposed to be used for), which is expressed in terms of its instruction (how it is supposed to be used).[68] Sometimes a tool can be identified solely by its instruction: without it, a stick is just an object, but depending on the use it is cut out for, it can be a weapon, a lever, a drill, a hammer, a ruler or a musical instrument.

Tools are engineered for their instruction, their user and the environment in which they are to function. For simple tools (such as the stick), not much adaptation is necessary to provide it with several instructions, and these can be easily changed or switched without altering the object. The more complex a tool's construction, the more it tends to have a specific instruction and the fewer random applications can be proper to it. When the tool is too complex for its parts to be handled directly by the user, an interface can be developed (for example, buttons on a machine). Operating a tool means that the user gives input through the interface; the output is what the tool accomplishes.

Complex tools are typically encased and only leave open those parts that need to interact with the outside world. Professional tools that need maintenance can have closed parts that can be opened by a specialist for cleaning, repairing or replacing parts or for fine-tuning factory settings, etc. The designer can then foresee different types of engagement with the instrument (such as performance, maintenance or recording), each with its own instructions and possibly its own open area, even its own interface. With industrialization, tools have become more and more limited to secondary access – that is, access through an interface. Depending on the level of professional use they are intended for, they can be closed to the point of being throwaway products, destroyed by definition when opened. Instruments intended for professional use generally allow for maintenance, but there is a tendency to safeguard the specific access to that function, making it more difficult for the average user to operate all interfaces.

To apply the concept of a tool and its instruction to our subject will help determine the properties of the piano and measure the ways these are or can be extended. As with any musical instrument, the piano is specifically designed and constructed to produce a pre-

[66] von Hornbostel & Sachs 1914.
[67] As in definition 1.a of the *Oxford English Dictionary*: "Any instrument of manual operation". According to the dictionary, a tool is now usually distinguished from an instrument, which is defined as "A material thing designed or used for the accomplishment of some mechanical or other physical effect" and as "used for more delicate work or for artistic or scientific purposes: a workman or artisan has his *tools*, a draughtsman, surgeon, dentist, astronomical observer, his *instruments*. Distinguished from a *machine*, as being simpler, having less mechanism, and doing less work of itself; but the terms overlap."
[68] For the idea of a musical instrument as a tool, we relied heavily (and gratefully) on Raes 2002, chapter 1, and Raaijmakers 1989, where these phenomenological concepts are further worked out.

conceived sound by playing on it in a pre-conceived manner. Together, both these aspects constitute the proper use of the instrument, i.e. its instruction. The piano is adapted to enable the pianist to provide the necessary input (performance techniques), and it is made to fit different aspects of its intended environment (live performance). The whole is encased and closed, except for the parts that are to be operated by the user. A second level of input is foreseen for maintenance of the instrument, with differences in openness according to the required ease of access.

2.3.2 The original intention: *instromento piano et forte*

As a name for an instrument, "piano" is commonly known to be short for "pianoforte" or "fortepiano," which is derived from the Italian "instromento piano et forte." The earliest indication of the piano e forte concept's instruction is found in the 1700 inventory of the instrument collection of Prince Ferdinand of Tuscany, which includes a keyboard instrument by Bartolomeo Cristofori (1655-1732[69]) with "hammers that produce soft and loud."[70] A decade later, a detailed description of Cristofori's "gravecembalo col piano e forte" was published by Scipione Maffei and is based on an interview with the instrument's actual builder.[71] The crux of Maffei's report – the "first thing" he wants to tell us when describing the instrument – is its hammer mechanism. This action was not thought of in order to produce a mere "soft and loud": Cristofori's design allowed the performer three distinct ways to directly control the sound production. First, the hammer action is made to strike the string

> with that measure of impulse, and that degree of force given by the hand; and hence the sound is greater or less at the pleasure of the player. [72]

Secondly, Cristofori goes on to add

> Also, it can be made to strike with much force, […] even a slight touch will affect it readily […].[73]

Cristofori's hammer action is based on the physical characteristics of compound levers that multiply the force transferred through them. The levers increase the speed and displacement of the hammer, the two factors that determine the force that the string receives from the hammer.[74] It enables the player on the one hand to exert minimum force and still obtain a sound, while on the other hand to apply considerably more force to the string than to the key. Thus the player is provided with a wider dynamic range

[69] For the exact date of death, see Fabbri 1964, p.172, fn. 82. Most sources still cite the originally recorded year of death (1731), but the Florentine calendar must be recalculated to correspond to our present-day calendar.
[70] Pollens 1995, p. 43: "[…] martelli, che fanno il piano, et il forte […]". The earliest reference to "instrumento piano et forte" can be traced back to the end of the 16th century, in letters by the organist and caretaker of the instruments of the court of Ferrara, Hippolito Cricca (a.k.a. Paliarino), and in two inventories of that collection. However, no determining specifics are known as to construction of the instrument Cricca refers to. (Pollens 1995, p. 27-32).
[71] "*Nuova invenzione d'un gravecembalo col piano e forte; aggiunte alcune considerazioni sopra gli instrumenti musicali*", published in the *Giornale dei letterati d'Italia* on April 21, 1711. A facsimile reproduction in full of this article can be found in Appendix 5 of Lelie 1995, pp. 300-308; a reprint is published in Pollens 1995, p. 238-243.
[72] Pollens 1995, p. 240: "[…]con quella misura d'impulsione, e con quel grado di forza, che vien dato dalla mano; e quindi viene il maggiore o minor suono a piacere del sonatore […]"
[73] Pollens 1995, p. 240: "[…]essendo agevole anche il farlo percuotere con molta violenza, […] ogni mediocre impulso fa salire con impeto un raggio di ruota."
[74] Pollens 1995, p. 65. Calculating speed and distance together, Cristofori's 1720 double-lever action converts +/-7mm of key motion into 31-35mm of hammer travel.

than that available in existing mechanisms, which transmit to the string only the exact force that is applied to the key, as in the clavichord and harpsichord.

Maffei further states that

> it was necessary that the hammer, having struck the string, should instantly quit it, detaching itself from it, although the key was still under the finger of the player [...][75]

The reason for this necessity is not given, but simple to deduce and essential to all sound production by way of percussion: the beater that does not leave the hit object immediately after striking diminishes that object's chances to fully resonate. If the hammer of a stringed keyboard instrument is to stay pushed against the string (as in a clavichord), it dampens the string's sound. When the hammer leaves the string immediately after striking it while the depressed key holds the damper away from the string, the player can let the sound continue at its natural level. This feature, known as an escapement, is still part of any piano's action.

Thirdly, besides maximizing the dynamic potential of the string's sound, Cristofori's action was devised to control the ending of the sound as well. This was achieved through the system of the dampers:

> [...] in this kind of instrument, it is necessary to suppress, that is to stop, the sound, which by continuing would confuse the notes that follow [...] it is also necessary in this new instrument to deaden it entirely and immediately [...] [the dampers] prevent the vibration which would be caused by the vibration of other struck [strings] [...][76]

Together, these three aspects of control over the sound – dynamic flexibility at the point of attack, optimum basic dynamic level and cut-off point – are what set the instrument apart. A mechanism that only meets the first requirement but not the second and third is exemplified by the clavichord (which was included in Prince Ferdinand's collection)[77]; a combination of only the first and second aspects is the action for a hammered dulcimer like the "dulce melos" that Arnaut de Zwolle described in 1440;[78] and the combination of

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[75] Pollens 1995, p. 240: "Ma perchè bisognava, che il martello percossa la corda subito la lasciasse, staccandosene, benchè non ancóra abbandonato il tasto dal sonatore[…]"

[76] Pollens 1995, p. 240 "[…] in questa sorte di strumenti è necessario spegnere, cioè fermare il suono, che continuando confonderebbe le note che seguono […] essendo anche necessario in questo nuovo strumento l'ammorzarlo affato, e subito [...] ed impediscono il tremolare, ch'essa farebbe al vibrarsi dell'altre sonando [...]"

[77] The tangent action of the clavichord allows for different dynamics controlled by the attack of the key, and it does so without the multiplication of force by compound leverage. The idea of some form of escapement would have been enough to remove the problem of the clavichord's strings being dampened by the tangent pushing against the string for as long as the key is depressed. There are two reasons why the compound system of levers is crucial to the ideal of "human expression" on a stringed keyboard instrument with a hammer action. First, the multiplication of the force applied by the player effectively extends the top of the dynamic range of the individual string's resonance. As such, the range of the touch-sensitivity of the keyboard is extended: instead of controlling a range from barely audible to soft, as at the clavichord, a pallet of dynamics from soft to loud is possible at the piano. The second reason is also a question of natural physics: as much as the clavichord could command individual dynamics within a certain range, that range was too much on the soft side to begin with. The basic dynamic level of strings struck by hammers without multiplication of the attack force is significantly lower than that of strings pulled by jacks. The low general level of the clavichord was a sacrifice Cristofori did not want to make: his compound leverage action was intended to achieve direct control over a greater dynamic range while at the same time raising the general level from the start.

[78] See Pollens 1995, p. 8-26. De Zwolle's action has a rebounding mechanism, but its purposeful lack of dampers makes it a "keyed dulcimer," an instrument in its own right, and not a piano. The lack of force multiplying levers furthermore limits the control over the attack and the general range of dynamics.

the second and third aspects describes the harpsichord.[79] It may never be certain whether or not Cristofori was rightfully given credit for a "nuova inventione,"[80] but the question of primacy is not of concern here. Compared to other instruments at the time of Cristofori, and judging the further development of the "instrumento piano et forte" until the present day,[81] the combined control over the sound's dynamic flexibility at the point of attack, its optimum basic dynamic level and its cut-off point is essential to the piano's instruction.

Cristofori had a specific reason for developing an action that would provide the performer with multiple controls over the sound. Maffei brings up the musical objective of the organological concept:

> It is known to every one who delights in music, that one of the principle means by which the skillful in that art derive the secret of especially delighting those who listen, is the piano and forte in the theme and its response, or in the gradual diminution of tone, little by little, and then returning suddenly to the full power of the instrument; which artifice is frequently used and with marvelous effect, in the great concerts of Rome, to the incredible delight of such as enjoy the perfection of art. Now, of this diversity and alteration of tone, in which instruments played by the bow especially excel, the harpsichord is entirely deprived, and it would have been thought a vain endeavor to propose to make it so that it should participate in this power. Nevertheless, so bold an invention has been no less happily conceived than executed in Florence, by Bartolommeo Cristofali [sic], of Padua, salaried cembalist of the Most Serene Prince of Tuscany. He has already made three, of the usual size of other harpsichords, and all have succeeded to perfection.[82]

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[79] When the jack of a harpsichord pulls a string, the force and the speed with which the key is depressed have no bearing on the volume with which the corresponding string sounds. The only factor influencing the sound of a pulled string is the distance across which the string is pulled from its resting position to the point where its vibration is set off. That distance represents the maximum amplitude at which the string will vibrate. The bigger the amplitude of the vibration, the louder the string will sound. The absolute maximum amplitude of any string depends on its breaking point, which is determined by the material and the tension of the string. The stiffness of the jack is the only factor that can determine the relative amplitude of a string, i.e. the amplitude at a given moment of pulling a particular string. The stiffer the material of the jack, the less flexibility it has and the more power is transferred to the string, hence the greater distance before it finally yields to the force of its own tension, slides off the jack and starts vibrating. But the stiffness of a jack and the extent of the amplitude to which the string is pulled cannot be changed while playing. Only a hammer action provides the player with an immediate control per string, because the force of the hammer striking the string determines the amplitude of its sound. This force does not depend on the fixed aspects of the mechanism (tension of string, flexibility of materials); rather, it is determined by the speed and distance of the hammer striking the string. In contrast to the physical evidence, the psychology of a performer's perception can sometimes convince him that hitting a harpsichord key hard enough will result in a louder sound than when hitting the key softly with the jack pressed against the string. The noise that accompanies the aggressive hitting of a key may be co-responsible for such an impression. Specific psychophysical research would be welcome to distinguish between subjective experience and physical facts.

[80] Both the 1700 inventory and the title of Maffei's report considered the pianoforte a new invention. A late 16th-century Italian spinet in the Metropolitan Museum of Art in New York was at one time retrofitted with rebounding tangents and dampers (Pollens 1995, p. 34-41). However, the evidence is based upon inscriptions that reveal "Martello" and "anno 1632," but otherwise appear undecipherable. The mid-17th-century Machina Organica, designed by Italian instrument maker Michele Todini and consisting of five musical instruments (a harpsichord, an organ and three small keyboard instruments) was described as "clavicymbalis B C D marculi, quos tastos vocant," with "marculi" pointing to a hammer mechanism, although Todini himself stated that only quills, bowing and air were used to produce sound (Pollens 1995, p. 32).

[81] See Pollens 1995 and Good 1982.

[82] Pollens 1995, p. 238 : « Egli è noto a chiunque gode della musica, che uno de' principali fonti, da' quail traggano I periti di quest'arte il zegreto di singolarmente dilettar chi ascolta, è il piano, e'l forte; o sia nelle proposte, e riposte, o sia quano con artifiziosa degradazione lasciandosi a poco a poco mancar la voce, si ripiglia poi ad un tratto strepitosamente: il quale artifizio è usato frequentemente, ed a maraviglia ne' gran concerti di

Present-day harpsichordists will argue that quick alteration of tone and dynamic is possible not only between separate movements or passages (when stops need to be operated by hands not occupied with playing) but also within phrases (by changing manual or changing register through knee levers). Even crescendo and diminuendo can be simulated by the swell effect of *super legato*, [83] and accents may be mimicked through *rubato* and articulation, all the while benefitting from the sensitive response of the intelligent listeners who "replace losses mentally."[84] Nevertheless, historical information does suggest some frustration concerning the matter of dynamic expression at the harpsichord. Composer and organist Giovanni Casini expressed regrets that “the harpsichord does not fulfill all the expressions of human sentiment” and wished for “the speech of the heart, now with the delicate touch of an angle, now with violent eruptions of passion.”[85] The ideas on how to implement more expressive means in the harpsichord were not confined to the artistic and intellectual high society of Italy for that matter. In France, in 1713, François Couperin (Le Grand) wrote in the foreword to the *Premier Livre* of his *Pièces de Clavecin*:

> The harpsichord is perfect as to its range and brilliant in itself; but, as one cannot increase or diminish its tones, I shall always be grateful to those who, through their infinite craftsmanship sustained by good taste, would be able to make this instrument capable of expression.[86]

A few years later, in *L’Art de toucher le clavecin*, he repeated his frustration:

> As the sounds of the harpsichord are isolated and cannot be increased or diminished, it has appeared almost unbearable, to the present, that one cannot give a soul to this instrument.[87]

One need not labor the point any further here by examining the underlying reasons for these utterances. It suffices to see that "giving a soul to the instrument" was a performer’s concern and that this concern provided the basic link to the pianoforte’s sound in the mind if not the ears of one of its designers.

This particular piano sound was the aim of the original concept of the piano. To achieve that goal, the hammer-damper action was designed, making it a mediated instrument, as there is no direct contact with the material that produces the sound. To adapt this mediator to the user, a known interface was used: the keyboard. In the traditional organological classification, set up by putting the fundamental sound-producing elements

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Roma con diletto incredibile di chi gusta la perfezione dell’arte. Ora di questa diversità, ed alterazione di voce, nella quale eccellenti sono fra gli altri gli strumenti da arco, affatto privo è il gravecembalo; e sarebbe, da chi che sia stata riputata una vanissima immaginazione il proporre di fabbricarlo in modo, che avesse questa dote. Con tutto ciò una sì ardita invenzione è stata non meno felicemente pensata, che eseguita in Firenze dal Sig. BARTOLOMMEO CRISTOFALI [sic], Padovano, Cembalista stipe[n]diato dal Serenissimo Principe di Toscana. Egli ne ha finora fatti tre della grandezza ordinaria degli altri gravecembali, e son tutti riusciti perfettamente. »

[83] Several harpsichordists, e.g. Frans de Ruiter, Ton Koopman and Jan Kleinbussink, have pointed this out to the author in private conversations.

[84] Ehrlich 1990, p. 11.

[85] As quoted in Good 1982, p. 30.

[86] Couperin 1713: “Le Clavecin est parfait quant à son étendue, et brillant par luy même ; mais, comme on ne peut enfler ny diminuer ses sons, je sçauray toûjours gré à ceux qui, par un art infini soutenu par le goût, pouront ariver à rendre cet instrument susceptible d’expression […] » Obviously, Couperin was not yet acquainted with Cristofori’s endeavors. Maffei’s article was reprinted in 1719, Mattheson published a German translation of it in 1725.

[87] Couperin [1716], p. 15: « Les sons du clavecin étant décidés, chacun en particulier ; et par conséquent ne pouvant être enflés, ny diminués : il a paru presqu’insoutenable, jusqu’à présent, qu’on put donner de l’âme à cet instrument. »

of the instruments in a hierarchic sequence, the keyboard comes at the end.[88] Yet, at least from the performer's point of view, the keyboard is as crucial to the piano as its inner workings. If Arnaut wanted to imitate the hammered dulcimer with a hammer mechanism, it was to be able to couple that specific timbre to a keyboard, providing considerable advantages over what Arnaut called the "ordinary and crude" playing method of the hammered dulcimer, with strings that are "struck only with a stick, peasant-fashion."[89] The keyboard allows the performer to produce polyphonic textures with more than two voices, and it simultaneous control of each pitch individually. Ironically, the keyboard is responsible for the transition from the least mediated kind of instrument – percussion – to the most complexly mediated– the piano. For Cristofori as well, the keyboard was not in question when developing his new instrument: the decision to use a keyboard was already made when starting out to develop the idea of the hammer action. Moreover, Maffei discusses virtually every organological aspect of Cristofori's piano but writes not one word on the keyboard, suggesting that Cristofori used a keyboard that was not out of the ordinary.

The design of the keyboard is as complex and ingenious as the hammer-damper action. Some aspects are determined by convention, such as the mapping of pitch onto a left-to-right sequence, or the coloring of the keys. In general, however, design features reflect careful consideration of how the performer will actually use the instrument. The performer is provided with dynamic control over the sound (taking into account the specific force and range of the finger). Each individual key is small enough to let the performer play chords and large enough for the fingers to fit between the accidentals, and of a size that allows fingers to cross over the thumb or even over each other. The capable performer can place the hands efficiently and quickly even without looking. The back of the keyboard is shaped to ensure that the asymmetrical placement of the natural and accidental keys (necessary as an ergonomic consideration for the player) translates into a regular configuration that enables a smooth, mechanically reliable action.

The finger keyboard was no novelty, so Maffei had no reason to go into its details. That may also be why he did not mention any other interface in use at the time. However, two of the Cristofori pianos that are left to us have an additional interface at the performer's disposal: knobs can be turned to laterally slide the entire keyboard and action.[90] Instead of the double strings that are the norm on these two instruments, this "mutation" stop provides a change in the piano's timbre by limiting the action to una corda. As the keyboard is made to fit the average length and width of the fingers, the stops are placed at spots that are convenient while playing on the keyboard, and the force necessary to handle them is measured to be compatible with the capabilities of the hands.

The early piano's complete performance interface, including the mutation stop, was taken over from the harpsichord, as were most of the other properties of the new instrument (except for the action). The whole pianoforte was encased, not only to physically hold all parts together (taking into account the tension of the strings) but with different levels of openness to serve different users and usages. The player's interface was the most accessible, the lid could be opened or closed according to acoustic needs, the tuning pegs were easily accessible only when not playing (as the music stand was meant to be on top of them) and the rest of the construction could only be opened by dismantling the instrument.

[88] Von Hornborstel and Sachs 2002, p. 427. In 314.122-4-8 for the piano and 314.122-6-8 for the harpsichord, "8" represents the keyboard, "4" the hammer action and "6" the plectrum playing action, while the first six digits are the same as the board zithers with a resonator box.
[89] Pollens 1995, p. 22.
[90] Pollens 1995, p. 73. Rowland claims three of the surviving pianos have the una corda stop (Rowland 1993, p. 17).

2.3.3 Genealogical position of the piano

Within the family of musical instruments, the piano's position is near that of several "relatives". When gauging the evolution of the piano as an extension of the original concept, it will be of interest to monitor the manner in which the piano relates to those that it neighbors.

Cristofori's piano was seen as a variant of the harpsichord: it was first described as a gravecembalo that could do piano and forte and Maffei's article often distinguishes the piano from what he called "common" or "ordinary" harpsichords Apart from the hammer-and-damper action, the thicker strings, the resonance holes in the soundboard, and the ways to eliminate the action's noise,[91] Cristofori's pianos were in all aspects indeed a late 17th-century Italian harpsichord. Even the una corda stop recalled the harpsichord's ability to switch between registers. In fact, it is argued that Cristofori made his pianos by just putting a hammer mechanism in a harpsichord.[92] But the piano's sound and action were essentially and conceptually so far removed from those of the harpsichord that it is difficult to draw an absolutely straight genealogical line between the instruments.[93]

In addition to the harpsichord, two other keyboard instruments were closely related to the piano. Like the harpsichord, the organ could only diversify dynamically by either operating stops and/or using a second manual; operating stops also meant the operating hand could not play). The swell in the organ could produce crescendo and diminuendo, possibly even in fine gradations[94] but not quickly enough to give a note an accent, which the hammer action did permit. The clavichord already had a basic, noiseless, hammer mechanism of levers and an escapement to attain the piano's level of expression. The tangent maintained its position against the string as long as the key was pressed, enabling the player to produce effects such as vibrato (Bebung),[95] but at the same time immediately reducing that string's resonance. Until the 18th century, the clavichord was mostly a fretted instrument, which means more than one tangent was used to play on one string, limiting the polyphonic potential. The organ's immobility and the clavichord's limited presence in 18th-century Italian musical life[96] may have been the reasons Cristofori was experimenting with the harpsichord, but they are as close to the piano as the harpsichord in their own ways.

The piano is also closely related to the dulcimer.[97] The hammer-type action[98] mentioned in De Zwolle's manuscript was intended for an instrument he specified as "Dulce Melos" – as distinct from (or as a category of) the "clavisimbalum" for which three other mechanisms (all plucking) were described. "Dulce Melos" is also believed to be the source for the name "dulcimer," a term used from that century onwards.[99] In Germany, Pantaleon Hebenstreit's dulcimer was all the rage. He was known by Gottfried Silbermann, who had made several large dulcimers for him, and who built pianos with a

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[91] Pollens 1995, p. 241: "In tutti I contatti, che vale a dire in tutti I luoghi, dove si potrebbe generar rumore, è impedito con cuojo, o con panno […]" (p. 60: "In all points of contact, which is to say wherever any rattle might occur, it is prevented by leather and by cloth...]")

[92] Unpublished observation by Michael Latcham as cited in Lelie 1996, p.31. Latcham measured and compared the 1722 harpsichord and the 1726 piano, both by Cristofori and both in the collection of the museum of instruments at the Karl-Marx-Universität in Leipzig.

[93] Good 1982, p. 43 claims that "Cristofori's type of piano was derived, as we have seen, from the harpsichord, both in its action and in its shape."

[94] See Williams & Thistlethwaite 2002.

[95] Brauchli 1998, p. 267-274.

[96] Brauchli 1998, p. 136-144.

[97] Kettlewell 2002, p.678. The term "dulcimer" is commonly reserved for a instrument played with hammers; the term "psaltery" is used when the strings are plucked.

[98] See footnote 4.

[99] Kettlewell 2002, p. 678 and Ripin & Wraight 2002a, p. 676.

stop (often referred to as "Pantalonzug") for raising the dampers and allowing the strings to keep sounding after the keys were depressed, thus producing the effect of a dulcimer.[100] Schröter is believed to have built the first piano in Germany, after Maffei's article was translated into German in 1725. He also knew Hebenstreit and built keyed dulcimers, called: "Pantalone."[101] The dulcimer was not a real polyphonic instrument. With only a couple of hammers, one couldn't produce harmonies and polyphonies as one could on the harpsichord or clavichord. But the dulcimer knew no limits in producing any shade of dynamics or any level of dynamic inflection. In contrast to the piano, the dulcimer had no dampers, letting unstruck strings vibrate sympathetically and letting struck strings sound as long as their natural capacity allowed.

Another precursor to the idea of a polyphonic keyboard instrument that could provide the player with controllable dynamic was the Geigenwerk. This instrument produced sustained notes by turning rosined wheels, against which the strings were drawn by the action of the keyboard. The inventor – Hans Haiden – claimed that his 1575 instrument would have been capable of producing all shades of loudness,[102] although this would have excluded the immediate correction in dynamic that, for instance, a player-controlled bow could provide on a violin.

Confusion over the piano's essence is deeply rooted in its conception. Organologically, the instrument is characterized by a dual personality: from the perspective of the vibrator (the string) it is a stringed instrument; from the perspective of the activator (the mechanical action) it is a percussion instrument. By birth it has inherited some harpsichord genes (shape and registers), but most of its character is related to the dulcimer (mallets on strings) and clavichord (hammer action and expressive dynamic pallet).

2.3.4 *The* piano

The complex origins and characteristics of the piano can give the impression that there will never be one kind of piano. In a sense, this has actually been the case. Yet, there are enough common traits in the different kinds of pianos that have evolved from Cristofori's brainchild to distinguish the properties of *the* piano.

After Cristofori, the piano underwent near-continuous development according to changing tastes, needs and interests. The characteristics described above were substantially kept, though mostly improved. Different sizes were developed; changes in materials were thought of and tried out for the soundboard, strings, hammers and frame; variants of the hammer-and-damper action were experimented with. Hand-operated stops evolved into knee-levers and then pedals, with a convergence towards the three registers that are today most common (una corda, sustaining and sostenuto). Ideas for facilitating the tuning, augmenting the dynamic range, coping with increased string tension and enlarging the scope of the keyboard, as well as the layout of the strings, were all patented; previous developments were sometimes temporarily discarded (e.g. Zumpe's square pianos without escapement), the industrial revolution introduced a few standards, and, most recently, the digital revolution had its way with the piano.

Despite many improvements, drastic changes and the increased density of mechanical parts over time, this study will consider *a* piano (or any denominator meant to be a synonym thereof) to be

[100] Rowland 1993, p. 17.
[101] Rowland 1993, p. 31.
[102] Ripin & Wraight 2002b, p. 627-628.

> a boxed chordophone made to produce a struck string sound of which the duration and the attack's dynamic – only limited by the string's natural capacity – can be controlled per note in a polyphonic context through a touch-sensitive keyboard, and of which certain timbral aspects can be changed for all notes at once through the use of a stop.

That this definition can apply to the digital keyboard just as well as to the early pianoforte may be surprising, but in fact, from the principle performance practical standpoint an 18th century Hammerflügel and a digital piano are the same because they are essentially played upon in the same manner and their sound is meant to be (or imitate) that of struck strings.[103]

2.4 The extended piano

Considering the extended piano as the improper performance practical use of the piano during performance, we can detail the characteristics of the concept by offsetting them against the characteristics of the proper instrument.

First of all, we will limit our investigation to the acoustic piano. Digital pianos also allow for improper use (as does any tool), but there is an essential difference: the digital piano is much more a closed instrument than the analog instrument. Apart from using interfaces like the keyboard and pedals (or buttons to operate registers), the performer cannot interfere with the sound that is produced through electronic circuitry. Because of the easy access to the different levels of interfaces on an acoustical piano, many kinds of deviations from the process of making the sound are possible: the pianist can easily open the instrument to bypass the mechanical action and manipulate resonant parts like strings and soundboard. On a digital piano, all access is strictly limited to the performer's interface. Maintenance and repair are possible, but that level of input is open only to those that can (re)program the software or manipulate the hardware, and can hardly lead to musical results during performance.[104] All other improper use (e.g. using the case of the instrument as percussion) is the same as for the acoustical piano.

As stressed before, the extended piano is a concept rather than a physical object. The extensions are a performer's actions and require a proper piano for their realization.[105] Designed changes to a piano's construction, intended to constitute a new property of the instrument (e.g. hybrid instruments), will onyx be considered when extended techniques on a proper piano are known to have provided a historical alternative to the instrument (e.g. in the case of the Luthéal). On the other hand, this study will examine extreme cases of changing the piano's instruction by, for instance, dismantling the instrument during a concert (where every public action and sound can have musical meaning).

This study will also discuss only those extensions that fall under the direct control of the pianist. Player pianos and piano players are not part of the investigation, nor are live electronics that are operated by people other than the pianist. On the other hand, if the

[103] Allowing for differences in timbre between 18th-century pianos as much as for differences in the quality of the samples on the digital instrument.

[104] The difficulty can be illustrated by an anecdote from the author's experience, involving a piece by Kaija Saariaho for which a digital piano needs to be programmed in order to perform quarter tone scales on it. Once, during a production of the piece, it was proven impossible for the composer to provide the necessary information to enable reprogramming the available instrument, which was a model evolved from the one experimented with by the composer while composing.

[105] If a helper is needed, e.g. the page-turner, to realize some effect at the piano, the helper is considered to be a performer.

handling of such sound manipulation is to be done by the pianist during the performance, it will be discussed as an extended technique. [106]

Not all improper techniques result in an improper sound (and vice versa), and not all music written for the extended piano contains only extended techniques and sounds. Music for prepared piano (which requires proper keyboard playing and produces improper sounds) sometimes has a few properly sounding notes; many compositions use clusters among proper chords; many – not to say most – composers write for the inside of the instrument in combination with proper sounds. Thus, the improper use of the piano is a matter of degree to which the piece deviates from proper playing. Categorizing the extensions can show this gradation and can shed light on how far the extensions depart from the piano's identity.

2.4.1 Classification of extensions

2.4.1.1 Limits of the extended piano

Crucial to the concept of the extended piano is the presence of a piano and a pianist in a public performance situation. The absence of either one brings us outside of the subject, e.g. any performance without a piano, or installations of a half dismantled piano without a performance of any kind (cf. Dick Raaijmakers – *Tombeau de Glenn Gould* or Rebecca Horn – *Concert for Anarchy*)[107] or any kind of performance without the presence of a piano that is relevant to that performance.

Within these boundaries, the range of extensions' improperness goes from completely improper to almost completely proper. The latter is due to the difference between an improper interface and the *improper* ***use*** of the *proper* ***interface***: hitting a piano key with the big toe of the left foot uses the proper interface and produces a proper piano sound, but since it is ultimately improper playing, it is still within the confines of the subject. Completely proper use, of course, falls outside of the concept. Completely improper is when the technique and the resulting sound are both improper. The extreme of improperness is the lack of sound and interface, with only theatrical actions making out the performance.

Many different kinds of extensions can be imagined and found, relating in different degrees to the proper piano and its use. This study will list examples in order of their grade of improperness (low to high).[108] This list can only present a modest view of the possibilities: to be exhaustive is unrealistic, as in practice the range of such techniques is limited only by the imagination of the composer. Henry Cowell once claimed that he counted up to 165 ways of playing on the inside of the piano before giving up counting.[109]

[106] Those extensions of the piano that are outside of the pianist's control will be treated in passing when they can help sketch the historical contexts.
[107] The examples are listed by name of the composer and with the title in italics. Dates are not mentioned here – each of the examples will be discussed in the chronology in the next chapter.
[108] Each extension is accompanied by its commonly used name or, if no such name exists, by an example from the repertoire (non-exhaustive).
[109] Lichtenwanger 1986, p. 124.

2.4.1.2 Degrees of improperness

2.4.1.2.1 Low-grade extensions

Extensions can consist of the proper piano sound and the proper interface, while playing on the interface in an improper manner.

The keyboard is designed to allow one finger to strike one key at the time with a vertical movement. Deviating from that principle, we find

- One finger gliding over keys
  (Glissando)
- More than one finger striking one key at the same time
  (Béla Bartók – *Suite* opus 14)
- One finger striking more than one key at the time
  (Finger-cluster)
- Another body part striking more than one key at the time
  (E.g. fist-, palm-, forearm–clusters)
- Another body part striking one key
  (E.g. the nose in John Zorn - *Carny*)
- Striking the keys so lightly that sound is not guaranteed
  (John Cage – *Europera V*)
- Striking the keys with force *after* the point of escapement is reached, resulting in extremely soft but guaranteed sound[110]

Like the keyboard, the pedals can also be played upon improperly while still using them to (help) produce a proper piano sound, e.g. by blocking them with an object instead of with the feet. (Henry Cowell – *The Banshee*)

2.4.1.2.2 Medium-grade extensions

Two medium-grade extensions can be distinguished: producing a proper sound through an improper interface, or an improper sound through the proper interface.

The proper piano sound is very much connected to the interface. The efficiency of the hammer-and-damper action to achieve that sound is such that any alternative way of producing that same sound is difficult and superfluous, hence rarely encountered. A few extended techniques can reproduce some of the properties of the piano sound, though, such as:

- Playing single notes directly on the strings with a soft percussion stick. Using the damper pedal in combination with this technique, the player can cause the sound to vibrate along its natural course. The control over the attack and the end of the sound are the same as with proper mechanical action.
  (E.g. Lucia Dlugoszewski – *Desire Caught by the Tail*)
- Muting of a string or strings by hand instead of by the damper action.
  (E.g. George Crumb – *Little Suite for Christmas A.D. 1979*, 1st movement, The Visitation)

[110] We have not found any example of a score explicitly requiring this technique, but Henck 2004, p. 86-87 shows excerpts from Josef Matthias Hauer's *Nomos* and Hans Otte's *Das Buch der Klänge* as examples of where the technique could be used.

Many kinds of changes can be made to the basic sound-producing elements in a piano, which are then activated by using the proper interface(s):

- Putting objects between the strings of a single chorus
  (Prepared piano)
- Leaving objects to vibrate on the strings
  (E.g. paper in George Crumb – *Makrokosmos II, Morning Music*)
- Putting objects in between the hammers and the strings
  (E.g. a keyboard-long strip of felt in Stefan Van Eycken – *(just like) starting over*[111])
- The use of live electronics, controlled by the performer
  (E.g. Karlheinz Stockhausen – *Mantra*[112])
- Silently depressing keys to open strings so that they can sympathetically vibrate with other strings that are activated properly
  (E.g. Karlheinz Stockhausen – *Klavierstück IX*)

2.4.1.2.3 High-grade extensions

High-grade extensions are improper in sound as well as technique used. Most of them leave aside the proper interface (the keyboard) and bypass the mediating function of the hammer-and-damper action, using body parts or objects to play directly on parts of the piano.

Body parts such as the fingertip, fingernail, knuckles, palm, fist, etc. are used to

- Strike or scratch or glide over strings
  (E.g. George Crumb – *Makrokosmos II*, 9th movement *Cosmic Wind*; Henry Cowell – *The Banshee*)
- Strike the frame
  (E.g. George Crumb – *Makrokosmos II*, 10th movement *Voices from "Corona Borealis"*)
- Glide over or to pinch the tuning pegs
  (Helmut Lachenmann – *Guerro*)
- Strike the keyboard lid
  (John Cage – *Nowth upon Nacht*)
- Pinch the lip of the keys
  (Helmut Lachenmann – *Guerro*)
- Strike the pedals with the feet
  (Kagel – *Unguis Incarnatus Est*)
- Strike the underside of the keyboard
  (E.g. John Cage – *A Flower*)
- Press a nodal point on a string while activating the string through the keyboard or pizzicato
  (E.g. Henry Cowell – *Sinister Resonance*)

Objects have been prescribed to

- Strike or to glide over the strings
  (E.g. beaters in John Cage – *Imaginary Landscape 1*; glass tumbler in George Crumb – *Makrokosmos II, Ghost-Nocturne*)

[111] The keyboard has to be taken out of the piano to put the strip of felt in place before the performance and to remove it after the performance, but this can (and is intended to) be done by the pianist.
[112] The music can be (and has been) performed with electronics (often digitalized) that are controlled by people other than the pianists, but the original intention was that the pianists would handle the electronics during their playing.

- Glide over keys
  (E.g. coins in Luc Brewaeys – *Requialm*)
- Strike the frame
  (E.g. beaters in John Cage – *Etudes Boreales*)
- Strike the soundboard through the sound holes
  (Henry Cowell – *The Leprechaun*)
- Bow the strings
  (Bowed piano)
- Indirectly activate the string's vibration
  (E.g. David Behrman – *Wave Train*, activating the strings through the magnetism of an E-bow)

A particular high-grade extension is the act of gradually or partly depressing the pedals. The action and its sound appear to still be close to the proper action and sound, but in fact both are manipulated improperly.

Extreme high-grade extensions – most removed from proper use and sound of the piano – involve no piano sound:

- No sound but theatrical actions
  (John Cage – *4'33"*)
- Non-piano sound near the piano:
  - With body parts,
    E.g. foot stomping (Frederic Rzewski – *Steptangle*)
    E.g. singing (John Cage – *Nowth Upon Nacht*)
    E.g. laughing in *MM51* (Mauricio Kagel)
  - With objects,
    E.g. striking the walls of the concert space
    (Frederic Rzewski – *On The Road*)
  - Recorded sound
    E.g. via remote controlled recorder
    (Mauricio Kagel – *Passé Composé*)
- Non-piano sound combined with open strings
  E.g. whistling onto open strings
  (George Crumb – *Makrokosmos II, Voices from "Corona Borealis"*)

In some cases the extended piano needs two performers to operate the proper interfaces *while* manipulating the strings directly.

- One pianist at the keyboard while the page turner presses objects onto the strings (George Crumb – *Makrokosmos IV*, 4th movement *Delta Orionis*)
- One pianist standing in the curve of the piano casing to play on the strings while another person depresses the pedal (e.g. Henry Cowell – *The Banshee*)
- One pianist pressing nodal points of strings while a second pianist plays chords on the keyboard to achieve polyphonic harmonics (Eric Oñia – *Jodeln*)
- A percussionist playing on the inside of the piano while the pianist at the keyboard plays clusters (Mauricio Kagel – *Transición II*).

2.4.2 Perspectives on the extended piano

The degrees in which the extended piano deviates from the proper instruction of the piano can be gauged from other angles also. The proper piano is a complexly mediated instrument. The conceptual distance between the performer and the actual proper sound production is among the longest known for any musical instrument. It should not be surprising that extensions are intended to compensate for that fact. By far most of the characteristics of the extended piano have to do with a sound that is made in another way than via the hammer-and-damper action. But while no mediation at all (i.e. producing the sound directly by activating a resonator with parts of the performer's body) is most common, it is not the only way in which extensions seek to avoid the mechanical action. Many sounds of the extended piano are made by using objects to extract sounds from parts of the piano. In many instances, these are beaters, and their use shifts the identity of the piano towards that of a percussion instrument, even more so than the hammer action already does. To use the piano as if it were a percussion instrument comes naturally, especially given the size of the instrument and its many resonant parts that can be used for making a sound. Equally easy to understand is the fact that a sizeable number of extensions are related to the performance practice of other stringed instruments. Bowing piano strings is not the most common improper use of the piano, but pizzicati, glissandi and harmonics may be more popular at the extended piano than straightforward percussion techniques.

Aside from the percussion and string instruments, some improper approaches towards the piano end up creating a new instrument, such as the bowed and the prepared piano. Just as the proper piano has enough personality to not have to consider it as a kind of a harpsichord or clavichord, the bowed and prepared piano are extended instruments in their own right. Their potential for novelty in sound production is such that they are not ersatz, but legitimate, complete concepts of a musical instrument.

Since most of the extensions are aimed at bypassing the piano's hammer-and-damper action, the characteristic that sets the piano apart from other stringed keyboard instruments, many improper piano techniques are not unique to the piano. Almost all of the low-grade and all of the extreme high-grade extensions are possible on the harpsichord, clavichord and organ. Some of the direct playing on the strings is also possible on the clavichord (e.g. harmonics) and those string-playing techniques that need open strings to resonate (e.g. pizzicato, glissando on the strings) can be executed on clavichords and harpsichords after the relevant key has been depressed and before it is released again.

A few techniques that we consider here as extensions of the piano playing technique, like singing, laughing or operating machinery while playing, have nothing to do specifically with the piano and are universal extensions.

When a tool is separated completely from its instruction, it becomes an object, like a stick of unknown use. Some extreme extensions lose the differentiation between handling the piano as a musical instrument or as an everyday object, e.g. when the performer's actions are theatrical and use the piano as a stage prop.

2.4.3 Extra nomenclature of the extended piano

A few composers have come up with names for the way they extend the piano in some of their compositions. Henry Cowell referred to some of his works as "for piano strings," "for Keyboard and Strings" or "for String Piano," even though most such pieces included

proper playing as well extended techniques. For one composition – *The Leprechaun* – Cowell differentiated between string and percussion playing:

> the devices used in the String and Percussion Piano (which is an ordinary piano but operated inside, on the sound board):
> 1. Picked strings (with a pick [plectrum])
> 2. Plucked strings (with a finger)
> 3. Swept strings [i.e. glissando on the strings]
> 4. Struck strings (tapped with various implements)
> 5. The bars, soundboard, sound post, lid, and frame tapped with various implements (rubber-headed drumsticks, plectrum, pencil, darning egg)[113]

The "percussion piano" does not seem to have returned after this one instance, at least in that form, although he wrote several other pieces with those tapping techniques. For the techniques that are used to activate string vibration directly with the fingers, Cowell never settled on one term, using "for piano strings" and "string piano" without apparent preference for either. Cowell never used a specific term for referring to the piano when played with keyboard cluster technique.

Before Cage decided on the "prepared piano," he had taken over "string piano" from Cowell – his teacher – as the term to denote his way to extend the piano. As in Cowell's *The Leprechaun*, Cage's string piano did not always strictly differentiate between playing on the strings or other techniques. For *Bacchanale* only prepared piano strings are used, and in some pieces for string piano both prepared and non-prepared strings are used, from which properly as well as improperly produced sounds are extracted. Once Cage stuck with "prepared piano," he did not return to "string piano," not even when playing directly on the strings was required.

In the 1950s, Pierre Henry and Pierre Schaeffer both spoke of the prepared piano but also mentioned "le piano complet" resp. "le piano à bruits." In the same decade, Lucia Dlugoszewski developed her approach to the piano, calling it "timbre piano." Most of the techniques applied by these three people involved objects to manipulate and/or prepare (in advance or on the spot) the piano strings.

George Crumb used referred to "extended piano" only in performance notes. For titles of compositions, he often used "amplified piano," which does not relate to any extended techniques but to a consequence of their use (i.e. soft sounds of playing on the strings may need to be amplified to be heard in large concert halls).

Except for "prepared piano," none of these terms has lasted after the inventors died. All of the techniques and concepts have lived on in the works of innumerable composers, but those compositions are almost exclusively published as "for the piano." This practice shows how instrumental dedication typically refers to a physical instrument used for performance and not to a concept of performance practice.

[113] As quoted from the program of the 1929 first performance in Boston. (Lichtenwanger 1986, p. 124.)

2.5 Individual extended techniques

The glissando and the cluster are the oldest and most well known of all the improper techniques, yet the critical literature mostly foregoes any detailed discussion of the identity, characteristics and terminology.[114] Similarly, the acoustics of "open strings" is traditionally limited to cursory treatment of silently depressed keys or Schoenberg's Klavierflageolett. For these extended techniques – and the prepared piano – it is worthwhile, necessary even, to investigate the theoretical foundations, bring into focus some of the peculiarities that characterize them, and (re)defining their identity.

2.5.1 The piano glissando

2.5.1.1 Etymology

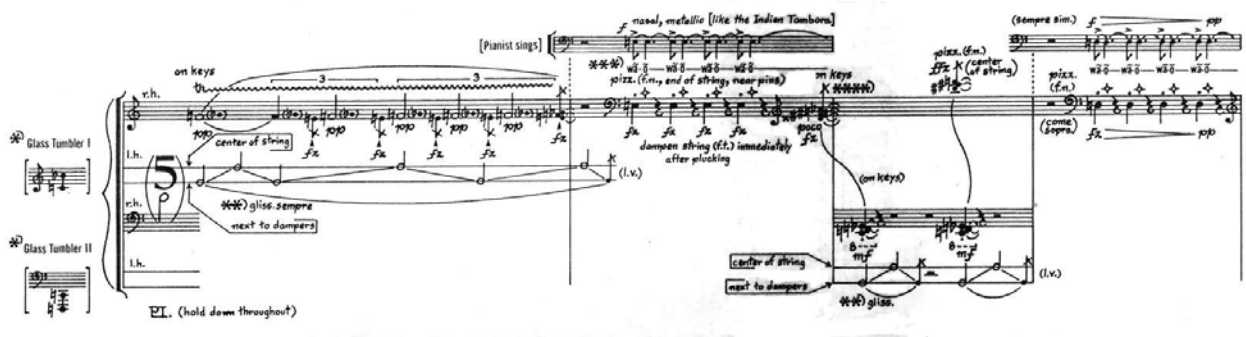
The word glissando is a hybrid form of the French "glisser" (to glide or slide) with an Italian present-participle ending.[115] In a few works (e.g. opus 60 n° 4 by Joachim Raff) we found "glissato", which would be the past participle form of the verb, some French composers used "glissez" ("glide") or "glisser" ("to glide").

2.5.1.2 On the nature of glissandos: a question of interfaces

If glissando means "gliding", the question we need to ask is: what needs to be gliding in order for it to be a glissando? As with many extended techniques, it can be the action (the technique of gliding) or the effect (the gliding sound). In this case, technique and effect are not automatically linked to each other in any causal way. With some instruments, such as the violin and the trombone, the action as well as the sound glides. For other instruments – e.g. the voice – the pitch glides, but no bodily part executes a gliding movement. With yet other instruments, such as the piano – it is only the action that glides whereas the movement of the pitch is nothing less ordinary than a diatonic scale (if gliding over the white keys) or a pentatonic scale (when gliding over the black keys).

The New Grove Dictionary differentiates between *glissando* as a gliding over pitches and *portamento* as gliding between pitches. The former is typical for the piano and harp, the latter for e.g. the violin, clarinet, voice, trombone and timpani. It is argued that these latter instruments can produce a glissando but that this is far more difficult for them.[116] For the violin, some distinguish between "expressive glissando" or "portamento" (a slide during which the intervening notes cannot be discerned) and a 'chromatic glissando' (individual pitches are heard during the sliding action). Other instruments, however, cannot execute a slide from pitch to pitch because the instruments semitones are fixed. This is the case for glissandos on the piano's keyboard. It is possible to really bend the tone of the piano, but only by playing on the strings: in *Ghost-Nocturne* (the fifth part of *Makrokosmos II*, 1973), George Crumb prescribes the technique of playing a trill on the keys while rolling a pressed down glass tumbler over the corresponding strings, which results in bending the pitch of the trill. He also indicates this technique as "glissando." (Ex. 2.1.)

[114] Herbert Henck is the exception, with Henck 1994 and 2004 treating the glissando, resp. the cluster.
[115] Grove5, vol. III, p. 671
[116] Boyden & Stowell 2002, p. 14.



Example 2.1. G. Crumb: *Makrokosmos* (1973), volume II, 5th movement *Ghost Nocturne*, opening bars.[117]

Next to the glissando as a fingered keyboard or string playing piano technique, the name is used for other gliding techniques executed on the pegs or on the keyboard with an object instead of with the finger. When using an object to *caress* the keys, i.e. without depressing them deeply enough for the hammers to strike the strings, this is called "guiro" or "guero" by the composers in whose work we have encountered this technique[118]. The sound emanates from the friction between the object and the keys it touches (hits) while gliding over the keyboard. There is no gliding of any pitch with this technique, either. One particular technique involving accessories requires the pianist to make circular movements on the keyboard with a piece of cloth, dusting the keys as it were.[119]

In some particular cases, the glissando playing technique can result in sounds that are not readily associated with any gliding. When holding a chord on a clavichord, the tangents push the corresponding strings upwards for as long as the keys are depressed. When gliding over the strings, only these particular strings are touched as they are sticking out. If a dominant seventh chord is held in this way, and a finger glides over the corresponding strings, one will hear an arpeggiated dominant seventh chord in *pizzicato*. When hearing the sound, one will not immediately think of a glissando. This is the case with a sonata by Wilhelm Friedrich Rust. (See 3.2.5.2.1.) Along the same train of thought, one sometimes cannot really hear whether or not a diatonic scale on the keyboard is played by a gliding finger or by a very well balanced individual fingering technique. Other examples of glissandos that do not sound like anything gliding include the glissando on the keyboard of a piano that is prepared with more than one type of material, or over a keyboard of which some of the keys are blocked. (See below, 2.5.1.5.)

Some commentators claim that "by their nature, both types of sliding [glissando and portamento] must be legato and relatively rapid."[120] We can agree with the aspect of legato only in as far as portamento is concerned, because a slide from one pitch to another is indeed legato by nature of the tone production. As for glissandos on fixed-pitch instruments such as the piano, the nature of the glissando does not command it to be legato. At least not if we leave out the working of the sustaining pedal and if we understand legato on a keyboard instrument to consists of overlapping articulation, i.e. a finger depressing a key and not releasing it until *after* the next note is played. The sooner the first finger is lifted, the less legato there is. The borderline between this keyboard legato and non-legato is difficult to establish because legato has a second, more general meaning: any way of playing consecutive notes without a "gap" of sound in between two notes. On a keyboard, however, with its decay in sound as soon as the

[117] Edition Peters 66539b. Reproduced by permission.
[118] As in *Requialm* by Luc Brewaeys (1989) and Helmut Lachenmann's *Guero* (1970/88).
[119] As in Michael von Biel's *Klavier-Duo Nr. 2* (1965).
[120] Boyden & Stowell 2002.

string is struck[121], there is only one kind of legato, and that is achieved by overlapping articulation. When playing a glissando, it is in fact impossible to have a finger sustain a note until after the next note starts to sound, because only one finger is used to play all notes. Therefore, it is in the very nature of the glissando on a keyboard that it is *not* legato. It is non-legato at best. We also do not agree with the idea that glissandos have to be "relatively rapid." A slide can be just as slow as the instrument and the player's technique can sustain the sound.

A second essential difference between the keyboard glissando and the glissando for other instruments like the violin, voice and trombone, lies in the nature of the instrumental interface. The piano's keyboard consists of fixed notes and cannot make a sliding sound. Therefore, there is no real difference between an individually (well) articulated run and a glissando on the keyboard. For instruments with a continuous interface, like the violin, trombone and the voice with several notes per string/column of air/breath, chromatic & diatonic scales are actually unnatural.[122] The so-called "chromatic glissando" for violin[123] is in fact simply a one-fingered individually articulated run.

Except for pitch-bending by manipulating the strings as in Crumb's *Ghost-Nocturne*, glissandos on the piano are a question of gliding *actions* rather than *sound effects*. Therefore the piano glissando is really only an ergonomical alternative to an individually articulated kind of run. Consequently, the indication in scores of the required performance mode is vital in determining whether or not glissando or individual articulation is in order.

For convenience's sake, we will consider the technique rather than the effect, and refer to a piano glissando as the gliding action, on the keys as well as on the strings. The actual gliding between pitches, e.g. when playing with the cocktail glass on the strings (as in George Crumb's *Makrokosmos II, Ghost-Nocturne*), will be called "pitch bending." Extremely fast chromatic runs, as can be performed by player pianos, may have the speed and even some audible characteristic in common with the most typical of glissandos but are essentially only runs, not glissandos.[124]

2.5.1.3 Conceptual vs. performance practical provenance

Probably having the closely related meanings of glissando and sliding in mind, one researcher has stated that the (keyboard) glissando "is an offshoot of the 'slide' (*Schleifer*),"[125] an ornament "which slides rapidly and smoothly through its two conjunct accessory notes to its main note."[126] (Ex. 2.2.) Thus the glissando is supposed to have started out as an ornamental figure and that, somehow, it evolved into something new that was then called glissando. There is no evidence of any of these assumptions.

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[121] This is so for the harpsichord as well. Added to this should be remarked that a third type of legato is used on the harpsichord, called "over-legato", i.e. holding a key even longer, possibly during more than one of the following notes.
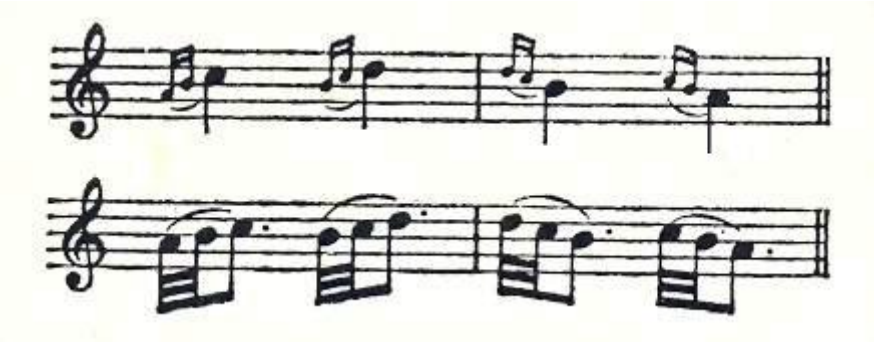
[122] Hence the many years necessary to master playing "in tune" on such instruments.

[123] Boyden & Stowell 2002.

[124] Henck 1994, p. 87 reproduces an excerpt from the manuscript of *3 Originalstücke für das Welte-Mignon=Klavier* (1926) by Ernst Toch, in which a "chromatisches glissando" [sic] is indicated (consisting of 41 notes in three beats at M.M. 96), and a fragment of a similar run in Conlon Nancarrow's *Study #40 for 2 Player Pianos* from the 1970's.

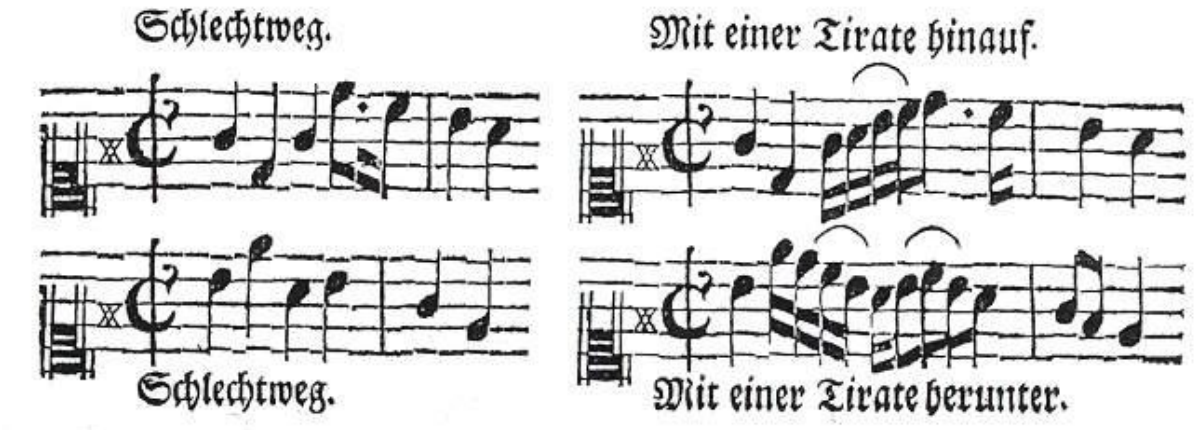
[125] Lin 1997, p. 14.

[126] Donnington 1989, p. 217.



Example 2.2. Fr. W. Marpurg: *Die Kunst, das Clavier zu Spielen* (1750), descending and ascending *Schleifer*.

If the glissando were to have come from an embellishment or from any specific figuration, it would rather have been from the *tirata*, one of the baroque ornamentations "grouped together under the loose heading of passing notes" or “connecting two disjunct main notes by a more or less conjunct movement”[127]. More specifically, the tirata (*run* in English, *cascata, tirade, coulade* in French) was "a series of passing notes connecting two disjunct notes more than a third apart."[128] Less than a third would have been a slide whereas tiratas "border on free ornamentation."[129] (Ex. 2.3.) But just as a run is too basic a type of passagework to define its root as coming from any specific ornament, just so should one refrain from defining the glissando as a type of figuration. Any and every run can be traced back to the tirata, but only C major (or F# pentatonic) runs can be glissandos.



Example 2.3. J. Mattheson: *Der Volkommene Capellmeister*, example (at § 45) of passages, "un-ornamented" as well as with a Tirata upward and downward.

Considering the nature of the piano’s interface, we would rather point to the ergonomical quality of the keyboard glissando as the clue for where it might have come from. The first glissandos we will encounter in the history of the keyboard repertoire cannot be distinguished from individually articulated runs and are used interchangeably.

The reasons for which the glissando was first thought of were most certainly practical. Gliding over the keyboard comes at least as natural as playing on it by individual articulation, especially for runs that are so rapid that expert dexterity is required to obtain the equality and regularity of touch that a glissando provides without effort. After
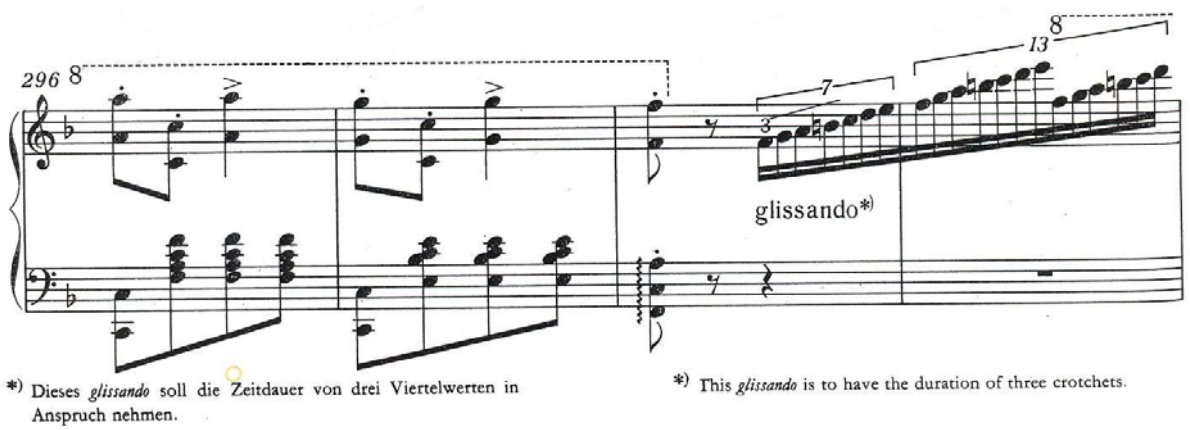
[127] Donnington 1989, p. 268.
[128] Donnington 1989, p. 269.
[129] Donnington 1989, p. 269.

all, the C-major scale is not the one with the easiest fingering: there are no black keys which can serve as a bridge under which the thumb has ample space to easily move about the keyboard. That every child's natural urge to glide over the keyboard is forgiven more readily than when a professional looks for it as the easy way out is merely a question of taboo. Once that has been broken, the glissando is a way of fingering just as acceptable as individual articulation.

2.5.1.4 Morphology and ergonomics

2.5.1.4.1 Touch

There are some remarkable and important differences between an individually fingered run and a keyboard or string glissando with the same notes. With proper fingering every note of a run – from the very first to the very last – is executed with individual control of the touch, i.e. each note can receive an accent or be used to form a rubato within the run. With the glissando, this is only partly the case. While rubato is possible, since the gliding action can slow down or accelerate, the glissando can have no metric or rhythmic accentuation during the gliding. Any notation suggesting otherwise (ex. 2.4) is misguiding and can only be used to clarify in what part of a bar the glissando needs to be performed.

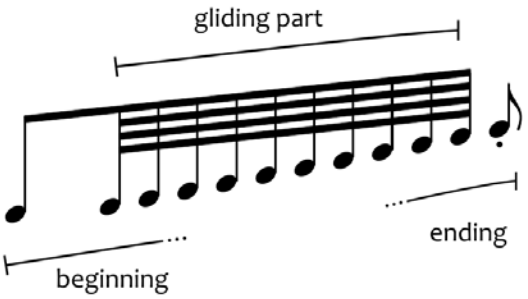


Example 2.4. Franz Liszt: *Hungarian Rhapsody XIV* (1853), bar 296-299.[130]

2.5.1.4.2 Beginning and ending

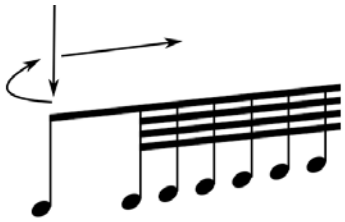
On the keyboard, many glissandos are written to fill up a distance between two notes that are intended to sound distinctly, often indicated by an articulation marking (accent, staccato dot), bolder print (with the gliding part in small print) or a rhythmically prolonged first note. Such beginning- and ending-notes are the pivotal points on which the hand is to reposition itself to switch from regular playing to gliding and back to individually articulation. We will consider such pivotal notes as "closed" beginnings and endings. (Ex. 2.5.)

[130] New Liszt Edition, Series I, Volume IV; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.



Example 2.5. Morphology of a typical keyboard glissando.

Switching between the two modes of playing requires a certain amount of time to achieve the actual change of position. (Ex. 2.6.) The gliding part also requires a certain momentum to guarantee the right amount of pressure on all the notes of the gliding part. If speed and pressure are not steady from the very first notes of the gliding part onwards, those notes may not sound. Similarly, if the change of position at the end of the gliding part is carried out too soon, the last few notes of the middle section will get lost as the hand moves upwards to turn towards the proper position for individual articulation. (Ex. 2.7.)



Example 2.6. Changing hand position at the beginning of a glissando.
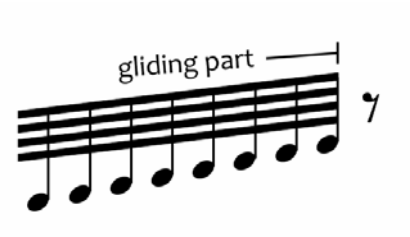


Example 2.7. Changing hand position at the end of a glissando.

It is possible to avoid loss of notes in the gliding part of a two- or three-part glissando when the change of hand position is left out and the beginning- and/or endnotes are individually articulated with the hand kept in the gliding position. (E.g. ex. 2.8.)
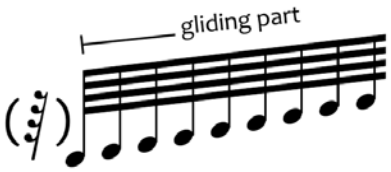


Example 2.8. The end of a glissando without change of hand position.

Of course there are glissandos that only consist of a gliding section or a gliding section with only an individually articulated beginning *or* ending. We can consider those to have an "open" beginning and/or ending. (Ex. 2.9. & 2.10.) While these do not look out of the ordinary, their particular morphology is audible, especially at the end. In theory there is no physical law or psychological impulse that needs a glissando to start and end fast (nor is it said that the middle section should be without any form of rubato). It is therefore quite possible that a closed-beginning or –ending glissando starts or ends slowly enough for not making an audible difference between the two hand positions and the change in between them. On the other hand, an open-beginning and -ending glissando can be executed with the gliding hand position from the very first note. By aiming to hit that first note in the gliding position and immediately starting to glide, no notes need be lost. However, as there is most often time to prepare for an open-beginning glissando with a gliding or "flying" start (requiring a downward movement of the hand, immediately followed by a lateral movement), to end it in this way is much more difficult. Stopping a gliding movement at a specific key entails an immediate halting of a momentum in the space of the width of such a key, which is less than 2.5 cm on a contemporary keyboard. What happens in most cases is that the hand is lifted upwards to stop the sounds without having to brusquely stop the movement. (Ex. 2.11.) Many (if not most) glissandos end away from the middle of the keyboard, and therefore at a place where the pianist does not have exact and full sight of the ending-note since his hand is in the way of his eye's focal point. The loss of notes at the end of such a glissando is almost unavoidable.



Example 2.9. Open-ended glissando.



Example 2.10. Open beginning of a glissando.



Example 2.11. Movement of the hand at the open end of a glissando.

On the strings, lateral glissandos (crossing consecutive strings or string choruses) can in principle be of the closed kind, with beginning and ending played as particularly stressed pizzicatos. We have not encountered such three-component string-glissandos, however.

2.5.1.5 Timbral characteristics

Glissandi can have different compositional functions, depending on when and how they are put to use in a musical structure. We will handle this aesthetic aspect in the next chapter, but some of the characteristics of the glissando already discussed here are essential to the way some of those functions can be developed.

Early glissandos are hardly anything more than part of the melodic material. The difference between proper and improper technique is merely a matter of choice, e.g. mood (as in Pasquali – see next chapter) or dexterity (e.g. octave runs at high speed) rather than that it has a distinctive sound.
The pivotal points of a three-component glissando are often notes in a melody and the gap between them is filled up with the glissando. In such instance, the gliding part itself is *not* melodic but an ornament like the tirata and other kinds of passing notes. This can have consequences for the interpretation, as speed and pressure can result in a wash of sound very much unlike that of an individually articulated run. Leaving out the pivotal points altogether also gives way to impressionistic timbres because the beginning and ending are much less clear due to the lack of properly articulated notes.

Rapid glissandos loose some of their tonal identity, and such unpitched timbre is sometimes used to fit non-tonal environments. One particular type of glissando could perhaps be considered as a "timbre-glissando": a simple keyboard glissando on a prepared piano will only rarely sound like the common glissando. Only if all preparations are of the same material, and if that material still leaves some of the original timbre to be discerned (as does for instance weather stripping), each tone on the keyboard will have the same kind of timbre and a glissando over them will sound like the common glissando: an upwards or downwards sequence of sounds. If the preparations are diverse in their mutational effects, as in the fourth interlude of John Cage's *Sonatas and Interludes*, a glissando is more like what composer Michael von Biel called a "noise chain."[131] With a heterogeneous preparation, the glissando looses its typical connection to the three-way set-up of the keyboard. Without preparations, even when played quickly (loosing the perception of the individual tones), the sound of a black-key, white-key or chromatic glissando is recognizably different. Preparing the piano strictly according to the white-key/black-key layout can restore this three-way division of timbre on what is then basically a two-manual percussion instrument.[132] In the line of such "scordatura" idea, combining keyboard glissandos with finger mutes (producing harmonics on the strings) or gliding over the keyboard while blocking some of the keys leads to sound sequences that are closer to arpeggios than to the common diatonic, pentatonic or chromatic glissando.

[131] Handwritten comment by the composer in a score of his *Klavier-Duo Nr. 2* (1965). As cited in Henck 1994, p. 97-98.
[132] Henck 1994, p. 98.

2.5.1.6 Types of glissandos

2.5.1.6.1 General terminology

For practical purposes, glissando types are distinguished and separately named according to general aspects of their morphology and ergonomics:

- *Keyboard*-glissando
- *String*-glissando
- *Ascending/upwards* vs. *descending/downwards* glissando
- *Inward* vs. *outward* glissando
- *White*-key vs. *black*-key glissando
- *Nail-, flesh-* or *object*-glissandos on the strings
- *Right*-hand vs. *left*-hand glissando
- *Parallel* or *contrary* motion
- Density-types: s*ingle*-note vs. *double*-note, *triple*-note, *quadruple*-note or *chordal* glissando

Unless specified otherwise, a "glissando" is for one hand and on the keyboard, and a two-hand glissando is written in parallel motion. The density of double-note glissandos is further specified as being in 3^{rds}, 4^{ths}, 6^{ths} or octaves, possibly (theoretically) in 5^{ths}, 7^{ths} or 9^{ths}. Next to triple-note glissandos, quadruple-note glissandos are also possible, theoretically and practically, although we only found these in Johann Nepomuk Hummel's piano method and not in any composition (see next chapter).

As for the length, an X-note glissando consists of X notes *between* individually articulated notes. For instance: a 14-note glissando is one that covers two octaves between its beginning and its end. A 2-note glissando is two notes long; a 1-note glissando does not exist (and so confusion with the density type of a single-note glissando is not possible).

2.5.1.6.2 Special types

Besides the above-mentioned types – single-note, double-note etc. - there exist a number of rare types of glissandos that are worthwhile considering especially.

2.5.1.6.2.1 Micro- and whole-tone glissandos

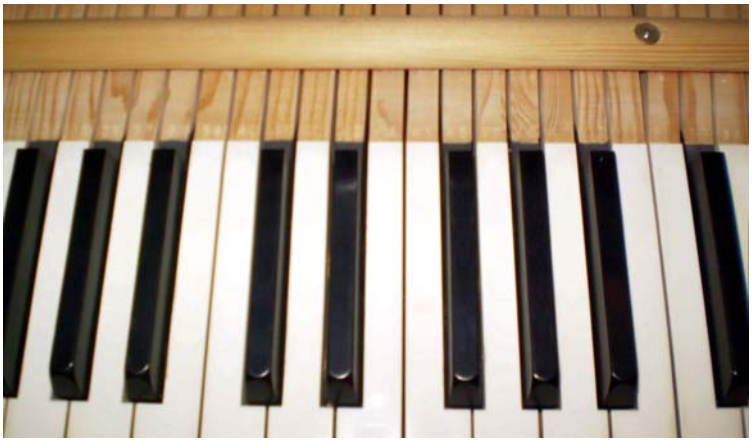
Besides gliding up or down the keyboard, the pianist can also glide with one finger off a black key and onto an adjacent white key. This very low-grade (and very common) extension of the piano technique can be called micro-glissando. Extending this principle, one can play an E♭-E-F or A#-B-C sequence by gliding as well, although the first written example of such fingering has yet to surface. Related to these is the whole-tone glissando (or hexaphonic glissando, as Herbert Henck suggests[133]), achieved by gliding over C-D-E-F#-G#-A#-etc. or C#-D#-F-G-A-B-etc.

2.5.1.6.2.2 (Pseudo-)chromatic glissando

A pseudo-chromatic glissando is a combination of a pentatonic and diatonic single-note glissando, played in the same direction and in close proximity, with two hands or with two fingers of one hand. Historically it was called "chromatic glissando", but since a real

[133] Henck 1994, p. 90.

chromatic keyboard glissando has been developed, it is best to distinguish between both types. The real chromatic glissando – first discovered by Herbert Henck[134] – can be produced by playing on the parts of the keys that lay *behind* the keyboard. The layout of naturals and accidentals on the keyboard is designed to serve the performer; where that playing field stops, at the point where the inside of the piano is closed off by the keyboard lid, the keys are converted back to identical wooden sticks. (Ex. 2.12.) When taking away the lid, the pianist can glide over the bare wood of the keys' back, producing a real chromatic glissando.



Example 2.12. "Back" of the keyboard, with the lid removed.

2.5.1.6.2.3 Density-shift

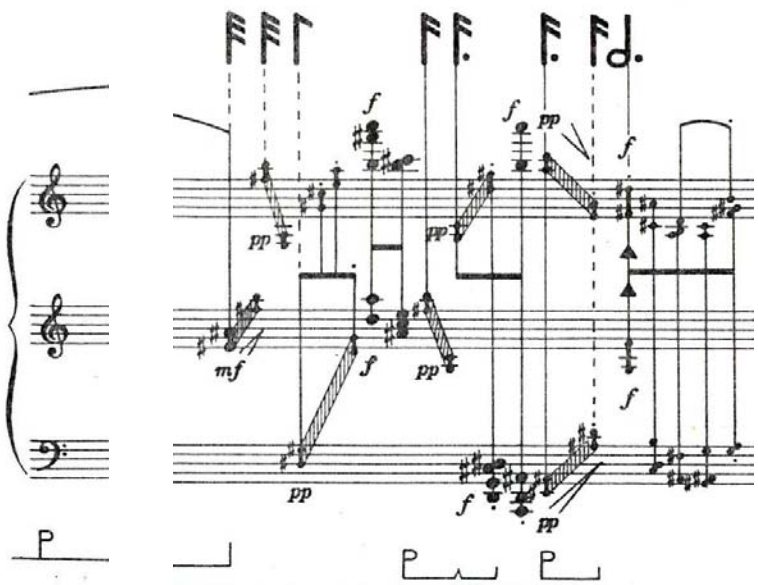
During a double-note keyboard glissando, a density shift changes the interval between both gliding fingers. In this way, a glissando in 6^{ths} can shift to one in 3^{rds} (and back), etc. Even the interval constituted by a pseudo-chromatic one-hand glissando can be modulated (e.g. changing the distance between the thumb on the white keys and the 3rd finger on the black keys in the downward direction).

2.5.1.6.2.4 Cluster-glissando

So-called *cluster-glissandos* – specified by for instance Henry Cowell and Karlheinz Stockhausen (ex. 2.13) – are keyboard glissandos played by the palm of the hand or the forearm and fitted in between the two clusters that start and end the glissando. As the palm or forearm glides over the keys, each newly depressed key will sound only once while immediately being superseded in volume by the attack of the next newly depressed key's sound. Once a key is depressed, it will stay down as long as the rest of the palm or forearm glides over it and decay in volume. Any practical speed will be so high that the decay is minimal, but at the same time this speed will also prevent the keys to be depressed long enough so that they can fuse with the newly depressed notes to form the sound of a cluster. The duration of each key's resonance depends on the surface of the body part used to glide: the forearm will keep each key depressed longer than the palm of the hand. In theory these cluster-glissandos can be diatonic, pentatonic or chromatic. Herbert Henck has considered a chromatic cluster glissando to be an illusion as the gliding section in between will not consist of a continuation of each of the chromatic cluster's notes but in reality merely be the combination of single-note white-key and black-key glissandos.[135] With the sustaining pedal depressed, this is certainly the case: the gliding part of any cluster-glissando - diatonic, pentatonic or chromatic – will then

[134] Henck 1994, p. 90-95.
[135] Henck 1994, p. 75-76.

merely sound like a single-note glissando or (in case of the chromatic cluster-glissando) like a two-finger pseudo-chromatic glissando. However, without the sustaining pedal, the sound of the combined keys that a palm or forearm depresses while gliding over them is distinctly different from any single- or double-note glissando. On the piano, a keyboard glissando of which the notes are depressed with the palm or the forearm cannot be the same as an individually articulated multiple-finger glissando. In the latter case, e.g. when gliding over the keys with five fingers departing from a C-D-E-F-G position, each tone (for instance the G) is repeated every time the next finger touches that key. The result is five superimposed diatonic clusters. However, when the *palm* glides over the piano keys, the only keys being newly depressed are the ones at the forefront of the palm. The other four keys that the palm covers are not repeated but remain depressed for as long as the palm glides over that range. It is the same with forearm-glissandos. Only in theory is it possible to perform individually articulated multiple-finger glissandos; in practice we do not find them, obviously because they are too hard and painful to perform. A player piano can be programmed to perform such a glissando with no difficulty. On the organ, palm- and forearm-glissandos sound differently as when performed on the piano: each tone keeps on sounding at the same level of the newly depressed notes, making such cluster-glissando sound almost like an individually articulated multiple-finger glissando. (See also 2.5.2.3.4.)



Example 2.13. K. Stockhausen: *Klavierstück X* (1956-61), 23/1/1. © With kind permission by UNIVERSAL EDITION A.G., Wien.

2.5.1.6.2.5 Blocked-key and blocked-damper glissandos

Another of Henck's experiments led to blocked-key-glissandos.[136] Black keys can be locked down by putting a rubber tuning wedge between the back of the black key and the keyboard lid; white keys can be blocked by inserting wedges at the front of the key. (Ex. 2.14.) All kinds of arpeggio-sounds can thus be executed at high glissando speed, reminiscent of how different glissando constellations are possible on pedal harps. When blocking every other key on the piano and playing a chromatic glissando, whole-tone runs are sounded.

[136] Henck 1994 (p. 95-96) calls them "Glissandoskalen und –arpeggien" ("glissando-scales and –arpeggios").



Example 2.14. Black and white keys blocked with wedges.

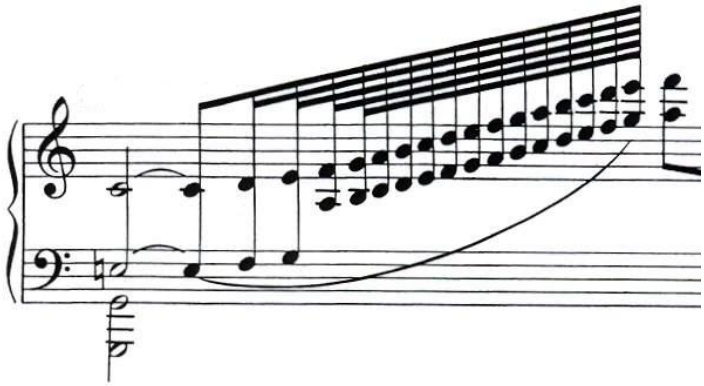
With blocked keys the respective dampers are blocked as well, so that the open strings can resonate sympathetically with the actual glissando sounds. When these are played without sustaining pedal, the sympathetic resonance is filtered from the glissando. Turning this effect around, blocked-damper glissandos can be used to filter sounds of a string-glissando. For instance, when silently depressing a C-E-G chord on the keyboard (by which only the dampers of C, E and G are raised) and then gliding over the strings (encompassing at least the strings of that chord), those three pitches will sound after the noise of the finger gliding over strings has decayed and for as long as the keys remain depressed. Depending on the speed of the glissando, this could be called "pizzicato-glissando", for it is as much a fast sequence of pizzicatos as a blocked-keys-glissando can be considered an arpeggio.

2.5.1.7 Notational issues

From the point of view of notation, the glissando is the most problematic of the extended techniques. As explained before, some sort of indication needs to accompany the glissando in the score for it to be understood as a glissando. As we will see in the historical chronology in the next chapter, the word "glissando" only came into use in the 1820's and before that there was no particular name for it and the technique was described in the score only rarely, e.g. as "sdrucciolato"[137] or "with one finger"[138] or "sliding with one finger" / "gliding."[139] Sometimes the glissando technique was not specifically indicated at all but could be deduced from other notational circumstances such as repeated fingering indications, e.g. *111111* (for downwards single-note right hand glissandos) or *42424242* (for double-note glissandos in 3^{rds}), or one such number for the fingering followed by a straight or interrupted line to show that this finger was used for the rest of the run. Glissando playing can also be deduced from for instance the fact that one hand has a fast parallel double-note run (too fast for individual articulation)

[137] As in Pasquali's *The Art of Fingering the Harpsichord*. The verb sdrucciolare means "to slip", "to slip away".
[138] As in two of Scarlatti's sonatas: "con dedo solo".
[139] Both in different editions of Clementi's 9th waltz opus 38.

while the other hand is occupied with something else so that it cannot play the lower part of the double-note run. Besides technical aspects of the glissando's performing practice, notation of its morphology can also be a give-away for glissando technique. For instance, the build-up of momentum at the beginning of the arm's movement can be notated as a written-out accelerando, like in Mozart's variations on *Lison Dormait*. (Ex. 2.15.)

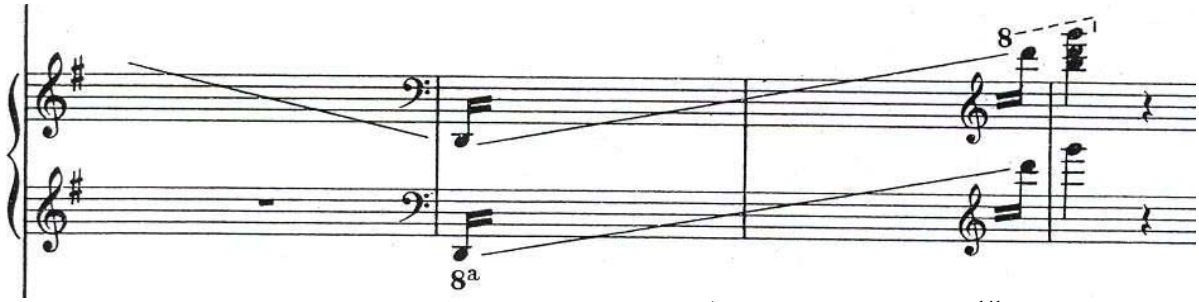


Example 2.15. W.A. Mozart: Variations on *Lison dormait* K.V. 264 (1778), bar "63d."[140]

Nevertheless, there are plenty of instances where we cannot know which keyboard performance technique was intended. (See 3.2.3.) If we discard taboos and perceived habits, any C major diatonic or F# major pentatonic run can be considered a glissando as much as an individually articulated run when there is no direct or indirect sign for either. A similar problem can arise with glissandos on the strings, when for instance in Wilhelm Friedrich Rust's sonata in C he indicates pizzicato for a passage that in fact requires gliding technique. Superficially considered, a glissando seems to be contrary to a pizzicato, but in actual fact a glissando over consecutive strings actually consists of consecutive pizzicatos.

Even after the word "glissando" had become the universal indication, other signs have been used. In the 20th century, a straight line is often drawn to replace the actual notes of a glissando. This makes it easier on the composer and copyist as it eliminates the rather unnecessary writing out of all the notes in a glissando, especially when many accidentals would have to be cancelled so that a white-key glissando can be notated in for instance B♭ minor.

Sometimes a glissando is notated with some of its ergonomical peculiarities taken into account, e.g. in cases where the slide would normally be notated as going up all the way to the last chord, but where the last notes of the gliding section are actually left out because they will not be played anyway since the grip of the next chord needs time to be prepared for. (Ex. 2.16.)



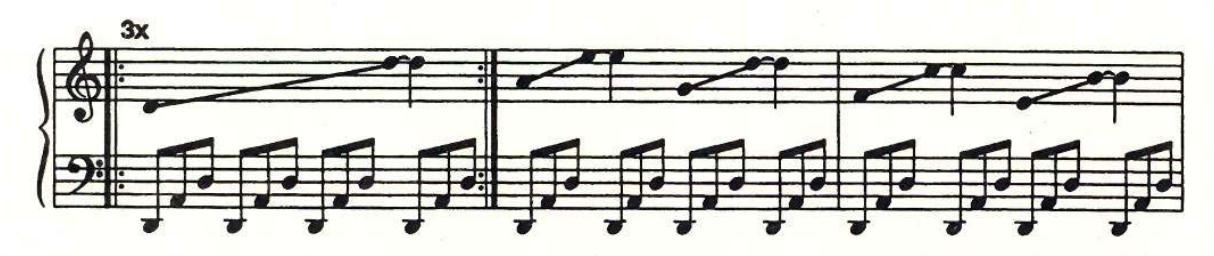
Example 2.16. M. Ravel: concerto in G (1931), 1st movement, bars 22-25.[141]

[140] Neue Ausgabe sämtlicher Werke. Serie IX: Klaviermusik. Werkgruppe 26: Variationen für Klavier. Bärenreiter Verlag. Reproduced by permission.

2.5.1.8 Speed and kinetics

The connotation of glissando technique and high speed has settled firmly in the mythology of piano technique.[142] Yet there is no reason to accept this as self-evident. First of all, "slow" and "fast" are a question of perception. From the performer's perspective, a glissando can be slow compared to the number of notes he is gliding over per second. In some cases the movement may even be too slow to be really comfortable (see for instance 3.3.2.3.2.7), even if the number of notes per second are as high as or higher than in comparable individually articulated fast runs.

There have also been cases in which glissandos where indicated to be performed slowing down. (See 3.4.2.1.9.) There is even an example of glissandos as slow as covering 8 notes in the time of three quarters at ♩=90, i.e. four notes per second. (Ex. 2.17.)



Example 2.17. M. Von Biel: *11 pieces for piano* (1989-92), last piece. © Michael von Biel.

Comparing the morphology of the white and black keys with the back of the keyboard, the relation of the number of keys that can be glided over per unit of time is 12:7:5. For an equal tempo (i.e. number of notes per unit of time), this means that the chromatic glissando requires the slowest movement of the hand, whereas the pentatonic glissando needs more than double that speed to sound at the same rate. Measured the other way around: when playing a pseudo-chromatic glissando with two fingers in one hand, the diatonic part of the double-note glissando will sound faster than the black-key part. Only in a slow tempo is this noticeable. As easy to detect at a relative slow speed is how the morphology of the keyboard's black part leads to irregular sequences of notes. Since the movement of the hand is steady, there will be gaps in between the A#'s and C#'s, and in between the D#'s and F#'s.

[141] Editions Durand and Cie. Reproduced by permission.
[142] As shown by the definition in TNGII: "A term generally used as an instruction to execute a passage in a rapid, sliding movement."

2.5.2 The Piano cluster

2.5.2.1 Problems in defining a cluster

The term "cluster" is very present in 20th and 21st century musical vocabulary, more so than extended techniques and perhaps even more than glissando. As much as the cluster is discussed in writings on the musical history of the 20th century, though, the lack of any unequivocal definition is all the more confusing. Whether consulting academic musical dictionaries, popular "democratic" internet encyclopedias, general but distinguished English dictionaries, musicological articles in secondary sources or specialized literature, it is remarkable how no one seems to agree on what the cluster is and how it is to be considered.[143]

Some disconcerting surprises in the comparison of these sources aside[144], it is first of all quickly noticeable how different authors use different perspectives from which to define the cluster. Some see the sounding result of a cluster as the basis for its identification[145], others depart from the visual representation of a cluster in its musical notation[146] or from its tactile aspect through performance[147], yet others base themselves on a mix of more than one perspective without any indication of being conscious that perspective(s) are left out or that contradictions are created[148].

Besides the differences in perspective, not all entries handle the same defining characteristics of the cluster and often contradict each other when they do handle the same aspects. Some definitions consider the accumulation of adjacent tones as the main defining factor[149], others include the idea of the cluster bordering on noise[150] and all of them apply and sometimes even stress[151] the simultaneity of striking the notes, while all but two leave out the moving clusters and other facets which were written about by some major 20th century composers and musicologists in their cluster theories[152]. Most of the commentators do not agree as to how close together the individual tones in a cluster

[143] We compared 'cluster' in TNGII (anonymous article, hereafter referred to as TNGII), the MGG (Grünzweig 1995), the English and German Wikipedia ('Tone cluster' in http://en.wikipedia.org and 'Cluster (Musik)' on http://de.wikipedia.org, hereafter referred to as 'English Wikipedia' resp. 'German Wikipedia'), the OED (entries printed from Oxford English Dictionary Online, Oxford University press 2007, 'second edition 1989' – hereafter identified as 'OED1' for the entry 'Tone cluster' and 'OED2' for the entry 'Note cluster'), Webster's Dictionary (hereafter referred to as 'Webster'), Dibelius 1966 (p. 319-320) and in the monograph on cluster notation Elias 1984.

[144] Despite its esteem, TNGII is disappointing in its treatment of a subject that can fill a book on its own. No author is indicated, there is no bibliography and at least four major scholarly mistakes can be found in the no more then five sentences long entry. (Clusters were not first used by Cowell, Bartók did not make the innovation independently, the notable study in clusters in Stockhausen's oeuvre is his *Klavierstück X*, not *XI*, the date of Cowell's *The Tides of Manaunaun* has been in dispute before this edition of Groves was published.) It is the free English Wikipedia encyclopedia that rivals with Grünzweig 1995 for depth and earnest. Strangely, the OED – "the definitive version of the English language" as it is advertised on their website – gives two contradictory definitions of 'tone cluster' resp. 'note cluster'.

[145] TNGII, Dibelius 1966, Elias 1984.

[146] German Wikipedia.

[147] OED1.

[148] OED2 ("sounded or written to be sounded"), Elias 1984.

[149] English Wikipedia, Dibelius 1966

[150] German Wikipedia, Dibelius 1966, Grünzweig 1995; Elias 1984 does not mention this aspect but implies it with many of the examples of cluster notation.

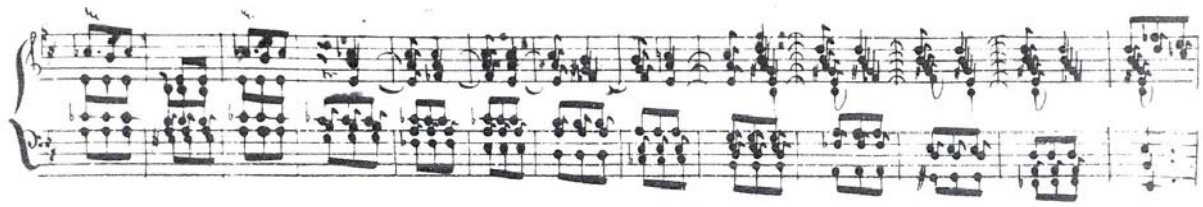
[151] English and German Wikipedia.

[152] E.g. Cowell's concept of moving clusters is only discussed in Grünzweig 1995 and Elias 1984, while others only mention Cowell's name. Other concepts worked out by Kagel 1959 (density, sonority, width) and Stephan 1972 (see below) are not treated by any of the definition makers.

should be. Some are vague, others don't seem to bother[153] or cannot seem to decide[154], and some are contradicting themselves[155]. Only one of them substantiates his findings and reasoning[156].

That last one – the entry by Grünzweig in MGG – could easily be the reference in this matter, but the contradictions as laid out above are not just a question of quality in definition making or of who's definition to take for the best or correct one. The confusion emanating from the incongruities leads to more questions about what the cluster is or can be and how to identify it.

It is unfortunate that commentators disagree so clearly without any debate. One definition explicitly excludes "ornamented figures involving acciaccaturas and the like."[157] This must surely be a reference to certain types of chords as can be found in sonatas by Scarlatti, e.g. in K. 119 (ex. 2.18). Such chords are nevertheless considered as clusters by several commentators[158], while most cluster definitions don't mention this issue at all.
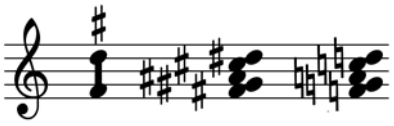


Example 2.18. D. Scarlatti: Sonata K. 119, bars 53-65.[159]

Different perspectives from which to consider one and the same cluster seem to work against each other. Adjacent notes on the piano mean geographically adjacent: chromatic (white and black keys), diatonic (only white keys) or pentatonic (only black keys). In western tonal theory, "adjacent" means chromatic only, but this would exclude the all-black or all-white key forearm clusters, even if they are cited or referred to as examples of clusters in most of the definitions. How notes can *sound* adjacent in a sound complex which is supposed to be *close to noise*, seems very difficult to asses if not a contradiction in terms, especially in certain registers of the piano. A diminished seventh chord played on the lowest octave of a grand piano may sound just as unspecific as a whole tone cluster. But most of the definitions mention clusters for other instruments as well as the piano. We cannot but doubt that the mixture of different timbres in ensembles and orchestras makes it easy – if possible – to recognize individual tones in a cluster.
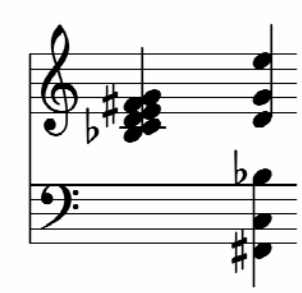
[153] TNGII, Grünzweig 1995 and OED 1 stop at 'adjacent notes' without specification of whole tones or semitones.
[154] English Wikipedia determines that basic clusters (chromatic) should be at least three or more notes, while four is the minimum for pentatonic and diatonic clusters.
[155] TNGII states that a cluster consists of adjacent notes, but goes on to write about forearm clusters, which must include all-black-note clusters, which contain intervals greater than seconds. OED has two definitions: the one for Tone Clusters sees them as piano clusters played with the forearm, or the flat of the hand, the other definition – for Note Cluster – sees them as 'sounded or written to sound simultaneously'. Elias 1984 departs from 'diatonic or chromatic' and goes on to discuss the 'three principal parameters of a tone-cluster': diatonic, chromatic and pentatonic.
[156] MGG.
[157] English Wikipedia.
[158] E.g. Sutcliffe 2003, p. 315 and English Wikipedia.
[159] From Ralph Kirkpatrick's edition published in 1972 by the Johnson Reprint Corporation. Reproduced by permission from the current copyright holder Irving S. Gilmore Music Library, Yale University.

Mixing perspectives leads to surprising paradoxes and questions: if A (ex. 2.19) is clearly a cluster (it is one of the most common representations of a pentatonic cluster), then B must also be a cluster. From a sounding perspective, they should be exactly the same. Unless we take a different perspective to asses this: then A played on the piano with the palm of the hand may sound less pronounced than B played with fingers because the fingers can better differentiate the attack and – for instance – "voice" the top note. From a theoretical perspective, A and B are also the same. But from the tactile perspective A and B are as different from each other as a C major scale with or without the word "glissando" written above the notes: without an indication of the performance technique, the performer will not know. How will the commentator know? And if B is a cluster, then surely C is one too. At least from a theoretical perspective: they are the same kind of chord, whether viewed in a tonal context or outside of such a context (where they are both a pentatonic chord). But then most of the typical "Debussy-like" chords should be considered clusters, even if hardly anybody sees Debussy as a composer of clusters[160] (in fact, "his" kind of chords has already been cited as differing from clusters).[161]



Example 2.19. A B C

Thinking through the consequences of considering a cluster as a chord, one wonders what the implications are if the comparison is worked out in detail. Inversions of tonal chords are still identified by the function of the root position of the chord. What about inversions of a cluster? The first chord in ex. 2.20 shows a cluster by every definition we encountered – is the second chord (one of the possible inversions) a cluster too?



Example 2.20. A B

And what with enharmonic notation? When we replace the *c* and *b♭* with *B#* and *a#* in ex. 2.20b, we have the final chord of Skryabin's first prelude of his opus 74. If this is a cluster, then Schoenberg, Messiaen and Skryabin – to name just three composers that use specific systems to build their chords – would having been using many clusters in their works, without any commentator noticing this, and contrary to the notion that a cluster would be a special kind of chord that doesn't fit a harmonic system.

To know how to investigate the history of the cluster – one of the tasks we will set ourselves in the next chapter – we need to know how to better identify the cluster. Since the existing definitions leave too many questions to meet that challenge, we will have to look at the cluster from scratch and attempt a reconsidering of all aspects of its identity. It is clear that the existing definitions struggle with reconciling different aspects and perspectives that seem inherent to and crucial to the identity of the cluster. The

[160] Schmitz 1950 (p. 190) considered the minor seconds in Debussy's *Feux d'Artifice* as clusters.
[161] Keillor 2004.

relation of the cluster to tonal chords (cf. the aspects of noise and dissonance, the exclusion of ornamental notes); the friction between the theoretical concept of adjacency (problematic in itself) and some established clusters based on ergonomics; the question of instrumentation, etc. All of these conundrums find their origin in the way both the usage and the concept of the cluster were developed historically.

2.5.2.2 Historical cluster theories

In the 20th century a few composers have expressed their personal ideas on the identity and applications of the cluster. Some have developed veritable cluster theories, revealing ways in which composers dealt with clusters theoretically as well as in their compositions.

2.5.2.2.1 Henry Cowell's Tone-Clusters

2.5.2.2.1.1 Definitions

The man who introduced the word "cluster" as applicable to a specific musical entity was Henry Cowell. It is logical, then, that we turn to him to see what he had in mind precisely. In his first published article *Harmonic Development in Music* (1921), he explained the cluster as:

> […] a convenient term to indicate two or more minor seconds in juxtaposition, struck simultaneously and used as a unit.[162]

In 1927, Cowell gave a lecture in which he defined the cluster as:

> An aggregate of sound, of all the major or minor [seconds] within an octave or more.[163]

In 1930, Cowell's book *New Musical Resources* – begun in 1918-1919[164] – was finally published.[165] In it, we find the cluster imbedded in a musical theory that was to encompass new and future developments in compositional methods:

> The use of chords based on clusters of seconds, […] will hereafter be called tone-clusters.[166]

Immediately after this, we find a third definition of the cluster:

> Tone-clusters, then, are chords built from major and minor seconds, which in turn may be derived from the upper reaches of the overtone series and have, therefore a sound foundation.[167]

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[162] Hicks 1993, p. 445.
[163] As quoted in Hicks 1993, p. 445
[164] As stated in Hicks 1993, p. 444.
[165] According to the editor of Cowell 1930, Joscelyn Goodwin, the oldest surviving form of the book dates from 1928. Nevertheless, Goodwin states "By 1919 the book was completed in what was virtually its present form" (Cowell 1930, p. x). Between the 1928 typescript and the published book, there are differences as to how Cowell treated the cluster, mentioned by Goodwin in the notes to the 1969 reissue. We are left to wonder at what the differences may have been between the longer stretch from 1919 to 1928, so we don't know how exactly Cowell evolved in his view on defining the cluster – and placing it in the thread of history – between his first published article and the 1927 lecture.
[166] Cowell 1930, p. 114-116.
[167] Cowell 1930, p. 117.

The differences between the above quotations show how some of the problems that still undermine a clear defining of the cluster today, were already present in the first concepts surrounding the cluster:

- Cowell does not seem sure as to what kind of seconds a cluster should consist of; he evolves from a chord consisting of *only* minor seconds to a chord consisting of minor *or* major seconds, to a chord consisting of major *and* minor seconds. In the article, he explains how no intervallic shifting is possible as all the members of the cluster are as close together as possible; in the lecture, he stated how "the shifting of tones within the cluster has possibilities of great subtlety."[168] The consequences of this difference are considerable. According to the first definition, only a chromatic fill-up is possible; according to the second definition, only chromatic or whole-tone chords can be clusters; according to the third definition, they consist of diatonically spaced notes, which Cowell considered equal to the upper sequence in the overtone series. In none of the three definitions would a chord of more than three notes consisting of only the piano's black keys be a cluster because of the minor thirds between A# and C# resp. between D# and F#. And yet these clusters are considered in the book and – in fact – were used abundantly by Cowell in his piano works.

- There is a definite sense of competition as well as confusion between theory and performance practice (on the piano, Cowell's own instrument) in what is explained as the basis of the cluster definition. In the first definition he sees the cluster as a unit, all the notes being struck together. Both these aspects – notes played together and the action "struck" – indicate piano playing. Yet, the first and last definitions (regarding the cluster as consisting of only minor seconds, resp. of major *and* minor seconds) do not allow for clusters on only the white or the black keys of the piano. The second definition – *all* minor *or* major seconds in at least an octave – is a little theoretical when applied to the piano, as it leaves only a chromatic palm-cluster or whole-tone clusters played with the fingers, palms or fists of *both* hands together.

- There is definite uncertainty about the minimum size of a cluster. Cowell evolves from a chord consisting of at least two (minor) seconds – i.e. a major second in total – to a chord that is an octave wide to basic cluster types of two intervals, which means a minimum of a minor third.

- Cowell hesitates whether the cluster should be a chord built from seconds or an interval filled-up with seconds. He starts with a chord that is the result of superimposing certain intervals (although at the same time he discusses the consonant and dissonant character of a cluster based upon the outer limits[169]) to a chord that is considered as an interval that is filled-out. In his *New Musical Resources*, he goes back to the idea of building chords from seconds. At the same time and place, he suggests a notation and further terminology (based upon the interval which encompasses the cluster) that are both indicative of the view that the cluster is an interval filled out with seconds.

It may be in need of saying that in general, Henry Cowell is not all too precise in his definitions: at the end of his book, he lists "definitions of terms", where we find that a "ninth chord" is "A chord in which the outside interval is a ninth." Apparently he silently proposes to use the word chord specifically for chords built out of thirds. Otherwise, a ninth chord could apparently be taken as a kind of cluster.

It is striking how we find the same problems in explaining the essence of a cluster when they were first seriously developed as when we have found in the definitions that were made long afterwards.

[168] As quoted in Hicks 1993, p. 446.
[169] As quoted in Hicks 1993, p. 445.

2.5.2.2.1.2 Building clusters

In the first article and his lectures, Cowell does not give many more details as to how precisely he recognizes what makes a cluster other than what the definitions allow for. In *New Musical Resources*, he does discuss at length his views on the evolutionary place of the cluster in musical history, its theoretical and acoustical relation to the overtones series, the different kinds of clusters, methods to build them and how they can be used in composition.

The purpose of Cowell's book was – in his own words in the foreword to the published version – to

> …point out the influence the overtone series has exerted on music throughout its history, how many musical materials of all ages are related to it, and how, by various means of applying its principles in many different manners, a large palette of musical materials can be assembled. Some of them are in use, some of them are presaged in contemporary music, and some of them seem to be unused so far.[170]

Cowell categorizes the cluster among such materials that are related to the overtone series. He further places it "in the light of the interpretation of the history of chord usage":

> In early times the first few overtone intervals, fifths, fourths and octaves, were regarded as the foundation of intervals, and the musical theory of those times permitted only fifths and octaves as points of rests, while thirds and sixths, or any other intervals were resolved to the "perfect" intervals. Thus it can be seen that the harmony of that time, which was considered identical to the counterpoint, was built on fifths and their inversion, fourths. Later, when thirds and their inversion, sixths, came to be considered concordant, they were made the basis of chords, and this is the system still taught. The overtones represented are the next removed from those forming fifths and fourths – namely, from the fourth partial to the seventh, the overtones there being spaced as thirds, first a major third, then two minor thirds. It is only by leaving out the eight partial that the ninth, necessary for the formation of a ninth chord, may be said to fall among the possibilities of the chords built in thirds. […] Since we have seen the development of the use of chords from the simplest ones in ancient times, through somewhat more complex ones later, and still more complex ones in present-day music, all following the overtone series upwards, it seems inevitable that the system of building up chords must eventually include the next overtones after those related in thirds – namely, from the seventh overtone upwards.[171]

Cowell finds further legitimization for the existence of tone-clusters in the fact that:

> there seems to be a need of such a system to further the understanding of contemporary material, which has had no adequate theoretical co-ordination, in

[170] Cowell 1930, p. xvi-xvii. The first published version of his book (1930) differs from the known manuscript chiefly when it comes to the third part discussing the tone-clusters. (The 1919 manuscript is lost, but a copy of the spirit duplicator version dating from 1928 is in the Library of the Performing Arts at Lincoln Center in New York.) In the manuscript, this chapter is called 'Tone Clusters', whereas in the published book it is called more generally 'Chord-Formation'. The manuscript also stresses the relation between the tone-cluster and the overtones more than in the book, were the notion prevails that tone-clusters are the historically inevitable third system of building chords (after the early polyphony based on the intervals of a fifth and a fourth, and the triads built with thirds). In Cowell 1930, the editor Joscelyn Godwin simplifies the differences between book and manuscript to the point of stating rather falsely that 'in the book, on the other hand, tone clusters are cited as a good example of chords built on intervals other than the third, major and minor, as is usual in Western music.'

[171] Cowell 1930, pp. 112-113.

> spite of being in everyday use in composition. It is impossible to explain all modern materials as being further complications of chords built in thirds.[172]

Cowell has thus found a way to explain the modern materials of Schoenberg, Rudhyar and Debussy. The first two composers are seen as investigating the first system of chords built in fifths and their inversions, after the ancients began it, and left during the classical period:

> This discovery on their part of the possibilities of a system in fifths seems to fill in a historical gap, bringing an ancient idea forward to its final use, rather than a step forward in the line of progress.[173]

And as regards Debussy:

> the overtones from the seventh to the fourteenth partials (if the twelfth, which occurs in a lower octave, is omitted) form a whole-tone scale, which is thus seen to have a sound acoustical foundation. Many of the chords employed by Debussy and others in whole-tone music give the suggestion of being built on major seconds. These chords, however, are rarely bunched together in groups of seconds, but are more often spaced more widely apart.[174]

Having distinguished Debussy-like chords from closely spaced chords of seconds, Cowell at the same time further legitimized the cluster as a modern compositional material with potential already being developed, albeit not fully.
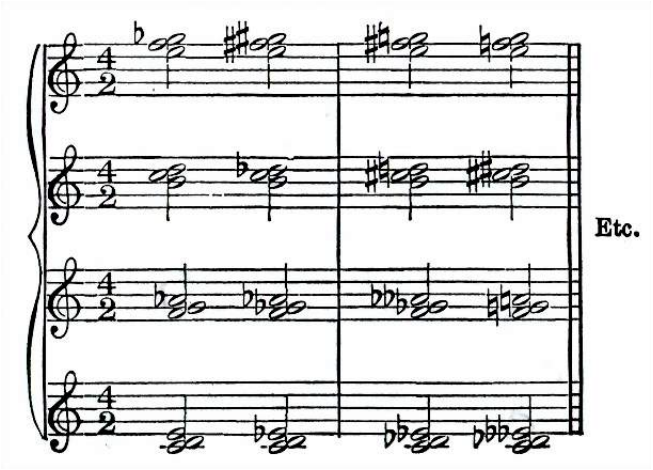
Regardless of the differences between manuscript and book[175], Cowell's perspective is clear. In his view, there is a "first" system of chord building (based on fifths and their inversions: fourths and diminished fifths), a 'second' (based on thirds and their inversions - sixths), and now a possible third system using seconds (major and minor). This historically inevitable evolution follows the overtone series upwards. The title of the first section of this part already shows the intent to see the cluster as a logical consequence of previous ways of building chords: "Building chords from different intervals."

Cowell distinguishes between four basic types of clusters, transplanting the formula for common triads to the system in seconds and arriving at exact equivalents:

(1) A major second with a minor on top gives us, building from C, the cluster C-D-E♭
(2) A minor second with a major on top / C-D♭-E♭
(3) Two minor seconds / C-D♭-E𝄫
(4) Two major seconds / C-D-E

From these basic types, Cowell derives all larger clusters by direct superimposition, "which can have great variety, owing to the many different possible juxtapositions of the triads within larger clusters."[176] (Ex. 2.21.)

[172] See Cowell 1930, pp. 113.
[173] Cowell 1930, p. 113-114.
[174] Cowell 1930, p. 114.
[175] In her notes to the 1969 issue of the 1930 edition, Godwin cites Sidney Cowell as saying "that she had heard Cowell give both views, and that the shift from one emphasis to the other did not at all indicate a change of opinion. In general, the differences between the two versions of the chapter are in favor of the book version, which is tighter and more succinct." See pages 156-157.
[176] Cowell 1930, p. 117-118



Example 2.21. Cowell 1930, p. 117.[177]

Leaving the more theoretical development of cluster concepts for a short while, Cowell makes room for touching upon the implications that instrumental setting has on the potential of the theory to be put to practical use.

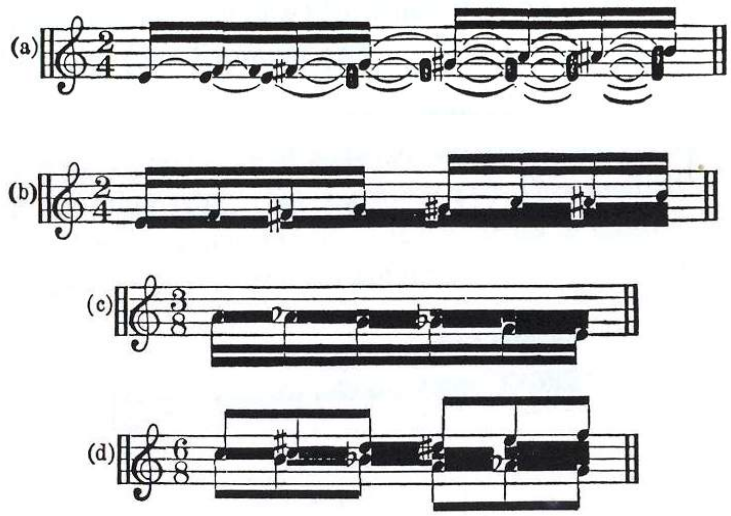
On the piano, not all combinations of the four basic types are playable, and he mentions three specific types of combinations typical for the piano: chromatic ("including all the keys between specific outer limits"), pentatonic ("all on black keys") and diatonic clusters ("all on white keys").[178] The chromatic cluster is clearly the superimposition of small clusters of the third basic type, the diatonic a combination of (4) and (1) or (2) – depending how one analyzes the cluster (cf. above). Cowell does not attempt to analyze the pentatonic cluster as a superimposition of the basic triads. We may meet him halfway in assuming he sees pentatonic clusters as "small clusters used only occasionally between chords of other systems,"[179] but neither the "occasional" character nor the "chords of other systems" are in concordance with how and how much Cowell himself had already used whole forearm-long pentatonic clusters in his works before *New Musical Resources* was published.

Compared to the piano, he finds it is the orchestra "where clusters are at their best"[180], enabling the composer to use "all the possible variety of large clusters which are neither all chromatic or diatonic, but constructed from a consistent building up of diversified smaller cluster triads."

After this short detour into the world of the cluster's instrumental potential, Cowell goes on to explain how, of all these clusters, he has "assumed that the several tones are struck simultaneously" and he now calls them all "fixed clusters." In juxtaposition to this newly installed and retroactive category, he considers "moving clusters" essentially different from the fixed clusters as they are not simply "a means of arriving at a fixed cluster of a larger interval", but changing size, "like an angle whose sides are projected to greater and greater length." Cowell sees three kinds of these movements:

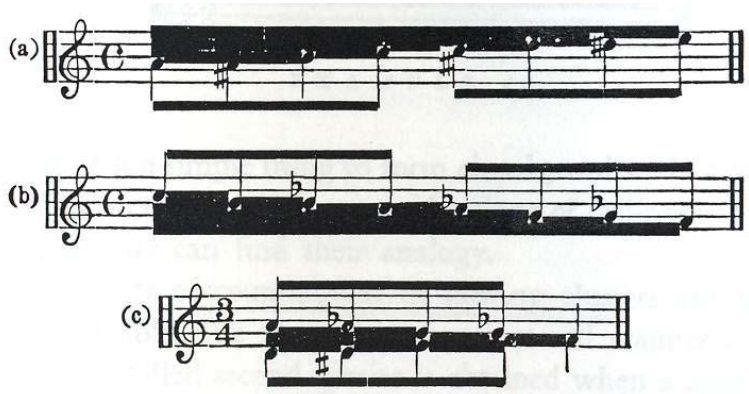
[177] All excerpts from Cowell's *New Musical Resources* (Cowell 1930) are reproduced by permission from Cambridge University Press.
[178] Cowell 1930, p. 120.
[179] Cowell 1930, p. 118-119.
[180] Cowell 1930, p. 120.

- Building up to a cluster[181]
  - To begin with the lowest tone and go up
  - To begin with the highest tone and go down
  - To begin with the middle of the cluster and spread it in both directions at once (ex. 2.22)



Example 2.22. Cowell 1930, p. 127.

- The reverse by leaving off tones
  - Beginning with the lowest tone
  - Beginning with the highest tone
  - Leaving off tones simultaneously from top and bottom, until only the middle is left (ex. 2.23)

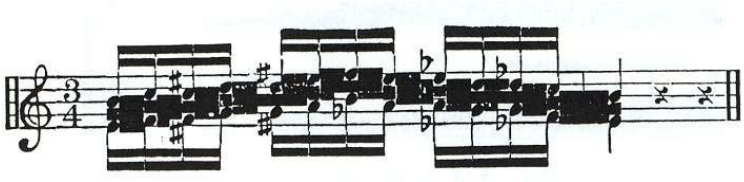


Example 2.23. Cowell 1930, p. 128.

- A combination of both:
  By beginning with a tone cluster of a given interval, say a fifth, and then adding tones at one edge at the same time that they are let go at the other, with the result that

[181] Cowell actually gives the account of the different kinds of moving clusters in a different order. He sees "three ways of thus spreading a cluster", namely going up from the lowest note, going down from the highest note and beginning in the middle. After this he shows "the reverse" and ends with "a combination movement". (p. 128) We have rearranged the schema to make the overview more concise in view of the ensuing discussion of adding and subtracting cluster-tones in Cowell 1930, p. 133-136.

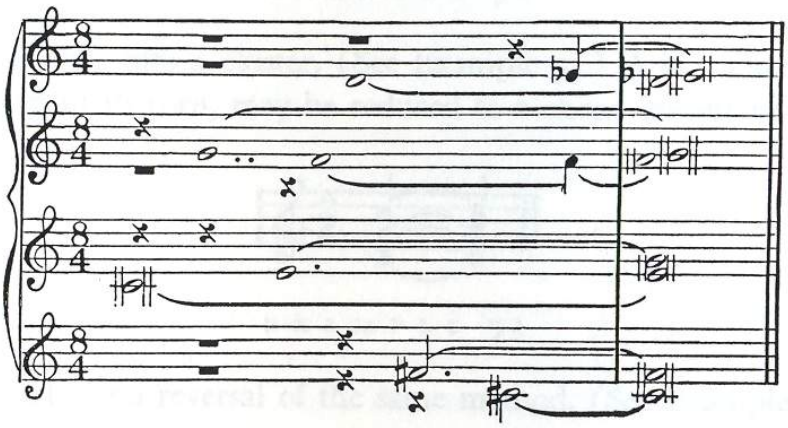
the cluster keeps its original interval of a fifth while shifting up or down the scale (ex. 2.24.)



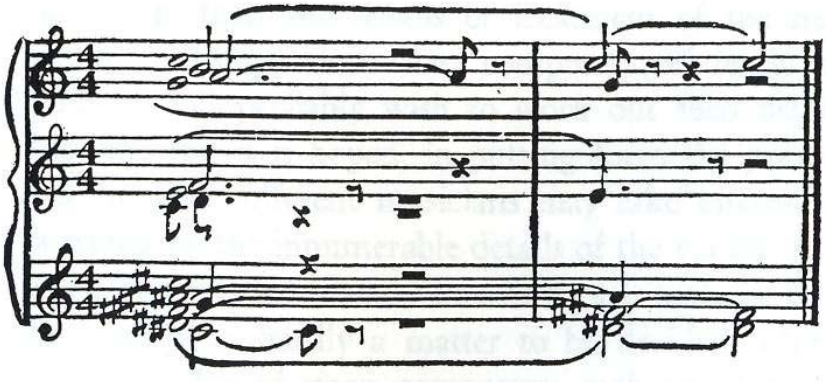
Example 2.24. Cowell 1930, p. 129.

These moving types can actually be seen as defined by what Cowell later on describes as resp. "addition" ("production of a chord by adding tones from the bass upwards until the desired chord is complete"), "subtraction" ("the tones of a chord are subtracted one by one, until only the lowest is left") and the combination of both. When adding or subtracting in random directions, or

> If the outline of a cluster is filled in from several different points, the cluster will be thought of as essentially fixed, even though the notes are not struck simultaneously, and this for the reason that the listener recognizes the intention to fill in completely an exact interval. We may think of it, then, as another kind of cluster. […] Reverse the principle of addition in its various methods, and we have different ways of applying the principle of subtraction. [182] (Ex. 2.25 and 2.26.)



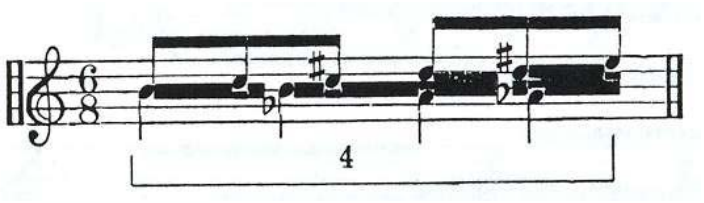
Example 2.25. Cowell 1930, p. 134.



Example 2.26. Cowell 1930, p. 136.

[182] Cowell 1930, p. 134.

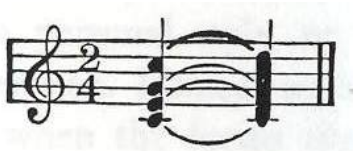
Besides the direction of the movement, the rate of expansion or contraction of the edges of a cluster – the speed of the movement – can also be a characteristic of moving clusters (ex. 2.27).



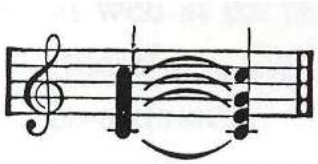
Example 2.27. Cowell 1969, p. 129.

This rate can be extreme, i.e. when the movement is immediate, and then Cowell sees how

> yet another variation in the method of building up clusters is to begin with a chord and then to fill in the requisite tones simultaneously. The chord then passes at once into a cluster. (Ex. [2.28]) And a cluster, in its turn, may be reduced to a chord instantaneously by reversal of the same method. (Ex. [2.29].)[183]



Example 2.28. Cowell 1930, p. 136.
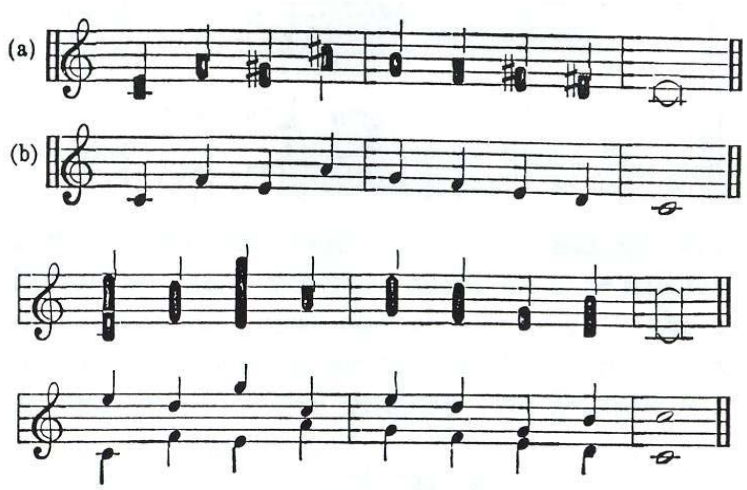


Example 2.29. Cowell 1930, p. 136.

Cowell's "moving clusters" are ways to build or deconstruct clusters rather than a new type of cluster: it is merely the movement of single notes that departs from or arrives at fixed clusters. It is therefore the set of small basic clusters types and the larger combinations of those four types with which Cowell is dealing.

[183] Cowell 1930, 135-136.

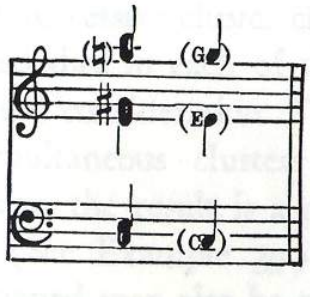
2.5.2.2.1.3 Use of clusters

Cowell continually spends space on his ideas regarding the potential for clusters in compositional practice. He starts by introducing simple melodic use, such as moving clusters of the same interval up and down the scale as single notes in a traditional melody, or the shifting of the clusters' size to accomplish contrapuntal movement of the outer tones. (Ex. 2.30.)



Example 2.30. Cowell 1930, p. 122-123.

Next to successive clusters for "melodic effect", simultaneous clusters can be used for harmonic effect through "cluster chords", large clusters built from spacing the small basic types instead of superimposing them directly. Cowell gives examples of such chords more or less corresponding to tonal harmony (ex. 2.31 and 2.32), adding, "Care should be taken to see that clusters are so spaced as to be distinct. The larger the cluster, the wider the spacing must be." (P. 123-124.)
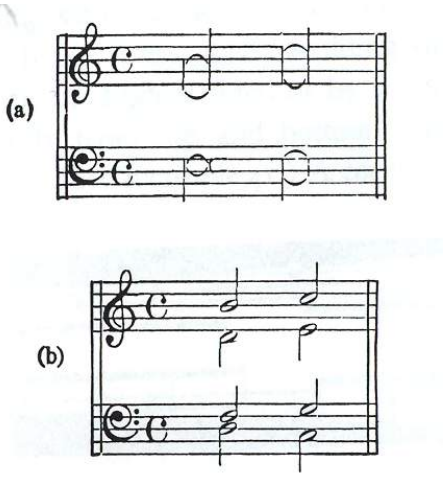


Example 2.31. Cowell 1930, p. 124.



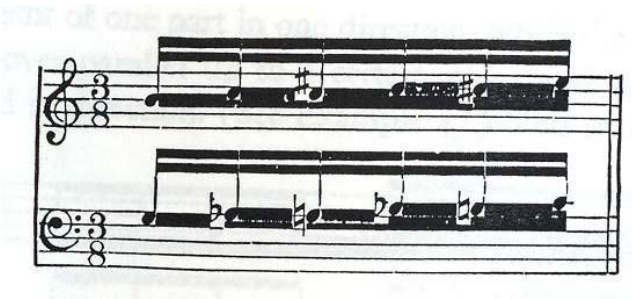
Example 2.32. Cowell 1930, p. 125.

Cowell obtains simple effects of counterpoint by combining melodies consisting of same-size clusters or by using clusters of different sizes to imitate four-part counterpart as in ex. 2.33.



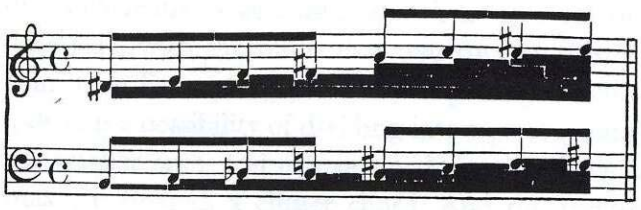
Example 2.33. Cowell 1969, p. 126.

Effects of harmony and counterpoint in moving clusters are also obtainable. Cowell finds the parallel progression of a gradual shift at both edges in the same direction suggestive of homophony (ex. 2.34). "From intervals thus built up it is a simple thing to form chords, and with chords as material the different applications of ordinary tonal harmony can find their analogy."



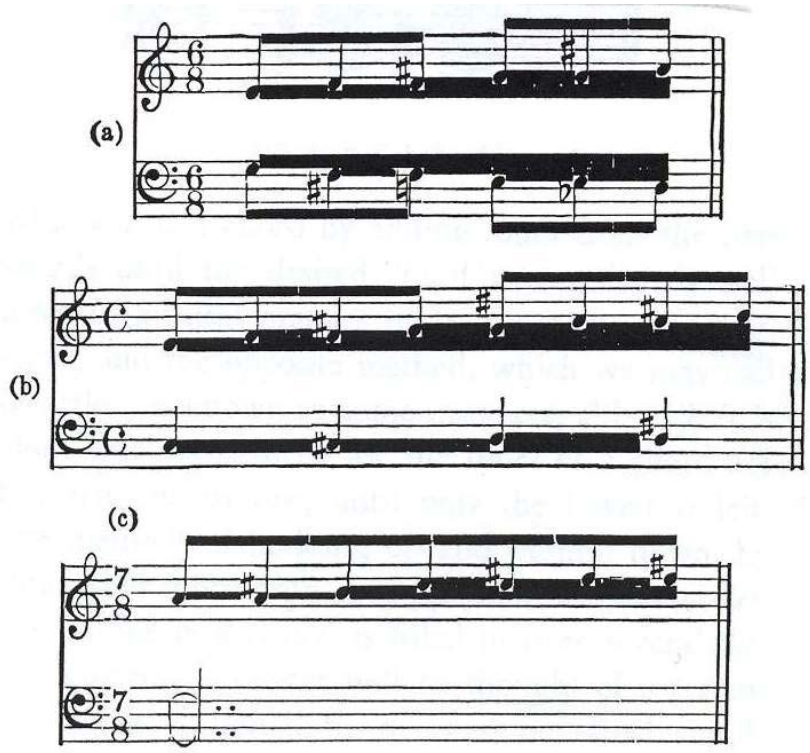
Example 2.34. Cowell 1930, p. 130.

The effect is more "polyphonic" when the expansion or contraction or shift results in oblique or contrary motion. Again, a simple beginning is illustrated by having one part moving continuously while the other part moves at a given interval distant, and then breaks, to complete the unit at a different interval (ex. 2.35).

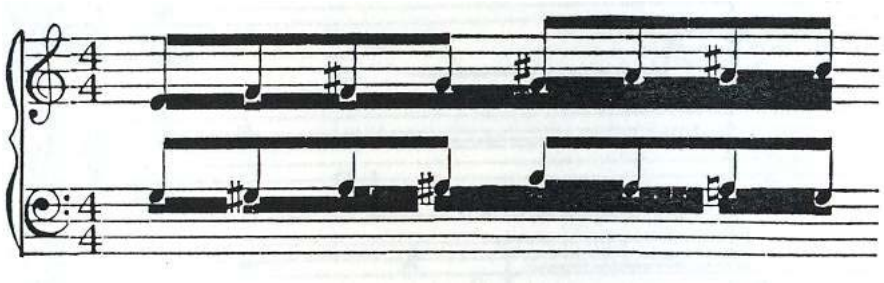


Example 2.35. Cowell 1930, p. 131.

Again, "From this as a simple beginning it is possible to build up a complete system of counterpoint in moving clusters"[184] by letting the parts move in contrary directions, by having different rates of speed between two related clusters, by combining fixed and moving clusters (ex. 2.36) or by combinations of methods (ex. 2.37).
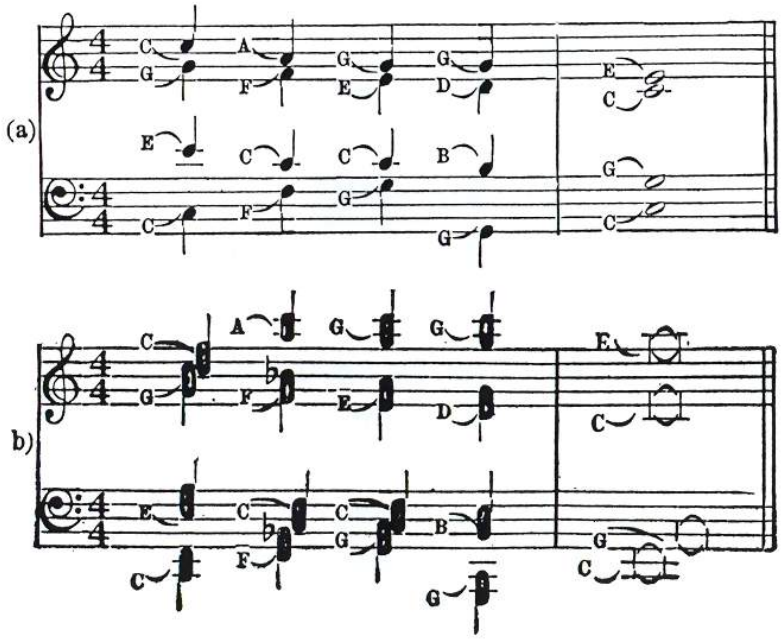


Example 2.36. Cowell 1930, p. 131.



Example 2.37. Cowell 1930, p. 132.

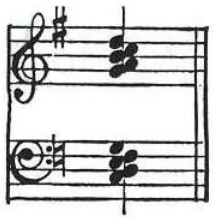
As a consequence of Cowell's general theoretical view on the place of the cluster in the historical evolution of chord building, he clearly chose to keep using this perceived link to develop further cluster concepts based on the tradition of triad building. As such, clusters take the place of notes in melodic, harmonic as well as contrapuntal writing, for instance in ex. 2.38, where (b) is a cluster version of (a).

[184] Cowell 1930, p. 130.

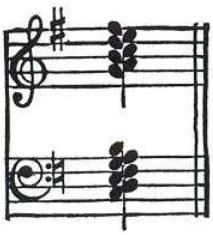


Example 2.38. Cowell 1930, p. 124.

But not all his thinking is conservative. Tiny links to the universe of bitonal music are offered: "In forming diatonic cluster chords two methods are possible in relation to the tonality or tonalities which it is desired to employ." (Ex. 2.39 and 2.40.)



Example 2.39. Cowell 1930, p. 137.

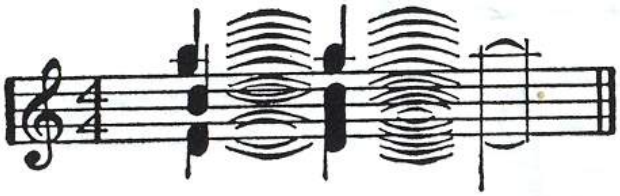


Example 2.40. Cowell 1930, p. 137.

And Cowell draws our attention to methods of using clusters that have no counterpart in traditional counterpoint and harmony. One could "begin with a sufficiently large cluster and then leave out the middle part, with the result that two smaller clusters remain (ex. [2.41]). In very large clusters, there is a possibility of dividing [them] into a greater number of smaller ones, and of spacing these at will, so as to make, if desired, a cluster chord." (Ex. 2.42.)



Example 2.41. Cowell 1930, p. 132.



Example 2.42. Cowell 1930, p. 133.

Several of the examples show that Cowell considered his clusters for other instruments besides the piano. Shifting the edges of clusters (like in ex. 2.34-2.37) is hardly relevant to piano playing, as it would come to nothing more than melodies that are played with the damper pedal depressed. Cluster chords and the pseudo-harmonic cluster treatment as in ex. 2.38 are not even possible on one keyboard. Most remarkable, however, is the absence of any reference to silently depressed clusters and their typical diamond-shape notation. He had already used both in his compositions long before his theory was published. As much as theorizing about clusters sometimes carried him away from practicalities, he forgot that he had in fact developed more cluster use than he had listed in *New Musical Resources.*

2.5.2.2.1.4 On notating the cluster as a single unit

Cowell suggests a specific notation, as in ex. 2.43, instead of the one in ex. 2.44:



Example 2.43. Cowell 1930, p. 121.



Example 2.44. Cowell 1930, p. 121.

He does not specifically elaborate on notation any further, but plenty of examples are found throughout *New Musical Resources* to show that he used the filled-up and empty cluster signs like the traditional system of a black-note-for-a-quarter and white-note-for-a-half-note as used for the notation of individual pitches. (Ex. 2.30, 2.33, 2.42.)

While he suggests this cluster notation because of the difficulty of reading clusters as in ex. 2.44, the entrance of this aspect in his theory comes at the end of a paragraph concerning a very specific aspect:

> A characteristic quality of harmony is the possibility of movement within outside tones; that is, in changes of harmony the inner voices usually move to tones that were contained within the outer limits of the tones of the previous chord. But so long as our scale is limited to half-tone intervals, it is obviously impossible to shift tones within the outer limits of a chromatic cluster, except through interchanging the parts. The cluster must be treated like a single unit, as a single tone is treated. All movement must be up or down the scale, as in melody.[185]

Apparently, by trying to treat clusters as chords, he came to a dead end when contemplating to actually translate the inner voices of traditional harmony into the cluster medium. His way out would have been to not limit the idea in this paragraph to the chromatic cluster and include the diatonic and pentatonic, but he does not choose to do so. He reasons that the impossibility for inner movement makes the cluster a single entity, all content being frozen between the outer limits. This led Cowell to the dogma that clusters must be treated like a single tone, with the notation as in ex. 2.43 as a literal and conceptual consequence. Following up with the melodic treatment of the cluster makes it all the more clear that Cowell saw the cluster as a single kind of sound. After having distinguished the diatonic and pentatonic clusters as typical for the piano – before this paragraph, he does not come back to these types of clusters anymore, even if they would have permitted inner voices as they can be considered in the traditional chord.

Given the attention to the polyphonic treatment of clusters in ways that are transliterations of tonal practices, it should not surprise us that he does not consider the "noise" aspect of the cluster. He goes no further than mentioning dissonance:

> In the consideration of tone-clusters it is useful to distinguish between those whose outer tones form a consonant interval, and those whose outer tones form a dissonance. The greater simplicity of the former is readily appreciated by the ear.[186]

2.5.2.2.1.5 Some terminology

Besides the definition of the cluster and the logical terminology used to indicate some of the types (small or large), Cowell suggests more terminology to name different other kinds of items discussed.

He measures the cluster to show its size, and does so using the distance between the outside members of the clusters:

> Thus, a cluster of three consecutive chromatic tones may be called a cluster major second, a cluster of four consecutive tones may be called a cluster minor third, etc.[187]

Hence C-D♭-E𝄫 is the equivalent of a minor triad (see above) – and brings to mind the associative term ‘minor cluster’ – but by its size, Cowell calls it a ‘cluster major second’. Consequently, C-D-E is associated with an "augmented" form in triadic terms, but measured as a " cluster major third." Furthermore, Cowell’s system of naming his

[185] Cowell 1930, p. 121.
[186] Cowell 1930, p. 123.
[187] Cowell 1930, p. 121-122.

clusters is not specific enough to distinguish between C-D-E and C-D♭-D-E♭-E, both "clusters major third", but of two essentially different families: the former a diatonic cluster, the latter a chromatic cluster (or – from a different perspective – the former a major-major cluster, the latter two superimposed minor-minor clusters).

Besides being potentially confusing, Cowell doesn't make much use of this denominational measuring system in the rest of his theory. Neither does he use his proposed system for differentiating between clusters of the same interval, which "we can conveniently designate […] by the names of their lowest tones."[188]

With the idea of cluster chords built from clusters, Cowell introduces more possible terminology. The cluster chord in ex. 2.31 is suggested to be called a "common major cluster chord" and,

> since we use the lowest tone to designate chords, it might be called the common cluster chord of C, with clusters of a third.[189]

He never comes back to this and never uses it himself in the rest of *New Musical Resources*.

2.5.2.2.2 Mauricio Kagel

Cowell had admitted already in the foreword of *New Musical Resources*

> […] that the various fields opened up are merely suggested, and that a separate book would have to be written about each one of the subjects, such as polyharmony, polyrhythm, or tone-cluster, to make any detailed application of the principles shown.[190]

A separate book on the tone cluster – or on any of the other ideas in *New Musical Resources* – did not come about, but one composer built on Cowell to publish more and updated ideas on tone-clusters. By doing so, he even brought the cluster from the US to Europe - literally, by having bought a copy of *New Musical Resources* in Argentina and distributing its ideas when moving to Germany[191] – thus enabling further writings on cluster theory and on the applications of the principles shown.

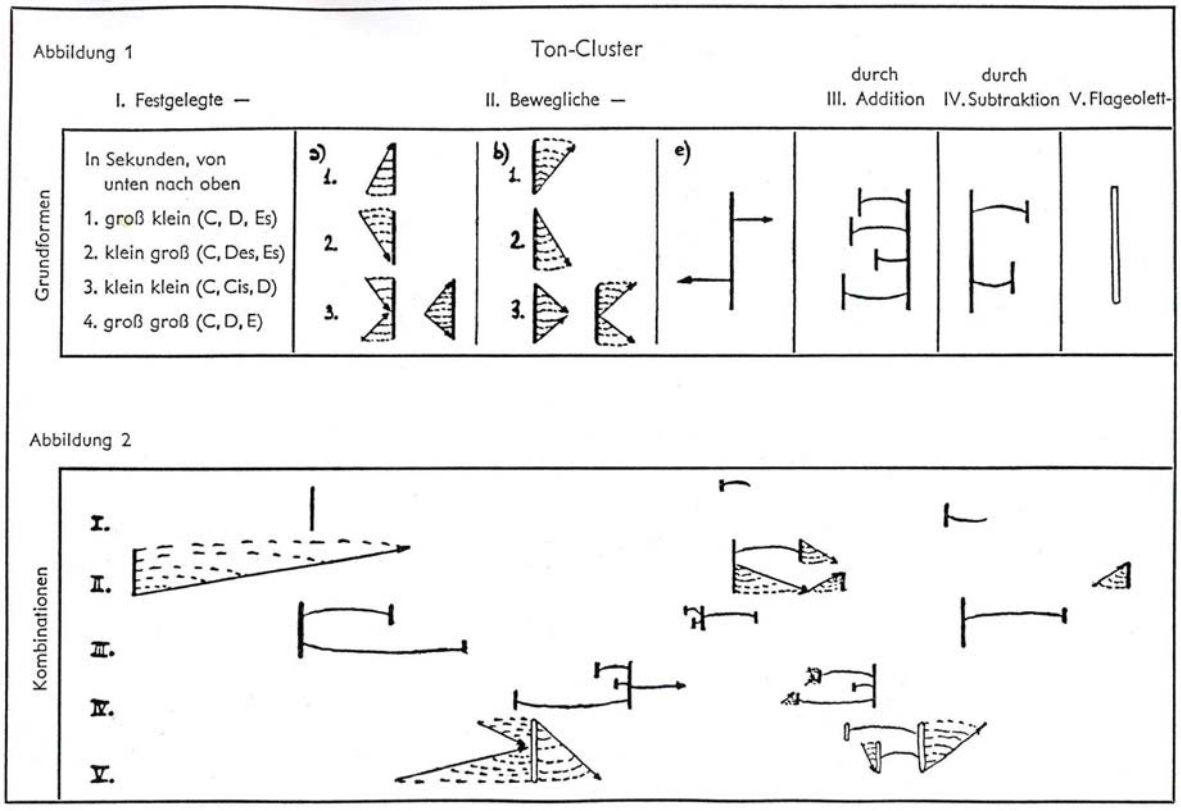
In 1959 Kagel wrote an article called *Tone-Clusters, Attacks, Transitions*. It departs from Cowell's *New Musicals Resources*, but Kagel decides to limit the ensuing discussion:

> We shall call clusters only those sounds which are at least a major third broad and filled out with major and/or minor seconds.[192]

At first it appears unclear in the article why he wants to impose these limitations, especially when he goes on to follow Cowell by listing the four basic forms of fixed clusters, including the superimposition of two minor seconds. The latter would be the smallest cluster, smaller than the major third that Kagel himself had set out as the minimum. Later in the article it becomes clear that Kagel limits himself predominantly to

[188] Cowell 1930, p. 122.
[189] Cowell 1930, p. 123.
[190] Cowell 1930, p. xxii.
[191] Personal communications between Mauricio Kagel and author. See also next chapter.
[192] Kagel 1959, p. 24: "Wir wollen in der folgenden Untersuchung nur denjenigen Klang einen Cluster nennen, der wenigstens eine große Terz breit und mit kleinen oder (und) großen Sekunden ausgefüllt ist."

the clusters that are performed on the piano and by improper techniques, i.e. with the hand, fist and forearm. The minimum size he calculates for such clusters is a major third. Kagel succeeds in concisely synthesizing Cowell's findings in both words and graphics, listing five main categories: fixed ("festgelegte") and moving or flexible ("bewegliche") clusters, clusters by addition and by subtraction, and silently depressed clusters. His table with drawings (ex. 2.45) clarifies Cowell's concept of angles in regards to moving clusters (cf. 2.5.2.2.1.2.) and "extends the principle developed by Cowell in his book."[193] For Kagel, a cluster need not only move from one note in both upward and downward directions (as in ex. 2.22), but can also start from both ends simultaneously, filling up with notes or leaving out notes by moving toward the middle. (See a.3 and b.3 in ex. 2.45). When clusters shift along the keyboard with both of their outer limits remaining at a constant distance from each other (cf. ex. 2.24), there is no recognizable transition from a fixed cluster to a moving cluster because the fixed cluster is in fact moving. (See "c" in ex. 2.45.) Kagel lists more combinations of cluster-types then did Cowell, as demonstrated by the bottom set of drawings (ex. 2.45), but warns that many cannot be performed on keyboard instruments because the sustaining pedal would prevent a clear articulation in the layering of different categories. Besides three dimensions of density (horizontal, vertical and diagonal), Kagel sees a fourth to be that of dynamic: "at constant loudness, a denser cluster is perceived louder than a thinner."[194] Tempo is relevant for moving clusters only, while fixed clusters are characterized by duration. Contrary to Cowell, Kagel did include the silently depressed cluster in his overview (V. in ex. 2.45), calling it "Flageolett-[Ton-Cluster]" in the text, in clear reference to Schoenberg's Klavierflageolett.[195]



Example 2.45. Kagel 1959, p. 25. © With kind permission by UNIVERSAL EDITION A.G., Wien.

[193] Kagel 1959, p. 26: "Die Tabelle der Ton-Cluster (Abb. 1) erweitert das von Cowell in seinem Buch entwickelte systematische Prinzip."
[194] Kagel 1959, p. 27: "Eine vierte Dimension der Dichte wäre der Dynamik untergeordnet: bei konstanter Schallstärke wird ein dichterer Cluster lauter empfunden als ein dünnerer."
[195] See 2.5.4.3 for Schoenberg's Klavierflageolett.

Besides enlarging on the methods of building clusters as Cowell had conceived them, (both in practice and in concept), showing the diversity of combining existing forms, and entering the discussion on the relationships between the cluster's dimensions in time and space, Kagel goes on to take the reader beyond Cowell. He develops his own ideas true to the conclusion that Cowell had put at the end of *New Musical Resources*. Exploring the cluster medium with a similar trail-blazing attitude, Kagel enters uncharted territory. When explaining subtraction of smaller sound regions from large clusters, he associates the cluster with frequency bands:

> This process is reminiscent of the electro-acoustic production of "colored noise": frequency bands of varying breadth are filtered out of "white noise."[196]

The association of Cowell's theory with contemporary developments in (electronic) music is only a teaser in this article, really – the idea is not developed any further – but a fresh historical framework is nevertheless developed a little later on, when Kagel questions the adaptation of clusters to the technique of serial composition.[197] Since harmony in serial composition coincides with the series' order of notes and the intervals between them, Kagel does not want to see a cluster as part of a harmonic system built from seconds, as Cowell had proposed. Kagel does agree with Cowell that a cluster should be seen as a unity, as if a single note. To that end, Kagel proclaims that a fourth cluster parameter must be added to the existing three (which he sees as register, duration, loudness): cluster-width ("Breite"), i.e. the interval that contains the cluster. But he immediately adds more parameters or characteristics, such as density ("Dichte" – "the greater or smaller number of vertically accumulated pitches"[198]) and sonority (the timbral mixture resulting from different instruments playing a cluster). The parameters are intricately connected to each other, e.g. sonority alters with changes in intensity for individual cluster-pitches; density automatically varies with width.

As much as Kagel writes about instrumentation, he states that the piano, celesta, harmonium, cembalo, xylophone, vibraphone, Glockenspiel, harp and bells are "amongst others the solo instruments with which a cluster can best be produced."[199] Yet he concedes that these cannot articulate the cluster's finest nuances and mobility. Orchestras or ensembles are not hindered by a monochrome sound. Their cluster's sonority can be changed, its structure can be enriched by the different families of timbre, large moving clusters can be built, small clusters can be denser than large clusters, and small clusters can move within larger ones. Kagel here refers to Ligeti's *Apparitions* (finished in the year of Kagel's cluster article) and "above all" early works by Ives, Cowell and Varèse.[200] Despite the tempting advantages in orchestral cluster writing, Kagel goes on to discuss clusters related to the keyboard.

After mentioning – almost in passing – that the cluster is "until now" generally used as a kind of "anti-harmony", as a transition between sound and noise, and that Cage went beyond the chromatic cluster by infusing it with noise in his music for prepared piano, Kagel investigates the modes of attack in cluster playing at the piano. By analyzing the relationships between four characteristics of a keyboard articulation (duration, power (speed), weight/form of the body part or object with which the attack is executed, and

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[196] Kagel 1959, p. 26: "Dieser Vorgang erinnert an die elektroakustische Erzeugung von "farbigem Rauschen": aus dem "weißen Rauschen" werden Frequenzbänder verschiedener Breite gefiltert." Kagel immediately brings nuance to this "reminiscence" by explaining how the cluster is nevertheless different from a frequency band in its being a superimposition of periodic vibrations in an equidistant pitch scale compared to the colored noise's aperiodic vibrations.
[197] Kagel 1959, p. 27.
[198] Kagel 1959, p. 28: "[…] größere oder kleinere Zahl von vertical akkumulierten Tönen zu verstehen."
[199] Kagel 1959, p. 28: "[…] sind unter anderen die Solo-Instrumente, mit denn ein Cluster am besten erzeugt werden kann."
[200] Kagel 1959, p. 28.

distance to the keyboard), Kagel comes to a "syntax of gesture."[201] For instance, he finds that, when the distance between a body part and the keyboard is constant but the speed with which the keyboard is attacked varies, the resulting dynamic of the articulated note changes accordingly. The same result is obtained at constant speed with varying distance. When defining these parameters in numbers (e.g. centimeters, metronome markings and dynamic markings), formulas can be worked out to serialize modes of attack. As such parameters of articulation as well as cluster-width, -density and -duration are related, one can predetermine different duration- and distance-scales for each cluster-width. And by more accurate knowledge of the relationship between keyboard articulation and dynamics, interpretation of dynamics is no longer necessary when actions are adequately described.

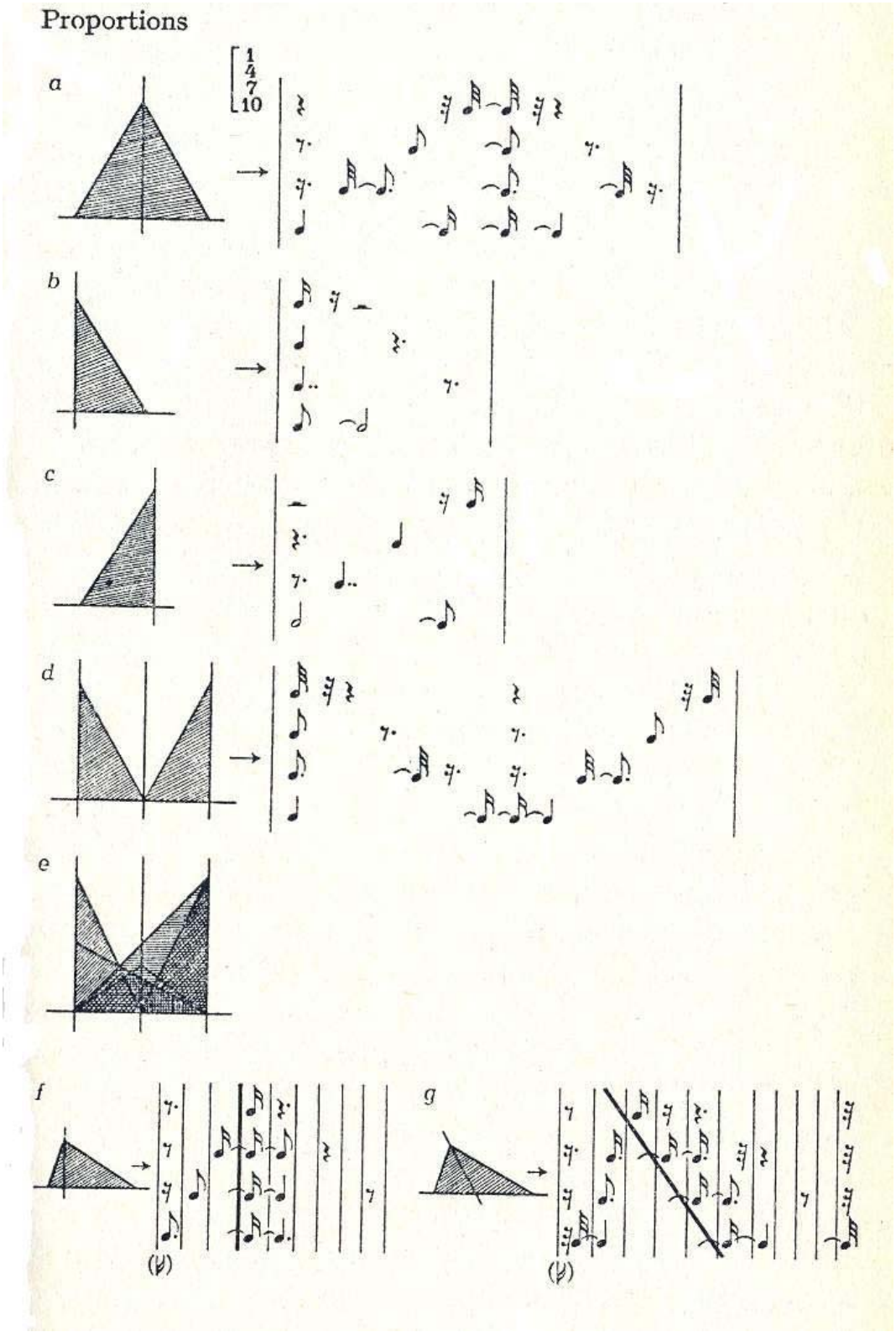
The rest of the article describes how Kagel incorporated such findings in his composition *Transición II* for percussionist and pianist. We will investigate this work and its relation to Kagel's cluster theory in the next chapter.

2.5.2.2.3 Pierre Boulez

In his booklet *Penser la musique aujourd'hui* (published in 1963), Boulez treats the cluster from a different angle than Kagel. Though he finds it superficial and part of too simplistic a styling for his taste[202] (as much as he had already used many clusters in several piano works himself), Boulez does express his personal opinion on the cluster's compositional status. He relates it directly to the glissando, finding both to be "sonorous surfaces", i.e. the integration and aggregation of all unitary intervals in between given limits of the continuum. The cluster fills that space vertically as does the glissando diagonally.[203] Without any explicit link, Boulez mentions the cluster right after having discussed the relations between sound and noise, and between "rough" and "processed" sounds.[204] He further associates the cluster with a frequency band, representing a field completely filled by an amorphous material.[205] In fact, for Boulez the cluster is amorphous, incapable of being inserted in a context or a structure other than as a borderline case.

Unlike Kagel, Boulez does not mention Henry Cowell (or Kagel, for that matter) anywhere in these writings, although the graphics he printed to illustrate his ideas on structuring layers of rhythmical values are rather much like the ones Kagel first used to summarize and elaborate on the kinds of moving clusters that he had discovered in Cowell's *New Musical Resources*. (Ex. 2.46.) Boulez does not discuss the distance between these layers and therefore avoids any association there might be with the notion of moving clusters.

[201] Kagel 1959, p. 29: "[…] eine Syntax des Gestus […]."
[202] Boulez 1963, p. 46.
[203] Boulez 1963, p. 45.
[204] Boulez 1963, p. 45: "sons bruts » and « sons travaillés ».
[205] Boulez 1963, p. 46.



Example 2.46. Boulez 1963, p. 61. © 1963, SCHOTT MUSIC GmbH & Co. KG, Mainz - Germany.

2.5.2.2.4 György Ligeti

Not unlike Boulez, Ligeti envisioned "sonorous spaces": new timbres in a static kind of music.[206] Related to his experiments with electronic music, during which a great number of tones and sonorous sequences (conceived of separately) were superposed, Ligeti transposed this "micropolyphony" to orchestral writing, and achieved transformations of musical tissue and timbres that differ considerably from those obtained by the usual instrumental combinations.[207] This tissue attained such a density that the voices can no longer be perceived in their individuality and that they can be apprehended collectively, at a superior level of perception.

Ligeti insisted on distinguishing these chromatically filled-out sounds, which have an "inner life" and which he called "timbre of movement"[208], from clusters.[209] The latter's notation alone has nothing in common with the image of the "keyboard instruments' tone grapes." Instead, he proposed "chromatic complex" or "chromatically layered sound."[210]

2.5.2.3 Reconsidering the cluster

2.5.2.3.1 Etymology and conceptual essence

There is no doubt that Henry Cowell was the first composer to write clusters while actually naming them as such. Contemporaries of his who also wrote clusters either sometimes referred to Cowell indirectly by using the specific term he had coined ("tone-clusters"), others indicated clusters by written instructions to play them with the flat of the hands, as had been the habit for some two centuries. (See next chapter.) Cowell was not the first composer to use the term cluster in relation to a musical entity, however. Johann Mattheson already referred to "Kluster" in his 1739 *Der Volkommene Capellmeister*, where he connects the ornament "Groppo" to the Italian, French and English words for "grape", meaning
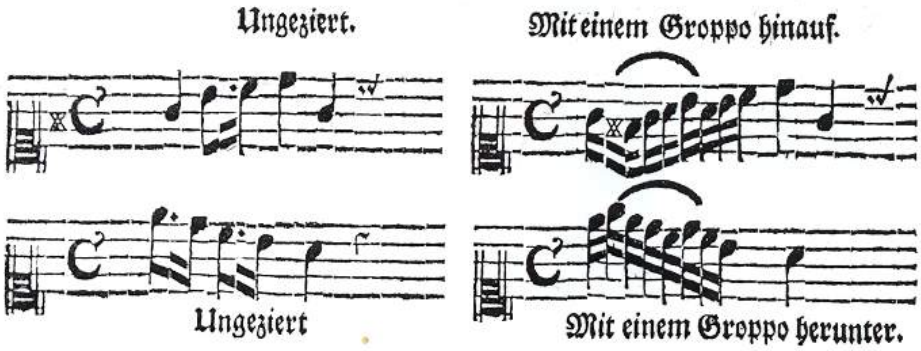
> everything that, properly as well as figuratively, we call in Niedersachsen as in English (and old-German) Kluster, i.e. many small berries or other things, that are close together: as here, in this manner, the notes closely connected.[211]

Matheson did not have vertical stacks of such closely grouped notes in mind: his "grape-ornament" was a sequence of two common ornamental figures (ex. 2.47). Nevertheless, the rationale that drove him to think of the association with grapes (as well as a reference to painting – "in painting it is called "groupe", i.e. an assembly of several bodies, one next to the other"[212]) is the same that made Cowell think of the word cluster. This term is so common and old in the English language that there is no need to look

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[206] Ligeti 2001, p. 198, footnote 11 : « Á partir de 1950 déjà, j'imaginais des timbres nouveaux, une musique statique, des « espaces sonores ». »
[207] Ligeti 2001, p. 198.
[208] Ligeti 2001, p. 198.
[209] As cited in Grünzweig 1995, p. 922.
[210] Grünzweig 1995, p. 922.
[211] Mattheson 1739, p. 115-116: "Nach meiner Verteutschung ist das so viel, als ein Knauff in Trauben-Gestalt […] Es kömmt gantz gewiß her von Grappo, eine Traube, die im Frantzösischen und Engländischen Grape […] heißt, und bezeichnet alles dasjenige, sowol ins eigentlichen als figürlichen Verstande, was wir im Niedersächsischen und Engländischen (als Alt-Teutschen) ein Kluster nennen, nehmlich z.E. viele kleine Beeren oder andre Dinge, die dicht zusammen gefüget sind oder sich häuffen: wie hier, bey dieser Manier, die an einaner geschlossene Schreib-Noten tun."
[212] Refers to « In der Mahlerei nennt man es Groupe, c'est à dire, un Assemblage de plusieurs Corps les uns aupres les autres. »

where Cowell might have picked it up. The fact that he specified the denomination by adding "tone" demonstrates how he consciously applied a term from the collective vocabulary to a specific musical phenomenon. In fact, it is the oldest known use of "cluster" that defines a collection of things of the same kind, situated closely together: already in 1382 the word cluster has been linked to grapes.[213]



Ex. 2.47. J. Mattheson: *Der Volkommene Capellmeister*, example (at § 41) of passages, "un-ornamented" as well as with a "Groppo" upward and downward.

The concept of a cluster, as in the concrete example of a bunch of grapes, relies on the effect that the mind perceives similar elements that are in close spatial proximity as a collective entity. It is the distinction of the totality versus its constituents that necessitates a separate word: a group of birds, stars or compositional variations is identified as a flock, resp. constellation or set when the number of individual elements is not the defining characteristic anymore because it is too high, or because the proximity is so great that the individual elements cannot be clearly or easily distinguished anymore. The words for such collectives are at least conditional on the similarity of the elements: a totality of birds *and* stars *and* grapes would not be identified as a flock, constellation or cluster. The different words for different types of such collectivities further demonstrate how the structure of the density is a factor in the defining process: grapes hang together on branches, birds fly in formation, stars are only a unspecified constellation when they are not identified as a perceived image of for instance the hunter (Orion) accompanied by his hunting dogs (Canis Major and Canis Minor). Despite the fact that general definitions of a cluster only mention aspects of density and similarity[214], the *number* of the individual elements is also a discriminatory factor: we will not call one or two grapes a cluster, even if they are still hanging fixed to a branch. How many grapes there need to be for them to constitute a cluster is not fixed. Several 1950's experiments in psychology on absolute judgment of one-dimensional stimuli (i.e. reporting the number of similar elements in a group without counting) have shown that in a number of diverse cases the maximum complexity of coding constructs lies between 5 and 9.[215] Under that threshold, the perception of the individual constituents is accurate, above it the discrimination is lost and the elements are seen as a group. These experiments did not consider aural perception, however.

2.5.2.3.2 Checking the cluster concept with the three perspectives

The general concept of a cluster of grapes is based on visual perception, although its characteristics – adjacency, similarity, and number – are the same when applying it to the tactile sense. Translating the concept to music, aural and tactile perception is

[213] OED, lemma "cluster".
[214] See OED, "cluster".
[215] The experiments are discussed in Miller 1956.

relevant as well as the conceptional perspective. Each perspective has its own set of governing rules, of which some are common to more than one perspective while others are not.

In hearing a number of sounds in close proximity, multiple factors influence the perception, such as loudness, timbre, density, register, octave doublings and even the (analytical or synthetical) listening attitude. Defining how we hear a cluster is far from easy. Experimental psychology has demonstrated how we cannot pick more than six different pitches without confusing them, but in those studies pitches were listened to in sequence.[216] No known psychophysical research has concluded how many sounds can be heard *simultaneously* before the listener loses his sense of distinguishing individual pitches.[217] It is not even established from how many tones onwards a vertical group gives an overriding impression of being one entity rather than many sounds, though research on timbre has revealed that common frequency periodicity for all frequency components of the pitches in a chord enhance the perception of those pitches fusing to form one entity.[218] This suggests that a group of chromatically adjacent tones would be perceived less easily as one sound than a tonal triad. But it is theory more than practice: the available empirical data relates to only a couple of pitches, and timbre, register, loudness and duration still have their role to play, perhaps making it easier for dissonant chords to fuse[219]. This brings us no nearer to any solid ground on which to define the difference in perception between a stack of thirds and one of semitones. As for the second parameter, similarity, there is also no scientific data linking it to proximity and/or number of cluster constituents. Nevertheless, at least the experiences of composers and musicologists who wrote about clusters show us how similarity matters: outside of the piano as a vehicle for clusters, the writers *mention* orchestra but when specific examples are put forward, it is mostly for homogeneous settings like for instance Ligeti's *Apparitions* (for 48 strings) or *Lux Aeterna* (16 a capella voices). And even if there is no empirical proof yet of *how* it happens psycho-acoustically, there is an easy to acknowledge sense that large and dense stacks of notes loose their identity based on individual pitches that are put together meaningfully, and become a collective "moment of timbre."[220] The dimension of pitch recedes and sequences of such stacks can be heard like sequences of unpitched percussion sounds: greater or smaller intervals are perceived between the stacks but none of the latter can be attributed a specific place on a scale of pitches. Crucial to this matter is the context in which the individually linked pitches in a cluster have "meaning." It is easy to recognize a chromatic stack of 6 pitches in a tonal context, and experience its construction as non-functional, just as the triads in the piano part at the end of Schoenberg's *Pierrot Lunaire* sound out of place in the atonal system at hand (though perfectly matching the text "O ancient fragrance – from the age of fairy tales!"[221]). Yet, it is less easy to distinguish a vertical collection of for instance 5 adjacent black piano keys in an F# major piece from its tonic. Finally, there is no consensus on which part of the aural experience is defining in judging a cluster: a C major run, played with the sustaining pedal depressed, will leave the sound of a diatonic cluster for as long as the pedal is depressed.

Theoretical construction of clusters also depends on context: a stack of major seconds played by quartertone instruments is only as dense as a tonal triad on a well-tempered piano. Traditional theoretical appliances like respreading (GABCDE → ACEGBD) and inversion (C E♭ G♭ B♭ D♭ F♭ → B♭ C D♭ E♭ E♮ G♭) do not work for the cluster concept of adjacency. The required similarity of the individual constituents would have to be guaranteed by

[216] Pollack 1952.
[217] Personal communication (March 2009) with Stephen McAdams, Marc Leman and Dirk Moelants, all specialist in psycho-acustics.
[218] Leman 2005, p. 100.
[219] Leman, 2005, p. 102.
[220] Grunzweig 1995, p. 922.
[221] "O alter duft – aus Märchenzeit!".

taking into account timbre, an aspect of music that is very much underrepresented in traditional music theory.[222] Especially western music notation – still the basis for most analytical activity – is deficient in that respect. Music notation also circumvents the problem of cluster density: in keyboard notation the oldest representation of a cluster (all notes written out) contained most of the visual clues of the cluster concept, with similarity, adjacency and especially density demonstrating the characteristics convincingly (compare e.g. 2.39 and 2.43 for the difference in density between a diatonic and chromatic cluster); the most widely used cluster notation – the thick vertical line – shows extreme and often unrealistic density (cf. the pentatonic cluster containing minor thirds), even if it best conveys the idea of unity. Henry Cowell's idea – that clusters "may" be derived from the overtone series – demonstrates how even the composer who first developed a theory around the cluster is not sure about how solid such a basis is.

As little of Cowell's theory is to be found in his compositions, as little evidence of performance practice on the piano can be discerned in his theory. And yet, it is the tactile perspective that led him to experiment with clusters and write the theory, as it most easily relates to all the characteristics of the cluster concept. The monochrome sound of the piano guarantees similarity; adjacency and multitude are assured because whole stretches of the interface are played; all the possible adjacent notes are automatically included. One extra nuance can be added to the picture: when playing on the keyboard with a body part other than the fingers, the articulation is much less controlled. Because of the irregular shape of the improper body parts and their surface the difference in touch is audible especially between the outer and inner tones of the cluster. The sides of the fist, palm and arm are oblique and do not depress the outer keys of a cluster as fully as the middle. The result is the undifferentiated interval of the cluster because the uncontrolled attack blurs the contours and emphasizes the noise-character of the cluster.

2.5.2.3.3 The cluster and the piano

All four composers that expressed their personal and expert opinions on the cluster – Cowell, Kagel, Boulez and Ligeti – have tried to put the cluster in a general framework. However, each of them has, more or less obviously, also put it in a perspective that relates to the keyboard. Despite the fact that many of Cowell's definitions do not allow for the black-key cluster, he clearly did depart from the keyboard cluster: by far most of his own works written before *New Musical Resources* and including clusters were composed for the piano (see next chapter) and the cluster notation he developed only makes sense in a keyboard score. Kagel's definitions also exclude the pentatonic cluster, and even if he agrees with Cowell that the orchestra is best placed to bring the finest nuances to the cluster, the whole of his theory culminates in his attempt to serialize attack modes for clusters on the keyboard. Boulez' criticism on the cluster – "their recent abuse has rapidly turned to caricature"[223] – can only refer to the spectacular effect of keyboard clusters. The only other writing of his in which he mentions the cluster was an analysis of his second *Improvisation sur Mallarmé*, where he discusses at length his use of the silently depressed keyboard cluster. Ligeti explicitly asks to differentiate between the piano- and other clusters.

Techniques for performing clusters on the piano have been historically decisive in styling the cluster's identity as well as confusing the matter of defining it. Large forearm clusters are even more removed from tonal recognition than medium chromatic clusters. Fist clusters have been the reason for the long association of the cluster with loud noise.

[222] See for instance Nicholls 1990, p. 212, stating: "[…] it becomes difficult to describe in conventional terms the thuds and plunks of *Bacchanale* and other prepared piano/percussion works; all that can really be done is to discuss form and rhythm."
[223] Boulez 1963, p. 46 : « Leur abus récent a tourné rapidement à la caricature".

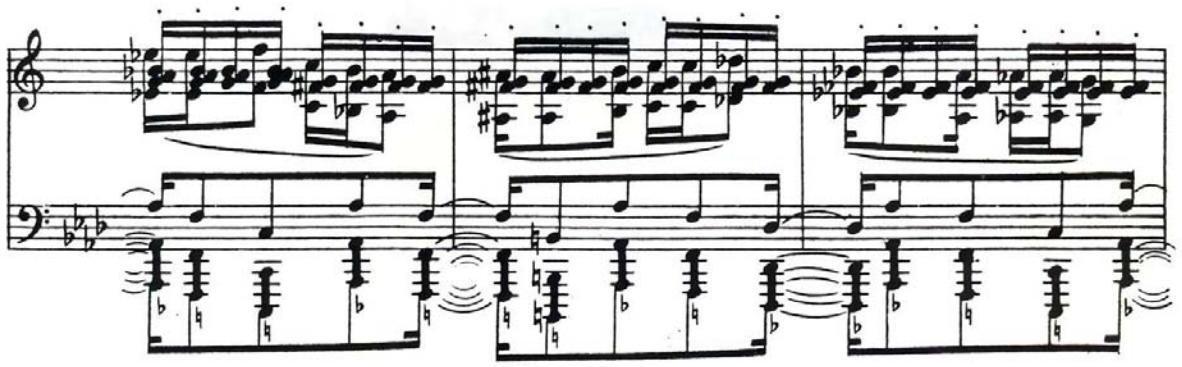
Arpeggiated forearm clusters were responsible for the misconception that Henry Cowell played clusters with his elbows, leading to critics looking down on what they perceived as cheap elbow music. Needing to incorporate these clusters into the system of clusters built from small minor-seconds triads led to some imbalance in Cowell's theory, which still leaves its traces in present day encyclopedic lemmas. Finally, the proposition to use the term "width" for the ambit of a cluster demonstrates how the horizontal layout of the keyboard was foremost in Kagel's thoughts when thinking of the cluster's parameters.

2.5.2.3.4 Defining the cluster as an extended piano technique
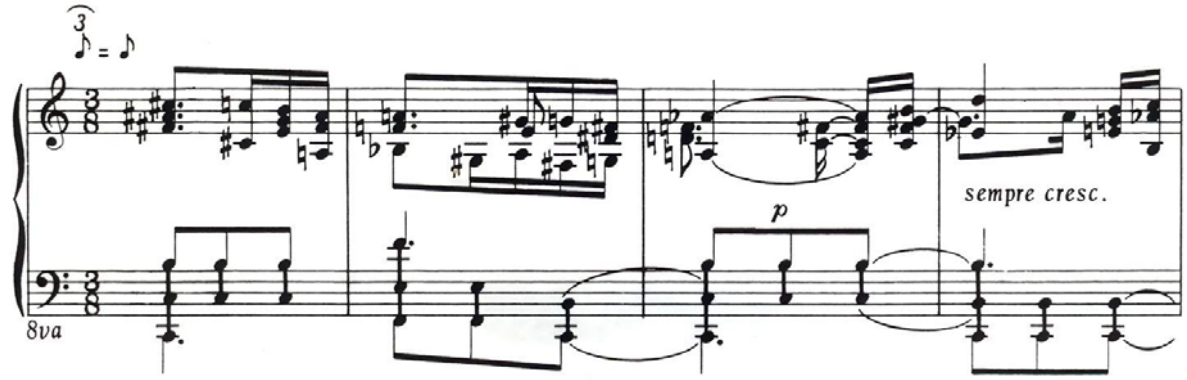
As has been established above, the cluster is defined differently according to three perspectives that determine the context. *Aural* perception of a cluster depends on variables such as instrumentation, loudness and register (as well as the listening attitude and the perception of verticality itself), *theoretical* construction of a cluster needs to take into account the composer's pitch-structuring system to be distinguished from other harmonic constructions, and the *tactile* perspective is dependent on the instrument and on whether or not any of the two other perspectives are allowed to influence the outlook. Hitting the strings of a guitar with the palm of the hand will not automatically result in a cluster as defined by theory: depending on the fingering in the left hand, the cluster technique will mostly result in tonal chords or aggregates. The perspectives have a tendency to interfere with each other and it is difficult to keep them apart: from the tactile perspective, C#-D#-F# can be a small cluster on the piano when played with the fist, but not when played with the fingers, and also not when transposed to C-D-F, when there is no sense in calling it anything but a chord.

It is impossible to establish a definition of the musical cluster satisfying all three perspectives at once. Even if we discard the aural standpoint (of which there is so little that can be said that its validity must be questioned), tactile and theoretical perspectives are difficult to reconcile. Like with the glissando, clusters are different on different instruments. This study will therefore use the tactile perspective as the sole basis for considering the cluster. A stack of adjacent notes (on the keyboard or on the strings) is a cluster as soon as it can be played improperly, i.e. with the fist, palm, arm, elbow etc. or with the help of an accessory, i.e. depressing a plank lying on the keyboard, or rubbing over the keyboard with cloth. Playing two or three notes together with one finger (for instance the thumb) or one note with two or three fingers together will be considered as part of cluster technique. We consider an aggregate as an undefined stack of notes, whereas a chord is part of a theoretical system such as tonality.

The tactile perspective allows for combinations of keys that cannot be obtained otherwise. The under arm can be used in two parts to play for instance a lower cluster with part of the underarm while hitting a single note with a finger, leaving a gap in between (ex. 2.48), or holding keys depressed with one part of the under arm while playing clusters with the other part (ex. 2.49), even lying the arm obliquely over the keyboard so that cluster timbre changes from diatonic over chromatic to pentatonic.



Example 2.48. H. Cowell: *Antinomy* (1917), bars 45-47.[224]



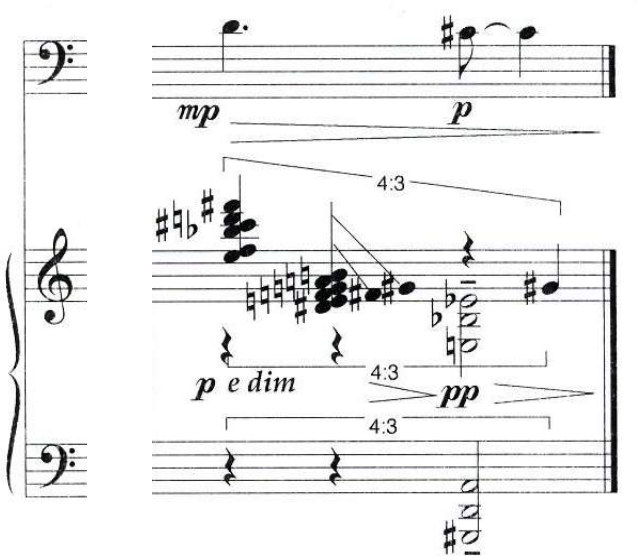
Example 2.49. H. Cowell: *Timetable* (1917), bars 13-16.[225]

On the piano, cluster technique can be applied to the keyboard as well as to the strings. Contrary to a keyboard cluster-glissando, where the only sound that really audibly moves is the one pitch at the cluster's edge in the direction of the gliding (see 2.5.1.6.2.4), all notes of a moving cluster on the strings keep sounding fully because the rubbing of the body part against the strings, as it glides over it, keeps on activating them. On the organ moving clusters have more aural effect, because the volume of each individual pitch does not decay.

Since the aural perspective is not the basis for the piano cluster as it is here considered, the audience may not know when a cluster is being played. This is particularly so when a cluster is depressed silently to open strings: it would take an extraordinarily trained ear to distinguish between the sympathetic resonance of strings that are opened by a cluster and those of an aggregate. When considering clusters on the basis of the technique, it is also irrelevant to distinguish between types on the basis of any aural impression, as for instance between colorist, harmonic and melodic clusters.[226]

Again like the glissando, the cluster technique only exists when it is in some way clear from the score that it is demanded, e.g. by its notation or by the fact that it cannot be played otherwise. Possible or potential piano clusters are considered "as is", i.e. analytical tools such as respreading, inversion or transposition have no influence on the focus. Scarlatti's acciaccatura-chords are not clusters, but the second aggregate in ex. 2.50 from Ornstein's opus 33 #1 is a cluster because it can only be played with the flat of the hand. A chord as tonal as $d\#^1$–$f\#^1$ becomes a cluster when played with the fist.

[224] Reproduced by permission from Associated Music Publishers.
[225] Reproduced by permission from Associated Music Publishers.
[226] As in Godwin 1969, p. 24-25, where cluster use in Cowell's *New Musical Resources* is discussed.



Example 2.50. L. Ornstein: *Two pieces for 'Cello and piano* opus 33, # 1, last bar (Adagio). Reproduced by permission of Poon Hill Press.

2.5.2.3.5 Parameters of the piano cluster

2.5.2.3.5.1 Ambit

The maximum ambit for a keyboard cluster is the same as the number of notes on the keyboard: generally 88, for some piano's it is more (e.g. the Bösendorfer Imperial). One commentator has indicated one single note as the smallest possible cluster.[227] From the point of view of cluster-*technique*, any interval – even the unison – must be eligible as long as a finger does not properly articulate it. As such an extremely small ambit forbids most of the cluster characteristics (no density, similarity or number, only unity) it is should be considered borderline. We will however consider a single note to be a cluster when it is played with more than one finger at the same time. Likewise, any number of notes played with together with one finger (e.g. the thumb) will be treated as a cluster. Both will be called *micro-clusters.*

It is often difficult to establish the exact ambit of a piano cluster. Not only does the size of body parts depend on the individual performer, the ambit can easily become diffuse as the top and bottom notes are less pronounced because the body parts' surfaces are not flat enough to ensure that each note is depressed in the same manner and with the same force.

2.5.2.3.5.2 Sonority

In general the sonority of a cluster refers to the timbre of the instruments that play it, e.g. piano, strings or voices, or combinations of different instruments. Inside the world of piano clusters, and despite the monochrome timbre of the piano, the keyboard cluster's sonority can be further distinguished according to its chromatic, diatonic, pentatonic or combinatory density. (Remark in ex. 2.47 how the second aggregate is neither chromatic, nor diatonic or pentatonic.)

[227] Stephan 1972, p. 122.

2.5.2.3.5.3 Density

Kagel considered the cluster's density to be "the greater or smaller number of vertically accumulated pitches"[228], though in effect it can be gauged through *two* types of measurements: the number of notes and the types of intervals within the ambit. Although there is no real correlation between the musical application of the cluster concept on the one hand and the physical world on the other hand, the notion of mass versus weight is efficient to distinguish between both aspects of the cluster's density. The mass of a cluster can be considered to be the number of notes inside the cluster. The weight of that cluster would then depend on the types of intervals inside the cluster. Contrary to Kagel's vision, it is the weight – the internal interval structure – that determines the effect of the density the most, as was concluded above. It is the weight, rather than the mass, which distinguishes a chromatic cluster (consisting of one type of interval – the half tone) from a pentatonic (two types: major second and minor third) and a diatonic cluster (major and minor second). Combinations of these three cluster types (played with one or two body parts) make for a diverse set of possibilities. Further exploring the comparison with natural physics, where weight equals the product of mass and acceleration due to gravity, the cluster's weight could change relative to the compression of its ambit. The smaller a cluster is made, while keeping the number of notes, the smaller the internal intervals are forced to be.

2.5.2.3.5.4 Register

Register is the equivalent of pitch for single tones and has an influence on how we hear the cluster. Very high and very low clusters tend to sound less dissonant. This is because in these registers their density is less clear and the ambit is less pronounced.

2.5.2.3.6 Terminology and types

The cluster denomination is generally specified by the body part (or accessory) that plays it and further detailed if possible or necessary, e.g. a "silently depressed chromatic left-palm cluster." When two body parts are used to combine clusters, these will be considered two clusters. One arm laid diagonally across black and white keys is one cluster.

That a fingered chromatic run would be an arpeggiated cluster[229] is, of course, irrelevant from a performance practical point of view. This is not to say that there is no arpeggiation in cluster technique. Gradually depressing adjacent keys with a palm or an arm constitutes an arpeggio. If the right arm quickly rolls upwards over the keys, the audience can confuse this with an elbow-cluster because the image of the elbow on the keys (the final stage of the arpeggio) determines the imprint in the memory.[230] Clusters can be arpeggiated inversely, i.e. gradually released from on side to the other, like arpeggiated releases of individually articulated keys in chords.

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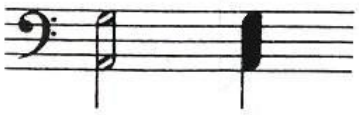
[228] Kagel 1959, p. 28: "[…] größere oder kleinere Zahl von vertikal akkumulierten Tönen zu verstehen."
[229] Godwin 1969, p. 25.
[230] Henry Cowell's debut in London in 1923 sparked off a range of newspaper articles and even a cartoon highlighting his so-called "elbow"-cluster playing (Manion 1982, p. 131-134). Cowell wrote elbow-clusters only extremely rarely, and not in or before 1923. More likely, audiences (and critics) confused elbow playing with the arpeggiated right arm clusters that were part of several pieces that he played then (e.g. *Dynamic Motion*, *Antinomy*).

Both techniques of playing two or three notes together with one finger and playing one note with two or three fingers will be called "micro-clusters."

2.5.2.3.7 Notation

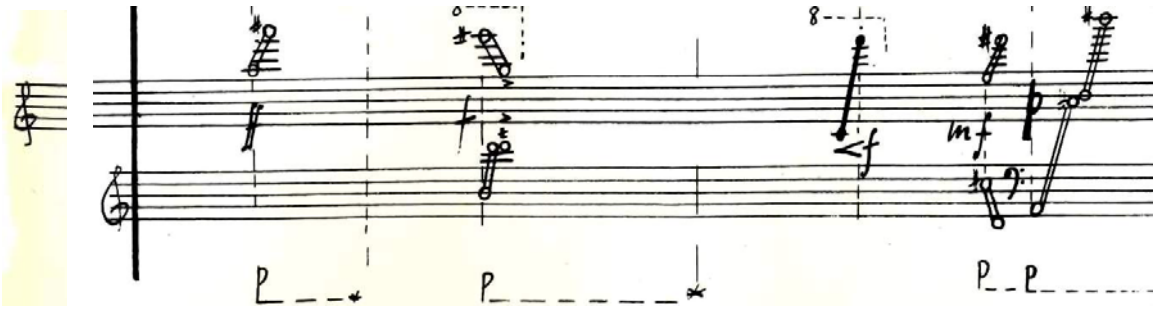
For keyboard clusters is it crucial that their notation is unequivocal in three aspects: ambit, duration and weight.

As to duration, the convention for single notes prescribes half-note and longer durations to have "white" note heads while the heads of notes with a value shorter than a half note are filled out in black. At the same time, clusters are easily associated with the color of the keys they are made of, resulting in the notation of white-key clusters with two stems on either side of the notes and black key clusters with the space in between those two stems blacked out. If both the note heads and the stem(s) are either black or white (ex. 2.51), there is no differentiation between duration and weight, i.e. the pianist cannot know what cluster type he is to play.



Example 2.51. "White" or half-note / "black" or quarter-note cluster.

Between ambit and weight there is also a dangerous association. The ambit is notated by the top and bottom note-heads, which can carry a sharp or a flat (or a neutral) to specify its specific position. At least in theory it is possible to have a white key arm cluster with a black key top and/or bottom note, or a black key cluster ending on a white key. In reality, however, this is impractical because cluster types are based on the way they are played with body parts and pentatonic clusters are therefore associated with black-key ambit notes, as are diatonic clusters with white-key ambit notes. When such situations do occur (as in ex. 2.52), questions arise as to the coherence of the system used.
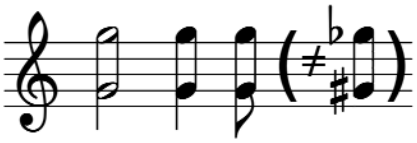


Example 2.52. K. Stockhausen: *Kontakte* (1959-60), p. 39. The "white" (double-stem) oblique clusters are supposed to be diatonic according to a footnote on page 33 in the score. The first cluster in the left hand specifically notates a diatonic cluster plus one black key. That the other clusters with a black key top note (some of them written before this one) are not indicated in this way casts doubt on the rest of the system. © With kind permission by UNIVERSAL EDITION A.G., Wien.
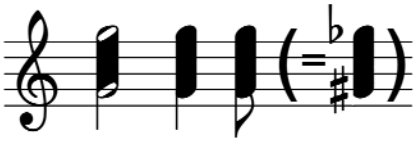
All in all, there are only three correct systems to inform the pianist as to how clusters are notated:

1. A performance practical note at the beginning of the score to explain the essentials of the notation used;
2. The use of a thick vertical line in between ambit notes and an accidental on top of the cluster or in front of it (but then in a type or size different from that used for the ambit notes to avoid confusion) to specify the type: ♮ = diatonic; ♭ or ♯ = pentatonic; nothing = chromatic.
3. The system that shows the type by way of three different types of stems (ex. 2.53).
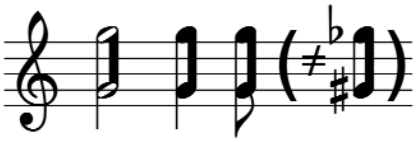
Diatonic:



Pentatonic:



Chromatic:



Example 2.53. Graphic cluster notation proposed by William Y. Elias.[231]

Unfortunately, the last system is rarely seen and the first is not very common either. The second is more popular but has the disadvantage that the chromatic cluster is only specified by deduction: if there are no pentatonic or diatonic clusters, a thick vertical line in between the ambit notes (and no accidental on top of it) may be confusingly alike to pentatonic clusters in the third system as mentioned under 3.

[231] See Elias 1984, p. 64-68.

2.5.3 In between glissando and cluster

Both the glissando and the cluster technique are archetypes of keyboard playing. Their primary musical expression is founded in every child's urge to bang on or sweep over the keyboard.[232]

Whereas the glissando is dynamic and stands for movement, sequence, time and speed, the cluster is static and represents inertia, simultaneity, space and density. On the other hand, both techniques have much in common. Their articulation is diffuse and comes more from the hands, arms, and shoulders than from the fingers. There is limited possibility to articulate single notes within the larger whole, and the pitches at the extreme ends have more chance of being individually perceived than those in between. The timbre of individual notes goes up into the color of the whole. The glissando and the cluster are therefore not easily integrated in just any harmonic environment and both are often considered as an effect or exotic color. On the keyboard, they are both categorized as basically (white-key) diatonic, (black-key) pentatonic or chromatic. Their notation needs too much space to always include details and is commonly abbreviated by straight lines.

Both techniques also depend on the instrument for their definition and only exist when explicitly indicated in the score or when no other technique is possible. If the notes at their extremes are not clearly articulated, the length of the glissando or the width of the cluster is not audible and the whole is perceived less as a filled-up interval in time or space and more as a single gesture or noise. Dense clusters and fast glissandos are defined more by the singularity of their sound than by their individual constituents.

Since both techniques are defined by their action, there is no difference between moving clusters and a cluster-glissando. The faster a glissando is performed, the more it will near the sound of a cluster. As an arpeggiated cluster sounds like a glissando with the damper pedal depressed, a gradually released cluster could be considered to be a "negative" glissando the way consecutive release of the keys in a chord could be thought of as a "negative" arpeggio.

2.5.4 Extensions of pedal functions and related techniques

2.5.4.1 Proper pedal usage

The three pedals that remain on current pianos are the una corda, sostenuto and sustaining (or damper) pedal. Before examining their properties, it is important to go into the acoustical characteristics of the way piano strings are set-up to interact with the keyboard and pedal interfaces.

2.5.4.1.1 Introduction: in general

In rest position, most of the piano strings are silenced by the dampers that press felt in between or around the strings to which they are assigned. The uppermost regions of the piano traditionally have no dampers. Without dampers, strings are "open", i.e. free to vibrate if and when excited. That they can then easily be triggered to actually vibrate

[232] The insights in the first three paragraphs of 2.5.3 have already been published by Herbert Henck in Henck 2004, p. 14-24.

without using the action can be easily heard when for instance blowing on the strings in the upper part of the piano, where there are no dampers. The displacement of air is enough to make the strings start to vibrate. When playing such a note in that region by using the keyboard and then stopping its sound by pressing fingers on the corresponding string chorus, the remaining open strings in that damper-less range can still be heard ringing. That is because they are acting sympathetically to the properly activated strings of that properly played note. So high up the piano's range, the sympathetic vibrations are not very loud because the tension of the strings is so high that the strings are not flexible enough to allow for any great amplitude. That is why dampers are not really necessary up there and why they are most often left out. The most flexible strings – the longest ones in the bass – are most easily excited.

The louder and shorter the properly produced tone, the more and longer the open strings will be heard. The loudness is directly related to the power of the hammer's attack and of the initial resonance, both of which need force to be transmitted to the open strings. The shorter the note, the less its resonance masks the sympathetic vibrations. (For more characteristics, see below at 2.5.4.3.1.)

Strings can be open "by nature", i.e. when there are no dampers (so that they can only be stopped artificially, i.e. using fingers or objects) or they can be opened by using the damper pedal or by depressing keys.

2.5.4.1.2 Una corda

The left pedal – una corda – is truly a stop, a register pedal. As its name indicates, it is meant to limit the number of sounding strings per note to one. In the 18th century that was actually the case, shifting the keyboard so far to the right that the hammers only struck one of the (mostly three) strings per chorus. The mechanism even allowed an intermediate, "due corde" position of the stop. Today the keyboard only shifts so far that the pedal mechanism makes the hammer miss the first (left) string of the chorus but still hit the two other strings on the right side, thereby eliminating the possibility of a due corde. The lower range notes that only have one string per key are unaffected by this pedal.

Popular belief holds that the una corda pedal is a volume-lowering pedal. While the effect on many pianos is often mainly perceived to be diminishing the volume of the sound – at least for those string choruses that are affected by the pedal – the acoustical basics of the una corda effect in fact alter the timbre of the proper piano sound. The string that is not struck by the hammer will vibrate sympathetically because its damper is lifted, allowing it to be affected by the sound waves that the neighboring struck strings emit and by the impulse of the hammer striking the two right strings and traveling onto the open string. (The first latter can be demonstrated by depressing the una corda pedal, striking a key and immediately stopping the vibrations of the two right strings of the corresponding chorus with the fingers of one hand while keeping the key depressed with the other hand – the left string will sound the pitch of the depressed key. The former effect – sympathetic vibrations through the air – can be produced by depressing the una corda pedal, pulling both right strings with fingers (pizzicato) while keeping the corresponding key depressed. Again, the left string will sound.) A non-struck vibrating string has a different sound from a struck string because it does not receive its impulse at the specifically chosen harmonic where the hammers are engineered to strike the strings. Striking a string at a particular harmonic affects the prominence of that harmonic, which is not particularly affected on a sympathetically vibrating string. The combination of three struck strings is therefore essentially different from the combination of two struck and one sympathetically sounding string.

2.5.4.1.3 Sostenuto

The sostenuto pedal is a very sophisticated mechanism that keeps only those dampers lifted that are already up through the depressing of their corresponding keys. It was intended for those instances where a limited number of notes (for instance a bass octave) needed to be kept sounding while the fingers had to leave those keys to play elsewhere on the keyboard. As such, its function was not to alter the timbre of the notes, only to sustain them. As there was already a pedal called sustaining pedal, another but confusingly similar name was chosen for the middle of the three most common pedals: sostenuto.

2.5.4.1.4 Sustaining

When the sustaining or damper pedal is depressed, all piano strings are opened at once. The mere rubbing of the dampers' felt against the strings is enough to activate them, even when no note is played. This is typical for pianos of which the dampers' positions were twisted when removing the stickers that had been glued onto the dampers to know where particular strings are when playing on the inside of the piano. When the dampers are not twisted and all strings are opened, the majority of the strings will audibly vibrate in sympathy with those of a note that is being played on the keyboard. The overwhelming amount and richness of sympathetic vibrations that all open strings add to the one struck note's own resonance, is demonstrated by playing that note and then stopping its string's vibrations by pressing some fingers against its strings while keeping the sustaining pedal depressed. The added partials that sound through the sympathetic vibrations of the open strings enrich the properly played tone. This is the reason why a fuller tone is achieved when playing a note with the damper pedal already depressed, e.g. at the beginning of a composition or after a rest, so that the other strings are open and ready. When depressing that pedal after a note is played (and depending on how soon the pedal is depressed), a wah-wah effect can be heard as strings will start vibrating sympathetically, but only those that are excitable enough to do so without the strong impulse that the hammer provides.

The technique of using sympathetic vibrations to enrich the sound quality of the tone is not limited to the piano. When violinists are asked to play a long *g*, which can only be bowed on the open G string, not allowing any active vibration on the part of the player, many will be seen to bow the *g* on the G string while at the same time 'silently' playing (i.e. putting the finger on the right spot but not bowing) g^1 on the D string and vibrate with the hand as if the g^1 were actually played. The D string is capable of sounding sympathetically with the *g*, therefore the finger-vibration will add to the timbre of the *g*.

2.5.4.2 Extended pedal techniques

Aside from the most obvious and high grade extended techniques for the piano pedals – e.g. hitting or loudly (noisily) releasing them for the sake of the hitting noise and not to operate the dampers or the shifting of the keyboard – they can be used to obtain extended sounds, i.e. sounds that are not those of struck strings.

A technique closely related to that of activating open strings is that of "catching" existing resonance. When depressing the sustaining pedal immediately after having played a short note or aggregate, the dampers have not had sufficient time to completely dampen the resonance, and lifting them soon again will allow remaining vibrations to ring through. Lifting the dampers again through the pedal makes for the newly opened strings to pick up the remainder of the not fully dampened sound. The action is typically notated

by way of a short rest before the sustaining pedal symbol. This sympathetic resonance will not be as rich as when the strings are freed by the pedal *before* the struck string sound is made. With caught resonance, the impulse of the attack is not transmitted to the open strings and only sound waves in the air and in the soundboard combined with the dampers rubbing against the strings can trigger their sympathetic vibrations.

Other techniques consists for instance of releasing the sustaining pedal so slowly that the damper felt touching the strings as it moves to its resting place can be heard, as in the third piano sonata by Boulez (at the end of *Commentaire*). From the point of view of the action, it is logical to assume that the pedals have been conceived to function as an on/off switch, but the nature of the interface allows for intermediate stages. Those potential gradations in the movement and the position of the pedal should be considered extensions. Requests to slowly (gradually) depress and/or release the una corda or sustaining pedals, or to depress them only halfway or even less, are not uncommon in 20th century piano repertoire. Depressing the una corda pedal halfway (as demanded also in Boulez' third sonata) cannot have anything but a psychological effect, however, for the mechanism can only make the hammer strike or not strike a string and does not allow for anything in between that might produce an audible effect. Not fully depressing the sustaining pedal can result in the felt of the hammers still lightly touching the strings, thereby still slightly dampening their sound or limiting their openness. Nevertheless, it is not realistic to assume that, between depressed and released, there are several pedal positions that each produce an audibly different effect, certainly not that they would work for all pianos at 1/2 and 1/3 of the way (if those measurements could even be accurately aimed at by the feet).

2.5.4.3 Silently depressed keys

As far as the damper action on the piano goes, there is no difference between playing a key and depressing it silently: both actions lift the damper connected to that key. Operating the dampers to open up strings by depressing a key has one advantage over the way the pedal mechanism lifts the dampers, however: it is like operating an evolved version of the separately operable upper- and lower-range damper mechanisms on some 18th century pianos: by silently depressing keys, dampers can be operated selectively.

2.5.4.3.1 Selectively activating open strings

By manually selecting dampers to be lifted, the complex multitude of sympathetic vibrations normally produced by the open strings when employing the damper pedal while playing on the keyboard can now be selected to ensure that only certain partials or combinations of partials are heard. Silently depressing A^1 before playing a^1 will add the 2nd partial of A^1 to the sound of a^1. When releasing the a^1 key while keeping the a-key depressed, the 2nd partial will still sound from the A^1 string. Any combination of silently depressed keys – tonal chords, atonal aggregates or any type of cluster – can be used to produce specific partials from open strings. These can be mixed with the properly played sounds or, most effectively, heard on their own as soon as the properly played keys are released.

The more closely related the open string is to the properly played note, the more definable partials can be produced. Most easily produced partials are octaves, by properly playing the same note as the silently depressed key but one or more octaves above. After the octave (2nd partial on the open string, reinforced with the 4th partial), the fifth (3rd and 6th partial), the third (5th partial) and the seventh (7th partial) can most recognizably be produced. Comparing that 7th partial on for instance the A^1 string to the

actual 7th (G^1) above that string, one realizes how an actual non-tempered tone can be produced on the piano.[233] The higher the overtones that are sought out, the more difficult they are to recognize them as clear pitches. Put in another way: the more removed the silently depressed key from the properly played note in terms of their position in the overtone series, the less audible and definable the sympathetic resonance is.

When activating several open strings or choruses at once, each will not just resonate in sympathy with the properly played key that has the same fundamental. For instance, when opening the C^1-E^1-G^1-C strings and playing c^1-e^1-g^1, the c^1 will remotely produce at least the 2nd and 4th partials of C^1 as well as of C, since these partials are all C's; the e^1 will directly relate to the 2nd and 4th partial of E^1 (they are E's) but also to the 5th partials of C^1 and C (also E's) while the g^1 will connect immediately with the 2nd and 4th partials of G^1 (both G's) and the 3rd and 6th of both C^1 and C (all C's). Besides these close connections, all three notes of the properly played c^1-e^1-g^1 chord will trigger partials that are further removed in the overtone series of the open strings. For instance, e^1 corresponds to the 5th and 10th overtones in both series on C^1 and C (each of those partials being an approximate E) and to the 5th partial of G^1 (i.e. B). At the same time, g^1 will bear on the 6th (= D) overtone of G^2. The result is a complex of partials that is definable only because of a majority of overtones directly relating to the fundamental of the properly played keys. When silently depressing an octave or forearm cluster and then playing the C major chord, the resulting cloud of interrelated partials only sounds as a sustained noise.

Such connecting of pitches with partials on other strings only works on a piano that is in tune. Out of tune instruments will just as well deliver sympathetic resonance, but the relationships will not be predictable and neither will the result be controlled.

As the longer and more flexible strings will more easily resonate sympathetically, the technique of silently depressed keys is most effective when opening strings in the lower ranges. It is of no use to silently depress c^3 and hope to get many audible sympathetic vibrations by playing any other note(s) on the keyboard.

Selectively producing partials from open strings was unfortunately called *Klavierflageolett* by Arnold Schoenberg. A flageolet – the sound and technique of manually pressing on a string's nodal point and then triggering that string's vibrations to produce the partial relative to the nodal point – is just as easily applicable to the piano action as it is to the violin, and perhaps required as much in the piano repertoire as the silently depressed key technique. Ligeti's calling the latter *touches blocquées* (blocked keys) was more accurate and to the point. This study will therefore distinguish between *flageolet* on the one hand (directly manipulating the string's length) and *silently depressed keys* or *open strings* on the other hand.

Besides silently depressing keys to elicit sympathetic resonance from open strings by playing other notes on the keyboard, they can also serve to let the open strings sound when manipulated directly by for instance gliding over them crosswise.

Silently depressed keys are typically notated with diamond-shaped note heads.

[233] I am grateful to Claude A. Coppens for this insight.

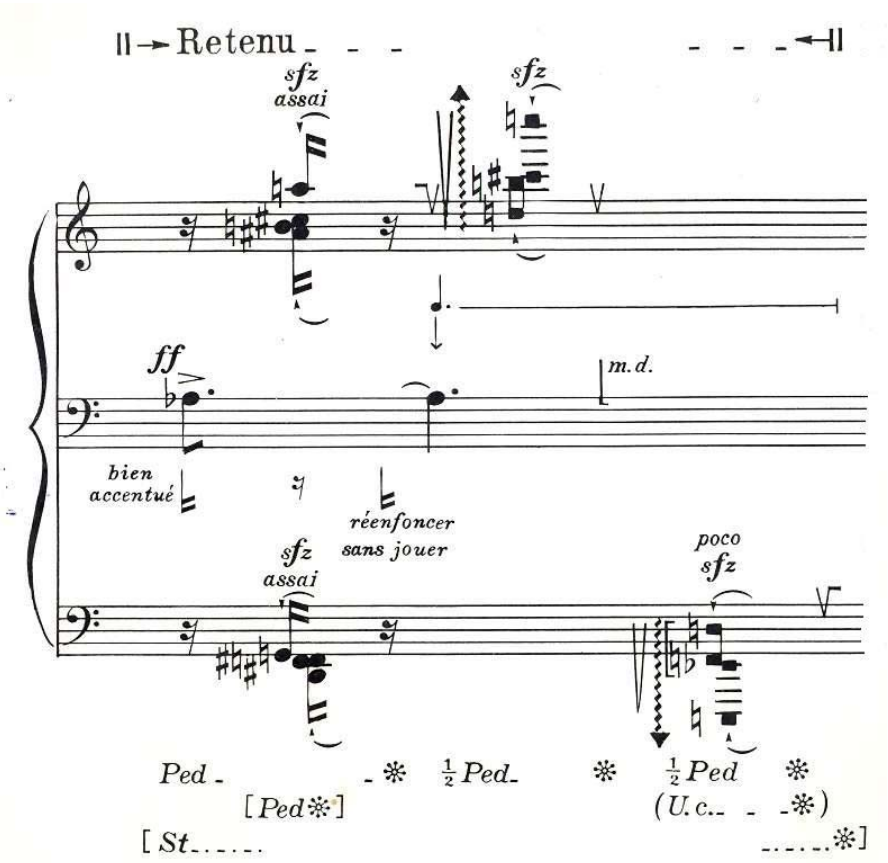
2.5.4.3.2 Catching resonance

As with sympathetic resonance (see 2.5.4.1.4 and 2.5.3.1), the effect of *catching* resonance can also be achieved selectively instead of by using the damper pedal (as in 2.5.4.2). Either the same key (as the one used to strike the string) or another one (or more) can be depressed silently as soon as the properly depressed key is released. As with the open strings, this results in a *selection* of left over partial vibrations, compared to when the damper pedal is used to catch partials from *all* the opened strings.

2.5.4.3.3 Filtering resonance

A more proper application of silently depressed keys mostly involves struck string sounds. When playing a number of keys with the sustaining pedal depressed, e.g. arpeggiating *C-E-G-c-e-g-c*^{1}*-e*^{1}*-g*^{1}*-c*^{2}*-e*^{2}*-g*^{2} then silently depressing only a few of those keys again (e.g. *c-g-e*^{1}) before releasing the pedal (while keeping the three keys depressed), those three notes will keep sounding but with some of the sympathetic vibrations of the other struck strings as well as of all the strings that had been opened added to the final sound. The timbre is audibly different from the "plain" sound of a struck string but it is less rich or full compared to those three notes properly played with the damper pedal lifted to make all other strings resonate sympathetically.

This technique is sometimes prescribed as an alternative to the use of the sostenuto pedal when the available piano does not have this pedal (ex. 2.54).



Example 2.54. P. Boulez: third sonata (1956-57), 2nd formant *Trope, Texte*, beginning of 3rd system. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Instead of explaining this technique as *filtering* a few particular notes from a chord, it can also be considered to just *dampen* the resonance of the chord. As such, it has been used

for repertoire where it is not indicated and not possibly intended originally. In Haydn's 1789 *Fantasie* in C major, the composer asks for a bass octave to be held until the sound has completely decayed. On present-day pianos this takes so much time that it destroys the structural flow of the music and some pianists play the octave, depress the sustaining pedal and then re-depress the octave silently, release and depress the damper pedal, again re-depress the octave silently again, followed by once more releasing and depressing the pedal, etc. Each time the notes are silently re-depressed and the pedal is released, the sympathetic resonance (produced by the strings that the pedal had opened up) is dampened. In the mean time, the sound of the octave decays so that the effect diminishes with each time that the strings are opened again. In this way the sound decays more rapidly – though unfortunately by audible steps – than when the octave is merely held until the sound dies out.

2.5.5 The Prepared Piano

2.5.5.1 Definition

The earliest definition for the prepared piano is found with the table of preparation in the score of John Cage's 1943-44 *The Perilous night*:

> Mutes of various materials are placed (in a grand piano) between the strings of the keys used, thus affecting transformations of the piano sounds with respect to all their characteristics.

The determination did not coincide with the initial development of such an instrumental concept: objects had already been inserted in the piano before Cage (see next chapter) and when he first started to put the idea in practice, he referred to the instrument as "string piano." The subtle difference between muting piano strings by hand and by fixing objects in between them often clouds the focus on what exactly a prepared piano is. From the mid-1940s onwards, the term "prepared piano" seems to have been commonly used to designate a grand piano that had any kind of fibrous or non-fibrous material inserted between strings *before* a performance and for the whole duration of that performance. Those objects were referred to as the "preparations" or "mutes." Extrapolating to other instruments, e.g. "prepared guitar" and "prepared violin" were later developed.[234]

Besides these fixed preparations, which remain inserted from before to after a performance, "mobile preparations" are put in place, moved and/or removed *during* performance. Such mobile preparations can consist of the typical and well-known Cagean materials such as screws and bolts but also of for instance the paper that George Crumb requires the performer to lay on the strings for the duration of only the first piece in his second *Makrokosmos*, the metal bar Cage prescribed in his first *Construction* to be rolled over the strings while playing a trill on the keyboard, or more recently the felt that Bart Van Hecke instructs the pianist to insert in between the hammers and the strings (by first removing the keyboard).

As mobile preparations involve incidental manipulation of strings, they constitute a middle ground between prepared piano and the string piano. Depending on the perspective, muting a string with a finger at a nodal point while playing the corresponding key can be seen as a preparation (an "object" is fixed to the string) as well as playing directly on the string (as part of Henry Cowell's repertory of string piano

[234] E.g. by the Belgian violinist Wilfried Deroo, resp. guitarists Fred Frith and Kevin Hufnagel.

techniques). Going on in this direction, any manipulation of the strings, with a finger as well as with hand-held objects would constitute a prepared piano.

This study will consider the prepared piano to be any acoustic piano (also an upright) that is played upon via the proper interface – the keyboard – and of which the sound is muted by objects that interfere directly with the acoustic properties of the strings. Fixed preparations are those that are inserted on beforehand (i.e. prepared) and sit in place for the duration of a piece, mobile preparations are inserted occasionally during a piece. Techniques that involve string manipulation by the fingers or the hand directly, or by hand-held objects (e.g. mallets, glass tumbler) that are not inserted in or near the strings, will here be considered as not belonging to the prepared piano.

2.5.5.2 Acoustics of the mutes

The preparations alter the sound of the piano in manifold ways, ranging from sounds that still remind us of the original instrument, to percussive noises that have no bearing on the proper piano sound. The often unclear or even lacking specifications of the mutes in scores make for the variable and undetermined nature of the prepared piano, and above all for the problem of subjectivity when describing its acoustical properties. As the sound qualities of the prepared piano cover a wide range in between exact pitches and complex constellations involving difficult to define noises, the associations with existing instruments such as gongs, bells, drums or damped cymbals are more problematic than that they lead to applicable conclusions. It is nevertheless of great value and importance to the rest of this study (of the history and performance practice trouble-shooting) to dig into the wealth of acoustical properties that characterizes the prepared piano. The empirical experiments that Monika Fürst-Heidtmann set up to investigate preparation materials that are common in the works of John Cage eminently can serve to enlighten this purpose.[235] It is of course impossible to research *all* the kinds of objects that can be used to manipulate piano strings, but Cage's metal, wood, plastic, rubber and textile mutes offer a solid basis for discovering the essentials of the prepared piano's acoustics.

2.5.5.3 Physical characteristics of the interaction between mute and strings

2.5.5.3.1 General

Objects that are stuck or woven in between strings issue vibrations in both directions along those strings. The resulting sound is the *preparation pitch* and is different from the proper piano sound. Muting materials that are soft can absorb the string's vibrating energy and muffle its overtones. Partials add fullness and body to a sound, so the more vibrations are absorbed, the more a preparation pitch can lack typical sound attributes, potentially ending up as a bodiless noise.

When the mute's (*secondary*) vibrations are in phase with the string's (*primary*) vibrations, the former enforce the string's pitch. When primary and secondary vibrations are not in phase, undefined sounds and noises are discerned in the preparation pitch.

When a mute is suspended on a nodal point, the preparation pitch is accompanied by the partial relative to that nodal point. (E.g. at 1/4 of a c^1 string, the preparation pitch of a

[235] Fürst-Heidtmann 1979, p. 57-91. For gathering the experimental data, nineteen different mutes – single as well as double and triple preparations – were inserted at c^1, C and c^3.

short screw can be as low as *a♭*, or for a bolt even *f#* - the added nodal pitch would in any case be g^1.) At the same time, it is possible that an object eliminates the partial on which nodal point it is suspended (e.g. wood+bolt) when louder components of the preparation pitch mask weaker partials. Even- and odd-numbered partials further influence the preparation pitch by making it resp. sonorous or hollow.

2.5.5.3.2 Pitch vs. noise

The preparation pitch – i.e. the sound that the mute produces – depends on the material of the mute but generally consists of 1 or 2 sounds, higher or lower than the string pitch, and with a different timbre, duration and volume.

The characteristics of the preparation pitch depend on the material or the combination of different materials and range from a *relatively definable pitch* (e.g. rubber wedge; felt; plastic; rubber+screw) over *sound complexes with partly indefinable pitch* (e.g. penny; 2 bolts; wood+bamboo) to *mostly noise-like* (e.g. triple preparation like screw/bolt + nut and 2 screws) and *only noise and no pitch* (e.g. woven rubber; bolt+screw).

Within a sound complex, a pitch or an interval can be discernable as a center that is enriched by noise. Pitches can also be heard as separated from the noise and there are preparations the sound of which is difficult to define (e.g. rubber+bamboo; rubber+penny). Their dull, colorless sound is as if without ‘body’.

2.5.5.3.3 Influences on the sound through characteristics of the material

2.5.5.3.3.1 Mass

The higher the mass of a string is, the greater its relative length and therefore the lower its sound. The mass of the mute is added to that of the string, therefore the preparation pitch is lower as its mass is greater, e.g.

← deeper---------- higher →

Bolt short screw Penny wood or bamboo / rubber felt

2.5.5.3.3.2 Dimensions

Sideways tension on the strings makes them widen. Their relative length shortens and the pitch goes up. The wider an object, the higher it pushes the preparation pitch. Other changes in sound that have been measured when altering dimensions:

	Bigger	Smaller/thinner
(all preparations)	deeper sound fuller and sonorous	shriller, hollower, more out of tune, less rich
(screws & bolts)		silvery, accompanied by rattling noises
(wood, bamboo and metal)	longer duration	

(metal)	less noisy
(nut)	darker, stronger noise shrill rattling

Changes of absorption with altered dimensions have not been registered, but with objects like rubber, felt and plastic woven through strings, bigger *strength* of the material also leads to deeper sound.

2.5.5.3.3.3 Sound absorbing potential

In general, preparations mute the string and therefore effectively lower the volume of its sound. That is why John Cage associated the sounds of the prepared piano with the harpsichord.[236] On top of this, soft materials dampen the sound and shorten its decay even more, though allowing for timbre to be heard.

← Resonance ----------			absorbance →
Metal	Wood/bamboo	Plastic	Rubber, cloth,...

A notable exception is the washer woven through the strings: it resonates less than other metal preparations because so much of its surface covers (and presses on) the strings.

2.5.5.3.4 Influences on the sound through characteristics of the piano

2.5.5.3.4.1 Pedal

As we have seen above (2.5.4.1.4), the damper pedal causes all strings in the piano to vibrate sympathetically. This is of course of interest to the sound quality of the preparations. Lifted dampers not only allow for longer decay and greater volume of the sound, it also helps the partials sound longer, so that the sound of the muted string(s) is fuller and more colorful.

If only the 2nd and 3rd string of a triple-string chorus is prepared (e.g. by a bolt put in between them), the preparation pitch of those two strings will mix with the unprepared 1st string of the chorus. When depressing the una corda pedal (shifting entire action to the right so that the hammers only strike the 2nd and 3rd string), only the preparation pitch is activated. If preparation materials are placed in between all three strings (e.g. a piece of bamboo in between 1st and 2nd string and a bolt in between the 2nd and 3rd string), the tre corde sound will consist of the first string's sound muted by the bamboo, the 2nd string muted by both bamboo and bolt, and the 3rd string muted by the bolt only. The una corda pedal will again limit the effect to the sound of the 2nd and 3rd string's preparation, i.e. a string muted by bamboo and metal, and a string muted by metal only. Thus, each of the triple-string notes can be used for two different kinds of sounds without changing preparations. However, the difference between the two sounds will depend on the way the 1st string is muted (if both preparation materials are exactly the same, there will only be a slight difference in volume); if the 1st string is not prepared, the difference is guaranteed.

[236] Kostelanetz 1991, p. 76.

2.5.5.3.4.2 Attack

The harder the attack is, the shorter and more percussive the preparation-pitch. The weaker the attack is, the more sonorous and the longer the duration of the sound. With felt in particular, a drum-like sound is perceived in the piano to pianissimo range, while a louder attack allows for more piano-like timbre.

2.5.5.3.4.3 Strings

All the above data is relevant to mutes placed at c^1. Empirical data for bass and treble strings was gathered through preparing resp. the *C* and c^3 strings. Lower and higher parts of the range are different from the middle range in placement of the hammer attack and the dampers, in length, weight and flexibility of the strings, and in the number of strings per chorus.

In the bass range, mutes produce a weaker change of the piano sound than in middle, with the exception of a little more metallic quality for metal preparations. There is a longer decay because the dampening effect is less on the long and heavy bass strings. Most bass choruses have only two or even one string so there are hardly any sound mixtures. The pitch (either unchanged, out of tune or deeper) is clearly audible and partials are more readily audible than in middle range. This is because the bass partials are within hearing range and the maximum intensity lays on the partials, as the fundamental is only weakly audible.

In the treble, the relation between mass and pitch is even stronger than in the middle range. The further away from the damper the mute is placed, the more the dry, resonanceless noise of the hammer hitting the string is heard. Treble strings are shorter, less flexible and under more tension, resulting in more damping and less decay than in the middle.

On all strings, the fullest, darkest and densest sounds are obtained when putting the mutes near the dampers. There the pitch is most recognizable and the timbre is purest. Suspension near the bridge gives a shriller, less harmonic and mostly out of tune sound, with the pitch less marked and often accompanied by rattling noises. At 1/3 and 2/3 of the string, the sound is shriller and less full and the inner interval is larger than at the string's ends. In the middle of the string, its second partial (the octave above) can clearly be heard. Here the untunedness is strongest and the sound is rather hollow, less sonorous or fused. The pitch is discrete even with strongly dampening materials that otherwise do not leave a definable pitch.

3 IN HISTORY: THE EXTENDED PIANO

3.1 Introduction

To investigate the history of our subject, we will describe the chronology of the extended techniques as they appear in the repertoire of music written for piano. A double perspective will allow us to gauge the evolution of the techniques as well as that of the concept of the extended piano.

The first and foremost focus is directed at the development of each of the techniques and of the techniques as a whole, this within the general history of piano writing as well as within the oeuvre of such individual composers that have contributed to them significantly. An accurate historical knowledge of the subject's evolution through general musical history and through specific compositional output will help the pianist assess aspects of performance practice regarding techniques that may not be adequately described in a score. The second perspective serves to look at the history of the composers' attitude towards the piano. Through this outlook we will be able to judge the importance of extended techniques in the piano repertoire and the composer's interest in both the extended techniques and the extended piano. Such interest can then be measured against the evolution of the usage of the techniques within the evolution of a composer's individual compositional style and within the body of works he wrote for the piano, whether it is solo, chamber music or concerto repertoire.

The chronology is ordered by pieces and their composers. The nature of the sources available to us, however, does not guarantee us a complete picture. Even with the present digitalization of library contents, there is no way of knowing how close one has come to seeing all the relevant scores that have survived. The difference between the 18th and 19th century in terms of the percentage of useful materials we could find, is comparable to an expected difference in speed of development of the subject (less in earlier periods versus more and more as time passes) but there is no proof that such a development is the reason for the divergence in the number of sources. Looking into the works of the most established composers is easy as they often benefit from the widespread availability of complete Urtext editions with extensive musicological apparatus. Unfortunately, our subject matter often thrived outside of the 'major' compositional output. It is much more difficult, if at all possible, to get an adequate picture of the works of many 18th century composers due to the lack of surviving manuscripts or biographical information. But also, for 19th century composers like Herz, Czerny, Tausig, and others that are not included in the RISM, there often is not even a complete and reliable work list available, let alone the necessary information as to which libraries may own copies of the long out of print editions. This makes it difficult to obtain a truthful picture of the chronological and geographical evolution of our subject as well as of how the extended techniques may be of importance in the oeuvre of a single composer when he seems to have included them in more than a few of his works. As for dating individual manuscripts, there is still often much room for doubt, whether it is an obscure piece by a little known author or a well-known concerto by Beethoven. A lot of basic research, such as the comparison of the different manuscripts and editions of a composer's oeuvre still needs to be undertaken, even for composers such as Scarlatti. For those periods that are especially affected by these kinds of obstructions, we need to be aware of the possible gaps we will have left between chronological steps in the evolutionary thread of the extended techniques. The order of those steps is equally provisional in the sense that reconsidered dates of pieces could easily lead to reversed ordering of the development's chronology.

We will start our investigation with the beginning of the 18th century and the appearance of the first piano around 1700. The first pieces known to have been specifically dedicated

to that instrument were not written sooner than 1732[234], however, so any early interest in playing the piano must have involved music for one of the other keyboard instruments. Since many of the extended piano techniques are bound to the keyboard or the strings only, and can therefore be played on most of the stringed keyboard instruments (some, like the cluster and glissando, even on the organ), we will not limit our search to those relatively few specific pianoforte pieces in the first century of its existence. If we can find worthwhile evidence of our subject in the repertoire for the harpsichord, the organ or the clavichord, this widened perspective may well serve to point at direct or indirect influences on the use of extended techniques at the piano.

Basing the chronology on the found material, we have divided the approximate 300 years of piano history into three main blocks. Starting with the earliest evidence we could find, which is dated 1724, a first period in which extended techniques seem to have been explored tentatively rather than exhaustively, ends around 1816. After the Napoleonic wars, about a whole century in our story of extended techniques is devoted almost solely to the glissando. With the early 20th century, a third period starts off showing a sudden surge of interest in the complete body of these techniques and leading to the present day. Within these three blocks, the presentation of the research and the discussion thereof is organized in three sections returning in each block. A general outline sketches the relevant musical context of that block. A listing of individual sources – by year and title of the composition question[235] – contains the relevant extended techniques with analyses of the value or meaning of the source's position in the general chronology and of its place in the total output of the specific composer. Closing off each chronological period, a summing up considers the listed findings in the more general light of the extended piano and its history. Depending on the kinds and numbers of relevant sources, we structured each listing (or subdivision thereof) around the most revealing common denominators. When, for instance, an extended period yields mainly individual evolutionary steps evidenced by single examples, the structure of the listing is based on the step-by-step progress of individual techniques resulting in a who-wrote-what chronology. When enough finds can be accumulated to provide statistical data, we will concentrate on bigger pictures from larger perspectives rather than on individual lines dependent on individual composers' pieces.

[234] The 12 *Sonate da cimbalo di piano e forte detto volgarmente di martelletti, opus 1* by Lodovico Maria Giustini (1685-1743), published in Florence. In France, the first known published pieces for the piano were the opus 1 by Eckhard, advertised in the French press on April 28, 1763 (Rowland 1998, p. 20).

[235] When the exact date is not known, it will be indicated by symbols like "<" (before), "ca" (circa) or ">" (afterwards). We have based the dating on the information of the libraries where we found the manuscripts, or of Urtext editions that published the scores we used.

3.2 ca1724-ca1816 Early extensions

3.2.1 Historical Context

Compared to the situation of the present-day, with the virtual supremacy of the Steinway concert grand, the first century of the piano's life was complex in many respects. In this age were it took composers a while to discover the full potential of the invention and where builders long experimented with a number of individual characteristics of the piano (such as range, pedals, action), the arpicembalo con piano e forte was competing for attention with its next of kin – the harpsichord and the clavichord - until the very end of the century. The first piece that seems to have been written specifically for the resources of the piano was published only in 1732[236] and the first keyboard method that was solely directed towards the piano did not appear before 1802[237]. Meanwhile, the success of the piano was not universal and opinions clearly differed as to which of the three stringed keyboard instruments could be preferable. In Germany, Carl Philip Emanuel Bach – whose father was initially critical and later positive towards the piano[238] - is known to have preferred the clavichord[239]. In 1769 in France, the organist of the Notre Dame, Mr. Daquin, is said to have compared the harpsichord to the piano: "the harpsichord is the bread, and the fortepiano a delicate dish, of which one will soon be fed up"[240], in 1774 Voltaire still thought the piano "a kettle-drum makers' instrument in comparison with the harpsichord"[241] and at the end of that decade, the harpsichord featured still on more occasions than the piano at the Parisian *Concerts Spirituels*. On the other side of the spectrum there were places were the piano did well relatively early, such as England, were 'most of the prominent keyboard players in London were performing in public on the piano' by the 1770's[242]. In terms of the piano's success with composers and performers, the gradual cross-fade between the harpsichord and clavichord on the one hand and the piano on the other hand was very much a question of geography (local versus international circumstances) and its social place (home/stage) and musical function (solo/accompaniment). All became much more clear somewhere after the turn of the century, when in 1804 it was finally stated how

> Nowadays, however, now that one has gotten to know the mostly advantageous characteristics of the good pianos, the harpsichord has been banned from all good orchestras.[243]

On top of the many and sometimes very different models of pianos that coexisted in an international context, the terminology for all stringed keyboard instruments was as confusing as it was profuse.[244] In the first three decades of the 17th century the term "piano" or "pianoforte" was completely unknown. After Cristofori, who had persisted in calling his pianoforte a "cembalo" or "cimbalo", sometimes adding "che fa il piano e forte", "con martelli" ("with hammers"), "con piano e forte" or "di martellati", the main

[236] The twelve sonatas by Giustini. See footnote 234.
[237] Louis Adam's *Méthode de piano du Conservatoire* (+/- 1802). See Kloppenburg 1951, pp. 130-138.
[238] Rowland 1998, p. 10-12.
[239] Kloppenburg 1951, pp. 63-71 and Rowland 1998, p. 13, citing from Carl Philip Emanuel Bach's *Versuch über die wahre Art das Clavier zu spielen*, 1753, part I.
[240] Hiller 1769, p. 32: "Mr. Daquin, ein braver Organist bey Notre Dame zu Paris, sagte daher, als wir uns mit einander auf einem silbermannischen Fortepiano ein Vergnügen machten: "Der Flügel ist das Brodt, und das Fortepiano eine leckerhafte Speise, die man bald überdrüßig wird.""
[241] As cited in Lelie 1995, p. 44: "un instrument de chaudronnier en comparaison du clavecin". This was in a letter to Marquise du Deffand, 8 December 1774. Also cited in Loesser 1954, p. 317, Good 1982, p. 1 and 44, and in Rowland 1998, p. 21.
[242] Rowland 1998, p. 19
[243] Georg Simon Löhlein's *Clavierschule*, 1804 edition, chapter 8, par. 4; as cited in Kloppenburg 1951, p. 80.
[244] The rest of this paragraph is taken from Badura-Skoda 1996, p. 250-252.

idea of a "cembalo straordinario" was taken over, evidenced by for instance the names "cembalo senza penne" ("without quills"), "clavecin à marteau", "(Hammer)Flügel" or even simply "cembalo" or "clavecin." When using Italian terminology in their scores, composers such as Mozart, Beethoven and Schubert continued to use the word "cembalo" when designating the piano. Only after the 1740's was new terminology slowly introduced into the musical life of London and Paris by German instrument builders. In Vienna the noun "pianoforte" did not seem to have been used before the 1760's. In Paris, even in the 19th Century "claveciniste" and "pianiste" were still interchangeable.[245] To add to the confusion, some builders (e.g. Stein) made keyboard string instruments that combined striking and pulling mechanisms. Chaos could be complete when, at one time, the keyed dulcimer "Pantalone" was seen as a piano[246], or when one book used "Clavier" for harpsichord, clavichord and piano alike while – within the same decade – another book applied it to the clavichord only, preferring "Saitenwerke" for all keyboard instruments[247]. Eventually the subtleties vanished and, until the mid-19th century, "cembalo" was used as a generic term covering both the harpsichord and the piano.

During the infancy of piano construction, compositional writing for keyboard instrument changed dramatically. In the process of evolving from baroque to gallant and "empfindsamer" style and onto the classical and pre-romantic notions – all within a mere century - the figured bass disappeared and with it one of the major functions of the keyboard instrument and its performer. This had to do with the change in compositional practice whereby, instead of only writing the skeleton of the harmonic progressions and leaving the ornaments and figuration largely to the performer to work out, the whole score was written out in more detail than ever before.[248] This meant a shift in responsibility over the sounding result of a composition: a change from composers leaving many details to many potential performers in many different circumstances with many kinds of limitations and options (e.g. national idioms, differently built instruments) to composers imprinting their own individual performance practice on the music to be disseminated.[249] The social position of the composer changed as well: when the musical patronage reached the end of its longevity, composers were in need of self-employment.[250] Towards the end of the 18th century, as the public concert houses were established[251], the composer as entrepreneur and traveling virtuoso came onto the stage of the musical world to actively pursue the publicity of his musical talents. With this revolutionary feat, publishing itself was deemed to flourish.[252] How commercial an enterprise the music publishing business became and what the consequences were for the musical quality of printed scores as well as for the sheer quantities of published music, is clear from a letter Madame Pleyel wrote to her husband: "We will do far better to print all sorts of small works every day, which require no great advances and on which the return is sure".[253] The consequences for musical quality are here meant to include the liberties editors took to add to the information that was contained in the manuscript. Efforts to maximize profits certainly included targeting the largest possible market as well, hence keyboard music published for two or more keyboard instruments as suitable vehicles for performances. While in some cases, the music would indeed be suitable to the piano as well as the clavichord and harpsichord, in other cases, the result could be absurd. As late as 1802, Beethoven's sonatas opus 27, containing specific markings for

[245] Ironically, some of the names for the latter – the Italian 'cembalo', French 'clavecin' and Dutch 'klavecimbel' – go back to 'clavisimbalum', a compound of the Latin 'clavis' (key) and 'cymbalom' (derived from the Greek kimbalom, meaning a *struck* instrument with a keyboard). (Kettlewell 2002.)
[246] Rowland 1993, p. 31.
[247] Lelie 1995, p. 66.
[248] See Donnington 1989, pp. 110, 157-158, 181-184, 364-365 and Rowland 2001, 75-78
[249] See Rowland 2001, p. 20.
[250] See Denora 1996, p. 276.
[251] Rowland 1998, p. 135-136
[252] Rowland 2001, p. 9
[253] As cited in Rowland 1998, p. 137, were reference is made to Gottfried Müller's *Daniel Steibelt* (Leipzig, 1933), p. 92

the piano's damper raising device, were published for "il clavicembalo o pianoforte."[254] Above and beyond such extreme cases pointing at the problems of publisher's integrity, composers and performers themselves were used to playing on a number of different instruments and changing from one to another flexibly.[255] All in all, if the score didn't narrow the specification down to one single keyboard instrument instead of several possibilities, then the fact that determining markings (e.g. registration for the harpsichord and organ, Bebung for the clavichord, transitional dynamics for the piano) effectively made many 18th century keyboard scores indeterminate.

Such characteristics of the age under scrutiny – the transition from composer-pianist to pianist-composer, the cross-pollination between the repertoire of the keyboard instruments, the influence of the publishers on musical evolution, etc. – are themselves worthy subjects of elaborate studies but fall outside of the scope of the matter at hand. Important here is the notion that, in such chaotic times, it is far from self-evident to identify (im)proper compositional approaches towards the piano specifically. If there was a lot to discover, work out and fine-tune concerning the possibilities this new instrument could offer before it could be well fitted in compositional practice, the scholar cannot readily expect to find much experimentation in the opposite sense, i.e. trying out what was pertinently *not* proper among those new possibilities. Those aspects of the performance practical identity of the piano – proper or not – that composers did experiment with, are then further concealed underneath the difficulties to determine whether or not a score contained actual "piano" music and not generic keyboard music.

Yet, this situation presents the perfectly muddy waters in which anything can grow, however unexpected and unrelated to the main course of events. If we look closely enough, we do find that precisely when the identity of the piano was not yet fully grasped, we can discern the first attempts at experimenting with what would soon be considered crossing the boundaries of that identity. If we keep in mind that the idea of a score written exclusively for one particular keyboard instrument was not partial to most of the 18th century[256], and if we then remind ourselves of how some extended piano techniques are common to all (stringed) keyboard instruments, we can set out to investigate the entire 18th century repertoire, approach and technical development of all keyboard instruments with the confidence of tracing improper creative thoughts. In actual fact, we will then find that it is exactly in this very confusing period that the cluster, the glissando, the keyboard flageolet, sympathetic resonance and pizzicatos were all clearly tried out by serious composers in scores meant for publication.

[254] Rowland 2001, p. 44.
[255] Rowland 2001, p. 44-46.
[256] Rowland 2001, p. 44

3.2.2 The first signs of the cluster

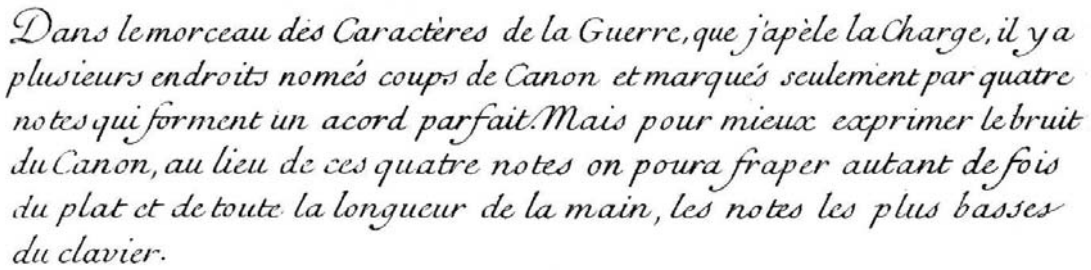
3.2.2.1 1724 Jean-François Dandrieu: *Les Caractères de la Guerre*

In 1718, the French royal publisher Ballard issued *Les Caractères de la guerre, suite de symphonie ajouté à l'opéra* by Jean-François Dandrieu (1682-1738). Which opera this suite is connected to, is unknown, but the composition – for violins, trumpets, bassoons, "basses", kettledrums, oboes and flutes – seems to have been popular at the time, considering the literary parody of it which appeared in the *Mercure de France* of 1722. Dandrieu's symphonic set is close to the numerous circumstantial compositions of the period, such as the fanfares of Lully or Delalande, and would not be of interest to us here were it not for the adaptation Dandrieu made of it for harpsichord.[257] In 1724, he publishes his arrangement as the final 'divertissement' of the first suite contained in a book of harpsichord pieces, containing also *les Caractères de la Chasse et la Fête de Village*.[258]

The harpsichord arrangement of *Les Caractères de la Guerre* is different from the orchestral original in that the key was moved from D major to C major, one movement was dropped, the titles were adapted (with one of them changed from "retreat" to "triumph"), and some individual pieces are new:

Orchestral version 1718	Solo version 1724
Boute-selle	*Le Bouteselle*
Marche	*La Marche*
Premiere Fanfare	*Premiere Fanfare*
Air grave	-
Deuxiéme Fanfare, Menuet	*Seconde Fanfare*
Marche	*La Marche*
La Charge	*La Charge*
-	*La Mèlée*
-	*La Victoire*
La Retraite, Rondeau	*Le Triomphe*
La Charge	-
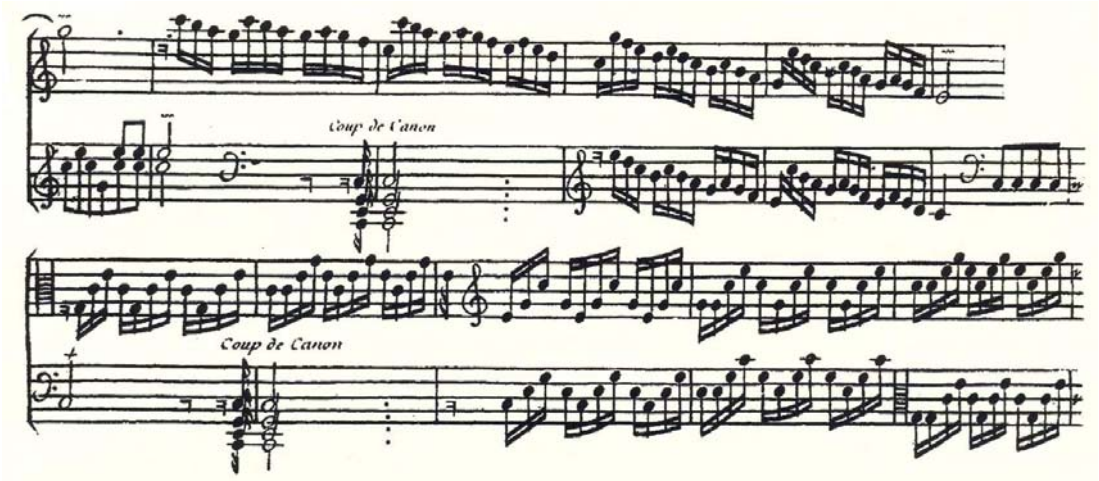
In the solo divertissement, we find the first known use of a cluster on the keyboard. Actually, it is not in the score but rather in the foreword, making this the first performance note for extended techniques in history. (Ex. 3.1.)


Dans le morceau des Caractères de la Guerre, que j'apèle la Charge, il y a plusieurs endroits només coups de Canon et marqués seulement par quatre notes qui forment un acord parfait. Mais pour mieux exprimer le bruit du Canon, au lieu de ces quatre notes on poura fraper autant de fois du plat et de toute la longueur de la main, les notes les plus basses du clavier.
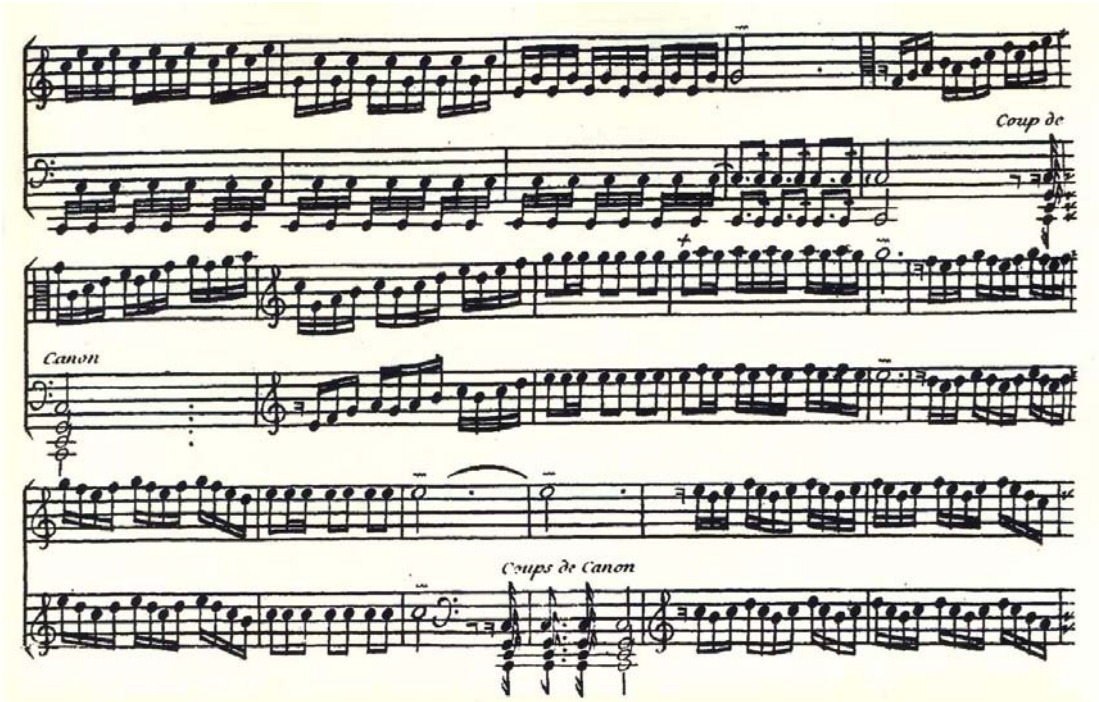
Example 3.1. J.Fr. Dandrieu: *Les Caractères de la guerre* (1724 solo version), preface. Reproduced by permission of Éditions Minkoff.[259]

[257] He may have made an arrangement as *Sonate pour violon*, as mentioned in a 1732 catalogue as well as in a 1732 lexicon. See François-Sappey 1982, p. 89.
[258] This paragraph is entirely based on the information in François-Sappey 1982, p. 89-91 and 129-131.
[259] "In the piece of the Characters of war, which I call the Charge, there are several places named Canon shots and indicated only by four notes which form a perfect chord. But to better express the sound of the Canon, in

These instances of canons firing, four of them in total, are all to be found in the second episode, *La Charge* (Ex. 3.2 and 3.3.)



Example 3.2. J.Fr. Dandrieu: *Les Caractères de la guerre* (1724 solo version), movement 6, *La Charge*, bars. 22-32 (1733 edition). Reproduced by permission of Éditions Minkoff.



Example 3.3. J.Fr. Dandrieu: *Les Caractères de la guerre* (1724 solo version), movement 6, *La Charge*, bars. 38-54 (1733 edition). Reproduced by permission of Éditions Minkoff.

In the rest of this suite, there are no more canons to be heard or performed. The opening movement – *Le Bouteselle*[260] – starts off "fierement" with the same kind of left hand chord with a sixteenth upbeat as used for the canon shots in ex. 3.2 and 3.3, but it is a three-part chord with an open fifth, no major or minor third. There is no indication of it being intended for the palm of the hand. The *Marche* is built upon an ostinato of the same bass chord. Two *fanfares* follow, after which the *marche* is to be repeated. Then
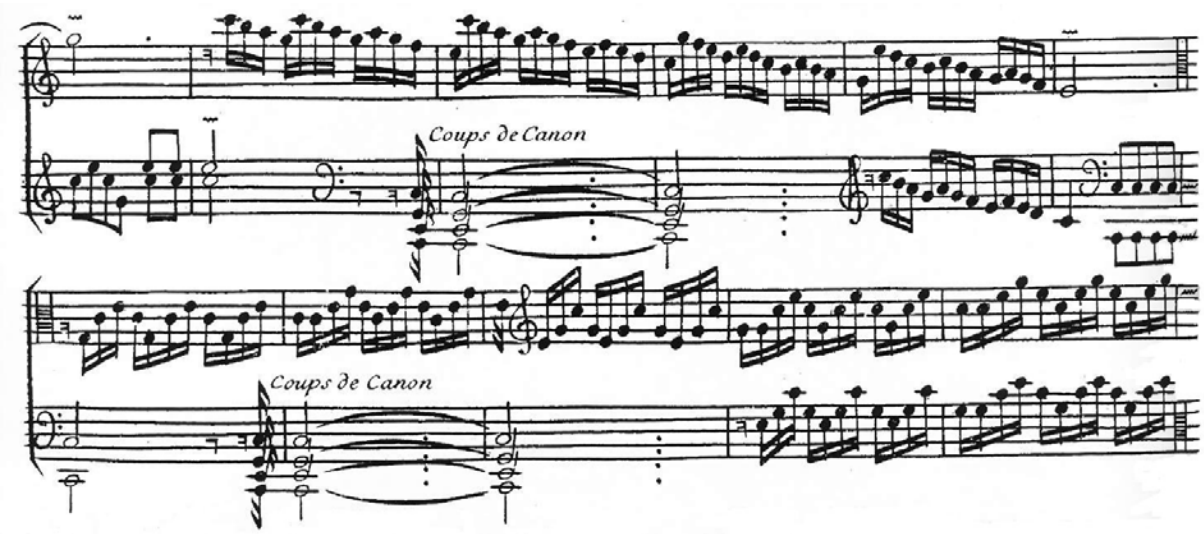
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stead of these four notes one will be able to hit as many times with the flat and entire length of the hand, the lowest notes of the keyboard."

[260] Military term, meaning the sounding of the trumpet to warn the cavalrymen to saddle and mount their horse. Also orthographed as 'Boute-selle'.

comes the *Charge*, *La Mèlée* (with the cries and complaints of the suffering), rounded off with a *Victoire*, its double and then finally the *Triomphe*.[261]
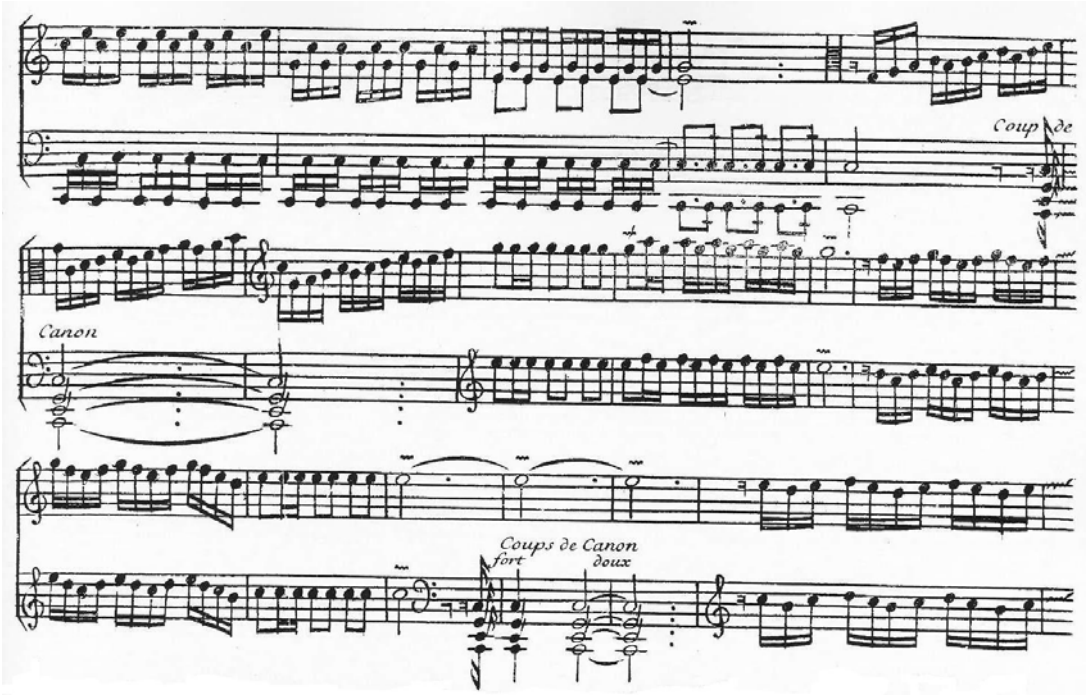
The set of harpsichord suites was first published in 1724, issued again at the end of 1727, and twice after 1734.[262] The 1727 edition contains some rhythmic changes in the fanfares and has the indication "coups de canon" added to the *Charge* (as in the above illustrations)[263]. Next to the four editions of the complete set, the war suite must have been a particular success, for Dandrieu published it twice separately, in 1733 (based on the 1727 second complete and corrected edition) and in 1754 (based on the third edition from 1734).

The above illustrations come from the second complete edition (1727)[264], beneath are the same excerpts from the fourth complete edition (after 1734)[265], showing how he revised the length of the canon sounds, probably to allow their reverberations to carry longer and die away naturally. (Ex. 3.4 and 3.5.) The added forte/piano contrast in the last instance indicates the desire for even more realism by mimicking the echo of the shot's sound bouncing of a mountain range. It is unlikely for this indication to point to experiments with the potential of the very early pianoforte, given the fact that there had not been a pianoforte in Paris yet[266].



Example 3.4. J.Fr. Dandrieu: *Les Caractères de la guerre* (1724 solo version), movement 6, *La Charge*, bars 22-32 (1724 edition). Reproduced by permission of Éditions Minkoff.

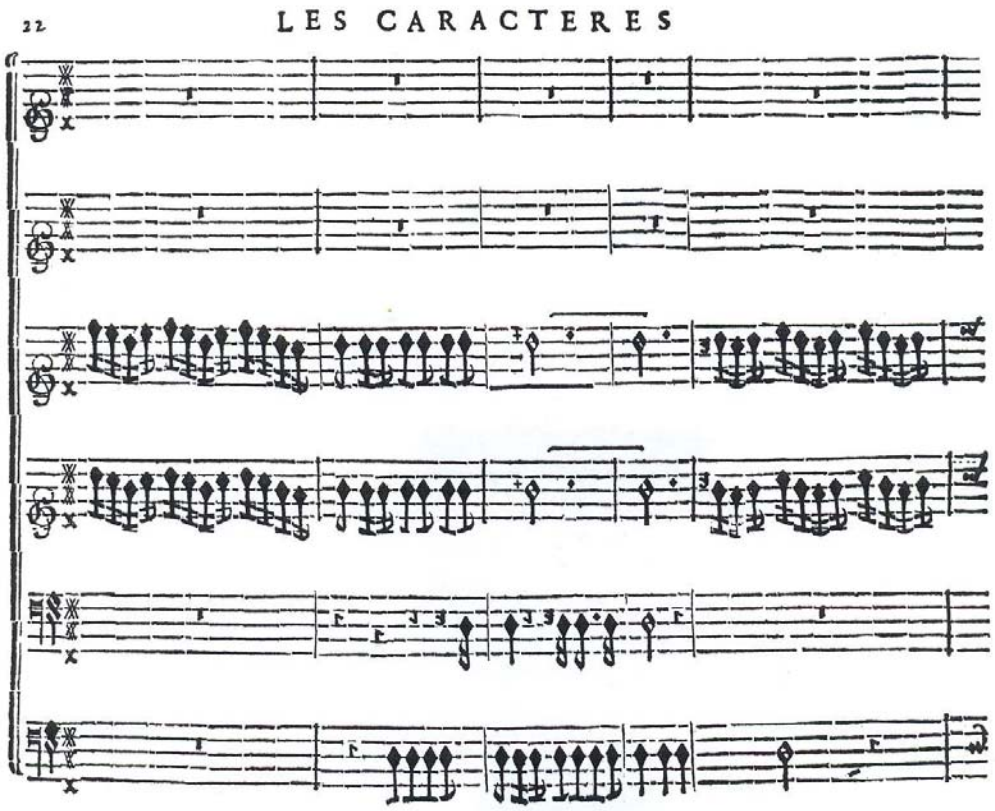
[261] The original symphonic version had an *air grave* between the two fanfares, while its *Charge* episode was followed by a less glorious rondeau: *La Retraite*, to be concluded with a repeat of the *Charge*. See François-Sappey 1982, p. 130.
[262] See Herlin 2004, p. V-XI, English translation on XII-XVIII.
[263] According to Herlin 2004, p. IX, Engl. Transl. P. XVI
[264] Minkoff Editions 2004, pp. 70-71.
[265] Minkoff Editions 2004, pp. 1-65.
[266] See de Place 1986, p. 3: the first mentioning of a pianoforte in music as well as instrument manufacturing in France is found between 1760 and 1763.



Example 3.5. J.Fr. Dandrieu: *Les Caractères de la guerre* (1724 solo version), movement 6, *La Charge*, bars 38-54 (1724 edition). Reproduced by permission of Éditions Minkoff.

It is of interest here to point out that Dandrieu's change from the key signature of D major in the symphonic version to C major in the solo arrangement only has implications for the use of keyboard clusters. Both keys were typical for this kind of music, so he may have consciously chosen C-major because it is more ergonomically apt for the alternative finger technique. Dandrieu tells us nothing about the specifics of the cluster technique he had in mind, e.g. whether the performer should strike all the notes within the octave (black *and* white keys, i.e. a chromatic cluster) or just the "C-major keys" (diatonic cluster), whether it to be an exact octave or whether a stretch of a major seventh would do if the hand isn't large enough (or vice versa on a large harpsichord). Admittedly, such considerations are somewhat rhetorical, and the outlandish proposition of replacing a perfect chord with a completely improper sound if one wishes so, will certainly have allowed for some latitude in the application of the required technique. More important here is the actual appearance of a rudimentary notation or, rather, indication of a cluster.

Nothing in the original ensemble instrumentation points to the need of or idea for a keyboard cluster in the solo arrangement. In the relevant instances in the orchestral version, kettledrums are used together with all the bass instruments in an ordinary rhythm to symbolize canon shots for those listeners already expecting them there, rather than actually depicting them in any attention grabbing fashion. (Ex. 3.6.)



Example 3.6. J-Fr. Dandrieu: *Les Caractères de la guerre* (1718 orchestral version), movement 7, *La Charge*, page 22, bars 49-53 (1718 edition). The kettledrums are on the fifth staff, the first two staves being for the violins, the third and fourth each for the oboes and trumpets, the sixth staff for 'toutes les basses'. Extract of the facsimiles edition "Livre de pièces de Clavecin, Les caractères de la guerre" of J.F. Dandrieu – Anne Fuzeau Productions – www.anefuzeau.com.

So the clusters are not a pianistic equivalent of a certain timbre Dandrieu had already had in mind at the onset of conceiving the suite in the first place. It is thus worthwhile to have a closer look at how or where Dandrieu may have gotten the sudden idea to suggest the performer to leave the known paths of using established finger technique, for, as we will see, the cluster's first appearance in music determines its destiny for the next 100 years or so.

The idea of a character piece goes back to the Greek philosopher Theophrastus Paracelsus of Eresos. He put together a set of 30 "Characters" that psychologically portray individual human character types in a lively, humoristic way. In 1688, the French moralist Jean de La Bruyère (1645-1696) used them as the basis for his *Caractères de Théophraste, traduits du grec, avec les caractères ou les mœurs de ce siècle*, effectively constituting a chronicle of the 17th century "esprit" and giving us an important view of French life at court. They became an undeniable success – by the time La Bruyère died, 9 editions had been prepared – and lead to the term "caractère" being much in vogue in the artistic circles of the first half of the 18th century. As an intellectual game it was "in the air" and composers used it to describe in music the diverse aspects of an art, an event or a sentiment. Musical examples include Rebel's *Les Caractères de la Dance* (1715), Dormel's *Les Caractères de la Musique* (1729), Colin de Blamont's *Les Caractères de l'Amour* (1736), Fagan's *Les Caractères de Thalie* (1737), de Bury's *Les Caractères de la Folie* (1743), Pierre Sodi's *Les Nouvelles Caractères de la Danse* (1747), etc.[267] If there seems to be no consensus on whether or not Theophrastus' sketches were meant to be

[267] As listed in François-Sappey 1982, p. 129-130.

caricatures or not[268], La Bruyère's paintings of the human soul's multiple facets were certainly satirical. The realism, the crudity of certain traits and the tendency to paint the exterior have been compared to the 19th century.[269] It is in this light that the somewhat uncomfortable place of the cluster in Dandrieu's otherwise unpretentious characterization of war can bee understood. His characters of war do not so much try and express the reality of men in battle – these were not such times – but rather a lighthearted portrayal of the battle: civilized and contained, a stylistic exercise, really, with the exception of the noisy first appearance of the cluster in published music.

Compared to Dandrieu's efforts to paint some characteristics of war in the rest of this suite, the clusters are one level above the simple triads they replace. Besides the canon shots, the other descriptions of battle sounds are to a certain degree abstract and evocative rather than pictorial. In *La Mèlée* (the turmoil), the "cries" at the height of the battle are illustrated by fast sixteenth tremolo figures, the laments of the wounded are limited to a diminished seventh chord introducing a slow c minor sequence, after which the running sixteenths are expected to depict the general battle clatter.

These are basic means of association: fast notes equal movement and can signify soldiers running around in the chaos of a battle; the harmonic tension of a diminished seventh chord can, together with a slow pace in a minor mode, be associated with the sorrow of wounded warriors. In contrast, Dandrieu's rhythmic and dynamic specifics of the clusters represent a rather advanced level of realism in its imitation of canon shots. With their sixteenth note upbeats, the chords in question can even be imagined as imitations of the double sound a canon makes by loudly bouncing backwards by the immense force of the initial explosion of the powder. This level of tone painting, this almost literal representation, may perhaps make the clusters stand out too much between the less graphic rhythmic and melodic associations in the rest of the piece. At this time in history, it seems too early for a composer to find a middle way in between stylistic symbolism on the one hand and the choc value of the ergonomical cluster as well as its noisy character on the other hand.

From this aesthetic perspective, Dandrieu's cluster introduces a new element in instrumental descriptive music. Detailed reference in music to objects that have an independent reality is especially effective when imitative. Without textual guidance (words sung with the music or written in between the staves or in the program notes), the transmitting of the idea depends on how acoustically concrete the imitation really is. In these early days of program music[270], direct reference to non-instrumental sound (e.g. a canon shot) by imitation was actually a rare thing, for it depended on the capacity of the instrument to mimic sounds and noises heard in the world, sound which were not proper to the instrument. When text was incorporated, military commands and shouts could be relied upon to illustrate the concrete situation. In ensemble music, military

[268] Barendregt 1977, p. 5 considers them as such, van Dolen 1991 decidedly does not. (p. 18).

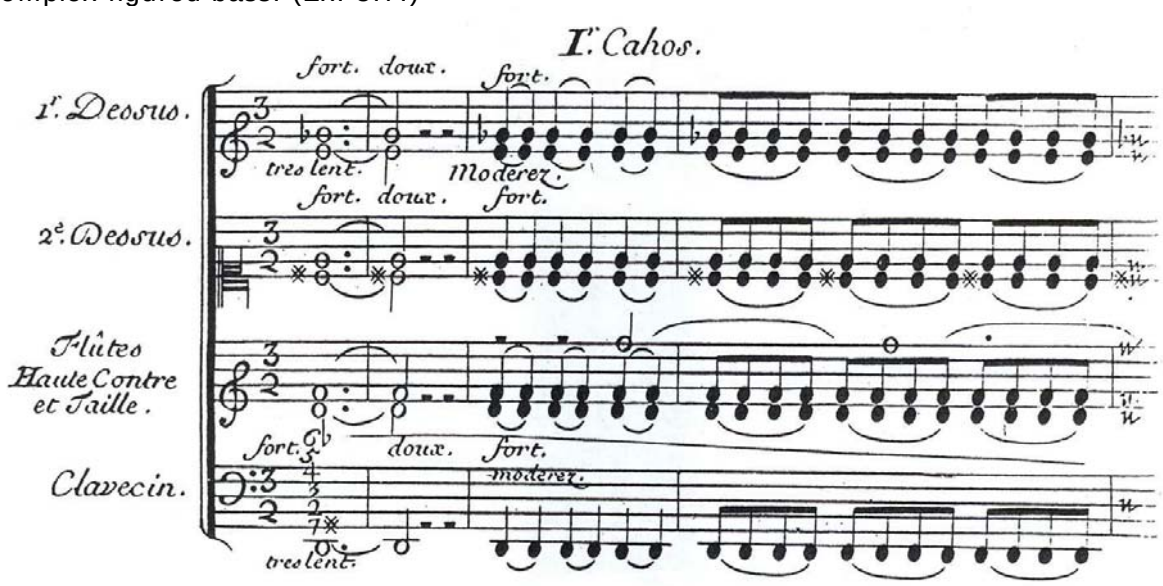
[269] As in Paul Souday, article 'La Bruyère' in *La Grande Encyclopédie*, volume 21, Paris, Société anonyme, no date (beginning 20th century), on the Internet on http://agora.qc.ca/reftext.nsf/Documents/Jean_de_La_Bruyere--Biographie_de_la_Bruyere_par_Paul_Souday, accessed on November 1, 2007.

[270] See Scruton 2002, p. 396-400 for the criteria along which a history of programme music can be derived. "If mere imitation is not regarded as a sufficient criterion of programme music, it must be concluded that the history of the genre is considerably shorter than might otherwise appear. It seems to have no medieval examples." A clear definition of 'imitation', 'evocation' and 'representation' seems difficult to make. For the purpose of the argument, we will here distinguish between 'direct imitation' (mimicking a non-instrumental sound by using an instrumental sound), and 'evocation' (imitating non instrumental sounds by using musically associative affects, melodies and rhythms, e.g. fanfare, birdcalls, 'galloping' rhythms, 'pastoral' affects). A separate category are the 'direct imitations' of music from or associated with the depicted scene, such as military music in battle (e.g. trumpet signals), melodies or national hymns sung in wars or revolutionary upheaval, and marches. We will consider these to be 'representation' when they are performed as in the depicted scene (using trumpets or a choir). If a trumpet call is mimicked in a battle piece for the harpsichord, it is 'imitation'. Evocations of atmosphere and entirely emotional or quasi-religious abstractions are not considered here.

signals were transmitted through the use of percussion and trumpets, but such imitations were a direct implementation of existing music that had a specific function in real life. Only onomatopoeias were commonly used to attempt imitation on one instrument of sounds made by another instrument (or no musical instrument at all). Instrumental resources for illustrating aspects of a battle other than instruments used in such situations (e.g. the trumpet or the drum), most often included symbolic means, such as ostinato chords, jumps from major to minor modes, tempo contrasts, contrapuntal imitation, etc.[271] This particular subject is worthy of a more thorough treatment, but for present purposes it suffices to note that only rare instances show the creativity of a composer looking for extensions of the instrument to bridge the distance with the real world sounds. In Heinrich von Biber's *Battalia à 10* (1673), string players are asked to play *col legno battuta* and a snare drum is imitated by attaching paper to the string of a violin. For the keyboard, however, and despite alluring titles such as *Bruit de Guerre*[272], Dandrieu's cluster seems to be the first sound in keyboard repertoire having a noise characteristic distinctly unmusical enough to compare to non-musical sounds in the world at large.

3.2.2.2 1738 Jean-Féry Rebel: *Les Elémens*

There has been the suggestion of a link between Dandrieu's cluster on the harpsichord and cluster-like densities in sound in *Le Cahos*, the first part of the ballet *Les Elémens* by French composer Jean-Féry Rebel.[273] At the beginning of this piece, we find an unusually complex figured bass. (Ex. 3.7.)



Example 3.7. J.-F. Rebel: *Les Elémens* (1738), first movement *Le Cahos*, opening bars. Reproduced by permission of Edition Wanhall.

Rebel himself (1666-1747) wrote in his "Avertissement":

> The introduction to this symphony was natural; it was chaos itself, this confusion which reigned between the Elements before the instant when, subjected to

[271] See Braun 1999, pp. 1300-1303.
[272] A title used by both François Couperin (in his *La Triomphante*, the first piece of the 10th *Orde* in his second book of harpsichord pieces of 1716) as well as Joost Boutmy (in his 2nd suite from 1738).
[273] Henck 2004, pp. 52-55.

> invariable laws, they took the place which was designated to them in the order of Nature. [...] I have dared to undertake the connecting of the idea of the confusion of the Elements to the confusion of the harmony. I have hazarded to make audible all sounds mixed together, or rather all the notes of the octave united in one sound. These notes then develop, by building up to the unison in the progression that is natural to them, and, after a dissonance, one hears the perfect chord.[274]

The naturalist opening of this programmatical ballet is a metaphor for contemporaneous musical theory (or vice versa): the natural state of harmony is based on perfect chords, whereas an unclear harmony represents chaos. To musically depict all the natural elements together, the composer mixes all the available sounds. At this stage of tonality's history, such an undertaking still requires a justifiably functioning harmony. Hence the superposition of a perfect chord with the chord furthest removed from it: the diminished seventh chord, then the most extreme combination imaginable. That all the notes of the octave are united in one sound is an overstatement, to be excused by the tonal limitations of his intention. In reality, there is only a minor sixth (C♯-B♭) filled up with a diatonic "cluster" (D, E, F, G, A). Only 7 notes are used of the 12 that any octave contains: only those that belong to the d-minor scale. This – together with the forte and the sustained effect (the dissonance does not resolve before bar 12) – was daring enough, though, as his choice of words in the Avertissement ("dared", "hazarded") demonstrate. Contrary to his apparent need to issue a warning about his boldness, and however much it suggest his audiences may have had difficulty to digest the dissonant opening, *Le Cahos* seems to have been considered "one of the most beautiful symphonic pieces in this genre."[275]

Although this is certainly an early example of the densest instrumentation in tonal ensemble writing, it is of a different order than Dandrieu's cluster. The latter has not much to do with harmony or dissonance: it is the noise factor and the ergonomical aspect of the technique that is characteristic. Rebel certainly sought to achieve harmonic confusion by superimposing two essentially different harmonic functions to suggest or evoke an unclearly defined atmosphere, in which he gradually brought movement and clarity so that identifiable elements could emerge. The Dandrieu cluster needs to imitate as precisely as possible a well-defined sound. Admittedly, this sound is without a definable pitch, but it is not about atmosphere. If it were harmonically confusing, it could be heard or construed as belonging to harmony, and thus lead astray from the correct association. On top of this, the factor of mixed instrumental color needs to be considered in *Le Cahos*. The blending of different timbres – harpsichord, strings and winds – actually prevents the ear to hear the two superimposed harmonies. The different colors of the strings and wind instruments automatically separate the d minor harmony from the diminished seventh chord on C#. Both pieces by Rebel and Dandrieu contain a definite degree of "noise", but from a compositional standpoint, they are both in a different category of their own. Rebel's "cluster" is no different than Scarlatti's acciaccaturas, the latter's being even more daring because many of them do not resolve like Rebel's first chord in *Le Cahos* does.

What makes this piece noteworthy here, are the autograph additions in the two copies of the first printed edition of *Les Elémens* in the French National Library in Paris, remarking

[274] "L'Introduction à cette Simphonie étoit naturelle; C'étoit le Cahos même, cette confusion qui régnoit entre Les Elemens avant l'instant ou, assujettis à des loix invariables, ils ont pris la place qui leur est prescrite dans l'ordre de la nature. [...] J'ay osé entreprendre de joindre à l'idée de la confusion des Elemens celle de la confusion de l'harmonie. J'ay hazardé de faire entendre d'abord tous les sons mêlés ensemble, ou plustost toutes les notes de l'octave réunies dans un seul son. Ces notes se développent ensuite, en montant à l'unisson dans la progression qui leur est naturelle, et, après une dissonance, on entend l'accord parfait." As printed on the first page of the first edition, housed at the Bibliothèque National in Paris, F-Pc Ac. e².685 (see preface for the library sigla).

[275] Mercure de France, March 1738, p. 566. As cited in Cessac 1993, p.V.

that the whole composition can be played as a solo harpsichord piece as well.[276] This would mean that the harpsichord player is free to interpret the opening figured bass as a soloist and – maybe – play an actual cluster. The figured bass does not provide the performer with many possibilities to play the chord in a wide inversion. If Dandrieu's ballet was as well known as the reprints lead us to believe, his cluster technique may easily have provided inspiration to a harpsichord player, performing Rebel's *Le Cahos* as a solo piece, to come up with the most chaotic of opening chords and thus playing an actual full palm chromatic cluster.[277]

3.2.2.3 ca1750 Pièrre-Claude Foucquet: *Les Caractères de la Paix*
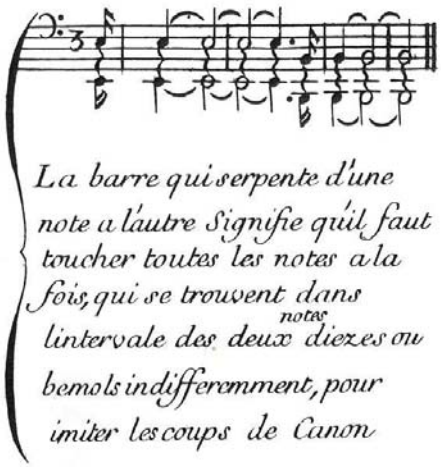
The first opus number of Pierre-Claude Foucquet (1694-1772) was one about peace. Its main differences with war music such as by Dandrieu, is that *Les Caractères de la Paix* is less action packed. Foucquet himself points to the reason for this:

> The harpsichord as well as the organ can express all the characters which good music must paint. [...] I will begin with the Caractères de la Paix, without any other reason for the choice than the present circumstances.[278]

Early 18th century France was not very war-minded. After the death of Louis XIV in 1715, the regent Duke of Orleans was devoted to government reorganization for a while and the cycle of multinational conflicts as under the reign of his predecessor seemed to have ended. So much so that peace was apparently considered enough part of life to paint its characteristics in music, even if Foucquet fires a lot of canon shots in his peace piece.

Included in the publication was a method to get to know the keyboard in one lesson and without a teacher. Next to an explanation of the keyboard's layout and the essence of playing a scale (involving the passage of the thumb in all directions), a table of ornaments (containing an explanation of how to perform super legato) makes room for a curious "ornament":

[276] On F-Pn Vm^{7}.1153: "Le clavessin seul poura aussy les joüere en maniere de piece" and on F-Pc Ac.e².685: "On poura aussy joüer le tout en maniere de piece sur le clavecin."
[277] Several harpsichordists who played the keyboard part in performances with ensemble (e.g. Ton Koopman, Frank Agsteribbe) have told me they play the opening with a two hands chromatic cluster.
[278] Page 2 in the 1982 Minkoff facsimile edition (part of the series 'Clavecinistes français du XVIIIe siècle'): "Le Clavesin ainsi que l'Orgue peut Exprimer tous les Caractères que la bonne musique doit peindre. Je commence par les Caractères de la Paix, sans autre raison pour le Choix que les circonstances presentes.",



Example 3.8. P.-Cl. Foucquet: *Les Caractères de la Paix* (ca1750), table of ornaments. "The line which snakes from one note to another signifies that one has to play all the notes together, which are between the interval of the two notes, regardless sharps or flats, to imitate the canon." Reproduced by permission of Éditions Minkoff.

There is no precise date available for this piece, but it seems to have been published around 1750[279]. The use of clusters in this peace piece differs from that in Dandrieu's battle piece in several ways. It is now required playing instead of a performance practical option, the clusters are furthermore meant to be fully chromatic, there are also many more of them, and they are even put in a clear tonal perspective.

Foucquet's clusters are part of the keyboard performance technique he touched upon in his method. He put the technical explanation next to the table of ornaments in his method and was further clear about how he considered them a necessary part of his piece:
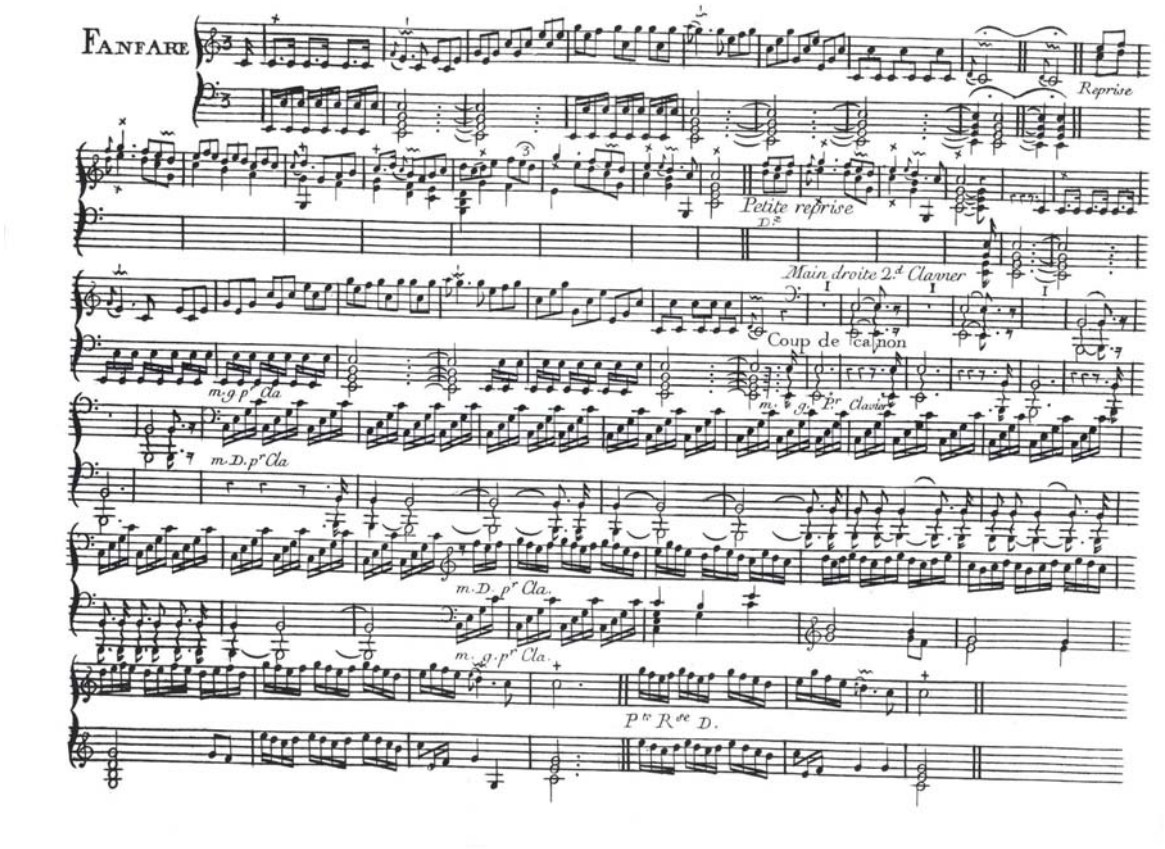
> I have left only those difficulties in this piece which I couldn't have suppressed without disfiguring the images and which would disappear if one wants to put in the efforts to conquer them, and apply oneself to the veritable fingering.[280]

His cluster notation is remarkably close to what 20th century composer have thought of, except that it does not allow for the distinction between diatonic and chromatic clusters. We counted no less than 30 cluster articulations in the fanfare[281], amounting to a real cannonade if ever there was one, and the final movement – *Feu* – contains 18 such articulations.

In the fanfare, the depiction of what may have been imagined as a peacetime military exercise is compositionally anticipated by low C major chords with the same sixteenth note upbeats as the later clusters. (Ex. 3.9, 2nd and 3rd system – mind the F clef in the left hand.) The canon shots themselves are musically developed by using two manuals for purposes of echoes and by distinguishing between clusters on the tonic and the dominant. This tonal diversification is surprisingly and paradoxically contrasted by the ensuing energetic bit where the right hand performs C major sixteenth note passagework while the left hand hits the chromatic cluster on G, suggesting bitonal tendencies. (See

[279] Kocevar 2001, p. 1538.
[280] On p. 2 in the 1982 Minkoff facsimile edition: "Je n'ai laissé dans cette piece que les difficultés que je n'aurois pû supprimer sans en defigurer les images et qui disparoitront, si on veut faire quelques efforts pour les vaincre, et s'assujettir au veritable doigter."
[281] Foucquet was not very accurate in his notation. Surely the right hand clusters in the second bar of the fourth system (ex. 3.9) should be tied. Not all the ties in the consequent bars in the left hand are there either, for instance in the fourth bar, or between the syncopated note heads on the first beats and the second beats in bar 8 and 9 of that system.

ex. 3.9, 4th system, 3rd bar onwards – mind the change in F clef.) Heinrich von Biber had already adopted bitonality to illustrate the conflict of battle[282], but it is not clear that this is really what Foucquet had in mind. A chromatic cluster on G is of course not explicitly bitonal, neither are chromatic clusters on tonal functions – as in the preceding bars – really tonal. The cluster on G could not have been used as the lowest possible one on the harpsichord he intended the piece for – as the ultimate canon shot fired by the heaviest piece or artillery in the army – for there is a low F major chord in the last movement. Most likely is the supposition that Foucquet indeed wanted to try and incorporate the chromatic cluster in a tonal environment. In that sense, Foucquet's use of the keyboard cluster on harmonic functions is akin to Rebel's connecting a chord with cluster-density into tonal harmony.
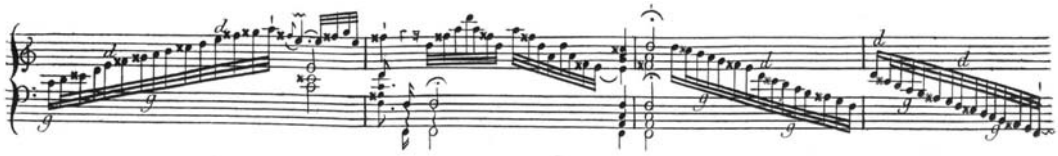


Example 3.9. P.-Cl. Foucquet: *Les Caractères de la Paix* (ca1750), third movement *Fanfare*. Reproduced by permission of Éditions Minkoff.

In the closing movement of this divertissement – the C major *Feu* – Foucquet goes on to explore the tonal potential of the chromatic cluster. Here he uses it in the left hand on the notes A, D, G and C (ex. 3.10-3.11 and 3.14), but takes his interest one step further: chromatic clusters are combined with perfect chords. And not just in a tonally logical way – a cluster on A with an A major chord in the right hand (ex. 3.12, 3rd bar), similarly on D with D major chord (ex. 3.11, 2nd bar) – but also in the already perceived "bitonal" manner: a cluster on g with a C major chord (Ex. 3.13, 4th system, 3rd bar) and one on G with a B minor chord in the right hand. (Ex. 3.14, last bar) The last instance may be a mistake by the hand that wrote the score, but it would be the only detectable one in the whole piece.
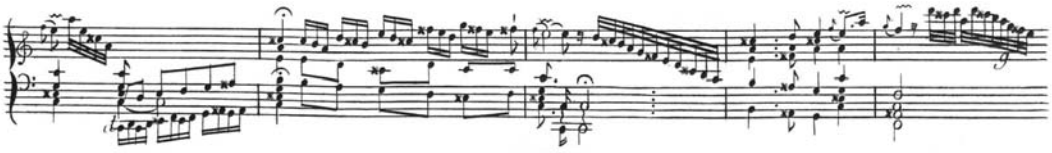
[282] As noted in Brown 1990, p. 290.
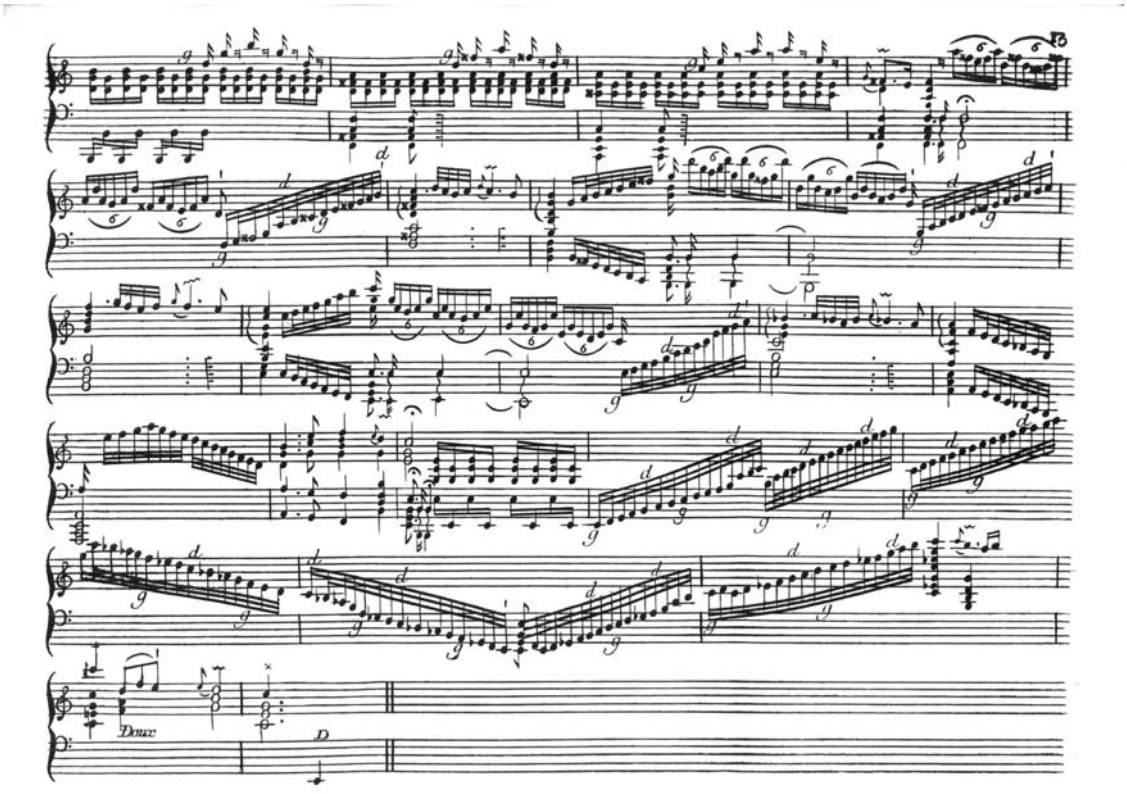


Example 3.10. P.-Cl. Foucquet: *Les Caractères de la Paix* (ca1750), final movement *Le Feu*, bars 18 (second half) to 21. Reproduced by permission of Éditions Minkoff.
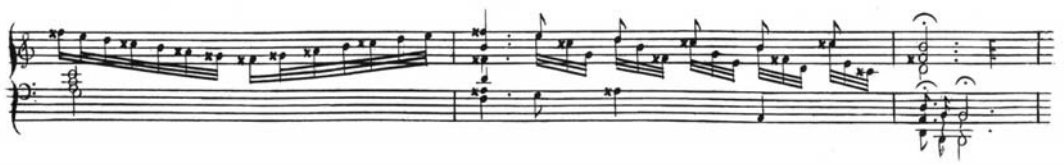


Example 3.11. P.-Cl. Foucquet: *Les Caractères de la Paix* (ca1750), final movement *Le Feu*, bars 22 to 25 (first half). Reproduced by permission of Éditions Minkoff.



Example 3.12. P.-Cl. Foucquet: *Les Caractères de la Paix* (ca1750), final movement *Le Feu*, bars 29 to 33 (first half). Reproduced by permission of Éditions Minkoff.



Example 3.13. P.-Cl. Foucquet: *Les Caractères de la Paix* (ca1750), final movement *Le Feu*, bars 41 to 61. Reproduced by permission of Éditions Minkoff.

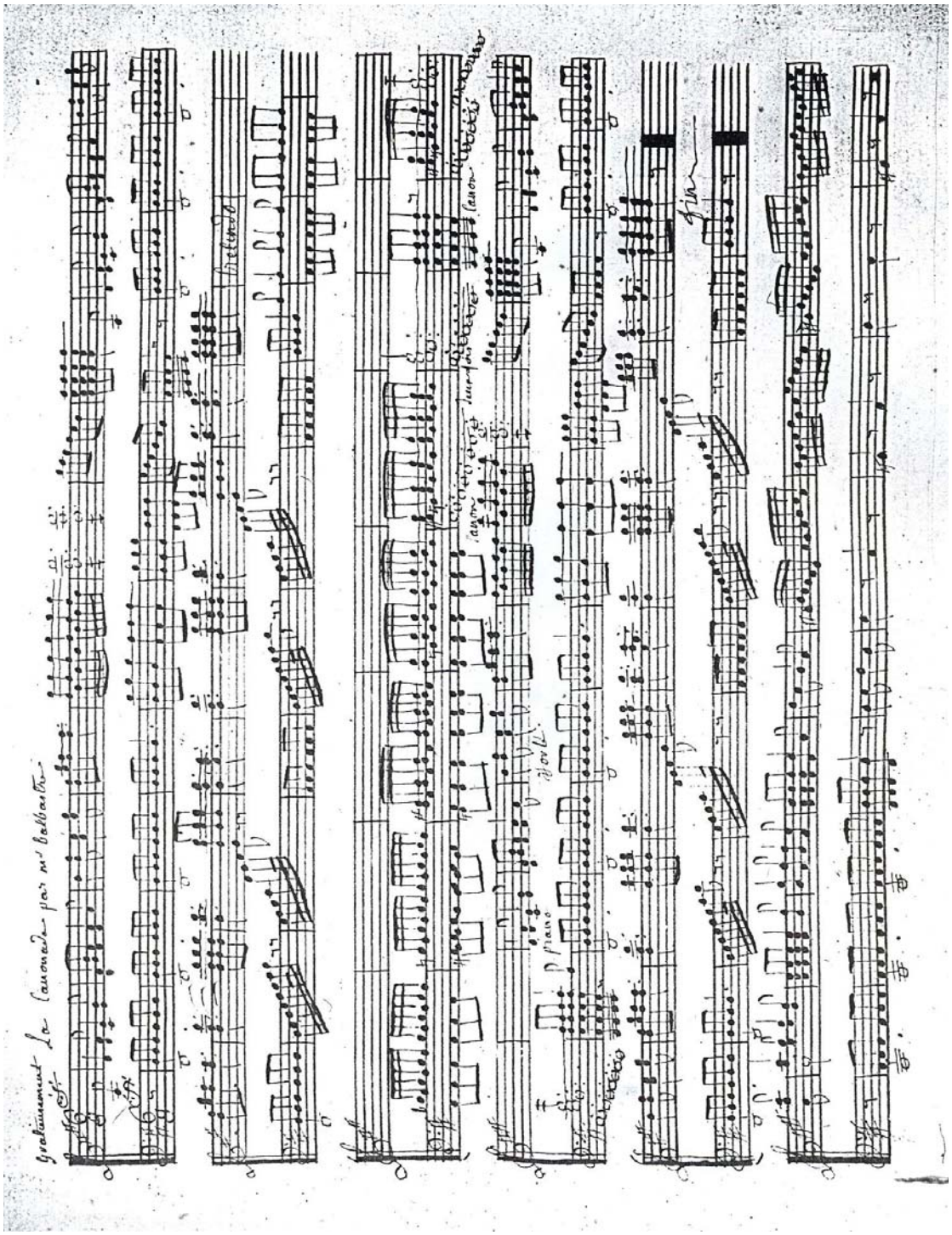


Example 3.14. P.-Cl. Foucquet: *Les Caractères de la Paix* (ca1750), final movement *Le Feu*, bars 38 (second half) to 40. Reproduced by permission of Éditions Minkoff.

3.2.2.4 1777 Claude-Bénigne Balbastre: *La Canonade*

A French manuscript called *Pieces de Clavecin par Monsieur Balbastre 1777*[283] contains an unmeasured prelude and an incomplete *La Canonade par m^s^ Balbastre*. Of the latter composition only one page survives, leaving us with no indication as to how many more bars the composer might have foreseen or even written out on the missing page(s). (Ex. 3.15.)

[283] F-Pn D-11207.



Example 3.15. Cl.-B. Balbastre: *La Canonade* (1777), Paris manuscript.

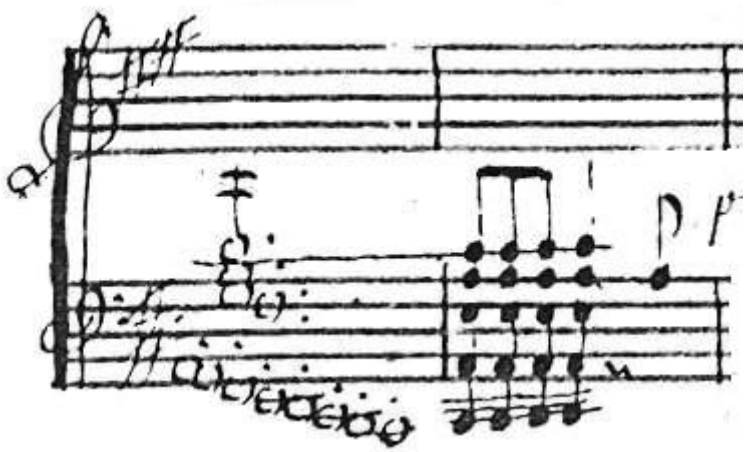
La Canonade is a character piece typical of the French classical keyboard repertoire and not unlike the ones we have come across earlier. The sometimes slightly irregular phrasing structure is nothing out of the ordinary[284] and the D major key is in keeping with the tradition of naturalistic composition[285]. The required galant performance practice ("gratieusement") matches the light dance-based concept and shows how even "heavy" subject matter could be considered with the necessary composure so characteristic of the time.

[284] The bars of the first section's phrases are structured {[(4,4)(4,3,4)]:[(2,2,2)(3,3)]:[(4,4)(4,3,4)]}.
[285] Schulin 1986, p. 135.

Balbastre intended the manuscript for the "clavecin", which in these times was more a generic term than an exclusive harpsichord dedication.[286] The crescendo beginning in the before last bar of the second system testifies to the idea that this piece was written with at least the possibility of a performance on the pianoforte in mind. At that time the transition period from the harpsichord to the piano in France was already irreversibly set in[287] and we know that Claude-Bénigne Balbastre (1724-1799) was quick to be a champion of the piano forte as much as he was famous for his organ recitals and his teaching nobility and foreign dignitaries the harpsichord.[288] As early as 1762 he was in possession of what must have been a conversion of a harpsichord to fit a hammer mechanism.[289] In the early 1770's, Balbastre was involved in a dispute over who invented the "jeu à peau de buffle", a new harpsichord stop to "make piano and forte" and to be used with the quills or independently of the traditional registers.[290] In 1770 a collection of pieces of his was issued "for the harpsichord or the piano."[291] He is also reported to have been the one providing the Marquise du Deffand with a "long suite of carols on his fortépiano" for her Christmas Eve party in 1774.[292]

While the crescendo in bar 20 of *La Canonade* has no written out ending (ex. 3. 15), it is logical that it leads to the most dramatic instance of at least the first section of this piece: the introduction of the left hand cluster in combination with the diminished seventh harmony in the right hand tremolo. With the descriptive designation "canon", the musical intention of the effect is clear and, even if the notation is clumsy (ex. 3.16), there is no doubt that the accumulation of notes is to be struck with the palm of the left hand.

[286] See De Place 1986, p. 14-15 and Fuller 1990, p. 10-11: at least between 1761 and 1775 the terminology used in Paris to refer to the piano ranges from 'clavessin a piano e forte' to 'Forte-piano' and 'clavecin à marteau'.
[287] See Rowland 2001, p. 34: A newspaper advertisement in 1759 describes a piano resembling the work of Silbermann, another advertisement in 1761 stated that four Silbermann pianos were in Paris and renowned organist Daquin owned such an instrument in 1769. See also Fuller 1990, p. 7-8: working pianos are reported to have existed in the late fifties; in 1759 a description of a piano-harpsichord was submitted to the Académie des Sciences; in 1765 an "excellent clavecin à marteau, faisant les piano & les forte" was announced in the press; the first record of a piano in a shop inventory dates from 1766; serious manufacture began with Érard's initiatives of 1777; a piano was first heard in public at the Concert Spirituel on 8 September 1768.
[288] Next to nobility, Balbastre has taught the daughters of Thomas Jefferson. See Herlin 1999, p. 85-86
[289] As listed among the inventory made by a notary after the death of Balbastre's wife in late 1763: "Item un autre clavecin a marteau a ravallement a un seul clavié et tiran dans son etuy de bois peint ledit clavecin fait par Blanchet [François Étienne Blanchet] prisé six cent livres." Cited in the CD-booklet "Claude Balbastre à Saint Roch", Abeille Musique CDNAT01 – 3760075340018, 2002. See also Herlin 1999, p. 86.
[290] See De Place 1986,p. 9-10.
[291] "Recueil de Noëls formant quatre Suites avec des Variations pour le Clavecin ou le Fortepiano" in Bibliothèque National, Paris, A.34.674. Curtis 1973, p. IV and IX gives 1771 as the date for this collection, De Place 1986 (p. 207) states 17 December 1770.
[292] Loesser 1954, p. 317. The mentioning of this moment prompted Voltaire's famous crude comment against the piano (see above, footnote 241). Another anecdote – recounted on the same page of Loesser 1954 – paints Balbastre more with a conservative set of mind than a champion of the new, with the account of him watching Taskin labor over a pianoforte for the royal family and supposedly having said "You are wasting your time; never will this newcomer, this bourgeois instrument, dethrone the majestic harpsichord."



Example 3.16. Cl.-B. Balbastre: *La Canonade* (1777), Paris manuscript, bar 30.

The composer found no other way to notate the effect than to write the dotted half notes in the 6/8 bars one after the other diagonally to have them be as close to one another as possible, thus moving the dots more towards the top of the note than after it. In the last bar of the third system (ex. 3.15), a second cluster seems to have been added without adjusting the duration of the first and without using the proper note value. Since no accidentals were used to indicate the F and C naturals where they would normally be F# and C#, the cluster is written out to be the vertical accumulation of the A major scale.

The omission of the accidentals must be a mistake – not the only incongruities in this manuscript[293] – as it is impossible to play the chord as notated with either the fingers or the palm. This leaves us with the question of whether to play a diatonic cluster (consisting of A minor notes but "missing" the two accidentals F# and G# (if considering the ascending a harmonic A minor scale) or a chromatic cluster (consisting of A major notes plus some that are 'improper' to that key, such as A#, C, D#, F and G). With the latter the performer achieves a more "noisy" character, while the diatonic cluster would diminish the effect of surprise by allowing for an effect that is still harmonic – albeit confused. At any rate, it is clear that the notation of the cluster is still in its embryonic stage.

Apart from the title referring to the very specific effect of a "canonade", the piece does not relate to any program – specific of generic.

[293] Bar 27 and 30 lack the F♮ and G♯ in the right hand. Where as this might still be pardoned as a result of a system (accidentals apply to notes until they need to be corrected and as long as no other notes come in between, even if bar lines separate repeated notes), some other inconsistencies are unequivocal: compare bar 15 with the same instances further down the page, or the mistakes in bar 18 (top not of the second chord in the right hand). The harmonic progression in the third system is awkward: the G♯ in the left hand in the second bar of this system would more logically be a G♮ natural, the F in the following bar (LH) might better be an F♯ with either the RH in the following (fourth) bar of that system also an F♯ or the LH an F♮. As it is, this fourth bar only makes sense if the system of accidentals allows for them to be valid across bar lines (which maybe well the case since it seems to be applied as such to the RH diminished seventh chords in the subsequent bars). It makes the whole progression less directional and more static, however, with two bars more or less sitting on a D minor chord and the right hand C♯ in the third bar serving as a kind of appoggiatura chord, all in all a little anti climax before the canons.

The genre of the battle piece had almost disappeared by the middle of the 18th century[294]. As far as French battle pieces are concerned, the complete lack of them in this period must certainly have had to do with the disastrous outcome for France of the Seven Year's War (1754-63), after which the French army was not at the forefront of European warfare until the revolutionary period.[295] Battle pieces were traditionally written not long after a particular war to celebrate victory and honor, in this case not something that would benefit a French composer writing for an audience of mainly fellow countrymen.[296] By the time *La Canonade* seems to have been written, king Louis XV – who was responsible for the fiasco of French foreign policy since 1714 – had died[297], but in view of his position in French society[298], Balbastre may still have thought it politically more correct to introduce the cluster in a rather neutral character piece based on the general sound of a cannon and without any other associations to risk stirring up sore patriotic feelings. If there is a link between *La Canonade* and real life, it must be found in another perspective. In 1777, shortly after the American Declaration of Independence, Benjamin Franklin was in Paris to sell his new country abroad. European nobility volunteered to fight under Washington[299] in the American Revolution and in 1778 France enters the war against England "to win a return match for the defeat of 1763."[300] *La Canonade* is likely an anticipative sort of battle piece, reflecting a moment when public opinion as being formed in favor of a new and up-and-coming war.[301]

All this speculation may just be futile, as it is not beyond a single doubt that "1777", as written on the Paris manuscript, is actually from that very date. Both the words and the notation are not in Balbastre's handwriting and both pieces are mentioned to be "by Balbastre", showing that it is a copyist's work. The awkward harmonic progression in bar 22-26 (ex. 3.15), which must surely be a copyist's mistake, the lack of page numbering and the minimal information on the set's title page are not enhancing trustworthiness either. The first piece of the set has already been called the last unmeasured prelude[302], suggesting reservations about the date being rather late for an example of this particular format. The reference to Balbastre in the individual titles, the coupling of the two pieces (which have nothing in common) and the fact that we don't know how many pieces may have been part of this set, may point to the idea of a collection of several pieces by several composers, suggesting the work of a copyist after Balbastre's death rather than the composer himself putting a collection together or taking part in it. Without any corroboration, *La Canonade* may have been composed before, on or after 1777.
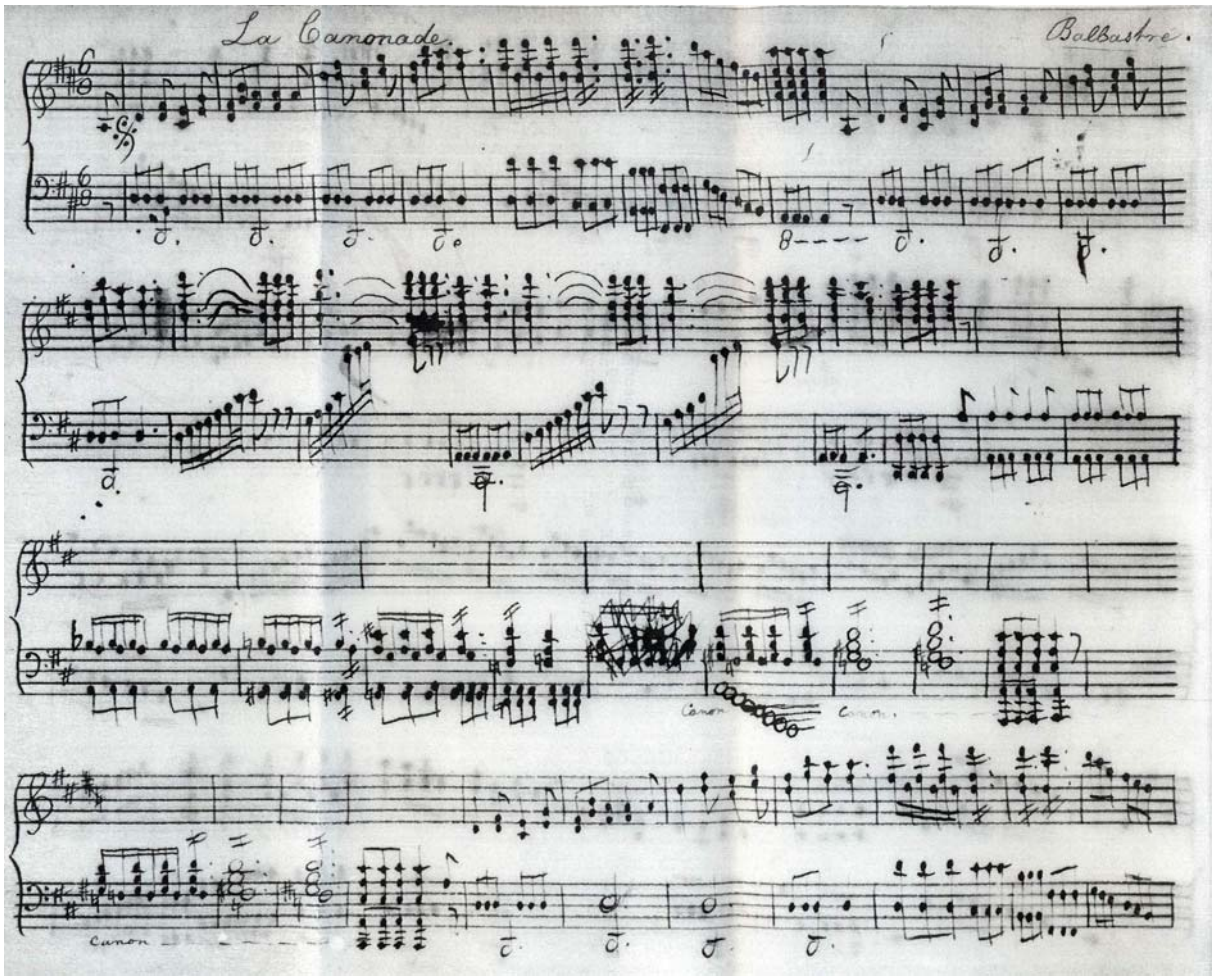
[294] Schulin 1986, p. 13: after a decline during the first half of the 18th century, this age old genre – in existence since the renaissance – Schulin states six battle pieces were found made between 1738 and 1788. We counted seven in her list on pp. 260-334.
[295] The Seven Year's War can be seen as the first world wide war as it was fought in Europe, North America and India. It lasted from 1754 to 1763 and was not unfavorable to the French at first, though the end of the war meant the end of France's colonial assets on the American continent. See Black 1994, p. 132-148.
[296] None of the four battle pieces found to have been written between 1738 and 1779 was French. See the list in Schulin 1986, p. 260-334.
[297] Louis XV was born in 1710 and ruled France from 1715 to his death on May 10, 1774.
[298] Besides the enormous fame he enjoyed among the people, his harpsichord lessons to the Duke of Chartres are referred to on the title page of his 'Sonates en quatuor' (1779) and in 1778 he has been reported as teacher of Marie Antoinette. See Herlin, 1999, p. 86
[299] Such as the Marquis De Lafayette
[300] Roberts 1993, p. 577.
[301] In this respect, it is telling that the music of *La Canonade* ended up traveling all the way to the US through the hands of Thomas Jefferson, pupil of Balbastre's in Paris in the 1780's. Two manuscript copies of the piece are found among the scores in the legacy of his grandchildren.
[302] Herlin 1999, p. 88. Herlin probably took over this conclusion from Fuller 1990, whose writings are listed in the bibliography.

There is a second manuscript of Balbastre's *Canonade*, resting in a US Virginia library as part of Thomas Jefferson's Monticello Music Collection[303], and which is not only complete but also and above all more coherent in the said progression (ex. 3.17). The American copy also presents a different interpretation of the "deux fois" that is added in between the first two clusters in bar 26 of the Paris version of the piece. (Ex. 3.15.) In the French score the first cluster is clearly meant to be repeated in the same bar, the way it is written out in full in bar 29. In the US version, the whole bar 26 is repeated, with only one cluster per bar. (Ex. 3.17.) As the repeat of this cluster motive is changed accordingly compared to the French version, the total structure of this first section is altered to a more traditional regularity.[304]

The piece was copied into an album with the names of Ellen Wayles Randolph, Jane Eliza Waller and Jane Blair Cary written on the frontispiece.[305] Ellen Wayles Randolph was the granddaughter of Thomas Jefferson, who lived in Paris from 1784 to 1789, when he served in France as a Commissioner and Minister. His daughters stayed with him and took lessons with Balbastre, who was then harpsichord instructor at the Abbaye Royale de Panthémont, the school in Paris attended by Mary ("Polly" - °1778) and Martha ("Patsy" - °1772) Jefferson, mother of Ellen Wayles Randolph.[306] The music book was either filled out by Martha Jefferson, having heard it played by Balbastre or having played it herself under his tutelage, or it was copied by the granddaughter who then must have heard her mother play it. At any rate, this copy could hardly have been made before 1784, not clearing up the question of when the piece was written. A second manuscript music book in the Monticello Collection, which supposedly belonged to Martha Jefferson Randolph (daughter of Thomas and mother of Ellen Wayles), contains *La Canonade du Même* (listed after a *March Querrier par Mr. Balbastre*), but this item seems to be lost.[307]

Whichever of the Randolph women wrote down the music of *La Canonade* must have known the Paris manuscript which survived to us, or they must have seen Balbastre's own autograph (if these two are not one and the same): chances are small that they would have come up with exactly the same notation for the clusters as in the Paris manuscript. (Ex. 3.17.) If the exact timing may not be known, the certainty remains that Balbastre is responsible for the earliest harmonic integration of the keyboard cluster that we could find.

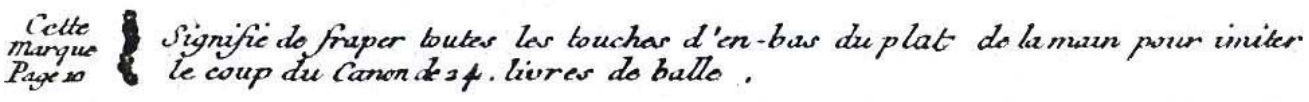
[303] MSS 3177-a, box 6, Folder 28. Heading: Monticello Music #28. The Monticello Music Collection is housed in the Albert and Shirley Small Special Collections Library of the University of Virginia in Charlotsville, but actually belongs to the Thomas Jefferson Foundation.
[304] The bars of the first section's phrases are structured {[(4,4)(4,3,4)]:[(2,2,2)(4,4)]:[(4,4)(4,3,4)]}. Compare to above, fn. 52.
[305] The music book also contains *God save the Commonwealth*, *Rise Cynthia Rise*, *Lullaby*, *Sonata of Edelman* and a German Waltz. See Cripe 1974, p. 12. There is a second manuscript music book in the Monticello Collection, which supposedly belonged to Martha Jefferson Randolph (Acc. No. 7443-F in the Manuscripts Department of the University of Virginia – See Cripe 1974, p. 119-120), containing *La Canonade du Même* (listed after a "March Querrier par Mr. Balbastre"), but this item could not be found at the time of writing this chapter.
[306] See Cripe 1974, p. 32-33 or Adams 1997, p. 22-23.
[307] Acc. No. 7443-F in the Manuscripts Department of the University of Virginia – See Cripe 1974, p. 119-120. The librarians have been unable to trace this item, as in electronic correspondence in August 2007.



Example 3.17. Cl.-B. Balbastre: *La Canonade* (1777), US manuscript. [308]

3.2.2.5 1779 Michel Corrette: *La Victoire D'Un Combat Naval*
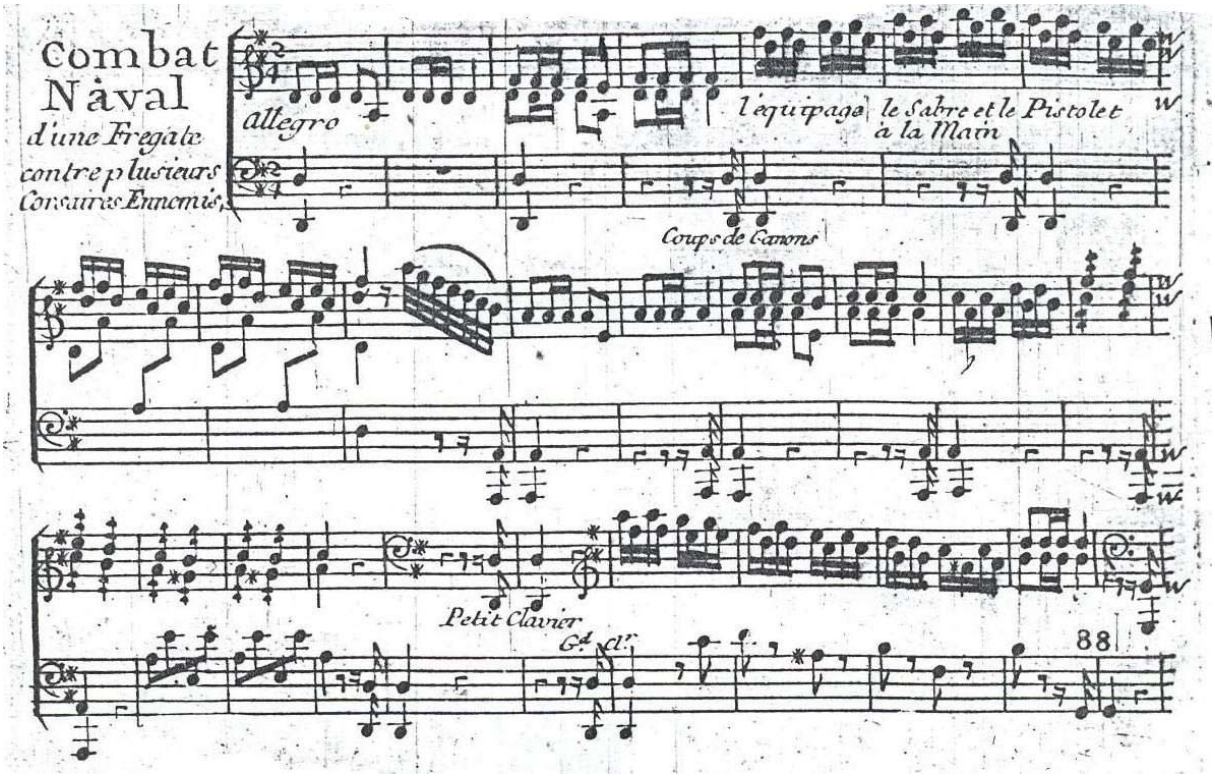
The only full-blown French battle piece from this period is Michel Corrette's *la Victoire D'Un Combat Naval Remportée par une Frégate contre plusieurs Corsaires réunis* from 1779.[309] It is the second piece of two comprised in *Divertissements Pour Le Clavecin ou le Forte Piano*[310]. The use of the palm of the hand to play the clusters is already indicated on the frontispiece (ex. 3.18), specifying the weight of the cannonball of which the sound is to be imitated:



Example 3.18. Michel Corrette: performance indication of the front page of *Divertissements Pour Le Clavecin ou le Forte Piano* (1779): "This sign on page 12 [...] means hitting all the lowest keys by the flat of the hand to imitate the 24 pounds cannonball shot."
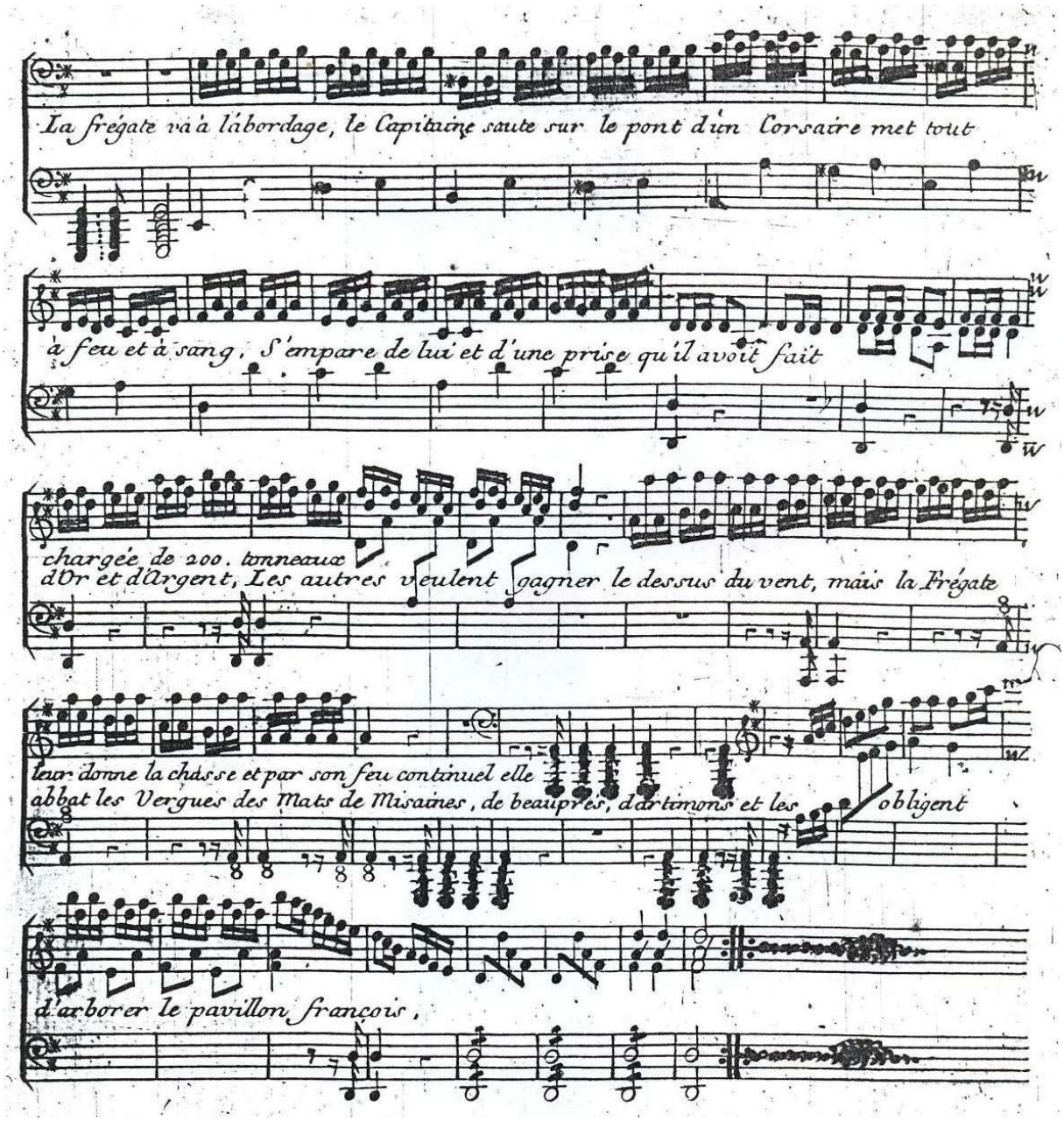
[308] US-CHj MSS 3177-a, box 6, Folder 28.
[309] The composition was first announced in the *Mercure de France*, January 1780 (Schulin 1986, p. 273) and written in 1779 (Jaffrès 2000, p. 1655).
[310] The manuscript is at the Paris Bibliothèque National, Rés. 49.

This opus is without a doubt intended for the harpsichord and only alternatively considered for the pianoforte. The only indications of dynamics can be found at the very end of this long piece (493 bars), where a "piano" phrase is followed by "forte". On the first page of the music the "coup de canon" is only a regular left hand bass octave, but in bars 21-22 the right hand has to play such octaves in the bass on the "petit clavier", followed by the same octave in the left hand on the "grand clavier". (Ex. 3.19.)



Example 3.19. M. Corrette: *la Victoire D'Un Combat Naval Remportée par une Frégate contre plusieurs Corsaires réunis* (1779), bars 1-27.

Five bars later, the same procedure is found, only a fifth lower and without indication of register. The right hand clusters in bars 157-160 (ex. 3.20, fourth system) are undoubtedly meant for the petit clavier as well.



Example 3.20. M. Corrette: *la Victoire D'Un Combat Naval Remportée par une Frégate contre plusieurs Corsaires réunis* (1779), bars 124-171.

As a battle piece, this "divertissement" complies with all the known characteristics of the best of the genre. An elaborate frontispiece complete with drawing of a naval battle situation, dedication to the duke of Angoulême, honors of the composer and teasers in the form of lengthy descriptions of the content and the above mentioned explanation of the cluster's symbol and performance practice. The second page addresses the Duke directly to assure him of the humble composer's best intentions in musically describing "the victories which are brought home every day by the armies of the invincible and good King your uncle against the enemies of the state."[311] Corrette cleverly diverts attention from the painful memories of the outcome of the Seven Year's War to a more easily gratifying naval combat against some privateers, won by a French frigate.[312]

[311] The uncle in question is Louis XVI, who had succeeded to the throne in 1774 after Louis XV had died.
[312] In the 18th century, mercenary sailors were commissioned by sovereign states to attack and even capture enemy ships. As long as they operated under the protection of a so-called 'letter of marque', they were not considered pirates and could keep a share of the profits from the sale of the seized loot. The French as well as the

The structure of the piece is largely in keeping with what can be found in most of this particular kind of early program music. It starts with a trumpet signal and an allegro preparing the crew – saber and pistol in hand – for battle. Uncomplicated passagework accompanies the attack with some light canon shots and fusiliers bring about carnage and chaos at the enemy's port and starboard. Tremolo and descending scales on top of diminished seventh harmonies make us see privateers catch fire and jump overboard. At the height of the fight, the canon clusters come into play when the frigate boards the enemy vessel. The French captain puts the corsairs under fire and blood, and when the wretched enemy tries to catch the wind to flee with their 200 tons of gold and silver, the frigate chases them and – by its continuous fire of full palm clusters – tears down the yard of the foremast, the bowsprit and the after mast and forces the privateers to hoist the French flag. Repeat signs enable the performer to revisit this scenery before victory is celebrated by a 6/8 dance with two variations (one of which in minor) and a da capo. A g minor adagio in *lamento* style conveys the desolation of the prisoners and 'paints the wounded' as well as a dying privateer captain. A sudden presto ascent – the cabin boy running up the fore-topgallant mast to catch sight of the harbor – announces a "fête marine" consisting of no less than three da capo minuets and a da capo allemande before two sailors enter *andantino*, disguised as bears performing tricks and scratching their ears and paws. A *ballet général* leads to the final fanfare with fireworks.

The clusters appear as canons only after these have been sounded in more traditional ways: at the beginning of the piece, simple octaves in the bass (left hand, afterwards also right hand on a different manual) are indicated as "coups de canons." At the end of the first page, "the frigate looses off a volley" which is translated into music by a rather anti climactically slow chord progression above a left hand tremolo on G. The first cluster appears at roughly two thirds of the allegro, when the French board the enemy vessel. Preceding the cluster was a "general combat" described by a harmonically chaotic series of diminished seventh chords and indecisively cadence-like progressions – a more traditional sequence follows, starting in e minor (ex. 3.20, third bar onwards). The surprise of the noise effect is actually introduced quite efficiently, but the follow up in the form of the most accessible harmonic sequence the piece has seen until this moment does not match the action well. The dramatic climax of the battle seems to require more musical daring, especially after the shock of the cluster. At this point, the musical structure forces some of the opening material upon the action, which – again – lacks some of the necessary dramatic support for the text. The light passagework is violently interrupted by the ultimate of canon fire, which asks both hands to execute the "continuous fire." These last clusters of the piece are in keeping with the narrative, but cannot be matched musically in the ten remaining bars of the combat part of this story.

It would be unfair to compare Corrette's large-scale compositional endeavor to the short character piece *La Canonade* on all levels, but at least on one point it is clear that Balbastre is the better composer of the two. Harmonically, structurally and creatively, the "canonade" is an example of the better solution to the question of integrating the cluster in music that is still relying on a simple harmonic basis with light melodic and rhythmical material, transparent passagework and little room for convincing experimentation. Balbastre clearly sought ways to successfully prepare for the clash of the noise in tonal construction and to incorporate the sound harmonically. Corrette's use comes across as no more than cheap shock effect. Fitting as this may be in a battle piece, it leaves the listener and the performer with an unsatisfactory impression.

British and the Americans used 'corsaires' to engage in this particular type of naval warfare. The first piece of Corrette's set – *Echos de Boston* – is probably a gloating musical reference to the Boston Tea Party (1773), the starting point for the catastrophe that the American war of independence would be for England, France's age-old enemy.

3.2.2.6. <1780's The cluster, thunder and organ improvisations

With Balbastre's *Canonade* and Corrette's battle piece, the 1770's bring us at the end of the earliest history of the cluster for stringed keyboard instruments. Outside of this particular medium, there is more to discover on the keyboard cluster, however. At some point in time performers started using the cluster technique on the church organ as evidenced in the 1781 *From the state of music in France* by Abbé Georg Joseph Vogler (1749-1814):

> Yet another corruption of taste has crept into it with the basses, now and then striking together five or six of the deepest Bombarde pipes alone, trying to depict with this barbaric droning and roaring the thunder or the cannons, after which follows such an enthusiastic cheer from the audience, that with each express injunction the unashamed outbreak of general clapping in the temple of God himself is hardly to be avoided.[313]

For sure, Vogler is describing cluster technique, and although it is not clear for how long this "corruption" had been going on, it was evidently not limited to the imitation of cannons on the harpsichord as we have seen until now. Apparently the cluster was used to depict thunder on church organs as well. We found no specific such organ piece from this year or before, and judging from the way Vogler expresses his observation, he did not agree with the aesthetics of the cluster's use. It is therefore doubtful that he himself had applied the cluster in or before these early 1780's, when he had already performed his own *Die durch ein Donnerwetter unterbrochene Hirtenwonne* on the organ, an improvisation that would later lead to Julius Knecht composing a piece (published in 1794) with the same title and including many instances requiring cluster technique.[314] (See below 3.2.6.3.5.1.) Knecht stated:

> I have never heard the Thunderstorm, which Abbé Vogler played on every organ everywhere: it is therefore my own invention.[315]

This does not necessarily mean that Vogler had indeed played clusters and that Knecht just had never had the opportunity to hear them. It could actually show the lack of proof that Vogler used any cluster *technique* at all to produce his thunder sounds and that this (the technique) is what Knecht believed to have invented.[316] In the pages to come, when discussing Corrette's organ composition from the late 1780's (possibly earlier even), we will see that Knecht was at least mistaken about his own role as inventor of the organ-thunder cluster. As for Vogler: in the early 1770's he had written music for a ballet about a wine harvesting interrupted by hunters[317]. The idea of a peaceful scene broken up by something more violent before returning to its original state would become a stylistic cliché in the next decades and because of his *Hirtenwonne* piece Vogler is said to have

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[313] As quoted in Henck 2004, p. 46: "Noch eine andere Verderbniß des Geschmaks hat sich mit den Bässen eingeschlichen, daß sie manchesmal auf einmal fünf oder mehr von den tiefsten Bombard-Pfeiffen ganz allein zusammenstosen, mit diesem barbarischen Gebrummel und Getöß den Donner oder die Kanonen vorzustellen suchen, worauf ein solcher enthusiastischer Beifall vom Folk erfolgt, daß man mit jedesmal ausdrüklichem Verbot den unverschämten Ausbruch ins allgemeine Händeklatschen im Tempel Gottes selbst kaum hindern kann." Henck cited from *Vom Zustand der Musik in Frankreich* in *Betrachtungen der Mannheimer Tonschule*, 10th-12th installment, March to May 1781, p. 74-75, reprinted in a facsimile edition by Hildesheim/New York: Georg Olms Verlag, 1974, p. 426-427.

[314] Henck 2004, p. 42, fn. 107 discloses his reasoning that leads to dating this improvisation 1779/1780.

[315] As cited in Henck 2004, p. 43: "Ich habe das Donnerwetter, welches Abbé Vogler aller Orten auf der Orgel spielte, niemals gehört: es ist also gegenwärtiges meine eigene Erfindung."

[316] Henck 2004, p. 46 draws a different conclusion and considers the quotation from state of music in France to be a rare case of double standards ("seltsamer Doppelmoral").

[317] *Les Rendez-vous de chasse ou les Vendanges interrompues par les Chasseurs.* Henck 2004, p. 42 gives 1772,Thomsen-Fürst 1771 as the earliest for this composition.

contributed to it by inventing the free pictorial fantasy ("Tongemälde") with a storm- and thunder intermezzo.[318] On the basis of later such interrupted pastoral scenes that did contain clusters, and due to the perceived link between Vogler and these pieces, his early work has been retroactively – but without further proof – associated with the earliest of cluster use on the organ. Remains the question of how much the cluster was in vogue in France when Vogler discovered it there.

Musical depiction of thunder was noted in Paris for its power to impress an audience that had come to a church to hear improvisations on the organ. Notably the Te Deum text had served as the basis for extemporization, making full use of the organ's potential for dramatic effect in the part that concerns the Last Judgment: "Judex crederis, esse venturus" ("We believe that Thou shalt come to be our Judge over us"). Around 1780 a commentator recounts a 1762 rendering of this hymn by Louis-Claude Daquin (1694-1772):

> It was on that day when Daquin, more sublime than ever, thundered in the Judex Crederis, which instilled the harts with impressions so vivid and so profound, that all present paled and shuddered.[319]

Here also, the basis for the account of such "thundering" on the organ was an improvisation and it will probably never be clear what performance technique Daquin used in such an apparently convincing way. Known as the best virtuoso improviser of his generation[320], Daquin may have used a cluster but it could just as well have been a more conservative effect achieved with regular fingering. As far as we know, he was at least distinguished for using "piquant novelties" such as birdsong[321], but this is equally vague as to whether the effect or the technique was novel.

In 1784 Jean-Pierre-Louis De Luchet (1740-1792), marquis of Laroche du Maine[322], wrote:

> The wonderful has won all the talented men. The organists even agree with certain orators to cause the ear pleasant titillations; but it is characteristic only of *Balbâtre* and *Miroir* to make sounds dialogue, to alienate and reconcile them at will; finally to imitate lightning, in a way that one believes it strikes, that the Temple collapses, that the world ends.[323]

Again, there is no direct evidence of any cluster technique, though the mentioning of Balbastre certainly lends credit to the idea that more than just individual fingers where used to achieve the effects the marquis describes. In this context and Eloi-Nicolas-Marie Miroir (1746-1815), organist at Saint-germain-des-Prés, we only know that he was later

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[318] Jakob 1976, p. 18.

[319] Mercier ca1780, p. 105: "Ce fut ce jour-là que Daquin, plus sublime que jamais, tonna dans le Judex Crederis, qui porta dans les coeurs des impressions si vives et si profondes, que tout le monde pâlit et frissona." This quote has been used in Pirro 1926, p. 1349, Dufourcq 1941, p.121, Marshall & Peterson 1995, p. 12.

[320] Montagnier 2002, p. 11-12. See also Pirro p. 1349 or Mercier c1780, p. 103-105.

[321] "Indépendamment d'un ramage d'oiseaux, qu'on peut regarder comme une nouveauté piquante, nous annonçons que le fameux compositeur donnera le tableau du jugement dernier après ces paroles: *Judex crederis esse venturus*." As quoted in Pirro 1926, p. 1349.

[322] Laroche du Maine is located South-West of Paris, in the department Vienne, region Poitou-Charentes, arrondissement Châtellerault.

[323] As quoted (partially) in Pirro 1926, p. 1364 and (fully) in Seydoux 1977, p. 159 : « Le merveilleux a gagné tous les hommes à talent. Les Organistes mêmes s'entendent avec certains Orateurs pour causer à l'oreille d'agréables titillations; mais il n'appartient qu'à *Balbâtre*, ainsi qu'à *Miroir*, de faire dialoguer les sons, de les éloigner & de les rapprocher à leur gré; de contrefaire enfin la foudre, de maniere [sic] qu'on croit [sic] qu'elle tombe, que le Temple écroule, que le monde finit. » Original quotaion in: De Luchet, Jean-Pierre-Louis, *Paris en miniature, d'après les desseins d'un nouvel Argus*, Amsterdam, 1784, p. 59.

credited (in 1852) with having executed the first storm "in seventeen hundred and something."[324]

In 1786 Guillaume Lasceux is reported to have written a *Te Deum*[325] but there is no musical score to be checked for clusters and their prescription. He did write performance practical advice for the cluster in his 1809 *Essai théorique et pratique sur l'art de l'orgue.* (Cf. below 3.2.6.3.5.3.) At the end of that 19th century manuscript he included a written out version of the *Judex Crederis Esse Venturus*, so it might be that he had already used the technique more than 20 years earlier.

Indirect evidence, clues and associations, leading to the supposition that organ clusters were wide spread in this period, keep surfacing in the decades to come. Vogler too produced a piece for organ on the last judgment – *Das Jüngste Gericht* – but neither date nor score is known[326], just like with his battle pieces *Die Seeschlacht* and *Die Belagerung von Gibraltar,* none of which can be checked for clusters.[327] At the end of the 1780's, he performed in Danzig, after which the organ players there are said to have improvised on Vogler's battle- and storm pieces *Die Seeschlacht bei Abukir* and *Das Wetter im April*[328]; on September 17, 1790, Vogler played a program in Karlsruhe with a piece called *La Prise de Jéricho*, including "the fall of the walls"[329]; the second half of the program contained a piece called "Joy of the shepherds, interrupted by the storm"[330]; Jean-Jacques Beauvarlet-Charpentier (1734-1794) is said to have used a fanfare, a march, the noise of a cannon and the rolling of the drums to celebrate a god of the armies in the *Sanctus* of his *Te Deum*[331]; (for the *Judex Crederis*, he reportedly commented: "this piece needing to paint the disorder of nature, one can start by an imitation of the winds by using "tous les fonds"", advising at the end of the verse to use the "tonnerre", "prolonged at will, to imitate the upheaval of the universe"[332]); in the early 19th century, Guillaume Lasceux (1740-1831) referred back to Armand-Louis Couperin (1727-1789) and 'the inimitable' Nicolas Séjan (1745-1819) as specialists of the genre.[333]

Despite the lack of precise dates for many of these improvisations and compositions, and despite the lack of conclusive evidence that all of them actually required cluster performance techniques, there is enough circumstantial evidence to support the idea that the organ cluster was more than an obscure and incidental effect. Especially the *Judex Crederis* was a subject "to which every organist has reason to attach great importance"[334] for he can "strike the audience by painting the picture of abomination, of desolation which will cause the terrible catastrophe of the last day."[335] This importance has been noted at the beginning of the 19th century, but the *Judex Crederis* was already

[324] Cited in Seydoux 1977, p. 158-159 : « [… le premier orage, qui fut exécuté en dix-sept cent et tant par le fameux M. Miroir, […] » Original in Champfleury, *Les sensations de Josquin*, Paris, 1859, p. 84-85. Champfleury was a pseudonym for the French novelist Jules Husson (1821-89).
[325] Seydoux 1977, p. 169-170.
[326] Thomsen-Fürst 2007, p. 182.
[327] Schulin 1986, p. 333. No dates are known. Of a further untitled battle piece, only the first and last pages remain.
[328] Jakob 1976, p. 19.
[329] '*Prière d'Israel*', '*le son des trompettes*', *'la chute des murs', 'entrée triomphale'*, in Eitner, *Monatshefte XI*, 1879, p. 101, as quoted in Pirro 1926, p. 1361, fn. 8.
[330] *'Joie des bergers, interrompue par l'orage'*, in Eitner, *Monatshefte XI*, 1879, p. 101, as quoted in Pirro 1926, p. 1361, fn. 8.
[331] As described in Pirro 1926, 1363 ("library of the university, fonds guilmant"). According to the catalogue of the library of the French Academy in Rome, they would be in possession of a copy of the *Te Deum*, but it cannot be located at this time. Electronic correspondence with the librarians, July 2007.
[332] As cited in Pirro 1926, 1364.
[333] Lasceux 1809, p. 37.
[334] "...auquel tout Organiste attache, avec raison, une très-grande importance." Lasceux 1809, p. 36.
[335] "…frapper l'auditoire par la peinture de l'abomination, de la désolation qui causera la Catastrophe épouvantable du dernier jour." Lasceux 1809, p. 36.

a very characteristic part of the post classic style: for the first time argumentative music appears in the organ repertoire, "like veritable little symphonic poems in several consecutive sections, with contrasting registers, opposing styles of writing, etc."[336] The basis for this novelty is found in a multi-layered tapestry of change in the world of the organ, and the cluster is one of the first proofs of the changing mentality of the organist.

With the early 18th century's secularization, organ playing evolved away from the devoted feelings habitual in churches and the most typical genre in its repertoire – the fugue –saw a gradual but distinctive decline in the quality of its craft and other genres were replacing it.[337] Already in 1727, there were observations about organists' lack of devotion in churches, playing "minuets and sorts of mundane airs."[338] This observation was not always negatively expressed:

> If the church keeps at great expense vast buffets of organ and a complete choir…, it is not for some Philidor, enchanted with a learned composition, to role his eyes towards the ceiling… while the people yawn and leave the service. The organ and the chant are for the people.[339]

The 18th century Parisian audiences loved the taste of the vulgar, the profane commentaries. They did not have to fear the severities of the arch bishop of Paris, who had forbidden the midnight mass at Saint-Roch and at Saint-Germain des Prés because of the multitude of people coming to hear the organist instead of the word of God[340], or that their applause would be suppressed by the priest.[341]

Already by mid-century, the evolution had become the object of a respected commentator's frustration:

> These days one treats instruments so much against their character. On the organ we hear nothing but storms, wars, hunts, sonatas and opera symphonies. It used to be a serious and majestic instrument.[342]

If Marpurg was not clear about the exact circumstances such wretched practices occurred in, by around 1780 at least they had infiltrated church service:

> Everything has changed the day I write this. They play, while the Eucharist and the chalice are held up, little arias and sarabandes; and during the Te Deum and the vespers, hunting pieces, minuets, romances and rigaudons.[343]

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[336] Gorenstein 1993, p. 59.
[337] See Gorenstein 1993, Pirro 1926.
[338] "La musique qui se fait aux églises n'est pas trop dévote, puisque les orgues jouent des menuets et toutes sortes d'airs mondains. C'est alors qu'il se passé beaucoup d'impudicités, de sottiese et d'impiétés." From Séjour de Paris, by J.-C. Nemeitz, 1727, as quoted in Pirro 1926, p. 1350.
[339] "Si l'église entretient à grands frais un vaste buffet d'orgues et tout un choeur…, ce n'est pas afin qu'un PHILIDOR, enchanté d'une composition savante, roule les yeux vers la voûte… pendant que le people bâille et déserte l'office. L'orgue et le chant sont pour ce people." Quoted in Pirro 1926, p. 1363, from Noêl-Antoine 'abbé' Pluche's *Spectacle de la nature, ou Entretiens sur les particularités de l'Histoire naturelle qui ont paru les plus propres à rendre les jeunes gens curieux et à leur former l'esprit*, VII, 1746, p. 139.
[340] Mercier c1780, p. 105
[341] See Pirro 1926, p. 1350: "En 1781, quand COUPERIN, SÉJAN, BALBASTRE et CHARPENTIER recurrent l'orgue de Saint-Sulpice, le curé dut veiller à reprimer les applaudissements (BRENET, ouvr. Cite, p. 381)" The cited work by Michel Brenet is 'Les Concerts en France sous l'ancien régime', 1900.
[342] As cited in Schulin 1986, p. 71-72: "So sehr handelt man heutiges Tages dem Character der Instrumente entgegen. Auf der Orgel höret man nichts als ungewitter, Kriege, und Jagdten, Sonaten und Opersymphonien. Ehemals war es ein ernshaftes und majestätisch Instrument..."
[343] Mercier c1780, p. 103

The intrusion of this harpsichord repertoire into organ practice was a sign of the times. Cross-fertilization in repertoire can be detected from different angles. Players of vielle, musette and others introduce a new genre: the *pastorale* and *Bergeries*[344]. Since the death of Louis XIV in 1715, the supervising Regent simplifies court etiquette and the aristocracy takes the habit of roaming the countryside. The rediscovery of the countryside helps setting up new compositional formulas such as the Tambourin. Besides social evolution, commercial opportunism engenders the habit of producing scores that are playable on the keyboard instruments most in use[345]. That the organ appears in the concert hall helps making it just that: more in use. Organists were also harpsichordists and pianists, hence the emergence of typical harpsichord music in the organ repertoire and the publication of organ pieces playable on the harpsichord. Music passes from one instrument to another without regards to the improperness or the extravagance. At the Concert Spirituel, since 1755, Balbastre does not only play organ concertos, but also overtures, sonatas and the *Sauvages* by Rameau.[346] In the 2nd collection of harpsichord pieces, Christoph Moyreau inserted a piece called *Purgatory*, to be played on the organ as well. On a republican party, Charles Broches, organist of the cathedral of Rouen, played a piece recounting the battle of Jemapes. "He proved to have exquisite taste in the art of "marrying instruments"", wrote Guilbert. "People kept talking for a long time of "the pleasure and the religious impression he made them experience in this verse of the Marseillaise: Sacred Love for the fatherland"".[347]

Next to the metamorphosis in repertoire, the traditional style and habit of improvisation endured innovation as well and lead to the dependence of the organist on effects. While some – as Daquin – are still careful, trying not to introduce too profane registers in the organ, at least in the beginning of his career[348], others had no shame, as proves the contemporary accounts of improvisation in general and the Judex Crederis in particular.[349] The search for effect was inextricably linked to the probe into acquiring new colors in instrumental timbre. [350] Due to the Concert Spirituel the Paris musical scene opens up to be influenced by foreign symphonic music. In 1750 the orchestra took on two permanent double basses, two years later two horns were added. After 1773, four double basses and trumpeters are definitively installed and clarinets become permanent, giving birth to a new organ register (first in Saint-Sulpice, later at Saint-Gervais).[351] The organization's commercial tendencies lead to continuing scrutiny of new formulas. On September 8, 1768, Mlle Lechantre plays the pianoforte, a success that goes hand in hand with the instruments à Turqueries. It was at the Concert Spirituel that the first French organ was destined to the public concert and not only the church. Balbastre took place at it and introduce the organ concerto.

The influence of the orchestra in organists' circles is rapidly noticeable. Michel Corrette became a kind of orchestra-man, writing tutors for almost any instrument. By the end of the 18th century, the organ was perceived to possess the means of imitating the orchestra: organists "sacrificed the individuality of the organ, and they tried to perfect, to distribute or to lay out the registers in such a way that the organist, by himself, would replace a troupe of concertizing musicians."[352] The sounds of the trumpet, the horn, the bassoon, the alto, violins, timpani, cymbals, birdsong and the human voice are on the list

[344] Gorenstein 1993,p. 8
[345] Gorenstein 1993, p. 20
[346] Brenet 1900, p. 256 and p. 262, as cited in Pirro 1926, p. 1363.
[347] From 'Notice historique sur le citoyen Broche', Rouen, an XII, p. 18, as cited in Pirro 1926, p. 1364: "Il y fit preuve d'un gout exquis dans l'art de "marier les instruments"." And "On parla longtemps "du plaisir et de l'impression religieuse qu'il fit éprouver à ce couplet de la Marseillaise: Amour sacré de la patrie"."
[348] Gorenstein 1993, p. 19
[349] Mercier c1780, p. 103-105. Also cf. supra for the application of effects in the Judex Crederis "genre".
[350] Gorenstein 1993, p. 7-10.
[351] In 1778 Mozart discovers the clarinets in Paris and uses them for the first time in his symphony in D (Paris Symphony).
[352] Pirro1926, p. 1361.

of instruments which builders are trying to reproduce on the organ. Grétry would hope of the same, that "the organ will maybe one day replace a whole orchestra of 100 musicians, if Érard achieves his superb invention" and Vogler had similar ideas. [353] The evolution of the organ's rang is equally reflective of this metamorphosis: the organ at Saint-Bénigne at Dijon – of which Balbastre was once the holder – had a giant pedal range of 36 notes.[354].

3.2.2.7. <1787 Michel Corrette: *Grand Jeu avec le tonnerre*

If the organ cluster's appearance is difficult to date because of its appearance in improvised pieces, the earliest composition containing clusters on the organ may also elude exact dating. Corrette's composition "with the thunder" officially dates 1787, though it may have been written before that date.[355] He may not have been the first either, as already in 1749 the Swiss organist Franz Josef Leonti Meyer von Schauensee (1720-1789) composed a *Festmesse* with an addition (in between the Gloria and the Credo) for three organs and three orchestras, entitled *Concerto rappresentando una battaglia musicale*. This contained all the necessary ingredients to fill 19 scenes of a battle piece storyboard, including the noises of charging platoons, mortar batteries, sable fights and cannonades.[356] Unfortunately the organ parts are lost[357], so no verification as to the use of cluster technique is possible.

Therefore, the first written out evidence of the keyboard cluster in organ repertoire is found in the score of Corrette's *Pièces pour orgue dans un genre nouveau.* For the penultimate piece of this collection's *Suite du 2e ton*, entitled *Grand Jeu avec le tonnerre*, he wrote advice on how to execute the specially developed technique:

> The thunder is produced by putting a plank on the lowest octave of the pedals (with the Trumpet and Bombarde stops drawn), which the foot pushes at will.[358]

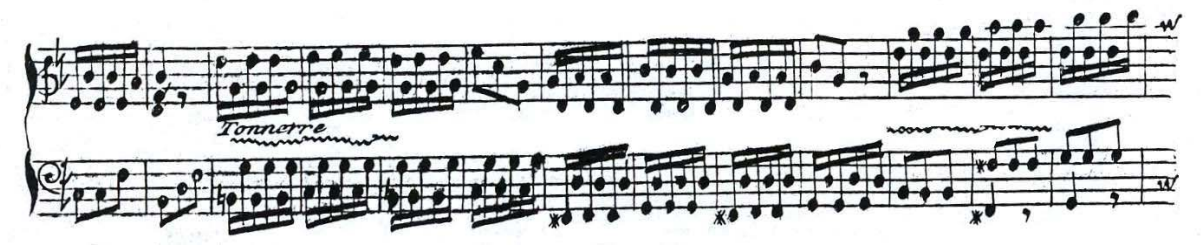
Corrette actually prescribes two kinds of clusters: one to be played on the pedals – by means of a plank – and one on the keyboard by using the elbow: at the last bar of the piece he indicates:

> At the end, to imitate the thunderbolt, you strike the lowest keys of the manual with the elbow.[359]
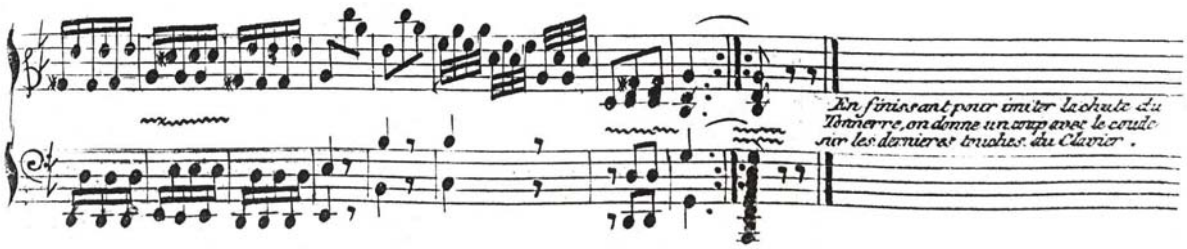
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[353] Pirro 1926, p. 1361.
[354] Gorenstein 1993, p. 17.
[355] Pirro gives 1786 as the date (Pirro 1926, p. 1362); Marshall & Peterson 1995 (p. 12) and Gorenstein 2005 (p. 2-3) give 1787. Whichever is correct, the assumption that the publication's 1780's date would coincide with the year of composition has been extensively questioned, even moving the possible real date back as much as twenty years (Gorenstein 2005, p. 2-3) Not all arguments for doing so are equally convincing (that the first edition of these pieces was made late in Corrette's life because he needed money is contradicted by the knowledge that Corrette had left a large enough fortune to his children for them to live on the bank's interest on it), but the comparison of the compositional style of the pieces with the age they were supposedly written in, and the contradictions between the score's indications for the registration and the instrumental reality in the 1780's, makes for a persuasive conclusion in favor of setting back the date of the Corrette cluster to an earlier period.
[356] As described in Jakob 1976, p. 29.
[357] Personal electronic communication with Friedrich Jakob (5.XI.2008).
[358] In the score, published by Editions Musicales Chanvrelin, p.20, underneath the title of the piece: "Le Tonnerre se fait en mettant sur la dernière octave des Pédalles de Trompette et Bombarde, une planche que le pied baisse à volonté."
[359] Editions Musicales Chanvrelin, p. 21: "En finissant, pour imiter la chute du Tonnerre, on donne un coup avec le coude sur les dernières touches du Clavier."

The indications for the use of clusters in the score itself distinguish between the pedal clusters and the manual cluster by using an extended trill sign for the former (ex. 3.21) and a traditionally notated chord of seconds for the latter (ex. 3.22). As there is no separate staff for the pedals, Corrette's sign for the pedal cluster represents the first time that, instead of notes, a mere symbol indicates cluster technique. Corrette's sign for the thunder occurs 17 times during this 180 bar piece.[360] The last bar contains two such signs, probably indicating that the elbow and the plank are to be used simultaneously, even though that is not clear from the accompanying text. Interestingly, the final cluster in the left hand is too large for just the elbow, and would require most of the forearm to be played as written.[361]



Example 3.21. M. Corrette, *Grand Jeu avec le Tonnerre* (<1787), bar 17-21.



Example 3.22. M. Corrette, *Grand Jeu avec le Tonnerre* (<1787), final bars.

At the end of this collection of "pieces in a new genre", Corrette put two more compositions – both called *Offertoire avec le Tonnerre* – which seem to require the thunder technique, but no signs or clusters are indicated. The writing of the first of these two is much less busy than the Grand Jeu, albeit more diverse, the second looking more like the initial one with busy sixteenths going up and down, batteries and some quick runs. Quite possibly the technique already explained was meant to be used "à volonté" when the genre permitted.
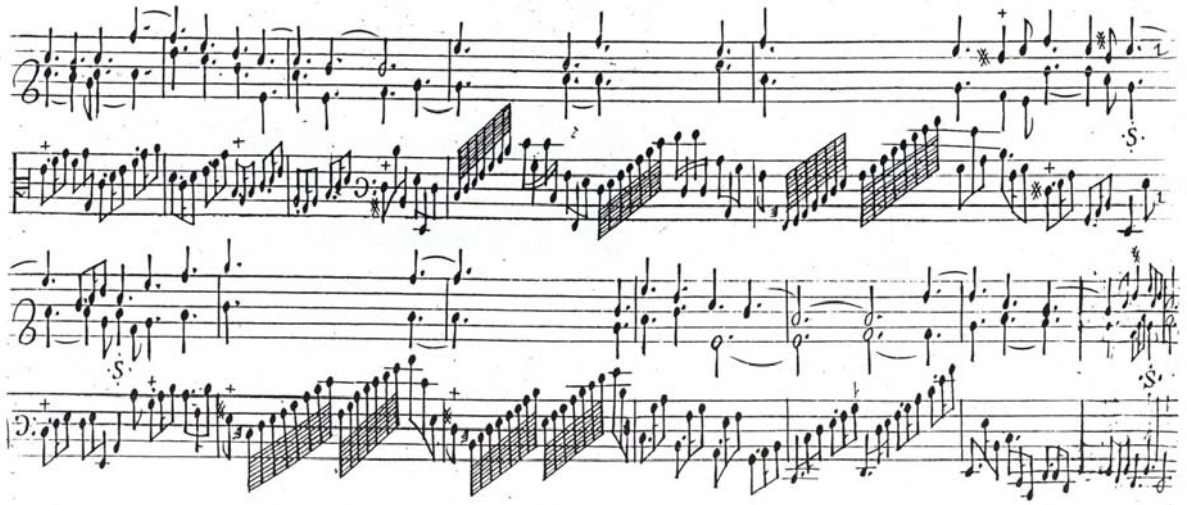
[360] The sign is mostly used in two-bar lengths. It appears three times in the first part (which is then repeated), 4 times in the second part (not counting consecutive bars double when they are split at the end of the line), which is also to be repeated, and twice at the end as the 15th instance (see ex. 3.21). The number of bars (180) includes the repeats. Marshall & Peterson 1995, p. 12-13 conclude that "the thunder sound effect clearly served as an embellishment to an apparently autonomous composition". Unfortunately, they also conclude that this is so "without upsetting the phrase structure", calculating that the thunder occurred 17 times in 90 bars and not mentioning that they counted the thunders in the repeats but not the repeats themselves, thus 'upsetting' the real balance between bars and number of thunder instances.

[361] To confuse between a (part of the) forearm and an elbow cluster is a mistake often made long after Corrette, when, in the 20th century, commentators wrote about Henry Cowell and his 'elbow clusters'. In fact, Cowell never wrote real elbow clusters. See later on in this chapter when discussing the works of Cowell.

3.2.3 The keyboard glissando: to glide or not to glide?

The first half of the 18th century may very well have known the keyboard glissando without leaving many discernable traces of its use in scores. Even before this century, keyboard repertoire can be found in which certain passages immediately raise the question whether or not the ergonomically alternative fingering might have been used.

In the preface to his copious *Livre de musique pour Orgue* (1685)[362], Nicolas Gigault (1627-1707) wrote that "The eight notes with many beams should not cause fright, in as much as one should consider them as if they were only sixteenth-notes."[363] He obviously refers to passages such as in the *Fugue à 3* (ex. 3.23), where the left hand is required to play very fast in what is essentially a gigue tempo.



Example 3.23. N. Gigault: *Livre de musique pour Orgue* (1685), *Fugue à 3*, bars 10-21.

Later on in his preface, Gigault writes: "With regard to the largest ornaments which one can give to all the pieces, they are to be played in time (rhythm) and cleanly."[364] Whether or not he considered the fast runs as in the three-part fugue to be "large ornaments", Gigault clearly wants his music to be played in time. And neatly, which could – at least in theory – entail the use of glissando technique, for at that speed, proper fingering may sound less clean than a glissando, especially in the fasted runs, e.g. the last four, which require an average of 15 notes per second at a moderate tempo of M.M.120 to the eight note. The choice of tempo is of course crucial in this matter, and not all church acoustics or keyboard actions will allow for such very fast runs, whether played by gliding or finger articulation. Other aspects of this particular passage easily deny the probability or at least the practicality of glissando playing. The first three instances can be played with the thumb, using the second finger for the arrival note, but the transition from the first to the second run in the second system of ex. 3.23 is problematic to play cleanly, unless the particular key dip of the instrument at hand is so shallow, and its key weight is so little, that the second run could be played with the flesh of e.g. the fourth finger. This is not at all unthinkable, nor would it uncomfortable in the right circumstances, but it raises the question of why to bother with the glissando in the

[362] F-Pn Vm71825 (microfilm: Bobine 14744).
[363] "Il ne faut pas que les croches barrées plusieurs fois les effrayent, d'autant qu'ils les faut regarder comme si elles n'estoient que double croches."
[364] "A lesgard des plus grands Ornemens que l'on peut donner a toutes les pieces cest de les toucher de mesure et nettement."
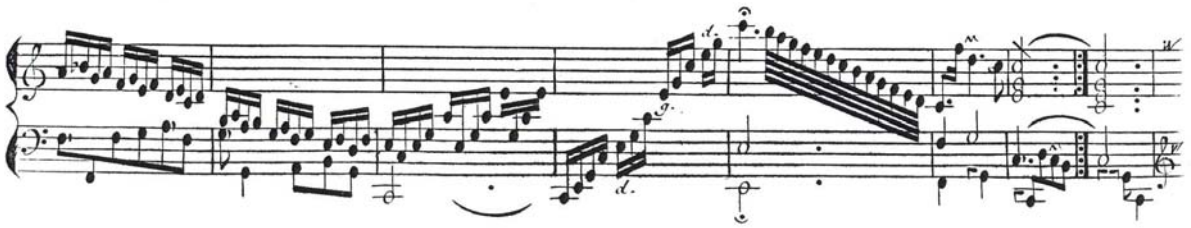
first place, which in turn keeps the question raised of whether or not the glissando was part of contemporary performance practice.
It is obvious that detecting a glissando in a score can be problematic, especially single-note glissandos. In the case of certain kinds of double note runs, it is often impossible to perform what is written by using regular fingerings (e.g. fast white-key right hand run in sixths while the left hand is playing elsewhere on the keyboard), so that there is no question about which technique is required. But single-note glissandi need to be specifically indicated as such to cast away any doubt, otherwise they could just as well be runs intended for individually articulated fingers. This leaves us in a catch-22: to gain insights in performance practice by tracing the history of composer's intentions, we first need the knowledge of performance practice to gauge those intentions in this period. That knowledge is not very extended. Until about the middle of the 18th century, no specific glissando indications are found, which certainly has to do with the fact that fingering information in general is quite rare in scores of this period. This leaves us with the necessity for finding other ways to detect this technique in written music. Based on the characteristics of the glissando (see previous chapter), a number of its aspects can sometimes be telltale of whether or not it is applicable. Just as a run in C♯ minor will never be a glissando, so can basically any all-white-key run be played by gliding. One level deeper, below this most basically identifying characteristic, a whole set of such aspects of the glissando can point towards this technique: a speed which is too high for regular fingering, legato indications, written-out accelerando, prolonged first note to provide time to change the position of the hand, an irregular number of notes, even accidentals that seem out of context (e.g. a run that sits in a clear F major context but that contains a B♭ to make it "glidable").

Applying these modes of detection, a number of possible glissando instances can be found in the early 18th century. Although none of them can positively be identified as exclusively requiring a glissando technique, they could all be played as such and are therefore all cases of certifiable doubt.

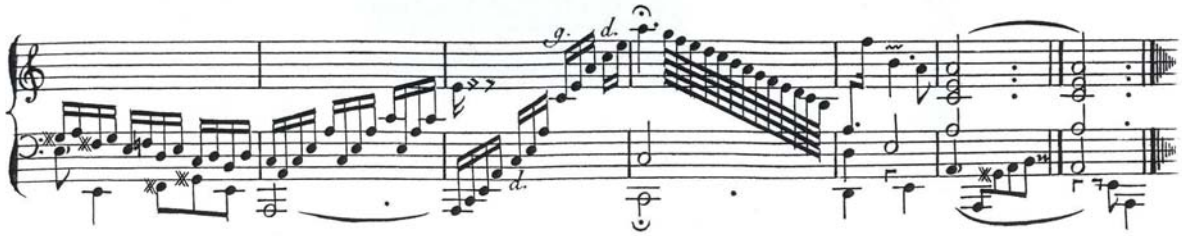
3.2.3.1 1728 Jean-Philippe Rameau: *Les Trois Mains*

In the *Nouvelles Suites de pièces de clavecin avec des remarques sur les différens genres de Musique*, we find the piece *Les Trois Mains* with two long, fast downwards runs. One is in a C major context (ex. 3.24), the other one – the same material – in the home key of A minor (ex. 3.25). The runs themselves are both written in C major, which is not extraordinary (an A minor run in downward motion does not require any F sharp or G sharp) but which is decidedly – if almost imperceptibly - convenient for a performer to play them both glissando. Besides the speed (these runs are the only 64th notes in the piece, for the rest Rameau only used 8th and 16th notes), the irregular number of 13 notes for the value of one and a half quarter note, and the all-white-key factor, there is one other aspect of these instances which is typical of the glissando: the fermata. This stop gives the performer ample time to switch from proper to improper hand position, and it allows for interpreting the metric value of the run in accordance to the speed at which he wants to glide over the keys.

Of course, this is no proof of Rameau's intentions about the use of the glissando in this piece. Nor is it testimony of which technique the average performer might have used around 1728.



Example 3.23. J.-Ph. Rameau: *Les Trois Mains* (1728), bars 37-44. Reproduced by permission of Performers' Editions, New York.



Example 3.24. J.-Ph. Rameau: *Les Trois Mains* (1728), bars 85-91. Reproduced by permission of Performers' Editions, New York.
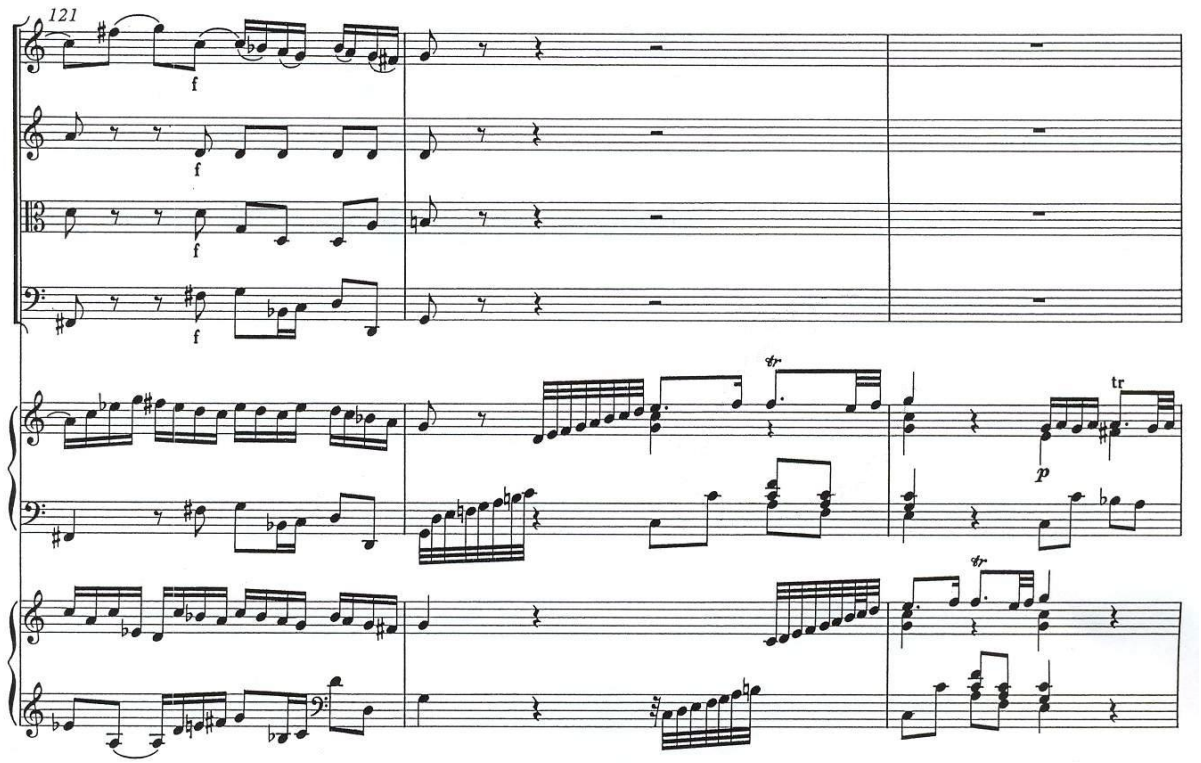
3.2.3.2 1735 Johan Sebastian Bach: concerto for two harpsichords

A famed 20th century musicologist wrote that

> In German and Italian keyboard music a scale passage on the white keys written in very short notes with a slur over them is to be played glissando. This convention is found in Scarlatti and also in Bach (e.g. in the first movement of the C major concerto for two harpsichords, at bar 122).[365]

Unfortunately, he did not mention any evidence on the basis of which he concluded his statement or his reference to the Bach concerto.[366] The Urtext edition of the said concerto by Bach – of which no autograph survives – indicates no slur in the bar containing the fast C major runs. (Ex. 3.26.) As for Scarlatti, some of his glissandos (cf. supra) are indeed slurred runs, but there are such passages in French keyboard music as well. At any rate, the two Bach runs are ergonomically written so well, that they invite the player to glide over them.

[365] Dart 1963, p. 98.
[366] Dart's recommendation was taken over by Geoffrey Chew for his article on keyboard articulation in Grove6, which was reused without revision for Grove7 and survived in TNGII, having gone by unchecked for some 30 years. (Personal electronic correspondence with Geoffrey Chew, May 2007.)



Example 3.26. J. S. Bach: Concerto for two harpsichords BWV 1061 (1735), 1st movement, bars 121-123.[367]

It is worthwhile noticing how the notation of both runs and the way they are composed coincide with certain characteristics of glissando playing. The first harpsichord sets out on a G but the actual run can be seen as starting from D, setting apart the first note from the upward movement and thus comfortably allowing for a right hand glissando from that D onwards. The second harpsichord takes off from C, but after the beat, necessitating an awkward correction in the right hand at the end of the bar to make the number of notes fit the meter. That the speed of the movement makes this rhythmic correction superfluous may be an indication of the importance of the second player's run starting after the beat. The only reason for the 32nd rest seems to be the consistency with the first player's run starting on D right after the beat. At face value, this has little musical worth, though. Whatever speed is chosen for this movement, it will always be too fast to really notice the second player coming in right after the beat. Moreover, acoustically, the full chord of the first player will also stand in the way of distinguishing the first note of the other player's run come in after and not on the beat. It is much more logical to see the little rest as an opportunity for performer to start his run *sometime* after the beat. That would allow him to let the exact moment of starting the run depend on the ergonomics of glissando playing. With a glissando, either the first note's rhythmic value is 'sacrificed' to facilitate shifting the position of the fingers and hand from proper to gliding action, or there is not really a specific first (stressed or prolonged) note because the run is played with a "flying" start, i.e. the gliding includes the first note. In either case, the glissando action is measured on the basis of when and where it ends, not on the basis of rhythmic division of the meter. The timing is measured on the distance to be covered with one sweeping movement, independent of the number of notes per beat. The small rest permits the performer to interpret its (the rest's) length, starting the run at the convenience of the glissando's ergonomics and not so much at the exact time of one or other 32nd note. In that sense, both runs are notated towards the same goal: if playing the first run as a glissando, it will benefit from the fact that it only starts from the

[367] From Die Neue Bach-Ausgabe (BA 5066, Series VII, 5 Konzerte für 2 Cembali), Bärenreiter. Reproduced by permission.
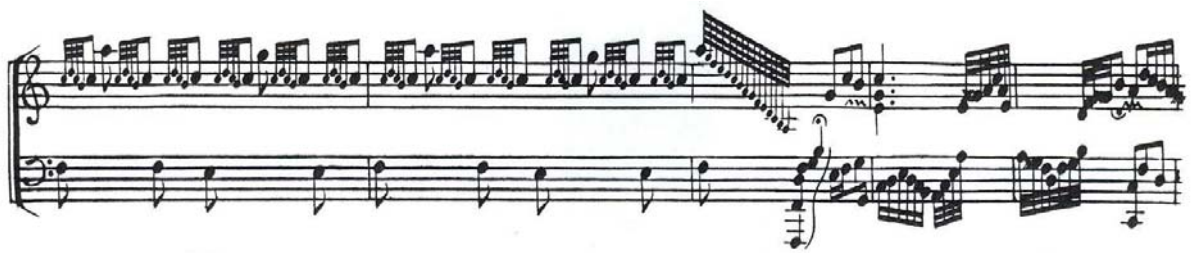
D, which provides the interpreter with a musical reason (cadence D-G and then a run as a new, separate feature) for switching to a different technique.

Because the tempo depends on the character the performer wants to base his interpretation on, these runs can still be played with proper fingering. In fact, it will be the tempo which ultimately dictates the technique, for too slow a speed will make the glissando lack momentum and too fast a tempo will render regular fingering impossible. In that sense the Bach example is different from the Rameau excerpts. In Rameau, the performer could chose without compromising the musical material because the fermata would provide room for adjusting the length – and thus the tempo – of the bars containing the downward runs. In the Bach example, there remains the question of which technique is advantageous.

3.2.3.3 1739 Jean Barrière: *Aria Amoroso*

One piece in which speed and notation assure the performer that a glissando is the first thing to think of, is the *Aria Amoroso*, the 9th of 15 pieces in the sixth book of *Sonates et pièces pour le clavecin* by Barrière.

For a few bars already, Barrière distinguishes ornaments from main notes by writing them in a different size. The culmination point of this passage (ex. 3.27.) comes with a^2 dropping to a fermata on *b*. The tempo is not clear because the composer switches between adagio sections and parts that have no tempo indication. Presuming that the groupettos in bars 74-75 are to be played in time for the main notes to sound in a coherent 6/8 meter, the passage at hand will not be much faster than an adagio. This still makes the downward run pretty fast: a fermata (or any other rubato) on the high A is ill advised since the build up to that A is realized mainly through the consistency of the preceding repetitive 8th-note rhythm. Coming down in time on the fermata chord is essential to the effect. With such speed, a glissando is most efficient. Once again, though, the passage can be played musically convincing without a glissando also.
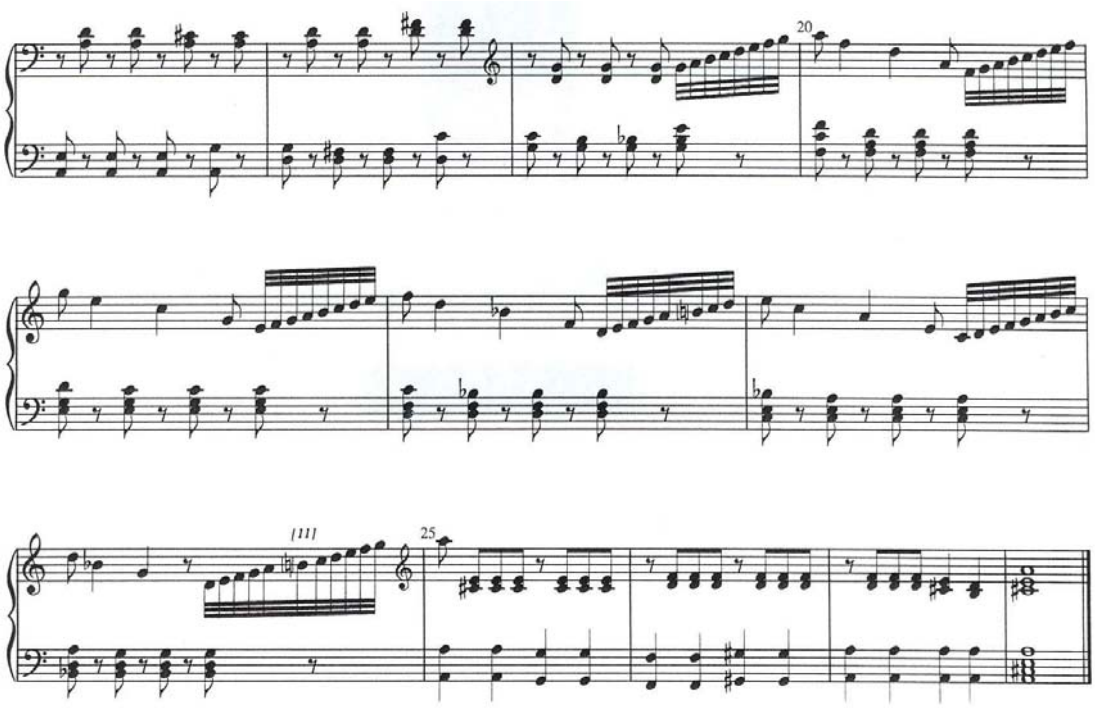


Example 3.27. J. Barrière: *Aria Amoroso* (1739), bars 74-78. Reproduced by permission of Performers' Editions, New York.

3.2.3.4 1744 Vincente Rodriguez: sonata 1

In the 1986 edition of *Thirty sonatas and a pastorela*[368], the most ambitious of Rodriguez' compositional efforts, the editor suggests that "for the runs beginning in measure 19,

[368] The original title of the manuscript used for this edition was *Libro de toccatas para cimbalo*, including 30 pieces labeled *sonatas* and one *pastorela*. (Howell 1986, p. vii and footnote 3.)

glissando may have been intended."[369] He refers to the second movement *Largo*, from the 1st sonata. (Ex. 3.28.)
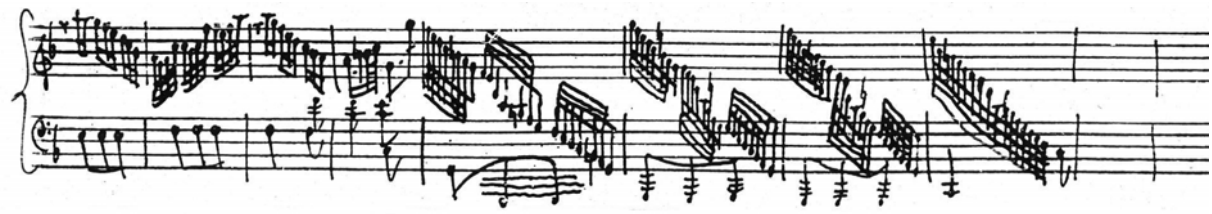


Example 3.28. V. Rodriguez: 1st sonata (1744), 2nd movement *Largo*, bars 17-28. Reprinted by permission of A-R Editions.

The slow tempo (Largo in 4/4) is unlikely to impose the use of glissando. Besides the irregular number of notes in the last run, only the bracketed natural signs in bars 22 and 24 could imply that a glissando was intended and that, because of the G minor context, a B♭ was to be cancelled. But these naturals have been added editorially, and the editor does not give any other reason for his suspicion about the use of glissando.[370] Nevertheless, the excerpt can furnish us with the idea that – if both regular fingering and glissando are equally possible by lack of anything forcing the decision either way – one can just as well opt for the improper solution. That tonally incorrect results may ensue from the decision to glide over white keys on a G minor chord is not altogether incompatible with other examples of such daring in the repertoire as it was already known.[371] These didn't involve glissandos yet, but regularly fingered runs and passagework, but give it another decade or so and we will see C major glissandos in F major.

[369] Howell 1986, p. ix.
[370] The musicological integrity of this edition is unquestionable. The critical apparatus consists of detailed notes per sonata as well as a general explanation of methodology, and is mirrored in the general and specific performance practical advice. However, contrary to the musicological critique, which is based on professional tradition and consensus, the performance practical notes sometimes suffer from being informed guesses rather than proven facts.
[371] See the many passages in for instance the works of Sweelinck, where runs are played in keys differing from the tonal context, e.g. a d minor run in the key of D major.
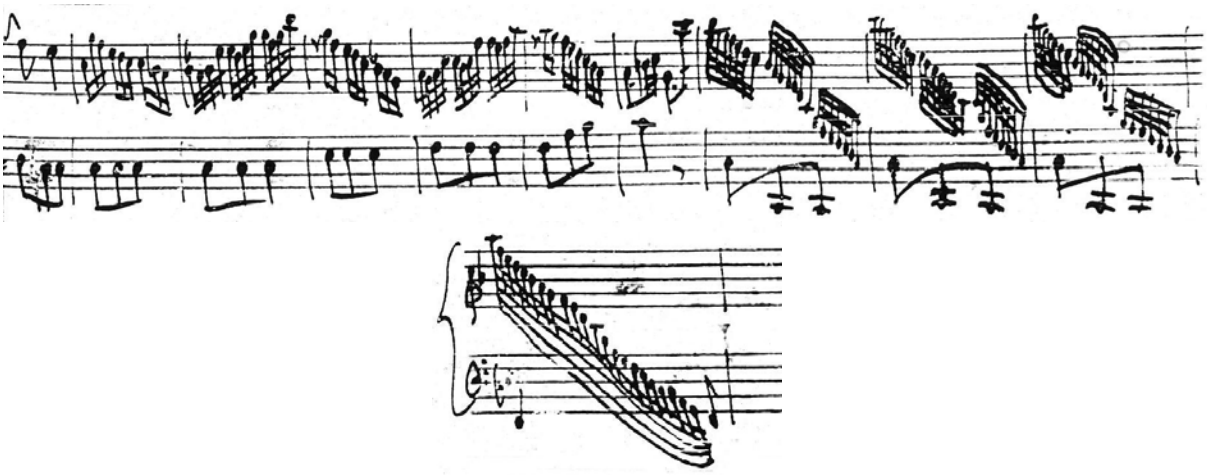
3.2.3.5 ca1752 Padre Giambattista Martini: concerto in F

That a composer may shy away from an instance which otherwise seems a perfect vehicle for glissando use, can be demonstrated by Padre Martini's *Concerto con cembalo obbligato* in F major. In the third movement, a series of 10 downwards runs on the dominant or the tonic of C major seem to form such an instance. (Ex. 3.30) They are all in the key of C and they look to be extremely fast. Even if the general tempo of the movement (which is not indicated) is taken at a moderate tempo without loosing the character of a finale, the 64th notes seem to invite a technique that is not bothered by the limits of individual finger action. Especially the last run (with the high D missing) is ideally suited for a glissando, playing the first note with for instance the third or fourth finger and gliding from the C downwards with the thumb. And yet, the composer writes *sostenuto* in between the staves of the orchestral instruments so as to "follow" the soloist, taking into account, as it were, that he may need extra time to get the runs played. This can only mean that they should be played with proper fingering.



Example 3.30. G. Martini: concerto in F major (ca1752), 3d movement, bars 16-23.[372]

Of course, even with this agogic indication one can still play glissandos. Only, when this material returns it is in the home key of F major, with unavoidable B♭'s in four out of the ten runs. (Ex. 3.31.[373]) Playing this passage improperly would depend on the daring of the performer to let some improper notes seep through. It is not known in how far this was within the boundaries of contemporary performance practice, and here also Martini asks the orchestra to follow the soloist. But this imperative is still interpretable and we will soon encounter suggestions that such daring may have been permissible.
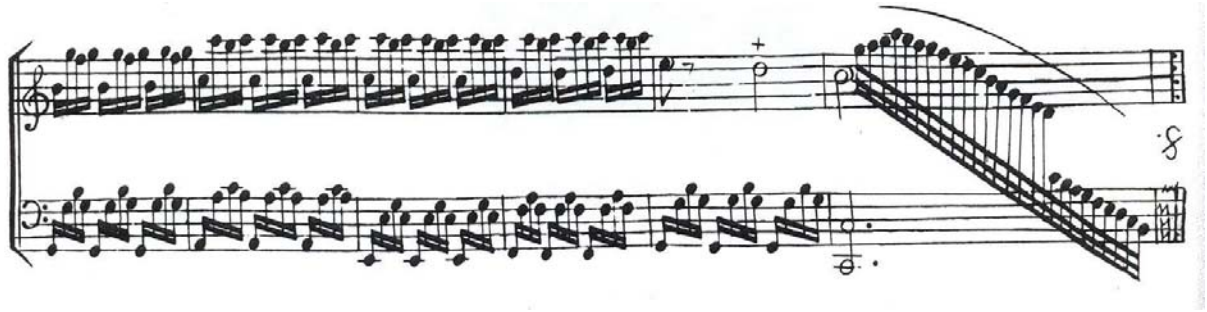


Example 3.31. G. Martini: concerto in F major (ca1752), 3d movement, bars 81-91.

[372] The manuscript is at the Museo internazionale e biblioteca della musica in Bologna (I-Bc HH.32). Excerpts reproduced by permission.

[373] The excerpt does not show the B♭ at the key signature because the manuscript has it indicated only on every other page.

3.2.3.6 1759 Claude-Bénigne Balbastre: *La Suzanne*

In *La Suzanne* from the first book of Balbastre's *Pièces de clavecin*, there is another moment on which to wonder which technique would have been used to play a long white note run. (Ex. 3.32.)



Example 3.32. Cl. –B. Balbastre: *La Suzanne* (1759), bars 35-40. Extract of the facsimiles edition "Pièces de clavecin – Premier livre. La suzanne" of C.B. Balbastre – Anne Fuzeau Productions – www.annefuzeau.com.
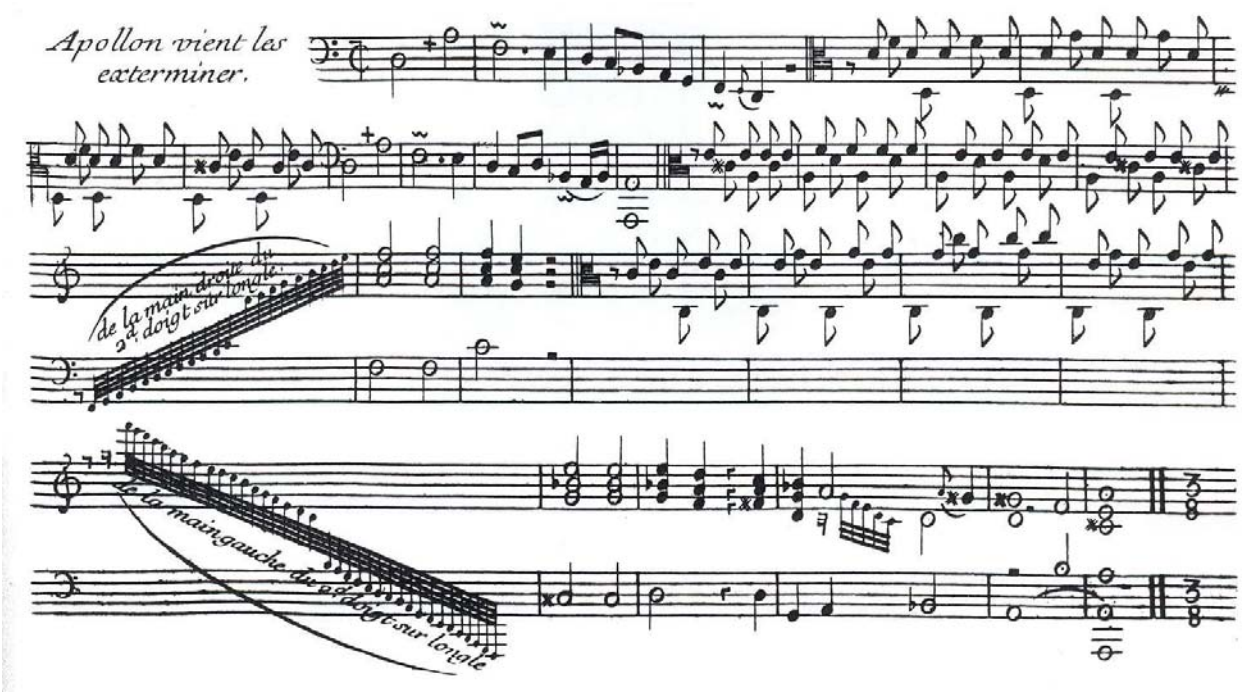
The tempo of the piece – "noblement et animé" – is certainly fast enough for the run to be a possible glissando on the basis of its speed alone. But, as it is at the end of a first section before the key of A major abruptly enters, a ritardando is not unimaginable. Such interpretative margin easily justifies normal fingering. The fact that the whole sequence is written in one go is not immediately calling to mind the glissando either, for this would mean splitting up the right hand passage in a four-note written-out on-the-beat tirata towards c^3, followed by possibly one downward glissando. But this would be easy to perform cleanly, just as with regular fingering, and without doing injustice to the music either. Nothing in the rest of the work points in the direction of either performance mode, in fact nothing even suggests that the choice was an issue. Of course Balbastre was familiar with other rare performance techniques, such as the cluster, but both extensions of the proper piano technical toolbox never appear together in the same piece in the 18th century. So without a clear signal from the composer, there is no clue as to whether or not the glissando was considered in such instances. Neither is there any proof that it wasn't.

3.2.4 The first signs of the keyboard glissando

3.2.4.1 <1753 Christophe Moyreau: *Appolon vient les exterminer*

Rather little seems to be known of the provincial composer Christophe Moyreau (ca1690-ca1772), organist at the Orleans cathedral.[374] Apart from his organ piece *Les cloches d'Orleans*, six *livres* of keyboard music survived, named as his opus 1 and dedicated to Louis Philippe I, the Duke of Orleans, from whom Moyreau got a publication privilege on 30 January 1753. The high number of pieces in this collection (18 to 26 per suite) suggests that they were compiled after an extended period of composing them. These were engraved by one of the finest engravers of the era, but the fact that only one copy of each book survives, may indicate that it was a small, private collection.

The publication of these *pièces de clavecin* nevertheless contains what may be the first original indication of glissando technique, and therefore the first undisputable glissandos in the keyboard literature. (Ex. 3.33.)



Example 3.33. Chr. Moyreau: *Apollon vient les exterminer* (<1753), complete. Reproduced by permission of Éditions Minkoff.

These glissandos do not only carry unequivocal descriptions of their performance technique, they are also extremely long (the second one covering the whole 5 octaves of the then largest existing keyboard), and they start without a stressed or prolonged first note, also a rare characteristic in this century. Positioned after a virtuoso 'rondeau' called *The Cyclops forging the thunder that murdered Aesculapius*[375], the atmosphere in the small piece is aptly aggressive in depicting how *Apollo comes to exterminate them*. In mythology, Aesculapius is the son of Apollo and god of healing. Because he had raised

[374] The only information we could find was on the Internet encyclopedia Wikipedia. Neither the MGG nor the Groves or any other established music encyclopedia so much as mentions Moyreau. Even between the English and French version of the Wikipedia article, the differences are considerable: the English version states the dates of birth and death as 1690-1772, the French article is more reserved: born around 1710 'at the latest' and died in 1772 or 1774.

[375] *Les Cyclopes forgeants le foudre meurtrier d'Esculape*.

the dead, Zeus killed him with a thunderbolt. In search for revenge, Apollo murdered the Cyclops who had made the thunderbolt for Zeus. Moyreau's composition is thus nothing less than a small battle piece, with a martial theme announcing Apollo, some virtuoso hand-crossing that may depict the chaos of the Cyclops fleeing, and Apollo striking with shockingly effective gestures.

3.2.4.2 1754-56[376] Domenico Scarlatti: sonatas K. 379, K. 468, K. 506
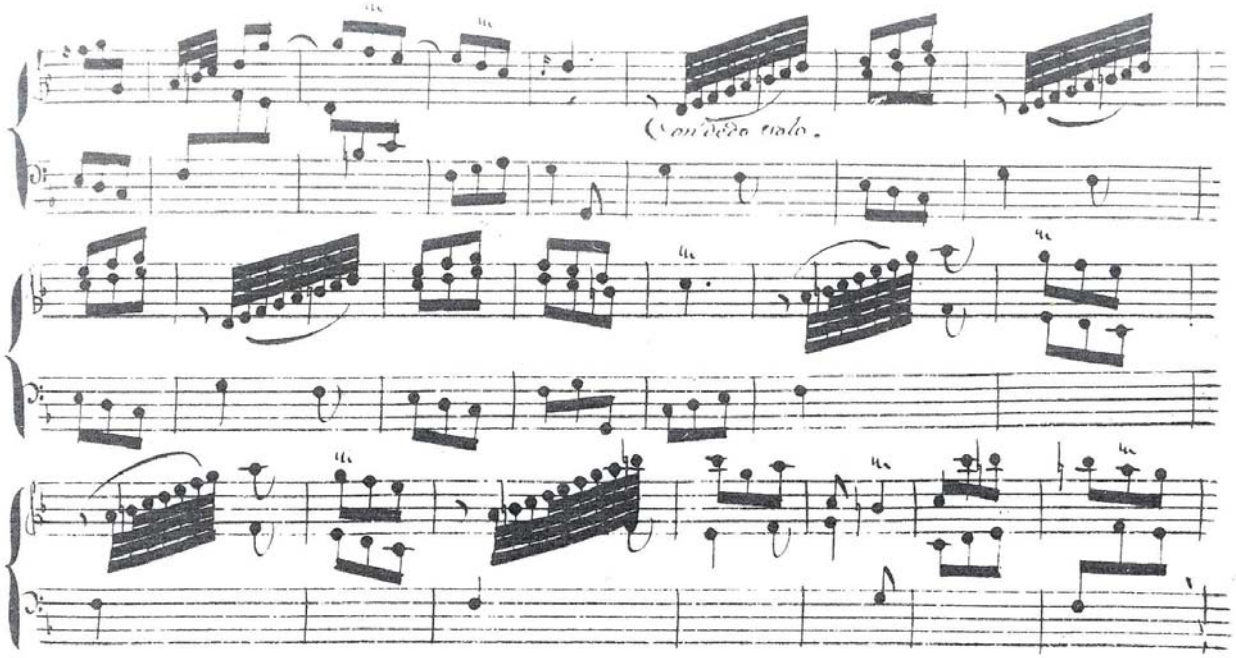
In more than 500[377] solo keyboard pieces by Domenico Scarlatti (1685-1757) we find three definite instances of glissando.

In bar 33 of sonata K. 379[378] in F major (1754), there is an indication *con dedo solo* ("with one finger") underneath a right hand 8-note run in the key of C major. (Ex. 3.34.) The indication appears in this one bar only, but since the next two runs are exact repeats of the first instance, it would follow that they too are intended as glissando. It is then likely that the three runs afterwards, in bars 41, 43 and 45, would have been intended as glissandos just as well. Two of these (in bars 41 and 43) start on a prolonged note suggesting a provision to shift the position of the hand from finger technique to gliding over the keyboard, even if the speed of these two runs is double that of the others, making this provision rather unrealistic.

[376] The three sonatas that contain definite glissandi all appeared in the 18th century collection usually designated as 'Parma' (housed at I-Pac ms AG 31406-31420). The volumes that include the relevant sonatas are dated 1754-1756. (See Hail 2008, http://mysite.verizon.net/chrishail/scarlatti/collections.html - accessed on December 28, 2008.) These sonatas may well have been composed before they were complied in collections – an educated guess by Chris Hail dates their composition as somewhere in between ca1745-ca1750. (See Hail 2008, http://mysite.verizon.net/chrishail/scarlatti/catalogue.html - accessed on December 28, 2008.) As the scores in the collection may have been final and therefore revised versions of the sonatas, we decided to use the collection dates of *those three sonatas that contain definite glissandi* for our chronology here.
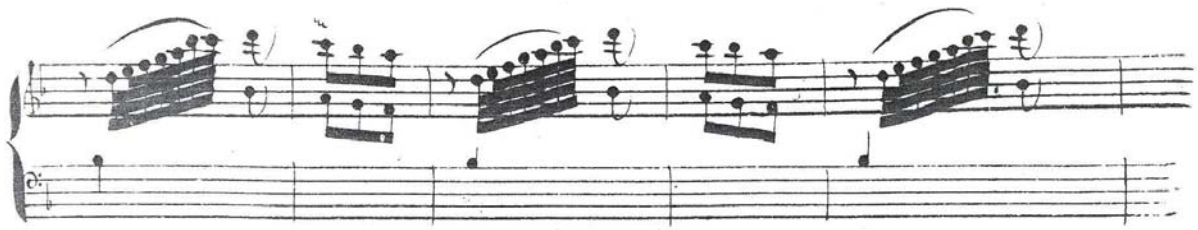
[377] We limited ourselves to the 555 sonatas (plus some variant versions) as reproduced in Ralph Kirkpatrick's 18 volume edition published in 1972 by the Johnson Reprint Corporation.

[378] There are good reasons for abandoning the old numbering by Kirkpatrick (see Hail 2008, http://mysite.verizon.net/chrishail/scarlatti/conversion.html - accessed December 28, 2008). However, because of its recognition value (and for efficiency's sake), we decided to retain the K-numbers here.



Example 3.34. D. Scarlatti: *Sonata* K. 379 (1754), bars 28-49.[379]

When this material returns in the second part of the sonata, without any *con dedo solo* indication, it is transposed to the home key of F major and the B♭'s are not cancelled so any glissando performance would be against the notation. (E.g. ex. 3.34, i.e. the transposition of bars 41-45 in ex. 3.33.)



Example 3.35. D. Scarlatti: *Sonata* K. 379 (1754), bars 85-89.
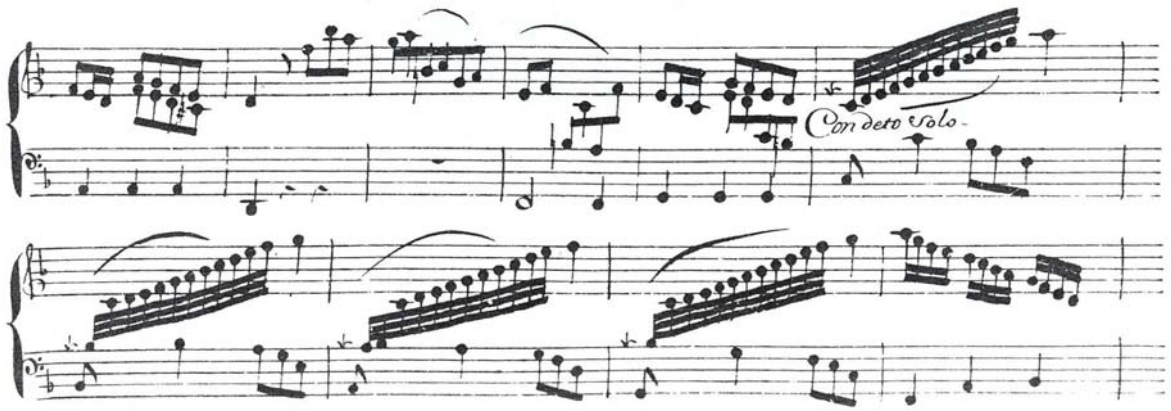
Another copy of this sonata[380] - called *Minué stravagante* – has a few minor differences: there is *con un deto* and bar 41 has no *b♮*', but every run has a slur over it (cf. the one lacking in ex. 3.33, bar 45). A third copy with the same title[381] has all the slurs and all the ♮'s but now shows *con un dito*.

[379] Unless otherwise indicated, we use excerpts from the scans of the Parma collection as reproduced for Ralph Kirkpatrick's edition published in 1972 by the Johnson Reprint Corporation. All excerpts are reproduced by permission from the current copyright holder Irving S. Gilmore Music Library, Yale University.

[380] The Diözesanbibliothek in Münster has five volumes with 358 Scarlatti sonatas (the Santinische Handschriften 3964-3968) that were once the property of Fortunato Santini and have been copied as early as 1754-56. (See Hail 2008, http://mysite.verizon.net/chrishail/scarlatti/collections.html - accessed December 28, 2008). In this collection sonata K.379 is nr. 2 in D-MÜp Sant HS3964, specifically dated 1754. We will refer to the copies in this collection as the 'Münster' copies.

[381] In volume A of the collection from Brahms' estate at the Bibliothek der Gesellschaft der Musikfreunde in Vienna (A-Wgm VII 28011). Most of this this collection (volumes A through G) is thought to be copied from the Santini collection in Münster (see Hail 2008, http://mysite.verizon.net/chrishail/scarlatti/collections.html - accessed December 28, 2008) but no date is given. We will refer to the copies in this collection as the 'Vienna' copies.
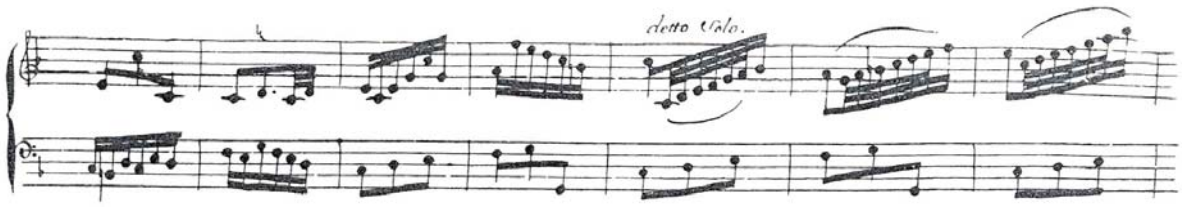
In bar 84 of the second part of the *Allegro* sonata K. 468 in F major (1756), there is a prescribed *con deto solo* (sic) underneath a right hand 12-note run in the key of F major (ex. 3.36). Here we have a glissando that cannot be executed properly because of the B♭. All the same, the runs in the bars that follow are basically the same and are therefore suggestive of the glissando technique as well, even if the problem of the B♭ persists. These four runs are the only upward runs of the piece, the other ones being downward 16th notes runs in either left or right hand.



Example 3.36. D. Scarlatti: *Sonata* K. 468 (1756), bars 79-88.

One Vienna copy[382] has a flat added to the *b*[1] in bar 84. Another Vienna copy[383] has *col deto solo* but no flat added and the first slur missing. The Münster copy is identical to ex. 3.35.[384]

In bar 34 of the sonata K. 506 (1756) in F major – again *Allegro* – there is *detto solo* (sic) above a right hand 6-note run (ex. 3.37). Apart from there relatively short span, these runs – the only 32nd notes in the sonata – are curious for the fact that two of them end on a B♭, which means the ending cannot be part of the glissando technique. Those B♭'s can only be played with a finger hitting the key and not by gliding over it, so the glissando has to be played with one finger (e.g. *2*, *3* or *4*) while one of the remaining fingers is kept for hitting the B♭'s.



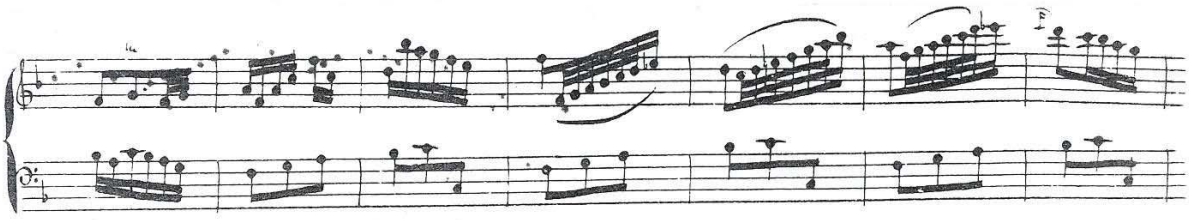
Example 3.37. D. Scarlatti: *Sonata* K. 506 (1756), bars 30-36.

Of further interest is the way Scarlatti wrote each of these three little runs over a dominant seventh harmony, as evidenced by the *b*♮[1] in bar 35. This is probably the

[382] A-Wgm VII 28011, volume C, nr. 3.
[383] A-Wgm VII 28011, volume G, nr. 30.
[384] D-MÜp SH 3966, nr. 3.

reason for which the Vienna copy[385] has the *b♭²* in bar 36 confirmed (as has the Münster copy[386]).

When this material returns in the second part of the sonata, there is no written indication of glissando playing. Here also, the dominant seventh harmony requires an *e♮²* (bar 85 in ex. 3.38).



Example 3.38. D. Scarlatti: *Sonata* K. 506 (1756), bars 81-87.

Both the Vienna and Münster copies of K. 506 indicate *deto solo* instead of *detto solo*.

It is remarkably how, in all three sonatas, neither the Parma collection is consistent in its verbal indication of the glissando (*con dedo solo, con deto solo, detto solo*), nor are the Münster and Vienna copies exact in their replication (*con un deto / con un dito, col deto solo, deto solo*). Nevertheless, none of them has put such an indication where another one had not. Based on that aspect, it would remain unclear whether the transpositions of the glissando materials in K. 379 and K. 506 should be played with individual articulation or not. However, since the indication in K. 468 appears right under a run with a B♭ in it, we conclude that the occasional black key in a white key glissando was not an insurmountable obstacle to Scarlatti. All the more so as black keys did not always protrude from the keyboard enough to make it literally insurmountable during gliding.[387] For those reasons (and because clear and regular individual articulation considerably limits the choice of tempo in at least the *allegro* sonatas) we consider the runs in the said repeats to be glissandos.[388]

Because of the questions surrounding the consistency in indicating 'with one finger', and based on some general characteristics of glissando playing as well as some common characteristic of these specific instances we have just looked at, it is possible that other (in some ways similar) instances in other sonatas may also have been intended as glissandos. Three such characteristics are handy, here. The key of C major is obviously typical of the glissando environment, even if the three instances we just discussed are mostly imbedded in F major. The rhythmical value of the first note (or its placing, e.g. after a rest) allows for ergonomical comfort in changing from proper to improper position of the hand. The slur above the runs can be of telltale importance as well. Recent Scarlatti research indicates that
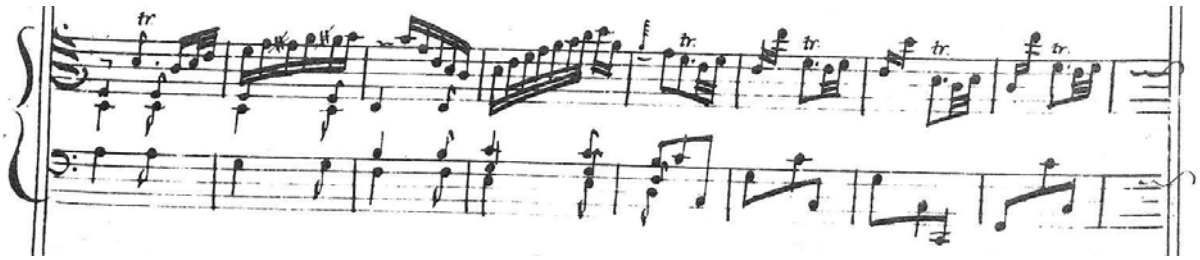
> The general purpose of slurs [in sonatas by Scarlatti] may be to indicate tempo rubato: primarily, not playing the right hand exactly with the left hand […], but

[385] A-Wgm VII 28011, volume C, nr. 38.
[386] D-MÜp SH 3966, nr. 33.
[387] Hail 2008, http://mysite.verizon.net/chrishail/scarlatti/catalogue.html (accessed December 28, 2008), Parma 10:22.
[388] Hail 2008, http://mysite.verizon.net/chrishail/scarlatti/catalogue.html, (accessed December 28, 2008), Parma 12:13 considers two other possibilities as well for K.468: the indication could be a 'joke', or the first run is a glissando and the others that follow are not. The former alternative makes little sense, the latter even less: if only the first run is a glissando because only that one has the indication, the timbral coherence will be lost (a glissando in this passage will sound much more smoothly than an individually articulated run at this tempo and containing a B♭). This problem would then also raise its head in K. 379 and K. 506.
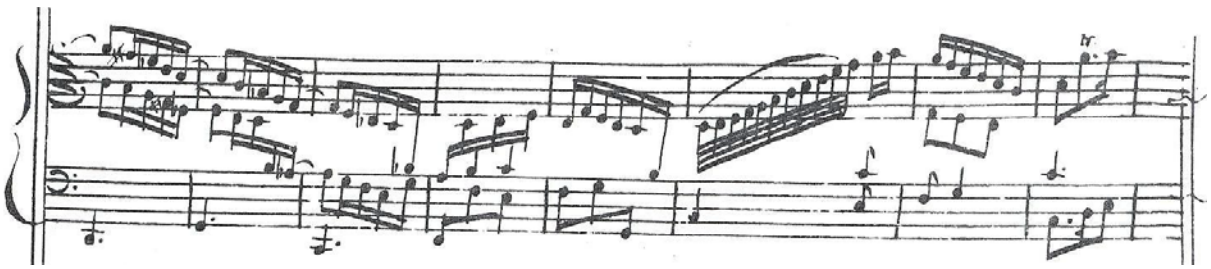
> also including the speeding up of note values in scales, and not playing all the notes in a passage at their exact written value. For example, a slur on a triplet [...] indicates of course that the each ♪ has 1/3 the value of ♩ rather 1/2 of it, but it also might indicate that the rhythm can be [♬] or [♪♬] rather than three equal ♪ 's.[389]

In terms of glissando playing in Scarlatti music, a slur over a run could allow the performer to put the run's written-out rhythmic or metric division into perspective. Finally, the speed of a run, compared to the tempo of the sonata, can prove it (too) difficult to play with individual articulation. This can be significant especially in combination with one or more of the other characteristics. In search of such runs that display some ergonomical or notational aspects that remind us of the glissando technique more than of proper finger technique, even if there is no such explicit indication, five sonatas attract our attention.

In bars 18 and 102 of the C major sonata K. 143 (1748) (ex. 3.39 and 3.40)[390] we encounter two runs that might both be a glissando. The first one (bar 18) rests on the first note, enabling the hand to turn position for the slide. It is only 6 notes long – perhaps short for a slide but not smaller than the *detto solo* run of K. 506. The second run, in bar 102, is 11 notes long, the only such large run in the sonata. It does not have a metrically stressed first note, but the metrically irregular number of notes and the slur could be construed as signs that allow the performer to take some time on the first note. But even though the glissando technique would fit in easily in this sonata, the overall tempo and speed do not seem to specifically warrant it.



Example 3.39. Scarlatti: *Sonata* K. 143 (1748), bars 15-22.

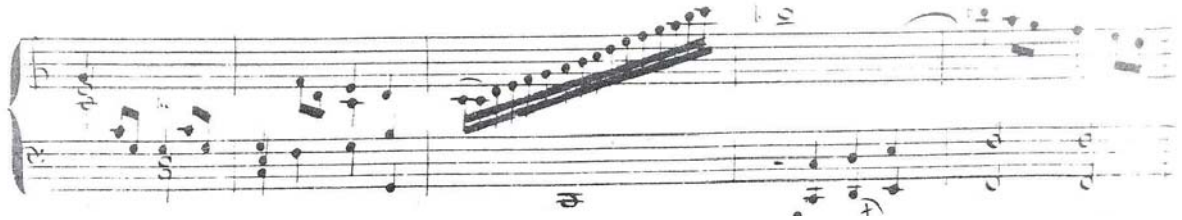


Example 3.40. D. Scarlatti: *Sonata* K. 143 (1748), bars 97-104.

In bar 68 and 72 of sonata K. 406 in C major (1754), there is a 15-note run in C major (identical in each of the two bars), covering the whole bar without any metric subdivision and with the first note prolonged (Ex. 3.41 shows the first of these two identical

[389] Hail 2008, http://mysite.verizon.net/chrishail/scarlatti/catalogue.html (accessed December 28, 2008).
[390] Sheveloff 1985, p. 413 and 418, considers it doubtful that this sonata would be Scarlatti's, "likely by Albero".

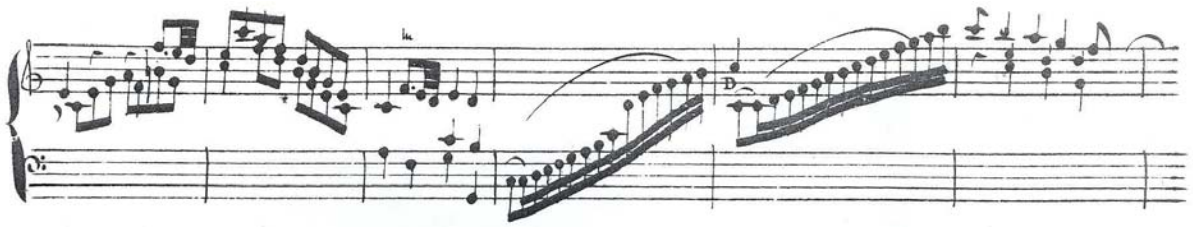
instances). The prolongation may have been deemed necessary to arrive at the right number of 16th notes to fill a 4/4 meter, but it also reminds us again of the typical pivotal note so characteristic of the ergonomics of the glissando technique and therefore so common in many glissandi later in history.



Example 3.41. D. Scarlatti: *Sonata* K. 406 (1754), bars 68-69.

The writing is comfortably in favor of the glissando technique: the first double-length-note gives the right hand some time for changing position from finger to glissando technique; the left hand rest on the first beat of the next bar would allow this hand to play the *b♭²* (or, otherwise, the thumb or 2nd finger of the right hand could play that note after gliding all the way up to the C above it – cf. above, sonata K. 506). The probability seems high, but there is no proof, nor is there any necessity for the application of glissando. Scarlatti didn't indicate anything in this sonata the way he had in K. 379, K. 468 and K. 506, and this particular K. 406 is ranked in between two of the other sonatas with a "detto solo" instance. Therefore, if the chronology of the sonatas in the extant sources is true to the chronology of composition[391] (or if Scarlatti indeed supervised the copying of the sonatas into those sources) – it makes no sense that Scarlatti would intend a run to be performed as a glissando and not use the special "with one finger" indication that he already used in a previous sonata. But then again, as seen in the above-mentioned sonatas, Scarlatti has not shown much concern for consistently coupling the indication to the relevant occasion, and the dispute over theories on the Sonata's chronology has not been settled yet.[392]

In bar 104 and 105 of the second part of sonata K. 422 in C major (1755), there is twice a run of fourteen notes with the first note prolonged. (Ex. 3.42.) Both runs are in C major and have a prolonged first note. In these 4/4 bars, those runs can readily be divided into 4 beats with an 8th-note and two 16th-notes in the first beat, the remaining three beats counting regular number of 16th-notes. It is not clear whether the letter 'D' in bar 105 is meant for the left hand to play the higher quarter note *c²* or for the lower *c¹* with which the second run starts. Both are possible, whether the runs are played with individual fingers or – just as easily – as glissandos.

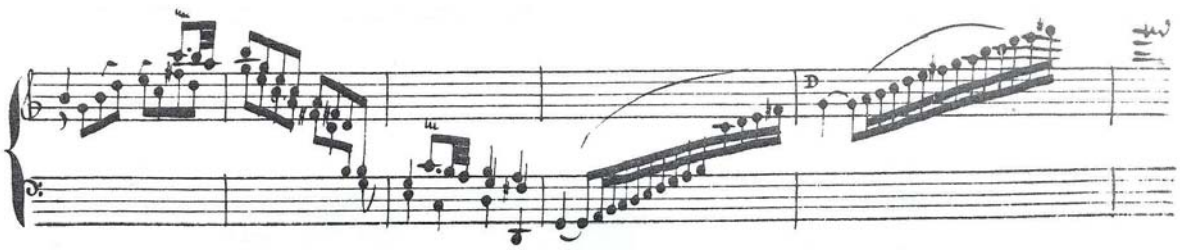


Example 3.42. D. Scarlatti: *Sonata* K. 422 (1755), bars 101-106.

[391] Sheveloff 1985, p. 420 doubts that the K. numbers "transmit any chronological information within the two categories" of K. 1-141 and 148-555. This is not contradictory to Pagano 2002, p. 403, who states: "the fact that they were intended for Maria Barbara implies that their internal organization is definitive."

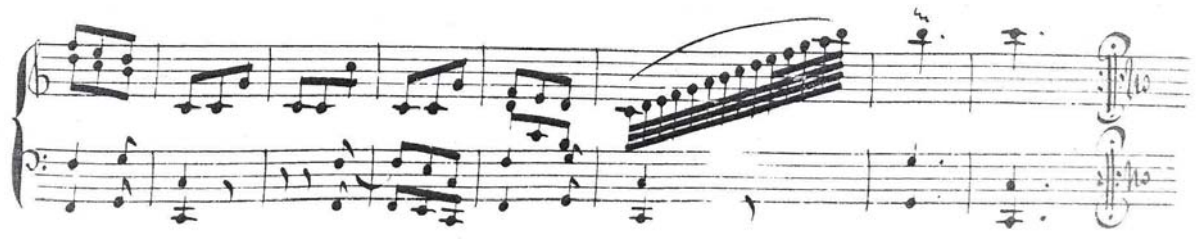
[392] See Pagano 2002, p. 400-404 and 407 and Hail 2008, http://mysite.verizon.net/chrishail/scarlatti/chronology.html (accessed December 28, 2008).

More puzzling is the parallel passage in G major in the first part of the sonata, bar 45 and 46. (Ex 3.43.) This time the two runs follow each other in the compass of the keyboard instead of the second scale starting lower than where the first one ended. More importantly, the first note is not an 8th-note, as it is in bars 104 and 105 (ex. 3.40), but a quarter, thus forcing the remaining 13 notes of the run to be played in only 3 beats instead of 4, which is not shown by the metric division of the run in 16th notes. This would mean that the runs in G major (which can hardly be played as glissandi on account of the F# in them) should actually be played faster than their counterparts in bar 104 and 105. This would diminish the chances that the latter were intended as glissandos for reasons of comfort, while the really fast runs would have to be played with real finger dexterity. There may of course have been mistakes involved in the copying of the sonatas, and all four runs in this sonata may have been meant to start with an 8th note tied to the run.[393]



Example 3.43. D. Scarlatti: *Sonata* K. 422 (1755), bars 42-46.

In bar 163 (out of a 165 in total) in sonata K. 487 in C major (1756), a fourteen-note run in C major brings the sonata to the final cadence. (Ex. 3.44.) This is the only run in this entire sonata, the rest being consistently written in quarter- and 8th-note rhythm. Writing out the last notes of this run in extra small rhythmical units is meaningless in the *allegro* tempo of this sonata (even if the run had been divided correctly as eight 32nds and four 64ths). It only enhances the suggestion that a glissando would fit in easily here, especially since the morphology of this technique is often characterized by an *accelerando* at the end. There are also the matters of the sheer speed of the run, the slur above it, and the fact that it ends with a repeated note that is very easily and effectively arrived at when coming from a glissando. The time it takes to lift the hand or finger to repeat the b^2 (if the ornament is not performed beginning with the upper note) is exactly what is needed for the hand to change from glissando to finger position. If the ornament is performed starting on c^3, then, a fraction of a moment to breathe in between the run and the ornament could be appropriate, which would still be perfectly synchronous with the technical requirement of changing position from glissando to finger technique.

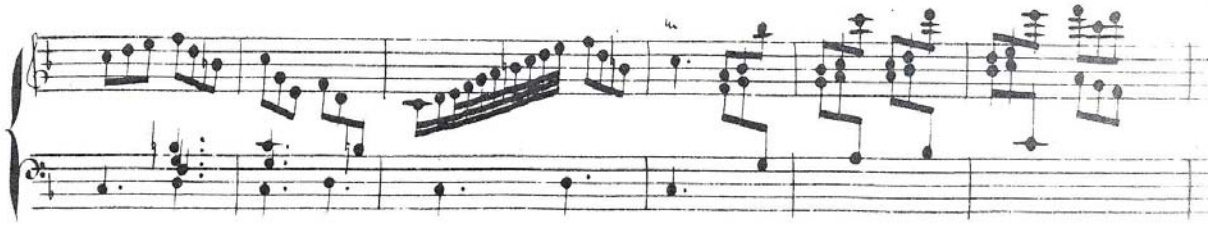


Example 3.44. D. Scarlatti: *Sonata* K. 487 (1756), bars 158-165.

In bar 68 of sonata K. 543 in F major (1757), there is a C major run of two 16th - and eight 32nd notes. (Ex. 3.45.) Like in the sonata previously discussed – K. 487 – this is the only scale in the whole piece (not counting the 4-note groppos). Like K. 487, this scale

[393] Kenneth Gilbert obviously thought so: he changed the first note in bars 45 and 46 to an 8th note length.

seems to be an open invitation to the glissando technique, even if there is no proof for it, not even a slur: just because of the tempo (*allegro*) and the suggestion that there is some time at the beginning of the run to take time and shift the position of the hand to change from proper to improper playing mode.



Example 3.45. D. Scarlatti: *Sonata* K. 543 (1757), bars 66-71.

All the runs discussed here, whether definite, probable or possible glissandi are right-handed and directed outwards. Any specific focus on the right hand for fast runs does not seem typical for Scarlatti's sonatas. When considering the fingerings he is reported to use for right hand C major scales, *12343434* ascending and *54321321* descending[394], the fact that these were much easier when going downwards than when going upwards, especially at a fast tempo, may have played a role in the composer's interest in the glissando. As a question of ergonomics, the glissando seems an efficient solution to facilitating the regularity in execution of a fast ascending run in the right hand. Of course, this goes for the left hand as well, in the outward direction. But whereas the right hand in general has much finger work, the left hand has much less in terms of fast runs, so there is less need to try out the glissando as a replacement for his typical fingering. As logical as this perspective sounds, it does not shed much light on why Scarlatti used the glissando, though. As much as this technique presents an easy alternative to the old fashioned fingering for upwards right hand runs, the fact remains that, in two out of the three definite instances of the glissando being asked for by Scarlatti, he uses those runs again in the transposed part of the sonata, requiring that same old fingering anyway.

That the manuscripts are not as clear in terms of glissando indication as would be practical, may actually provide us with a clue for understanding the prescription of it in the sonatas. That some instances are indicated as glissando but contain notes that cannot be played as such, that others leave room for doubt as to how many of a set of similar scales on the same page or in the same sonata should be performed in the same manner, that yet other places contain runs that are perfectly apt to be performed as glissando but have no indication for it, may all point to a rather casual attitude towards performing and notating the glissando. The glissando may have been considered as a facultative performance technique and therefore indicated as optional in its notation as it was in performance practice. The sonatas have been left to us in a copyist's autograph, not in the composer's own manuscript. We don't know how much time there has been between the date of composition and the date of copying, so we cannot just expect the scores to represent exactly, completely and faithfully what Scarlatti had written and performed to begin with. We also do not know the copyist and only surmise that it must have been a good one because the copies were intended to be used by the Queen.[395] If Scarlatti really supervised the copying, as is suggested[396], then K. 406 definitely contains no glissando, as it contains no such indication like in the K. 379 before it. But it would also mean that the notational inconsistencies are Scarlatti's as well, pointing to a general casual approach of his own towards notation and application of performance techniques, including the glissando. If he didn't possess such nonchalance, and was meticulous in

[394] Kirkpatrick 1953, p. 188.
[395] Pagano 2002,p. 402-403.
[396] Pagano 2002, p. 401.

these matters, then he would have seen to it that no such attitude seeped through in the scores by way of the copyist. There are very many notational discrepancies and divergences in the sources that we know[397]. Many of them bear no relation to specific or special performance practice habits, and the above noted inconsistencies around the glissando technique (slurred or not, reoccurring with or without indication, prolonged first notes) could be categorized as such. They point in the direction of an approach less meticulous than we might in retrospect expect.[398] And if Scarlatti didn't supervise the copying, than the inconsistencies may have been the copyist's mistakes, or they may point to the same casual attitude – by the copyist –towards notation of performance practical indications.

This idea of the glissando as a technique left to the discretion of the performer (as ornamentation and figured bass had been) rather than part of a musical idea as important as the key or the rhythm, can match some of the rest of the characteristics of Scarlatti's technique. In what is described in a discussion of Scarlatti's keyboard virtuosity as his 'flamboyant period' (between 1742 and 1752), his

> feats of acrobatics stems as much from a love of the instrument and from an intense joy in playing it as from a desire to show off. He becomes so absorbed in the dance his harpsichord is leading that his entire body participates, in gestures that strictly speaking are quite unnecessary, in risks that like those of a sportsman lend intensity to the moment. […] The most difficult passages in this piece [K. 120] could perfectly well be played without crossing the hands, but the excitement would be lost.[399]

The sonatas under our scrutiny here belong to the 'late sonatas', in which

> Scarlatti's resources of keyboard virtuosity have become so much assimilated into the service of specifically musical effects rather than of display that one senses a certain independence on his part from the instrument over which he has gained complete command. A few of the sonatas feel as if they had been composed away from the harpsichord, with all the consummate knowledge of sound effects gained in years of improvising, but in such a way as not to become entirely enslaved by the conformations of the hand.[400]

Kirkpatrick is here referring to obvious display of virtuosity such as the acrobatic crossing of the hands (which happens rarely in the late sonatas). But his observations could apply to the glissando too, with a combination of high-level mastery and a resulting independence from the instrument and its typical technique leading to the kind of freedom Scarlatti may well have had in mind when he wrote the preface to the 1738 edition of his 30 *Essercizi*: "an ingenious jesting with art by means of which you may attain freedom in harpsichord playing."[401] Such independence may also mean performance practical choice of technique taking priority over certain levels of compositional integrity, explaining away the problem of the B♭'s in K. 468. At the speed which suites the character of that sonata, B♮'s in F major runs may easily go by unnoticed, anyway, making the tonally incorrect result an eminently worthwhile sacrifice in favor of performance practical freedom.

[397] See Sheveloff 1985, p. 422-430.
[398] Contrary to Pagano 2002, p. 402, who hypothesizes that Soler might have been the copyist on the basis of the diligence "so essential to carrying out so demanding a task" and which Soler was attributed by his biographers.
[399] Kirkpatrick 1953, p. 162.
[400] Kirkpatrick 1953, p. 169.
[401] Pagano 2002, p. 401.

The question of how Scarlatti's sonatas relate to the early pianoforte is still the subject of debate[402] and we needn't go into it too far. The universal keyboard-nature of the glissando makes the less of an issue whether it was intended for the piano, harpsichord, clavichord or organ. But it is worthwhile to investigate whether access to the piano may have made a difference in Scarlatti's writing for the glissando at this early stage.

The first known works specifically published as written for the piano – the 12 *Sonate da cimbalo di piano e forte detto volgarmente di martelletti* by Lodovico Maria Giustini - were dedicated to Domenico Scarlatti's royal pupil Don Antonio Infante di Portogallo, who later became king of Portugal. Scarlatti had had the opportunity to know Cristofori's instruments in Italy 1702 and 1705[403] and, even though we do not know the impression this kind of instrument left on the young musician, he surely had at least occasion to play upon early piano's in Lisbon after 1719, when he was in the service of Maria Barbara, Queen of Spain. The 1758 inventory of the Queen's instruments included five pianos made in Florence. On the grounds of the keyboard range, three of these could have come from the workshop of Cristofori. Two of the pianos in the inventory of Maria Barbara had been converted into harpsichords, showing perhaps some dissatisfaction felt by either Scarlatti or the Queen, but not revealing how long the instruments had been used in their original form. At any rate, Scarlatti had had access to the piano when his sonatas were being copied into the Venice and Parma manuscripts (from which we extracted the "dedo solo" excerpts).

That Scarlatti had experience with piano playing does not justify the assumption that he wrote any of his music specifically for the piano. The instruments with a smaller range may have been used only for continuo or for accompanying (e.g. Farinelli, who was in the service of the same court) while the ones with the full five-octave compass could have been used for the solo music. But he may very well have written his sonatas for the harpsichord in the extended sense of "with or without quills", much like the feeling C.P.E. Bach had about the piano being just one of the possibilities. It could be that Scarlatti's music was meant to be played on either instrument, depending on which one served best any specific sonata at hand. Kirkpatrick finds sonatas that "are quite different in character from Scarlatti's usual harpsichord writing", but he has to admit that "on grounds of style it is almost impossible to draw a definite borderline between mid-eighteenth-century harpsichord music and music for the early piano."[404] At least some of the *Essercizi* and sonatas, such as K. 86 and K. 506, seem to be conspicuously limited to the *C-c*^{3} range of the Cristofori piano[405]. In the inventory there was one piano with a range of 49 keys (at the palace of Aranjuez), one with 54 keys (at the Escorial palace) and one with 56 keys (presumably at the Buen Retiro palace).[406] Of the pianos that had been made into harpsichords by the time the inventory was made, we know that their compass was 50 and 56 keys. On the basis of the extent of the keyboard required, we find that only the ranges of K. 379 (50 keys / *C-d*^{3}), K. 506 (53 keys / *C-f*^{3}) and K. 487 (56 keys / *GG-d*^{3}) would have suited the Queen's pianos. The other sonatas discussed above would have needed the full five-octave compass (K. 468 = *FF-f*^{3}; K. 406 and K. 422 = *GG-g*^{3}; K. 543 = *GG-f*^{3}), possible on the three Spanish harpsichords only.[407] But we don't know on which note the counting of the keys in the inventory of the Queen's instruments had started. Mapping the sonatas which are of interest to us on a chart of likely or less likely actual pitch ranges on those piano's[408], gives us a narrower result:

[402] See Pagano 2002, p. 403-404.
[403] Pagano 2002, p. 403.
[404] Kirkpatrick 1953, p. 184-185.
[405] Lelie 1996, p. 39.
[406] Kirkpatrick 1953, p. 178.
[407] Kirkpatrick 1953, p. 179.
[408] In Sheveloff 1986, p.93. Sheveloff considers the following likely ranges per keyboard (in brackets the less likely range): 49 keys: *C-c"'* (*D-d"'*) / 50 keys: *C-d♭"'* (*BB-c"'*) / 54 keys: *GG-c"'* (*AA-d"'*) / 56 keys: *GG-d"'* (*AA-e"'*) / 58 keys: *GG-e"'* (*FF-f"'*) / 61 keys: *GG-g"'*.

only the sonatas K. 379 and K. 487 could have been played on the Queen's pianos without a problem.

That at least one of them was in fact *meant* to fit a piano can be seen in the organization of the musical material itself. When the *dedo solo* runs of the first part of K. 379 are transposed from C to F major for the second part of the sonata (see above, ex. 3.35.), it is remarkable that the last run of the transposed ones does not go all the way to the high f^3, as would be consistent with bar 45 (compare with ex. 3.34.). That it stops at d^3 can have no other reason than the limit of the range it was intended for. Since the f^3 could only have fitted one of the harpsichords, he who wrote this sonata down as it has survived to us, tailored it to fit the pianoforte.

3.2.4.3 1758 Niccolò Pasquali: *The Art of Fingering the Harpsichord*

Italian composer Niccolò Pasquali (1718-1757) was active in London from ca1732, after which he moved to Dublin (1748-49) and Edinburgh. His work on keyboard fingering was found after his death in 1757 and published a year later. In general, Pasquali's system of fingering is based on a tight legato, in which a note is held precisely for its full value. The underlying concern is that for a "good tone" which, according to Pasquali in his Preface, "arises from the fullness of the vibrations of the strings". An "indifferent" tone stems from the "scantiness" of the vibrations, "which breaks the Continuation of the Sound, so necessary in Vocal and Instrumental Performances." His conclusion, "that the holding the Fingers upon the Keys the exact length of the Notes, produces good Tone; and the taking them off frequently before the Time, occasions the contrary."

At the end of the treatise, Pasquali describes "the different touches":

> As I would not conclude this Work without communicating to the Learner all I know of the Power of the Harpsichord, I thought proper to insert in it its various Touches, which, when judiciously applied, must greatly contribute to the different Expressions so necessary in many musical Performances.[409]

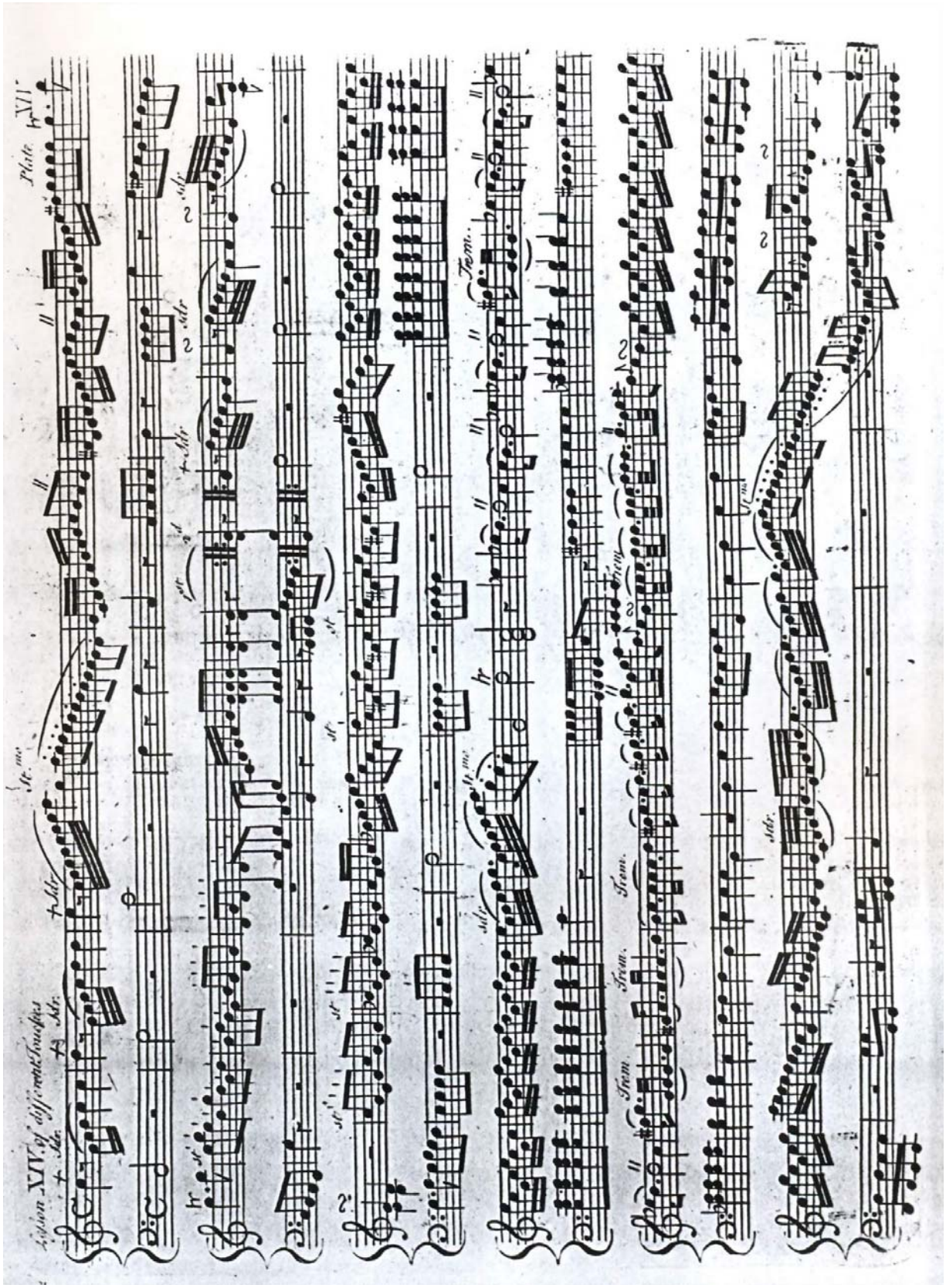
He names and explains five different keyboard touches: *Legato*, *Staccato*, *Sdrucciolato*, *Staccatissimo* and *Tremolato*. The *Legato* touch is Pasquali's main touch, the one he endeavors to teach. The *Staccato* is to be used seldom, as an effect and by way of contrast to the *Legato*. The *Sdrucciolato* – Italian for "slid" (past perfect of "to slide") – is "performed by sliding the nail of the Fore-finger over the keys ascending, or the Nail of the Thumb in descending" and recommended only as a whim, which, "if applied in a Lesson of Humor, may afford a pleasing variety." Likewise, the *Staccatissimo* and *Tremolato* are "whimsical" touches. The *Staccatissimo* is furthermore seen as making a great contrast with the *Sdrucciolato*, "being, as it were, a *Caricature* of the fine Contrast that is found between the *Legato* and the *Staccato*." The very last page of the treatise is the last *Lesson*, and include all the five different touches. (Ex. 3.45. – *Sdrucciolato* is abbreviated as "Sdr." And can be seen in the first 4 bars of the 1st system, the last 4 bars of the 2nd system, on the third system and in the 4th bar of the last system.) Pasquali leaves his learners with the motto: "The Practitioner [...] should leave nothing to Chance, but always choose his Fingers from the Dictates of his Reason and Taste."[410]

From the way Pasquali puts the *Sdrucciolato* in the same category as the Legato, both in contrast to the two non-legato touches, we detect how he considers the glissando technique as a fingering enabling the performer to achieve legato where regular fingering

[409] Pasquali 1758, p. 26.
[410] Pasquali 1758, p. 29.

may not be as efficient. Especially for runs longer than five notes, the use of the thumb to shift position, may have been too new to be reliable for legato in long and fast runs. That he links the gliding touch – as much as the other touches – to the performer's taste is more than an indication of the performers' independence from compositional premises. It shows how the glissando may have been in use more than notated scores generally suggest. Other aspects of this little posthumous publication point in the same direction. With Pasquali's stress on legato as the basic touch, in his prescription of the thumb and the little finger on chromatic notes, and in recognizing the importance of the thumb in moving from one position to another on the keyboard, this treatise is advanced compared to many of his contemporaries.[411] That this pedagogical work also describes and advocates the glissando as well as positioning it in a broader perspective of keyboard technique is significant. The title of the edition we had at our disposal[412] is limited to the harpsichord, but there is an edition at State University of New York, Stony Brook, which includes the spinet and the organ in its dedication as well.[413] The glissando may have been at the discretion of the performer more than we might readily acknowledge.

[411] Johnson 1992, p. 48-49.
[412] Microfilm copy of RISM B VI, 638 at the Dutch Music Institute (N-DHnmi: mf varia/5353).
[413] Johnson 1992, p. 9.
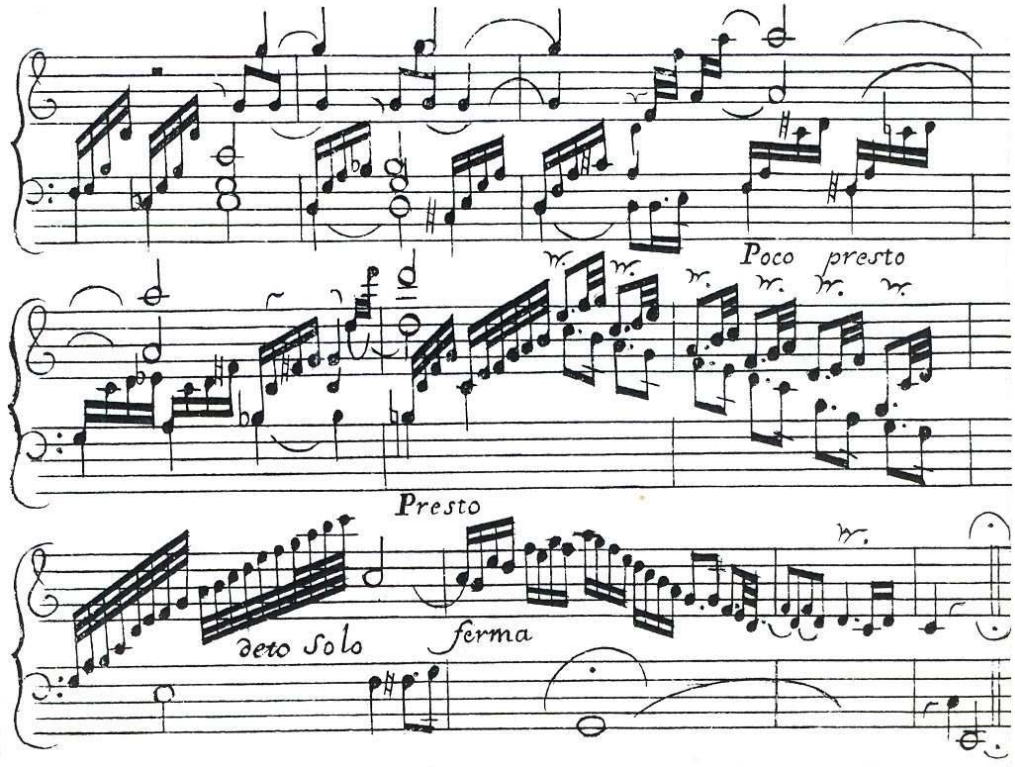


Example 3.45. N. Pasquali: *The Art of Fingering the Harpsichord* (1758), Lesson 24 "of different touches."[414]

[414] Reproduced from microfilm at NL-Dhnmi (mf varia/5353). According to NL-Dhnmi the original owner of the microfilmed edition is not known.

3.2.4.4 1761> A. Soler: *Llave de la modulación* & sonatas

Catalan composer and organist Antonio Soler (1729-1783) was a Jeronymite monk in the community of Escorial, where the Spanish royal family spent the autumn with its musical entourage. This gave occasion for Soler to be related to Scarlatti[415], and set off theories about how he might have been the copyist of the main manuscript sources of Scarlatti's sonatas that have survived to us. In 1761, four years after Scarlatti's death, Soler wrote his theoretical magnum opus *Llave de la modulación y Antiquedades de la Música*. This "key to modulation and musical antiquities" was published a year later but brought him much criticism for its modernity and daring. Chapter X of the first part ("On Harmony and Modulation") of this treatise is the chief original contribution of the book. In it Soler shows ways to modulate as quickly as possible, irrespective of how far the keys are removed of each other, so as to provide practical help for organists in church services. Soler concludes his demonstration of such modulatory procedures with eight "preludes for learning", aimed at teaching performers and composers the art of improvisation and conceived for the harpsichord as well as the organ.[416] These preludes share many of the mannerisms of notation of the Scarlatti sonatas, for example the same signs for ornamentation, and directions such as *Arbitri* for *ad libitum,* and *deto solo* to indicate a glissando. (Ex. 3.46.)

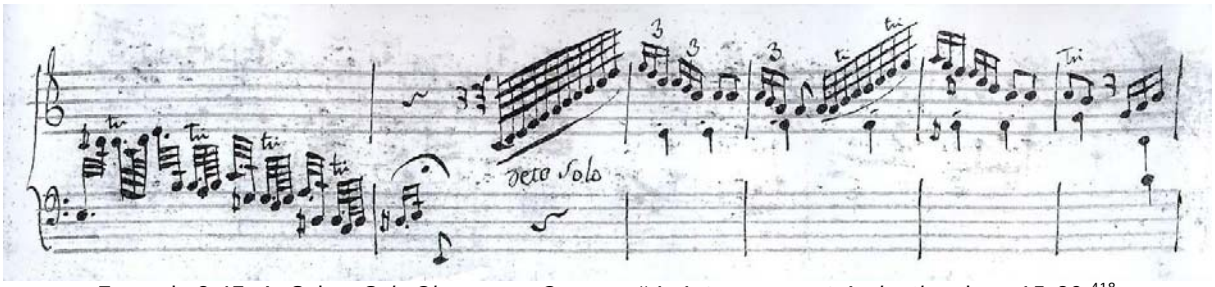


Example. 3.46. A. Soler: *Llave de la Modulación* (1761), chapter X, *Prelude* 3, bars 4-13. Reproduced by permission of Performers' Editions, New York.

[415] Soler has identified himself as *scolare* of Scarlatti, probably meaning disciple rather than pupil. (Marvin 1993, p. VIII.)
[416] According to 'the editor' in the preface of the Spanish 2002 edition Scala Aretina, Serie C (Música instrumental), Volume 6C: *A. Soler. Preludios para clavecin. Harpsichord Preludes.*

By 1765 Soler stated to have composed four books of keyboard sonatas and during the royal visits he was keyboard instructor to the talented Infante Don Gabriel (1752-1788), whose interest incited Soler to compose numerous sonatas.[417]

In the fourth sonata for organ in C major we find an 11-note run with the indication *deto solo*. (Ex. 3.47.) The glissando begins after the beat and, significantly, is the first known upbeat glissando (at least when we do not consider the Bach concerto discussed above).



Example 3.47. A. Soler: *Seis Obras para Organo*, #4, 1st movement *Andantino*, bars 15-20.[418]
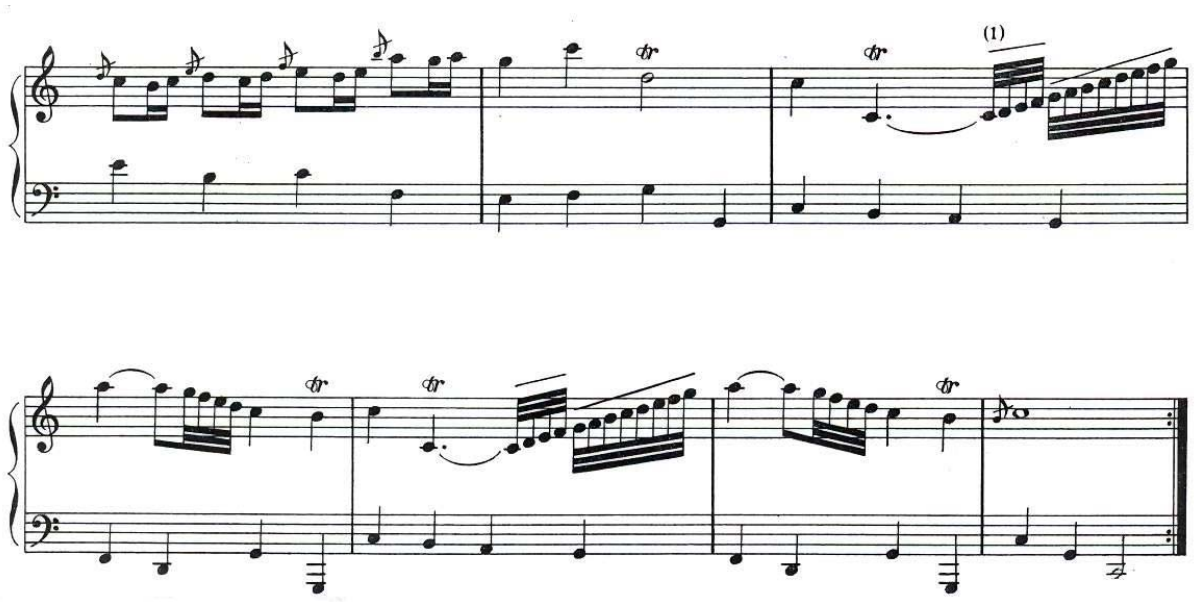
More than any aspect of the third prelude from Soler's treatise, the glissando instance in this organ sonata serves the purpose of quick modulation between keys. We will have to wait until Franz Liszt to see another glissando bridge a modulatory gap like this.

In bars 46 and 48 of sonata N° 75[419] in F major, there are two glissandi consisting of 11 notes, with each the same graphic indication: a straight line over each of the groups of 32^{nds}. (Ex. 3.48.)

[417] The autographs of Soler's sonatas are lost (the existing manuscripts are undated copies made during his lifetime) and any chronology can only be based on surmise. See Heimes 1965 (p. 15 and 22–34), Rubio 1980 (p. 114), Ife & Truby 1989 (p. ix-x) and Marvin 1993 (p. VII). The Montserrat manuscript (containing sonata 66, here discussed) is comprised of music dated from in between 1767 and 1777. Rubio believes that the single movement sonatas (like nr. 75, here treated) were composed before 1766, a view that is contested by all the others without any alternative possible date of composition.

[418] Manuscript at E-Bbc (BC 932/14). Reproduced with permission.

[419] Numbering according to the edition *P. Antonio Soler, O.S.H. (1729-1783). Sonatas para instrumentos de tecla,* issued by 'Union Musical Española' (Madrid 1959).



Example 3.48. A. Soler: *Sonata* n° 75, *Andante*, bars 44-50. The (1) refers to the footnote: "Indica que se debe tocar con un solo dedo". (c) 1957 by Antonio Soler – Union Musical Ediciones, S.L. Madrid (España). All rights reserved. International Copyright Secured. Reprinted by permission.

A reference to a footnote at the bottom of the score inicates that these run are "to be played with one finger."[420] Halfway the first part of this one-movement sonata, the key signature has changed from F major to C major, setting the second subject and these glissandi in the key of C major. At the end of the sonata, the passage is repeated but in the main key of F major and – not surprisingly – without an indication of glissando. It is further noteworthy that the glissandi cover more than one beat and that this is visible in the notation, unlike in the works of Scarlatti's.

Soler is regarded to have written his sonatas without clear distinction for the trilogy of keyboard instruments: the majority for the harpsichord, a few for the organ, and the possibilities of the pianoforte taken into account at least when writing his later, multi-movement sonatas (like n. 66).[421] To these three should be added the clavichord, widespread in 18th century Spain and suitable as well to sonata nr. 66.[422] At any rate, Soler is considered to be "truly a master of the keyboard, versed in the most advanced "pianistic" techniques of his epoch and, for this reason, a teacher of consequence."[423] That such a modest but highly regarded teacher considers the glissando worthwhile occupying a place in his most important work – the *Llave de la modulación* which he so passionately defended against any criticism – pays homage to the glissando and its status in the Iberian peninsula.

[420] "Indica que se debe tocar con un solo dedo". The source for this sonata in the edition by Rubio was the manuscript he indicated to be in the possession of Paul Guinard (former head of the French Institute at Madrid). We were unable to track the present location of the manuscript.

[421] See Heimes 1965, p. 48-49, and 33 (fn. 23) on sonata 63 (but applicable to nr. 66 as well): "apart from the *Intento* [the third movement], the ornamentations in the first movement and the drum-basses of the second make this sonata a very unlikely piece for the organ, although it must be admitted that most pages of Soler's concertos for two organs show as little regard for idiomatic organ style as does this sonata. [...]."

[422] Ife & Truby 1989, p. xii: clavichords were built in Spain until the end of the century, a survey of surviving instruments suggests that before 1783 they had a compass of *C-c"'* or *C-f "'*. The latter would fit sonata 66 (*C-e'"*) without a problem.
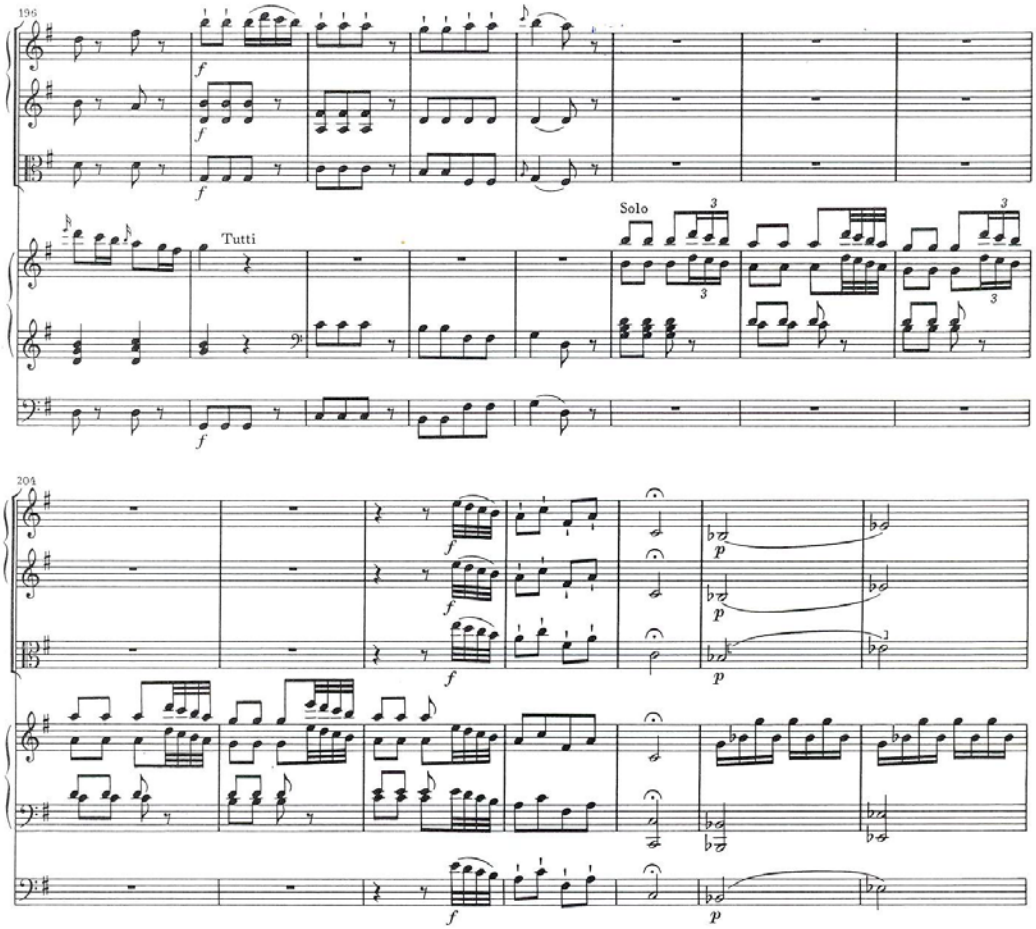
[423] Heimes 1965, p. 100.

3.2.5 The necessity for extensions

As far as we can determine, the glissandi we have come across and which we could positively identify as such, appear to have been performance practical alternatives to the fingered scale, indicated by the composer (and not just at the discretion of the performer), but not compositional necessities strictly speaking. In the 1770's we notice a new trend: the double note glissando rising from the necessity to come up with a specific technique to play a specific sound which could not otherwise be executed, which could not be realized with proper fingerings.

3.2.5.1 ca1772[424] Joseph Haydn: concerto in G

The earliest sources for Haydn's keyboard concerto Hob. XVIII:4 show some very fast octaves in the right hand of the third movement. (Ex. 3.49)



Example 3.49. J. Haydn: Concerto in G Hob. XVIII:4 (ca1772), *Rondo* (*Presto*), bars 196-210. Reprinted by permission of G. Henle Publishers.

[424] Haydn's keyboard concerto in G (Hob. XVIII:4) is difficult to date. The Hoboken thematic-bibliographic catalogue states 'composed before 1782' (Van Hoboken 1957, p. 817), recent research indicates a possible first autograph as early as 1772 or before. (Walter & Wackernagel 1983, p. 175.)

This whimsical finale rondo evolves towards a fermata, before which the soloist answers to the tutti by playing the main theme with all the instruments' orchestral might. Octaves are in order, but the lack of a specific glissando indication combined with the fact that the fast little tiratas can be played by both hands without much trouble leads to the dispute over the required technique.

Depending on how much the performer masters the technique, gliding over such a short distance can produce a kind of smudged sound effect because there are not enough notes to play in order for the gliding movement to gain a steady momentum. If the first note is hit in normal playing mode, then the second may suffer from the change of position of the hand getting ready to glide. If the first octave is played with the hand already in gliding position, then that very first octave's sound will not be as controllable as when articulated properly. The last octave of the glissando, before the first beat of the next bar, can get lost in the same kind of movement the hand needs to make to get back from the gliding position to the regular position to play the repeated octaves on each first beat. That leaves only a couple of octaves for the really gliding movement. The end result of playing a glissando here can therefore sound a little nonchalant, though this is perhaps in keeping with the humor that is found throughout this gay rondo. But it has to be said that the alternative of playing the octaves with two hands presents a similar problem. To play the left hand chords after four *presto* 32nd notes, and coming from a different position on the keyboard (which the right hand does not have to do), is just as hard to execute cleanly as when arriving there by gliding. Furthermore, the two-hand option makes less sense musically since this passage's concept is based on octave playing and the alternation of wrist and finger technique is an unnecessary complication.

The possible consequences of the glissando's performance practical aspects has prompted at least one harpsichord player[425] to state that the glissando technique is not necessary here. If, in the 1770's, Haydn still wrote for the harpsichord[426], the passage in this concerto could have been meant for a two manual harpsichord with the coupling of registers to execute the octaves. The right hand would play on one manual with e.g. 8'+4', the left hand on the second manual with just an 8'. At first sight the notation (two sets of stems for the right hand) would support the idea of registration, but double stems in one hand occur further in this piece where registration adds no value.[427] In theory here is not much to be brought up against this thesis: registration is as much a possible alternative for glissando playing as is proper fingering. But we know little of Haydn's own instruments[428], and it seems exorbitant that he would have required an expensive two-manual harpsichord for this one little passage (there is no other evidence in the concerto of the need for registers).

The historical sources for this concerto converge over time towards single notes instead of he fast octaves in the rondo. The Viennese handwritten copies from the 1770's have the double stem notation, one German handwritten copy from around 1785 has octaves with one set of stems, and two editions from 1784 (Paris: Boyer) and 1785 (Amsterdam: Schmitt) as well as a German handwritten copy from the 1790's contain simplified versions that do not require fast octave playing.[429] This evolution coincides nicely with the generally emerging prominence the piano gained over that period. For instance, the first public performance of the concerto is reported to have been given by Maria Theresa Paradies at the Concert Spirituel on 28 April 1784.[430] She performed on a pianoforte at

[425] Ton Koopman in a telephone conversation on January 28, 2008. He admitted that he had never tried to play octave glissandos, thinking it would hurt too much.
[426] Somfai 1995, p. 23-24. However, even if pianofortes did not play a "considerable" role in Vienna before the late 1770's, they would have appeared there as early as 1763. (Somfai 1995, p. 8, incl. footnote 23.)
[427] For instance, in bars 214 of the rondo the right hand has double stems to show the polyphony of the material.
[428] See Somfai 1995, p. 18-21.
[429] Walter & Wackernagel 1983, p. 174-176 and 184 (notes in the critical Henle edition).
[430] Walter & Wackernagel 1983, p. 174.

that time[431], and – in defense of its expressiveness – her instrument (which she had brought with her on tour) was praised by a reviewer for its particular keyboard characteristics:
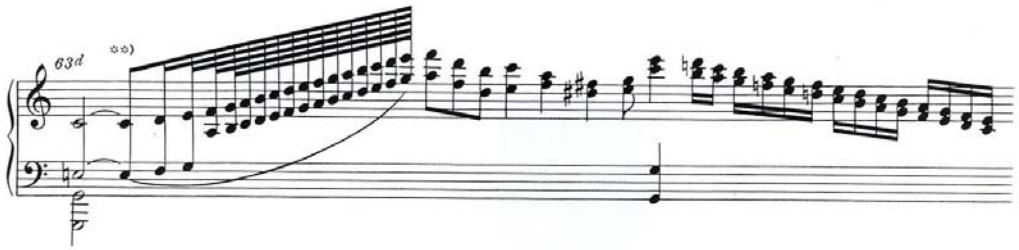
> [...] its keys are smaller and do not go down nearly as low as on the ordinary piano-fortes; this, on the one hand, fits the small size of her hand & her manner of playing, & on the other hand, helps the nimbleness of her fingers, which is hindered by a deep key dip.[432]

That performance most certainly did not use registration to realize the octave passage in the rondo. If the size of her hand and the "nimbleness" of her fingers were indeed an issue for Paradies, and if the key-dip had any specific advantages to her, she may well have performed glissandos or perhaps a simplified version such as in the Paris edition from that year. In the life of Haydn the 1780's represent a transitional period in which he wrote in a "tentative fortepiano idiom", while the 1790's reflect "a fully fledged, mature craftsmanship of fortepiano writing rooted in personal experience."[433] Unfortunately we do not have any information regarding who exactly initiated or authorized the successive changes in notation of the octave passage in the editions and copies: it may have been the sole responsibility of the publishers or the copyists and not of Haydn himself.

If there is no direct proof that the glissando technique is in order here, we can also find no argument against it. The only argument against the registration theory lies ahead, in two more works that Haydn wrote later in the century. His 1789 solo *Fantasie* (3.2.6.1.2.) and the 1790's piano trio in C (see below 3.2.6.1.8.), both certainly written for the pianoforte, contain the same kind of octave sweeps as the concerto.[434] All three octave instances – especially those in the concerto and the *Fantasie* – are strikingly similar and make for a convincing case of one and the same motive in one and the same technique being used throughout several decades.

3.2.5.2 1778 Wolfgang Amadé Mozart: *Lison Dormait*

If fast octave glissandos can still be performed without the glissando technique in times where harpsichords could have been at least as much the music's intended instruments as the pianoforte, a glissando in sixths cannot be a question of registering. In the last of *Nine Variations in C* on the arietta *Lison dormait dans un bocage* (K.V. 264/315d) from *Julie*, a comedy by Nicolas Dezède, Mozart included an ascending glissando in sixths for the right hand only. (Ex. 3.50.)



Example 3.50. W.A. Mozart: Variations on *Lison dormait* K.V. 264 (1778), bar '63d'. The double ** refers to a footnote by editor Paul Badura-Skoda: "To be played as glissando".[435]

[431] See van Epenhuysen Rose 2006, p. 16.
[432] As quoted in van Epenhuysen Rose 2006, p. 17 from the *Journal de Paris* 95 (4 April 1784).
[433] Somfai 1995, p. 23.
[434] Somfai 1995, p. 23.
[435] „Als Glissando auszuführen". Neue Ausgabe sämtlicher Werke. Serie IX: Klaviermusik. Werkgruppe 26: Variationen für Klavier. Kassel/Basel/London/New York: Bärenreiter Verlag, 1961, p. 81. Reproduced by permission.

In the *Neue Mozart Ausgabe* there is no fingering for this run in sixths, only a footnote by editor Paul Badura-Skoda, claiming it to be a glissando. We don't know how Badura-Skoda decided this and we don't know for sure if he meant it to be played as a glissando for one hand or for two hands. We should however remark here that Mozart himself could have meant the passage to be played as two runs, individually fingered, or as a two-hand glissando just as well as a single hand glissando, if we only take the written score as indication of performance practice. Unless the notational practice in cadenzas could entail that this octave in the bass should or might sound until the next bass (which would be harmonically viable in this instance but inconsistent with the notation of rest of the left hand), the left hand octave on G in the bass stops before the run starts and is not needed until quite a long way after the glissando should finish. What is most indicative of the idea of glissando, here, is the way an accelerando is written by means of the gradual, though quick, doubling of metrical value of the notes: from 8th to 16th, 32nd, 64th al the way to the extreme 128th. This is certainly an indication of high speed (even in a cadenza). Such an accelerando is in keeping with the technical maneuver that has to be carried out. The slower the glide over the keys, the more difficult it is to obtain regularity of touch and sound; the faster the glide, the more effective the glissando becomes, both technically and musically.

The K.V. 264 set was presumably written at the end of August or September 1778 while Mozart was in Paris when he was 22 years old and in search of employment. Nicolas Dezède (1745-1792), or Mr. Des Aides, had been writing Singspiele from 1772 onwards, most of them performed in Paris and also on the German stages. His *Julie* was a *comédie mêlée d'ariettes* in 1 act, first performed in 1772 and put on the bill again in a new production on August 20. 1778. It would be at that occasion that Mozart heard the melody and soon afterwards made the variations on. The first edition of this composition was published by Artaria, a company that would also publish early Beethoven compositions such as his trio's opus 1 and the sonatas opus 2 (see below 3.2.6.1.5 and 3.2.6.1.6).

As a set, K.V. 264 is similar to other ornamental variations such as the next K.V. 265 *Ah, vous dirai-je, mama'* (1778, also in C major, also on a theme by Dezède) or the later *Unser dummer Pöbel meint* K.V. 455 (1784, in G major), both in variation technique and musical character. Like the latter, K.V. 264 shows a strong performative element in the genre of the variations. We know that K.V. 455 originated in a concert given at the Burgtheater in 1783, during which Mozart improvised variations on the operatic theme[436], and this was most likely the case for the two Parisian sets, K.V. 354 and 264.

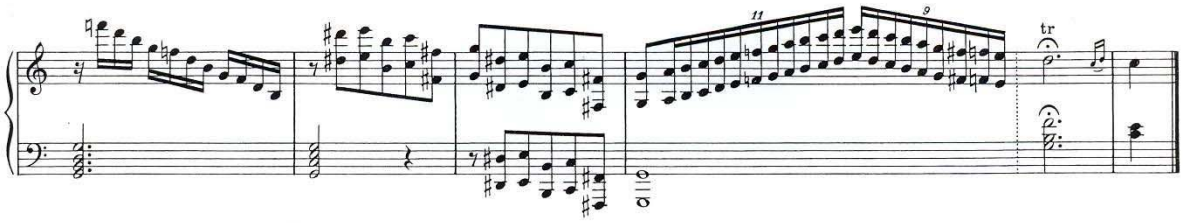
What is very different, though, in respect to the other series of variations – indeed compared to the whole of Mozart's keyboard works – are the ways in which certain aspects of performance practice are written out in the published scores of the Parisian variations. Apart from the "elaborate notation and rich rhythmic vocabulary" of the Adagio's in K.V. 264 and K.V. 354, there are the numerous occasions for including a cadenza throughout the *Lison Dormait*-set. In the second part of the theme, there is already a fermata on a rest just after a harmonic stop on the dominant (in the middle of the developmental section of the theme). In each of the subsequent variations, this cadence fermata is indicated by a fermata sign plus either a trill or some other ornament, or a short cadenza-like transition to the rest of the variation (e.g. in variation IV). In the final variation, the fermata moment is left out (the music goes on without interruption) but only to save it for the end of the variation where an actually written out cadenza starts on a 6/4 chord on the dominant. This cadenza, like the ornamentation of the slow variation, is elaborate (more than half a page) and virtuoso, covering the whole keyboard with rapid scales, double notes, arpeggios and broken sixths, topped off by the strikingly prominent glissando starting on a 4/6 chord on the dominant. In keeping with how the ornaments in the Adagio and the cadenzas remind us of a written out improvisation, the

[436] Sutcliffe 2003, p. 71.

glissando seems to be in keeping with such a performance-oriented composition. Unexpected changes in rhythm (e.g. the left hand accompaniment in the slow movement), four and five 64th notes against three 16th notes, running ornamentation speeding up and slowing down at a moment's notice (e.g. bar 38, 53-55), placing of accompanying chords against fast scales that shows influence of performance practice logic rather than theory of notation (bar 38 and 62), cadence-like scales to change position from one end of the keyboard to the other (bar 37 and 61), these passages are all indicative of a cadential mood rather than just an ornamented adagio.

If this composition was meant as a show-off type of piece for audiences liking to see as well as hear virtuosity (for which there is ample occasion in this set, even without the glissando), and if it is indeed largely based on an improvisation (as we may deduce from several features of the writing as well as comparing its fantasia-like quality to the other sets mentioned), then a glissando would be very fitting. At any rate, when he arrived there in March of 1778, Mozart was known in Paris foremost as the *Wunderkind* that had visited the city before in 1764 and 1766 and for his piano sonatas and variations[437]. As late as February 1778, he had written how "the piano is only a secondary matter to me, but thank God, a very strong secondary matter".[438] He depended upon the piano for his livelihood, as it was his performing career that would compensate for the lack of real interest in him as an opera composer at that time.[439] His concerts included almost invariably his own works and improvisations, the latter of which seem to have been eagerly awaited attractions.[440] Cadences were normally improvised by the performer and served to show technical bravura – even the conservative Leopold Mozart tolerated the use of special effects in cadences.[441] The glissando would certainly have been a special effect fitted to impress the audiences that were already engulfed with opera in the Paris of the 1770's. It wouldn't be surprising, even, if this particular feature were part of an existing repertoire of show stopping devices.

A second instance of what looks like a possible Mozart glissando is found in a cadenza to the C major second movement *Andante* from his 17th piano concerto K.V. 453 in G major (1784). (Ex. 3.51.)



Example 3.51. W.A. Mozart?: Cadenza K.V. 624 (626a), last system.[442]

On stylistic grounds, at least one authority on Mozart highly doubts that this whole cadenza was written or played by Mozart.[443] It may have come down to us from a later time period altogether, leaving us with little basis for gaining any historical insight into

[437] Eisen 1990, p. 185.
[438] Nohl 1865, p. 127-129: "[…] das Clavier ist nur meine Nebensache, aber Gott sey Dank, eine sehr starke Nebensache".
[439] Gale 1990, p. 287 and Rushton 1990, p. 93
[440] Komlós 2003, p. 223. The variations K.V. 264, 354, 398, 455 and 613 may be notated versions of such improvisatory performances.
[441] Mozart 1756
[442] Neue Ausgabe sämtlicher Werke. Serie V: Konzerte; Werkgruppe 15: Klavierkonzerte; Band 5; Kadenz zum zweiten Satz (Andante), KV 624 (626a) Nr. 25 (KV⁶: Nr. 51). Kassel/Basel/London/New York: Bärenreiter Verlag, 1961, p. 81. Reproduced by permission.
[443] Badura-Skoda 1965, p. IX.

Mozart's compositional and performance practice of the glissando in the 1780's. Nevertheless, it is worthwhile to consider this passage for the sake of elaborating a little further on glissando playing in cadenza style performance.

If the tempo and character of the movement to which this cadenza applies (*Andante*) is any measure for the cadenza, then individually articulated octaves – legato (4-5 fingering in the soprano) or *portato* (all soprano notes with the 5th finger) – are certainly possible, though they could sound tedious without much agogic differentiation. The irregular (11-note) arrangement and the prolonged first note are suggestive of a single movement technique like the glissando, especially with the left hand notated to occupy the rest of the bar. Because of the chromatic ending, the descending scale would have to be individually articulated, at least partly. In a cadenza, the resulting change of technique, "in mid-stream" as it were, is easily acceptable without such a discontinuity being visible in one or other parameter of the notation (e.g. the rhythmic division of the meter). Most likely, this cadenza passage was meant to require (or allow) glissando technique for the upward movement, stopping at the high C octave and coming down with individual articulation. The combination of both octave techniques would best strike the right balance between the need for affirmation of the movement's character (especially when nearing the transition to the *a tempo* after the trill) and the wish for agogic flexibility in such a long octave passage.

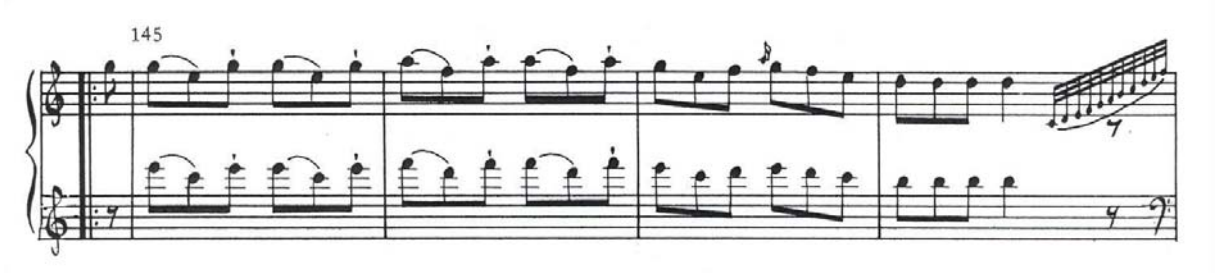
3.2.6 The first wave of extensions

In roughly 25 years time, from the beginning of the French Revolution to the end the Napoleonic wars, extended techniques will outgrow the early stages they have been lingering in during most of the 18th century. Suddenly their number will boom in published scores, their types and kinds will expand rapidly from the tentative cluster and glissando techniques to the experiments with about every possibility their use, even exploring the inside of the piano-forte.

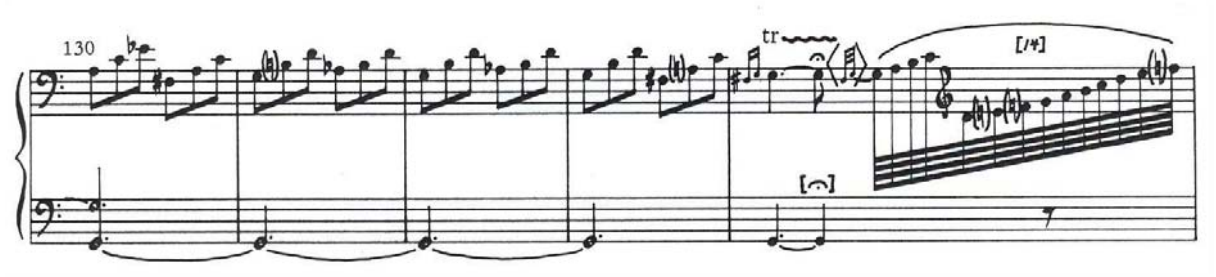
3.2.6.1 Extending the glissando's operational ground

The limited kinds of glissandos we have found in the sonatas by Scarlatti and Soler, in the Haydn concerto and in the Mozart Variations, are now spreading to other genres within the piano repertoire. Where as they have been mainly right hand and upwards runs in solo keyboard music, to be performed as if by a mere alternative to the traditional finger technique, we will now see how the glissando waxes into a multi-facetted technique, with new ergonomical types and compositional functions.

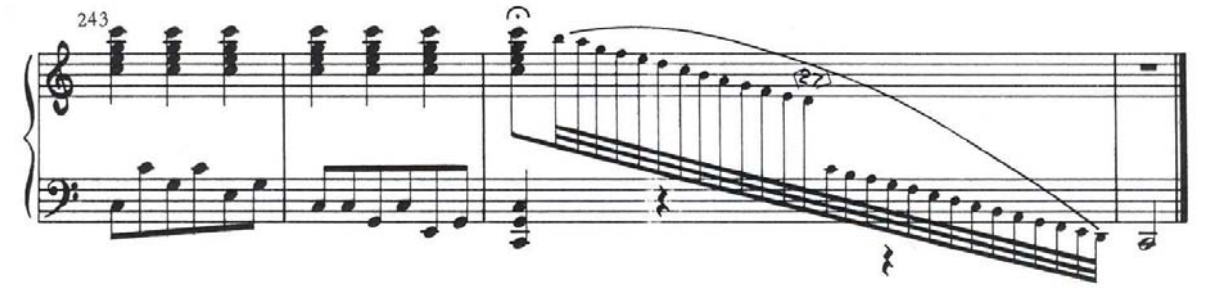
Despite the advance in glissando development, the difficulty to assess single-note C major runs in keyboard music persists even at the end of the 18th century. Irish composer-pianist Philip Cogan (1747-1833) serves as an effective illustration of this problem. He wrote 23 piano sonatas, of which we have seen 11, all dating from in between 1780 and 1799. In 3 of these we can detect instances where it is not clear which finger technique to use for fast white-note runs. (Ex. 3.52, 3.53, 3.54, 3.55.)



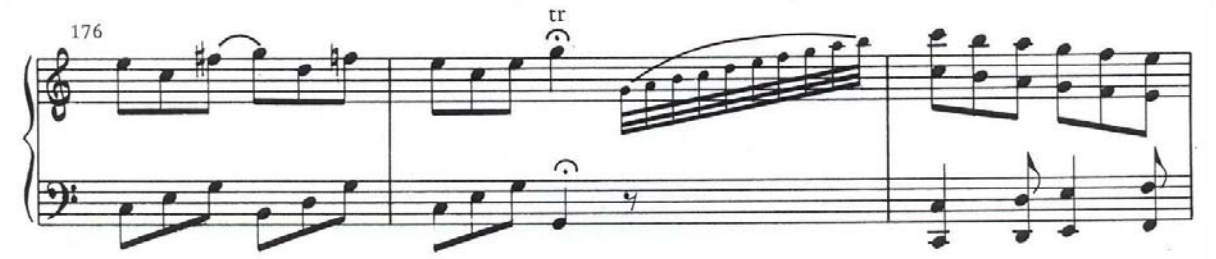
Example 3.52. Ph. Cogan: *A Favourite Lesson and Rondo* (1780), bars 145-148 from the *Rondo*.[444]



Example 3.53. Ph. Cogan: *Sonata* Op. 2 nr. 6 (1784), *Giga - Prestissimo*, bars 130-134.



Example 3.54. Ph. Cogan: *Sonata* Op. 8, nr. 1 (1799), 1st movement 'Allegro non troppo', bars 243-246.



Example 3.55. Ph. Cogan: *Sonata* Op. 8 nr. 1 (1799), 3d movement *Rondo – Quasi Allegro*, bars 176-179.

The bulk of Cogan's keyboard writing in these works is rather simple, with most of the main material consisting of eight notes. In that respect, the main level of keyboard technique doesn't match the mastery required to play these fast runs with regular fingering. Musically, the melodies – often popular tunes of the day – don't respond well to slowing down the tempo to get the notes in these runs played. Another sign of the

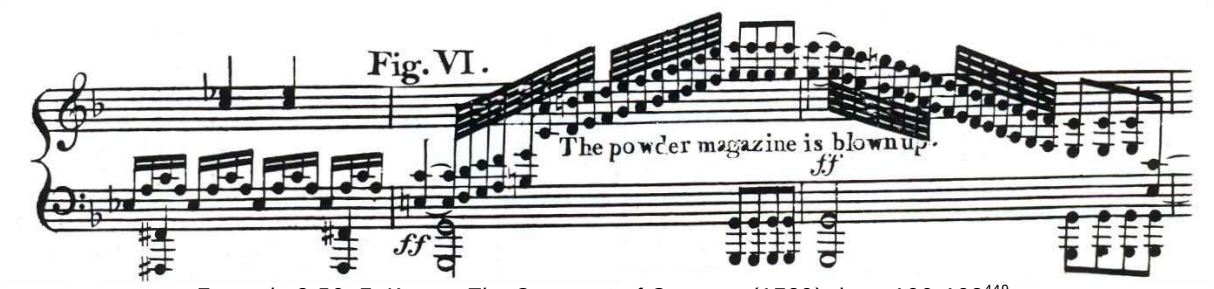
[444] *Complete works for piano solo by Philip Cogan; published from 1780 to 1799.* In: *The London pianoforte school 1766-1860,* Vol. 8. New York: Garland Publications. Reproduced by permission.

probability of glissando technique intended here, is the slur over each of the runs, the only instances in the 11 sonatas where we encounter slurs over fast runs. As before, there is no other evidence to be conclusive on this matter.

3.2.6.1.1 1789 Ferdinand Kauer: *The Conquest of Oczakow*

In the descriptive *Sonata Militaire* on *The Conquest of Oczakow*[445] (1790) by Moravian-Austrian composer Ferdinand Kauer (1751-1831) we find the same right hand glissando in sixths as in Mozart's *Lison Dormait*, this time in both directions and as a tool for tone painting. (Ex. 3.56.) There is no proof of a direct and causal link with Mozart's glissando. Kauer's piece appeared in number 7 of the *Bland's Collection*[446] three months after Mozart's set of variations had appeared in number 4 of the same journal, but that would have been in 1790, while Kauer's composition was already advertised in the Wiener Zeitung of April 11, of 1789[447]. Four years earlier, however, Mozart's set had been offered to that same newspaper, and before 1789 there had been editions of the Mozart variations by Le Duc (1785), Artaria (1786), Götz (1786) and Hummel (1788)[448], so chances are that Kauer had seen Mozart's glissando in 6ths.

It is striking how the "canonade", which precedes the Russian's blowing up of the Turkish powder room, is painted by simple right hand notes played in the bass register. This hand crossing technique was often used in keyboard battle pieces for when the canons entered the game, but one would have expected the cluster to be a better match for the glissando in terms of imitative power. It may mean that the Parisian clusters of the 1720's, 30's and 70's had not traveled outside of France.
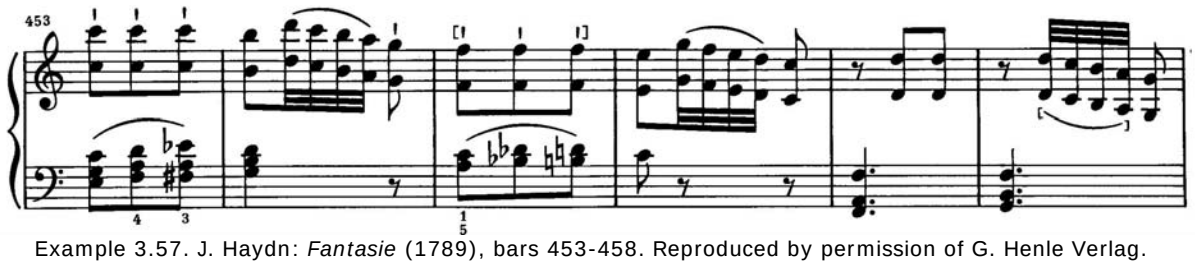


Example 3.56. F. Kauer: *The Conquest of Oczacow* (1789), bars 106-108[449].

[445] Ochakov or Ochakiv in present-day transliteration. Ochakov is a city on a peninsula in the Black Sea, in southern Ukraine. The Russian Empire saw it as the main obstacle of the Black Sea littoral and besieged it succesfully in 1737. In 1739 it was restored to Turkey and during the Russo-Turkish War of 1787-1792 a second siege by the Russians began in 1788 and lasted six months. The fortress was stormed in December and taken at the temperature of -23 C after a terrible loss of life. In 1792 the city was transferred to the Russian Empire.
[446] A monthly 10-page long issue of *Sonatas, Lessons, Ouvertures, Capricios, Divertimentos &c.&c.* for the harpsichord or Piano Forte 'by the most Esteem'd Composers', published by the London house of J. Bland.
[447] Schulin 1986, p. 288.
[448] See von Fischer 1962, p. 75-76.
[449] Excerpt from *Bland's Collection of Sonatas, Lessons, Overtures, Capricios, Divertimentos &c.&c. for the Harpsichord or Piano Forte* (London).

3.2.6.1.2 1789 Joseph Haydn: *Fantasie*

The octaves in Haydn's concerto in G (see 3.2.5.1) were recuperated in his 1789 *Fantasie* (or *Capriccio*) in C major, published as for solo harpsichord or pianoforte but written for the pianoforte.[450] (Hob. XVII:4 – ex. 3.57.) The analogy in musical material, place in the structure, character and tempo (again *Presto*) as well as the notation for the left hand (demanding it either to rest or hold chords) is striking. Here also, the composer leaves just enough room for the runs to be executed by two hands using proper fingering. In such case, the left hand chords (bars 454 and 458) could not be played with exactly the notated duration, but the use of the damper pedal (or knee lever) could have compensated for that. Yet, as with the concerto, the musical gesture is that of octave playing. Two-hand finger technique only interferes with the musical, and therefore performance practical, confidence that this final occurrence of the theme in the piece exhumes.

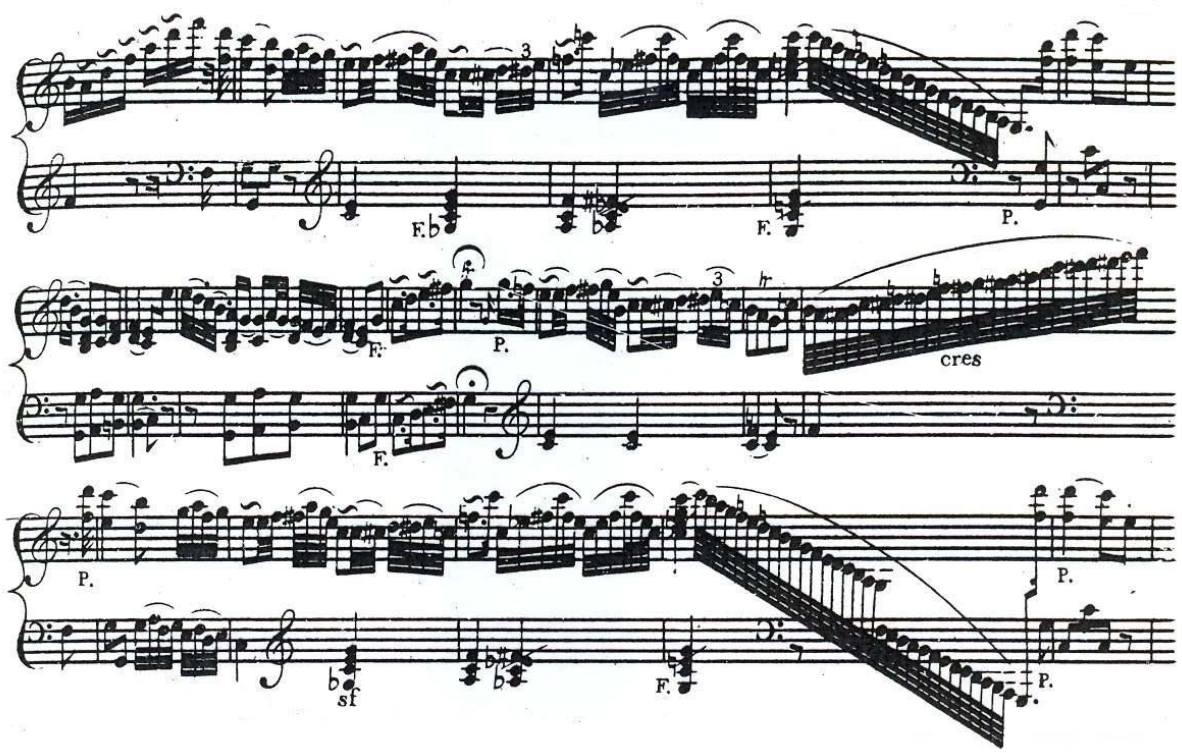


Example 3.57. J. Haydn: *Fantasie* (1789), bars 453-458. Reproduced by permission of G. Henle Verlag.

3.2.6.1.3 1791 Johann Nepomuk Hummel: *The Plough Boy with Six Variations*

Hummel (1787-1837) was acquainted with the glissando at an early age, when he played Mozart's variations on *Lison Dormait* in Dresden in 1789.[451] The impression the glissando technique in K. 264 may have made on the 11-year old keyboard prodigy, may account for the very fast 64th note runs in the 5th variation – adagio – of his own first published composition. (Ex. 3.58.)

[450] Somfai 1995, p. 14, 26 and 347. Haydn called the piece *Capriccio* in a letter to his publisher.
[451] Sachs 1990a, p. 781.



Example 3.58. J. N. Hummel: *The Plough Boy with six Variations* opus 1 (1791), variation 5, bars 11-30.[452] The right hand chords on the first beats of bars 15 and 29 must surely be 8th notes instead of quarters in order for the "gliss." runs in question to start and end *before* the *g* on the second beat.[453]
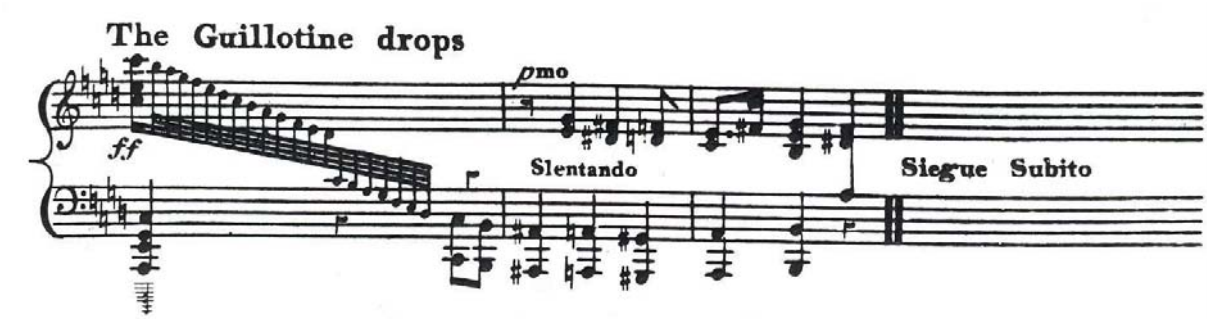
Like the Cogan examples – there is no way of proving that these long fast runs in the Hummel piece were meant to be glissandos, nor that they were (only) performed as such. But each of these runs are in a "strong" bar of the four-bar phrases and, considering the tempo which is needed to sustain the metrical pulse, slowing down in order to facilitate regular fingering would complicate the realization of the phrasing. Whether or not the runs start before or on the second beat – depending on which solution one chooses to correct the obvious mistake in notation of the rhythm in those bars – is then irrelevant. Significantly, all the other fast finger work in this adagio is given more time or is written with a margin for using some rubato: the long chromatic run goes all the way to the second half of the second beat, and the fast passages in the second part of this variation are given the benefit of either fermatas or cadenza notation.

3.2.6.1.4 1793 Johan Ladislav Dussek: *The Sufferings of the Queen of France*

Another descriptive piece, but not a battle piece per se, is *The Sufferings of the Queen of France, A Musical Composition, Expressing the feelings of the unfortunate Marie Antoinette, During her Imprisonment, Trial &c.* (1793) for the pianoforte or the harpsichord by Czech composer Johan Ladislav Dussek (1760-1812). This sensational program piece was written and announced within two months of the decapitation of the queen on October 16th. The downward right hand single note glissando is a rarity in the

[452] Sachs 1990b.
[453] *Works for pianoforte solo by continental composers in London ; Haydn, Dussek, and contemporaries; published from 1766 to 1810*. In: *The London pianoforte school 1766-1860*, vol. 6. New York/London: Garland Publications. Reproduced by permission.

18th century but surely the best way to express not only the Queen's feelings but especially the fate of the royal head itself. (Ex. 3.59.) The rendering of this tableau was successful, with the initial English edition (Corri) followed by French editions in Paris (Pleyel) as well as Amsterdam (Kuntze), a German one printed in Sweden (Müller) and the later 1808 Peter's edition.[454] Differences in titles show publishers' care of taking into account the tense political atmosphere in France in the last decade of the 18th century. Pleyel's version (printed just after he settled in Paris in 1795) is simply called *La Mort de Marie Antoinette, Pièce de clavecin par Dussek*, leaving out the word "Reine" and diplomatically rephrasing some of its sectional titles, such as the *Tumulte du Peuple* instead of *the savage tumult of the rabble* and a simple *Finale* instead of *the APOTHEOSIS*.[455] The glissando was obviously considered universally neutral and unsurpassed in its effectiveness, regardless of personal stance in any debate on capital punishment. The different editions took the instrumental technique to a wide variety of geographical locations.
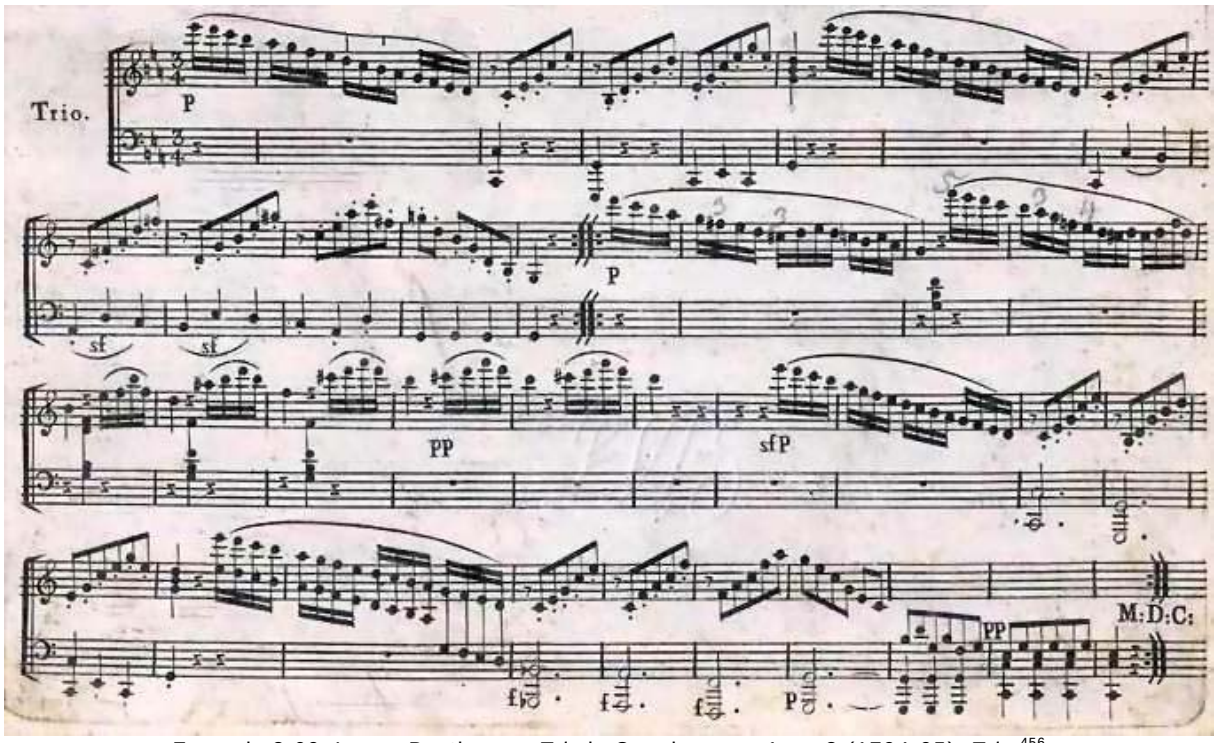


Example 3.59. J. L. Dussek: *the Sufferings of the Queen of France* (1793), unnumbered section in between the *Molto Adagio* N° 9 (*The QUEEN'S INVOCATION to the ALMIGHTY just before her DEATH*) and the *Allegro Maestoso* N° 10 (*The APOTHEOSIS*).

3.2.6.1.5 1794-95 Ludwig van Beethoven: *Trio* opus 1 nr. 3

In November 1792, Beethoven arrived in Vienna with introductions from Count Waldstein and an invitation to study with Haydn. There is no doubt that the young student would have familiarized himself with the works of the famous composer under whose tutelage he was to be. It is then likely that Beethoven knew of Haydn's 1789 *Fantasie* or even the earlier piano concerto, and was influenced to try out the glissando himself. His third piano trio opus 1 (1794/95) contains a more than two octave long downward right hand octave glissando in the *minuet*. (Ex. 3.60.)

[454] See Kipnis 1975, p.3-4.
[455] Temperley 1985, p. xx.



Example 3.60. L. van Beethoven: *Trio* in C major opus 1 nr. 3 (1794-95), *Trio*.[456]

That this octave run is to be performed as a glissando is stated in Czerny's performance practice advice on playing Beethoven's works, as was published in 1842[457]:
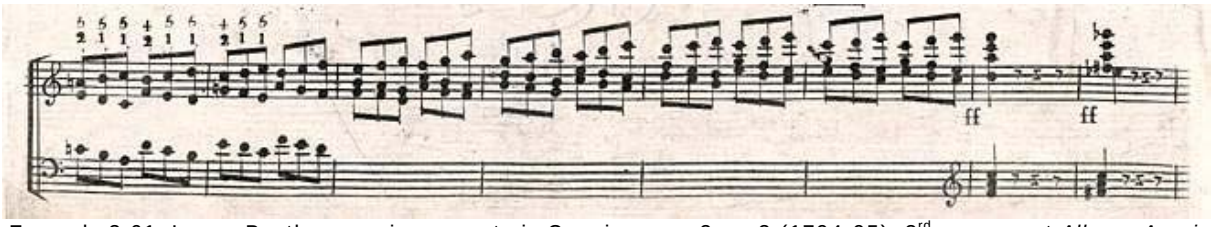
> The slided octaves in the 2nd part [of the *Menuetto*] [are to be played] in the way we have already discussed for Liszt's compositions and in the solo sonata opus 53. Smaller hands simply take the top notes, with usual fingering, but very powerful.[458]

There is no way of knowing whether the alternative of playing just the top notes came from Beethoven or whether Czerny thought of it so many years later. It is very interesting, however, that Czerny would advise this particular option rather than just mentioning that the run could be played with two hands. The reason must lie in his respect for the fact that the left hand is prescribed total non-activity in this instance. Even if the glissando were not possible, the run would – in Czerny's mind – still have to be played by the right hand alone, as Beethoven notated it.
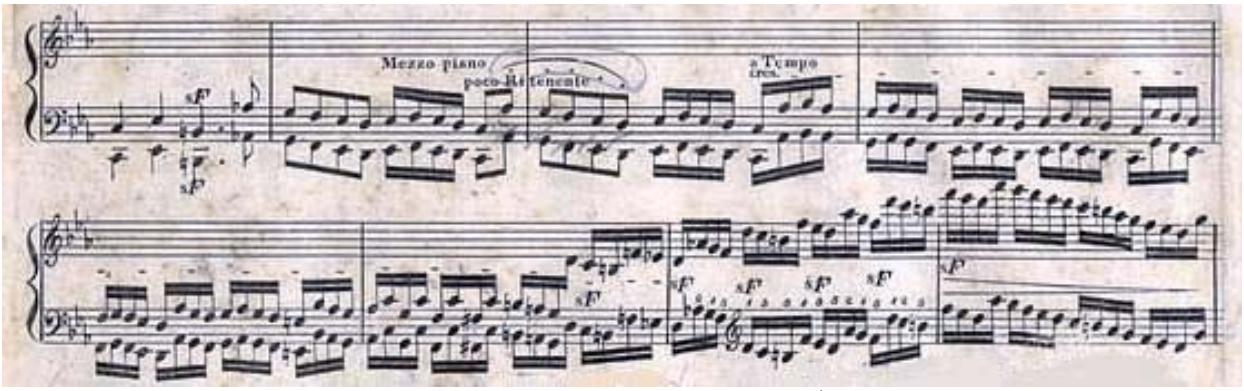
Czerny had studied opus 53 and the concerto opus 15 with Beethoven, both of which pieces have similar octave runs that Czerny designated the glissando technique in 1842, but we do not conclusively know whether he discussed this particular instance with Beethoven (however likely this was to have been the case). But we need not take Czerny's word for this run to be an octave glissando. The left hand's non-activity serves as an indication of the glissando as a non-specifically notated performance practical device. There is no instance in Beethoven's piano scores – early or late – where a

[456] First edition by Artaria with added fingerings by Beethoven. (D-BNba Sammlung H. C. Bodmer, CB C BMd 2 [Tresor].)
[457] Badura-Skoda 1963. This publication contains a facsimile reprint of some of Czerny's 1842 supplement to his 1839 *Vollständigen theoretisch-practischen Pianoforte-Schule* opus 500. See also 3.2.6.1.7, 3.2.6.1.13 and 3.3.2.3.3.3.1
[458] Badura-Skoda 1963, p. 88 (96 in the facsimile page numbering by Czerny): "Die geschliffenen Octaven im 2ten Theil auf jene Art, die wir schon bei *Liszts* Compositionen und in der *Solosonate* Op: 53 besprochen haben. Klein're Hände nehmen die obern Noten einfach, mit gewöhnlichem Fingersatz, aber sehr kräftig."

passage for two hands would be notated as for one hand: whether on one or two staves, whether in unison and an octave apart or not, it is always shown as two voices with a set of stems for each. And in all instances in Beethoven's piano writing where two hands are notated on one staff, the other staff has no rests, meaning that the hand pertaining to that empty staff is being used to partake in what is written on the other staff. (E.g. ex. 3.61-3.62)



Example 3.61. L. van Beethoven: piano sonata in C major opus 2 nr. 3 (1794-95), 3rd movement *Allegro Assai*, bars 272-279.[459]



Example 3.62. Beethoven: piano sonata in c minor opus 111 (1821-22), 1st movement *Maestoso – Allegro con brio ed appassionato*, bars 21-28.[460]

As in all comparable instances in Beethoven's works, the rests in the left hand staff of the trio under investigation mean to indicate that this hand has nothing to do. Departing from that basis – one hand playing the octaves in this right-hand passage – we can further acknowledge that the tempo is too fast for the octaves to be articulated individually. Taking these two factors in account – notation and tempo – we can conclude that we are dealing with a glissando and that the absence of any specific glissando indication has become irrelevant.
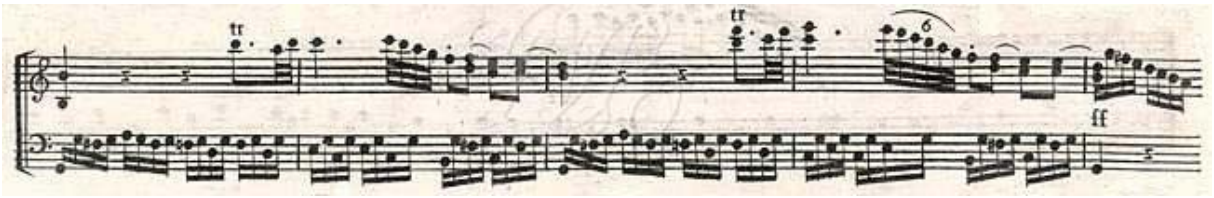
Even more of note is the fact that Beethoven integrates the glissando in the musical development. It is not just an effect: it is a logical consequence of the organic development of the downward run that typifies this movement. The theme opens with this run as a single, soft scale, repeated for the second part of the phrase. The B section of the minuet's trio develops the run by varying it and building up towards the dominant and a little question-and-answering between piano and violin using only a remnant of the developed motive, before the piano reenters the main theme, this time with a *sforzando-piano* on the first note of the characteristic run. The second part of the phrase then contains the octave glissando leading to the first and only forte moment in the whole movement. The intention of a steady organic development is made clearer in the arrangement Beethoven made of this composition much later in his life. That 1817 version for string quintet, opus 104, carries more dynamic indications (e.g. the downward run in question is to be performed *crescendo*), and different instrumentational

[459] First edition by Artaria, plate number 614. (D-BNba Sammlung H. C. Bodmer, HCB C op. 2.)
[460] Early edition by Cappi und Diabelli, plate number 1384. (D-BNba C 111 / 1.)

devices are used to work out the build-up that leads to the final run (e.g. the second violin, second viola and cello counter it by a simultaneous upward run). In total, it is clear that Beethoven wanted the ultimate variation of the downward run to be a culmination of dynamic and timbral potential of the thematic upbeat. Consequently, there is no use for the glissando technique to play the single note run at beginning of the original version of the theme itself. It would be possible to do so, but the fact that no metrum can be made audible while gliding would prevent the performer to express whether he is playing the opening in ¾ or as a hemiola. In fact, gliding would obscure any metric indication at this point. It is most interesting that Czerny did not mention this option: it can prove that there were limits to how much the metric identity of such an opening motif could be compromised, or that single-note glissandos were not at stake in Beethoven's works.

3.2.6.1.6 1794-95 Ludwig van Beethoven: sonata opus 2 nr. 3

Another composition of this productive period of Beethoven's, his third piano sonata opus 2 (dedicated to Haydn), contains some more runs that could easily be compared to the little sweeps over the keyboard in the two Haydn pieces. (Ex. 3.63.)



Example 3.63. L. van Beethoven: piano sonata in C major opus 2 nr. 3 (1794-95), 1st movement *Allegro con Brio*, bars 21-25.[461]
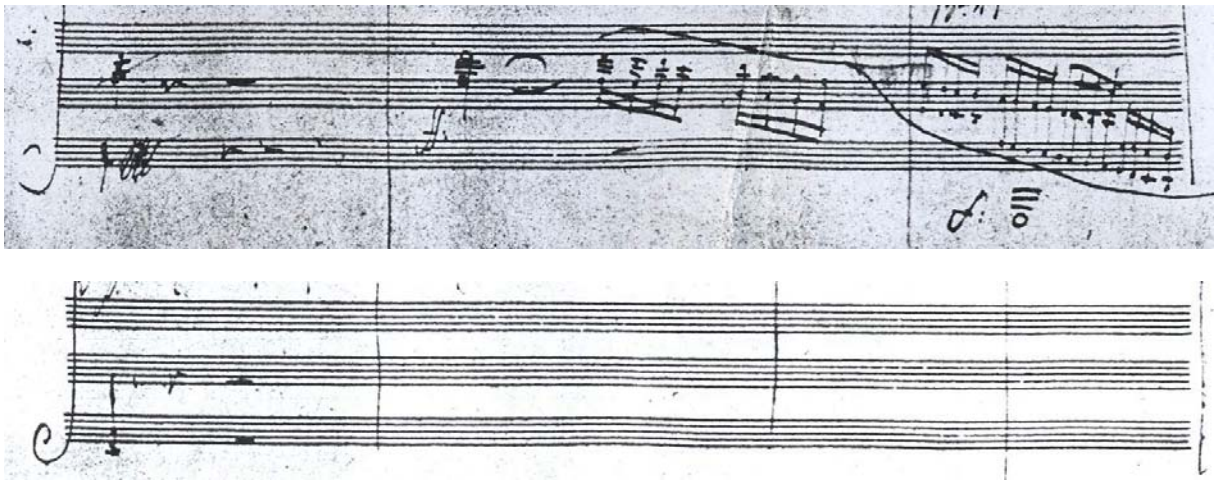
Especially the sextuplet, which returns in exactly the same way and key in the re-exposition, seems apt to be a glissando. Other than the dedication to Haydn and the link with his pieces, however, there is no direct or indirect musical indication that Beethoven would have intended this to be a glissando. Czerny does not mention the instance in his opus 500 (cf. 3.2.6.1.5). More than in any other example we have come across until now, it is just as possible here to use proper fingering as it is to apply the gliding technique.

[461] First edition by Artaria, plate number 614. (D-BNba Sammlung H. C. Bodmer, HCB C op. 2.)

3.2.6.1.7 ca1795 Ludwig van Beethoven: *Grand Concert pour le Forte Piano*

The most well known early glissando issue is certainly the downward octave run in Beethoven's *Grand Concert pour le Forte Piano*[462] opus 15 in C. It has not been possible to accurately date the composition due to the multiple revisions, the confusion surrounding Beethoven's performances of three of his concertos (opus 15, 19 and 37) in the 1790's, the first sketches of opus 15 dating from 1793 and the lack of a complete solo part before 1800. Nevertheless, there is a consensus for 1795 as the date of the first complete version. The concerto was published in 1801.[463]

At the end of the development section of the first movement (*Allegro con brio*), after a gradual but steadfast decline in volume, ever higher repeated descending chromatic scales and a pedal note in the orchestra's base with the piano's presence filtering out towards the highest regions of the tessitura in pianissimo but teasing diminished seventh chords, there comes a fortissimo glissando in octaves for the right hand, accentuating the power of the dominant seventh chord that leads to the C major orchestral tutti of the re-exposition. (Ex. 3.64.)



Example 3.64. L. van Beethoven: *Grand Concert pour le Forte Piano* opus 15 (ca1795), bars 343 -349.[464]

When Beethoven arrived in Vienna, the times were right for a virtuoso pianist: potential rivals had moved out of Vienna (Clementi and Cramer to London, Wölffl to Warsaw) and with the death of Mozart just a year before, there was room for a pianist of the first rank. The need for positioning oneself as a virtuoso and safeguarding the ensuing reputation would make a soloist use any and every means to enhance his profile. Pianistic duels would constitute such means. But playing one's own piano concertos was equally effective for a virtuoso to claim his territory. And a surprising double octave glissando at the end of a quiet, fantasia-like passage could be just the thing. On April 2, 1800, the young Beethoven gave his first public concert for his own benefit, the program of which included works by Mozart, Haydn, his own first symphony in C op. 21, the septet and his concerto opus 15. It is hardly doubtful that the loud glissando was a way of showing off to the audience. An octave glissando can easily surpass a two-hand octave run in volume because in the glissando much more arm weight can be applied to the keys. The position of the piano on the stage was still not such that the audience could see the keyboard and the fingers of the pianist (that would only with Dussek), but the pianist's bodily

[462] Küthen 1984, p. 11.
[463] Küthen 1984, p. 4-8.
[464] Excerpt taken from the manuscript (D-B: Mus.ms.autogr. Beethoven 15). Reproduced by permission of the Staatsbibliothek zu Berlin – Preussischer Kulturbesitz, Musikabteilung mit Mendelssohn-Archiv.

movement to the left (forced by the position of the arm) to execute a descending octave glissando would certainly have been noticeable.

What a powerful effect this must have presented to the audience that had come to the concert to hear this young piano virtuoso perform his own new concerto. That is to say, if Beethoven indeed played a glissando. That the left hand needs to play the G in the bass, while the right hand's octaves are under way, seems clear evidence of the impossibility of playing the octaves as two separate and regularly fingered runs. It has nonetheless been argued that there are still other ways to play this passage. In essence, the argument boils down to an antagonism over five different aspects of the passage:

a) there is no explicit indication for the glissando;
b) the key is C major but Beethoven is reported to once having played this concerto in C♯;
c) the tempo is too slow for the necessary momentum to glide over these relatively few octaves but too fast for individually articulate octaves;
d) the legato slur;
e) Czerny's 1842 statement that this run is to be played as a glissando.[465]

Because of the lengthy, in-depth an ongoing debate over this instance, we will re-evaluate these arguments, which have been used *pro* and *contra* the idea that this famous passage contains a glissando.[466]

a) Except for four composers (Scarlatti, Soler, Pasquali, Moyreau – none of them from Germany or Austria), we have not seen anyone use any unequivocal and explicit indication for glissando playing before at least the late 1790's. It has been clear that such lack of explicitness has not excluded the existence or even the necessity of glissando playing. See also d).

b) In the 1838 account by Franz Gerhard Wegeler and Ferdinand Ries in their *Biographischen Notizen über Ludwig van Beethoven*, the story is told of how, at the first rehearsal, Beethoven played his solo part in C♯ instead of C because his piano was tuned half a tone lower than the wind instruments.[467] If so, Beethoven could not possibly have performed the octave run as a glissando. This line of thinking needs to be questioned, however. First of all, the story goes on to report that Beethoven had everybody retune their instruments to the piano's B♭ in stead of to its A, after which he played his piano part in C♯. It remains unclear whether Beethoven actually transposed his part: if the winds tuned to a lower key, they were back in tune with the piano, so why would Beethoven have transposed his part a half tone up if they would then once again be playing in different keys? Even if he did transpose his part, the story does not say that Beethoven rehearsed the complete concerto, or that he played every note of his solo part. At such a first rehearsal (at his own home), he may indeed have taken temporal license to play individually articulated octaves, he may have played a single scale, he may have left out the left hand *GG*, etc. He may have modified his part to suit the occasion in any number of different ways. Let us not forget that his solo part was not even fully written out yet at that time.[468] Secondly, the way Beethoven played at a first rehearsal, being forced to compromise by the circumstances, says little,

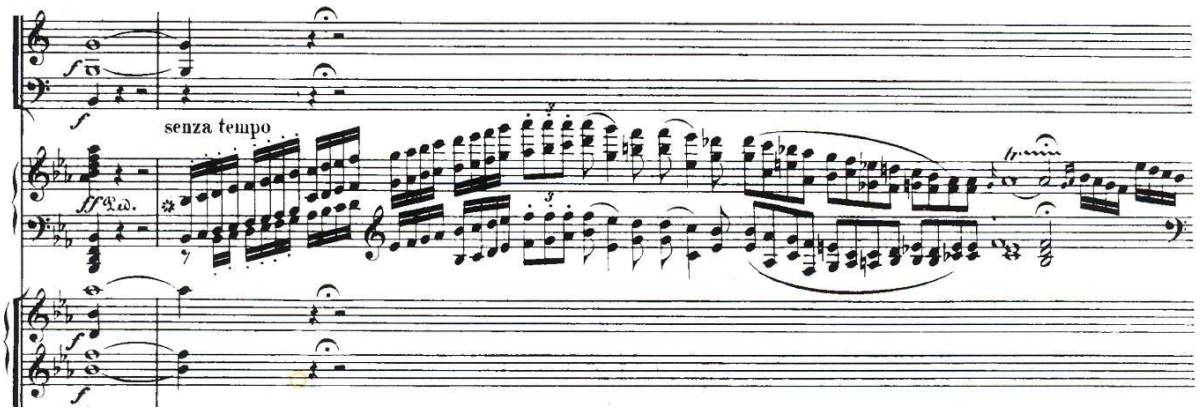
[465] Badura-Skoda 1963, p. 105. See also 3.2.6.1.5, 3.2.6.1.7, 3.3.2.3.3.3.1.
[466] The matter has been discussed thoroughly by Küthen 1984, p.17, albeit from the perspective that this passage in opus 15 does not concern a glissando, but rather individually articulated octaves.
[467] Cited in Küthen 1984, p. 5-6.
[468] Küthen himself states that the solo part as we know it came to us after a thorough revision by Beethoven in 1800 (Küthen 1984, p. 7-13).

if anything, about the way he may have played it in public performance or about the way he would have wanted it in optimal conditions. Surely, the final version of the solo part was not written out for anything but normally expected circumstances.

c) As for the tempo, there is no reason for the glissando to need some kind of minimum speed. It may be a misconception born out of the present day perception of a glissando, just like it is often presupposed to be loud. On a 20th century piano, these two aspects – speed and volume – actually coincide in glissando playing: with higher speed, the heaviness of the piano's action stands less in the way of regularity or consistency of sound, and added pressure (and thus volume) prevents a superficial sound. On an 18th century piano, a glissando does not have to be very fast to achieve the proper effect. On such an instrument, with a light key weight and shallow key dip, a glissando can be performed surprisingly slow compared to modern keyboards.

To get out of the perceived paradox concerning the tempo – too slow for gliding but too fast for individual articulation – suggestions have been made in different directions. Czerny[469], Kullak[470] and Paul Badura-Skoda[471] all advised to increase swiftness by adding notes to the run. (Though they may have taken into account key-weight and -dip of keyboards heavier than Beethoven's). Another "camp" – in favor of individually articulated octaves – sought a solution in comparing the passage with the *Kadenzierenden Praeludium* right before the re-exposition in the first movement of Beethoven's fifth piano concert opus 73.[472] (Ex. 3.65.) There, the upward staccato octaves are accompanied by a remark in the score: "senza tempo". To overcome the problem that the tempo of the first movement in opus 15 is in fact too fast for any individually articulated octaves in 16th notes, the context of the first concerto has been thought of as actually allowing for the same kind of "tempo license" as in opus 73. The lack of such indication in opus 15 is then justified by the reasoning that any context in such an early composition would be lacking textual indications.[473] This logic has led to a third mode, i.e. starting the run with individual articulation and switching to glissando technique at some point in the run.[474]

[469] See below and in Badura-Skoda 1963, p. 11.
[470] In Kullak's Steingräber edition of the five Beethoven piano concertos (published somewhere between 1881 and 1890), he cites Czerny and adds that it may be more effective – despite its anachronistic character – to lengthen the glissando by yet another octave.
[471] Badura-Skoda 1963, p. 10 himself follows Czerny's suggestion to play a single-note glissando instead of octaves.
[472] Küthen 1984, p. 17
[473] Küthen 1984, p. 17.
[474] As suggested by Bart van Oort. (Private communication, April 2009.)



Example 3.65. L. van Beethoven: piano concerto opus 73 (1809), 1st movement *Allegro*, bars 369-372.

d) That a slur over one-hand octave runs would point towards glissando technique is an argument based upon the idea that gliding over the keys would produce more of a legato effect than individual articulation. At the required speed of this particular instance, the latter would necessitate wrist action and therefore result in staccato octaves. The gliding motion cannot produce *real* legato (i.e. depressing a new key before the last one is fully released) but at least the octaves would not be completely detached from each other. In the Beethoven case, this idea has been turned around to see the slur as Beethoven's wish for an octave run "as much legato as possible" and therefore *not* glissando.[475] To achieve any kind of meaningful legato in individually articulated octaves, a *545454* fingering for the top notes would be necessary. For that to be efficient, a *senza tempo* would have to take down the speed too much and ruin the tempo relationship between the development section and the re-exposition.

e) In 1842 Czerny wrote that

> The reentry into the main theme (after the 2nd part) consists again of the octaves glided with two fingers (as in the solo sonata opus 53) and from there smaller hands can take the run in the easier way, but on the other hand lengthen it with an extra octave downwards at higher speed.[476]

While not all "crown witnesses" such as Schindler, Ries and Wegeler agreed on all aspects of the interpretation of Beethoven's music[477], Czerny's remarks on the glissando passage in opus 15 have nowhere been refuted[478]. Even a pertinent remark on Beethoven's agogics (as published by Wegeler and Ries) is not sufficient to doubt glissando practice:

[475] Küthen 1984, p. 17: "Es ist warscheinlicher, daβ Beethoven einen so weit wie möglich gebundenen Oktavenlauf und nicht dessen *glissando*-Ausführung beabsichtigt hatte". Proof for this would lie with sources such as Czerny and Beethoven's own sketchbooks, wherein indications of performance practice can be found, all showing how the composer wished for the strictest legato in playing his works.

[476] As reproduced in Badura-Skoda 1963, p. 105 (p. 97 in Czerny's original publication): "Der Wiedereintritt in das Hauptthema (nach dem 2ten Theile) besteht wieder in den, mit 2 Fingern geschliffenen Octaven, (wie in der Solo-Sonate Op:53) und klein're Hände können daher den Lauf einfach nehmen, aber dagegen mit vermehrter Geschwindigkeit um eine Octave abwärts verlängern. " When Czerny lists his advice on the concerto, he had already discussed the sonatas, hence the word 'wieder'.

[477] See the introduction to Badura-Skoda 1963, p. 9.

[478] Küthen 1984, p. 17 states "this exclusive interpretation by Czerny as *glissando* must be questioned" ("Diese ausschließliche Interpetation Czernys als *glissando* muß in Frage gestellt werden"). He does not offer any argument towards the idea that Czerny may have been historically incorrect, merely offers his own (Küthen's) opinion on how individually articulated octaves have not been put forward as a possibility.

> In general he himself played his compositions very capriciously, though he stayed mostly in fixed meter and only occasionally, but rarely, pushed the tempo a little. Once in a while he slowed the tempo in his crescendo with ritardando, which made a very beautiful and highly remarkable effect.[479]

In theory, there is the distinct possibility that Czerny was influenced by the glissando's popularity in the 1840's, when he published his memories on Beethoven performance practice: by then several 18th century works had been revised to be published with added glissando indications (see below 3.3.2.3.3.3.1) and he himself had written glissandi in his compositions and pedagogical works. On the other hand, the esteem that Beethoven had held towards Czerny was certainly mutual from the part of Czerny and – especially having studied opus 15 (and 53) with Beethoven personally – it is unlikely that Czerny would have advised a different technique to play a Beethoven passage without at least including the manner in which Beethoven himself had played it or taught it to him.

In general, the problem with the arguments in favor of individually articulated octaves is that they are inconsistent. Apparently, Czerny's authority can be used for arguing *for* as well as *against* the glissando (too late to reflect contemporary practice / proof of individually articulated legato playing). The lack of textual indications would allow for the assumption of a "senza tempo" license[480] but not for a "glissando" technique. It should, at the same time, be said that the example of opus 73 (with the senza tempo indication) could go either way. A senza tempo could allow the performer to take the extra time needed to play all the octaves with individual articulation, but it could just as well be meant to allow for adjusting the tempo in the opposite sense, i.e. playing at a higher speed so that an octave glissando could be played comfortably, with the necessary momentum. But there is no indication that the passage in question requires or allows any cadenza-like playing. On the contrary: the whole musical build up at the end of the development section needs an up-beat that firmly reintroduces the tempo after the hesitant and fading little dialogue between French horns and piano.
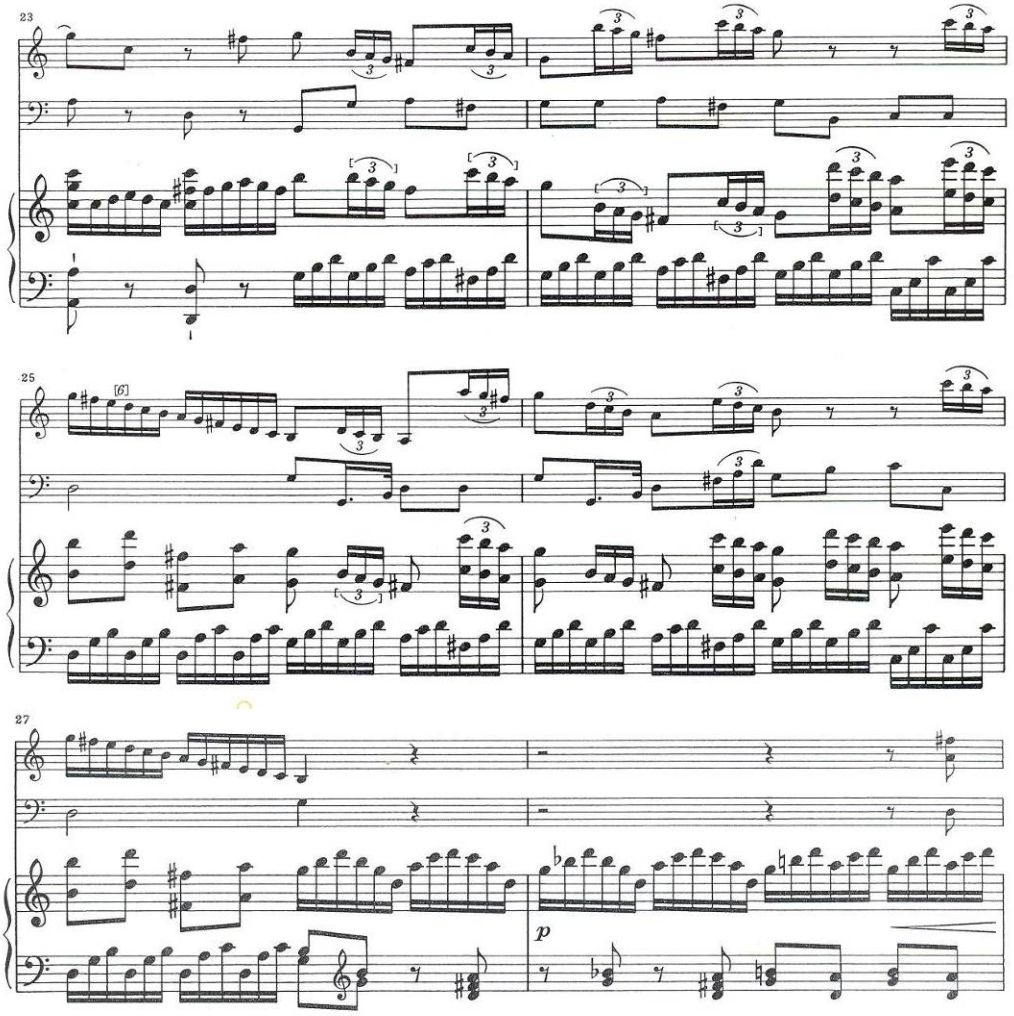
Strictly assessing the facts, the lack of a precise indication of the articulation Beethoven intended for this passage forbids us to say with absolute certainty whether individual octaves or a glissando had been in his mind. Besides the text of the score, no evidence about Beethoven ever having played a glissando can be discerned in reviews, letters or any other contemporary source. One would expect that such a performance feature would not have gone unnoticed, unless it was not as rare as we think it may have been.

[479] Badura-Skoda 1963, p. 9: "Im Allgemeinen spiellte er selbst seine Compositionen sehr launig, blieb jedoch meistens fest im Tacte, un trieb nur zuweilen, jedoch selten, das Tempo etwas. Mitunter hielt er in seinem crescendo mit ritardando das Tempo zurück, welches einen sehr schönen und höchst auffallenden Effekt machte."

[480] Most instances of cadenza playing in Beethoven's piano parts, where a *senza tempo* is appropriate, are visually detectable through either small shaped notes, the presence of fermatas, or words like 'cadenza' or *ad libitum*. E.g. in the 62nd bar before the end of the first movement of the quintet opus 16, in bar 74 of the 14 variations for piano, violin and cello opus 44, in the 22nd bar of the first, second and third variation of opus 105 Nr. 5 (cello and piano) or in bar 135 of the last movement of his piano trio WoO 39.
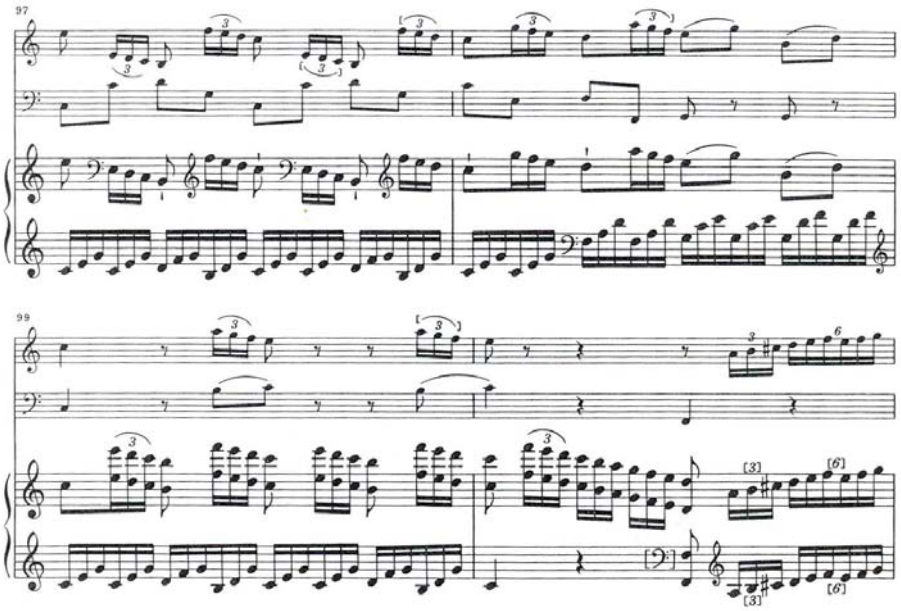
3.2.6.1.8 1795-97 Joseph Haydn: *Trio* in C

Around the same time of Beethoven's opus 1 being published, Joseph Haydn also wrote a piano trio in C major (Hob. XV:27 - 1795-97), containing in the first movement the downward right hand octave sweeps which we can by now call typical of Haydn. (Ex. 3.66 and 3.67.)
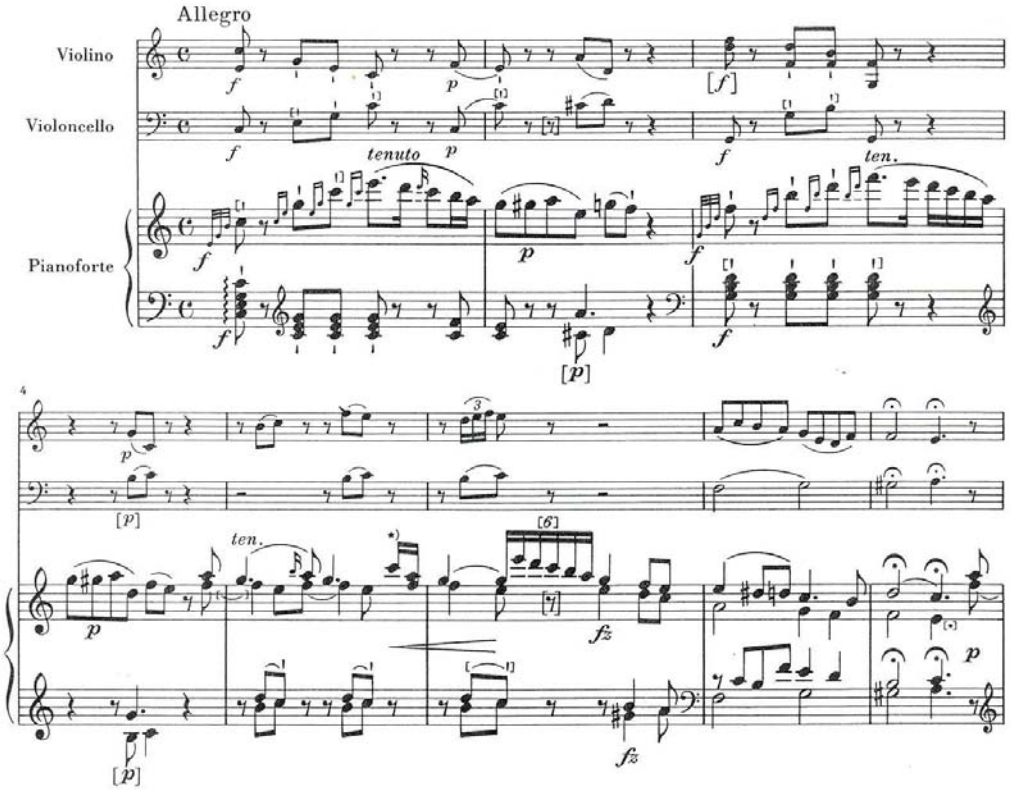


Example 3.66. J. Haydn: *Trio* in C, Hob. XV:27 (1795-97), 1st movement *Allegro*, bars 23-28.[481]

[481] G. Henle Verlag: HN 412 Klaviertrios, Band V, Urtextausgabe. Excerpts from this edition are reproduced by permission of G. Henle Verlag.



Example 3.67. J. Haydn: *Trio* in C, Hob. XV:27 (1795-97), 1st movement *Allegro*, re-exposition, bars 97-100.

Because the character indication for this movement - *Allegro* – is to be interpreted to determine the tempo, the maximum speed at which the pianist can play individually articulated octaves could be used to set the general tempo here. On the other hand, the main theme does not benefit from such a tempo. Especially the slow harmonic rhythm of the opening phrase's end (bars 7-8) requires between ♩ = 100-108, certainly not slower than ♩ = 96 to be convincing. (Ex. 3.68.) Even the latter tempo is dangerously fast for individual articulation in the octave passages.



Example 3.68. J. Haydn: *Trio* in C, Hob. XV:27 (1795-97), 1st movement *Allegro*, bars 1-8.

As such choice of tempo is personal and therefore not a conclusive basis for deciding in this matter, the dispute over the mode of playing is alive here as it is with Beethoven's opus 15. Apart from tempo, several other factors have been called upon to weigh the issue: glissandos would not be appropriate because they would not match the energy of the triplets in the violin part; the character of the piece would be too serious and too orchestral (vs. pianistic) for glissandos; individually articulated octaves would better fit the left hand 16th notes.[482] As for the seriousness of the composition and its orchestral-like richness in timbre: the trio is indeed a grand masterpiece, but the idea that a glissando would only thrive in light and humorous circumstances is as unfortunate a presumption as that it would naturally be fast and loud. Glissando technique is not necessarily an effect to be noticed musically, serving to communicate a specific intent. It can be no more than a technique that enables the pianist to play certain sequences of notes at a certain tempo. Concerning the ensemble playing: in instances like these, where the violin and the piano have the same material, the bowing in the string part is a matter of interpretative agreement between the musicians. It is true that if the violin plays its long downward runs in bars 25 and 27 non-legato, the intensity *can* lend the run an energy that is best matched on the piano when the pianist plays his comparable run in bar 100 with individual articulation. But the argument can easily be turned around: there is no proof that the piano has to follow the violin part in the interpretation of the triplets, as there is no proof that the violin must play its triplets and long runs with individual articulation. As for left and right hand synchronisation in the piano itself: on a late 18th century pianoforte, there is little risk of losing a sense of regularity in touch when combining such fast glissando octaves with individually articulated triplets in the other hand.

Transcending any argument, however, about whether or not these octaves were meant to be glissandi, and most interesting historically, is how Haydn adapted his writing to allow for the gliding technique. As the octaves occur in the sonata form's second theme,

[482] These objections to glissando playing were made by Bart van Oort in a private conversation. (April 2009.)

they are composed in the context of G major when they first occur in the exposition, and in the context of the C major home key in the re-exposition. In the latter part, the all-white-key tonality allows for a consistent integration of the glissando technique into the closing section of the second main theme. (See bars 99-100 in ex. 3.67.) In the exposition's the key of G, however, the F♯'s are in the way of any glissando performance. Haydn cleverly avoids gliding towards or over the F♯ by incorporating a little question and answer game. (Ex. 3.66: bars 25-26.) It is interesting to see the resemblance between the 8th-note motif and its upbeat in bars 25 and 27 of the trio and what Haydn had written in his concerto in G (see bars 206-207 in ex. 3.49), but whether the modelling of the second theme in the trio's exposition is the original intent of the composer for this material, and the reoccurrence in the re-exposition is the developed version or the other way around, is not really an issue. Haydn adapted his material to use a glissando, and did so with musical creativity. Like Beethoven in his trio, Haydn found a way to make real compositional use of the glissando.

3.2.6.1.9 1797 J. P. Milchmeyer: *Die wahre Art das Pianoforte zu spielen.*

Johann Peter Milchmeyer (1750-1813) wrote his *Die wahre Art das Pianoforte zu spielen* in 1797. Although there are conservative tendencies, such as the "Affektenlehre" based on Bach and Marpurg, he was generally predisposed towards progress in keyboard playing. He considered the clavichord outdated and considered the pianoforte *the* instrument great composers should write for. He even constructed a keyboard instrument with three manuals, which was reported to realize 150 combinations of timbres. [483]
In his piano-playing manual, he devoted attention to double note scales with glissando fingering for both hands, in thirds, sixths and octaves. (Ex. 3.69.)
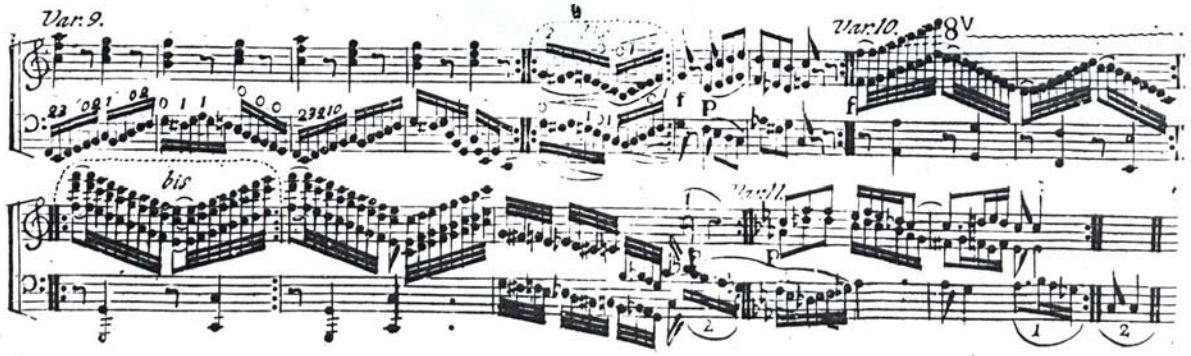


Example 3.69. J.P. Milchmeyer: *Die wahre Art das Pianoforte zu spielen* (1797), p. 29.[484]

This is the first time the glissando is taken seriously enough to be discussed in a keyboard treatise. Not as an option for a whimsical mood as in Pasquali's tutor, but as a part of scale fingerings, the most important part of most treatises for the 18th and 19th century keyboard tutors. The technique is also developed theoretically in the sense that permutations and combinations of glissandos are presented.

[483] Kloppenburg 1951, p. 115.
[484] Reproduced from a microfilm at NL-Dhnmi: mf VIII/262. The original is part of the collection of the Utrecht university library. Reproduced by permission.

3.2.6.1.10 1798 Abbé Vogler: *Quarndansen*

We have already encountered Vogler in this story when clusters in his organ improvisations were at issue. Of his modest solo stringed keyboard output, the *Pièces de Clavecin* are of note for reasons of another extended technique: the glissando. Published in Stockholm (1798) together with a Swedish language manual for performers, the *Clavér-Schola*, the set's complete title reads: *Easy pieces for the harpsichord, with fingerings and variations of a gradual difficulty, to serve as an example to the harpsichord tutor.*[485] The manual – intended as a guide for the development of technical skills and musicianship – starts off with the most basic of levels, but that these pieces would be "easy", is to be taken with a grain of salt. Some of the pianistic devices, such as double trills, seem "designed to tax the stamina of even the more experienced performer."[486] Of the seven pieces, number six – *Quarndansen: Danse suedoise* – catches our attention. In the tenth of the twelve variations we can see the first chord glissandos. (Ex. 3.70.)



Example 3.70. Abbé Vogler: *Quarndansen: Danse suedoise* (1798), variations 9 and 10.[487]

The theme is a little four bar andantino, described *lourdement* in between the staves. Different tempos are possible and with the many changes in character throughout the set - from 6/8 andantino (theme) to andante (Var.1), 4/4 gavotte (Var.4), 6/8 (Var.5), 4/4 march rhythm (Var. 6), 6/8 (Var. 7-11), *Phantasie* Allegro (Var. 11) and *Musette* (Var. 12 = theme) – it is hard to know which character variation 10 belongs to. It is not clear either whether the theme's *lourdement* is to be applied to the touch or the dancing character of the theme, nor whether or not it remains relevant for each of the variations. As such, we don't know whether the theme should be played in 2𝅗𝅥. or in 6𝅘𝅥𝅯, which of course has implications for deciding how fast the 'andante' should really be.

To keep a dancing rhythm in the theme and in the more rhythmically oriented variations, 𝅘𝅥𝅯=120 seems to hover towards the slower of the possible tempos. This would still – if barely – make the 32nd octaves and chords in variation 10 playable with regular fingering, i.e. individually articulated. It would make for a little study in wrist action, with prolonged first notes to give the wrist and arm some time to rest in between the runs. Such a study would comply with several of the other variations, which could be considered exercises on e.g. arpeggio playing (Var. 8), repeated chords in dotted rhythm (Var. 6) or chromatic single and double note lines in legato playing (Var. 7).

[485] "Pièces de clavecin faciles, doigtées, avec des variations d'une difficulté graduelle, pour servir d'exemple à l'école de clavecin."
[486] Grave 1986, p. ix.
[487] Reproduced from a microfilm at NL-Dhnmi (mf IVa/138). The original edition is at B-Bc (14211). Reprinted by permission.

Another line of thinking departs from the idea that Vogler would have intended the trills in variation 11 (where they are combined with an octave melody, all in one hand) as 16th notes.[488] The melody is in the exact same rhythm as the theme, and the written out trills show them to be intended as 16th notes. To make alternating 16th notes sound anything like a trill, and to comply with the allegro character of this specific variation, it seems appropriate to play in 2𝅗𝅥., with more than 𝅗𝅥.=60 (♪=180). To define the allegro this way could bring an andantino up to more than ♪=120, which would then necessitate glissando technique in variation 10. So the question of whether or not we have to do with glissandos in this piece depends on how fast one would want to play the trills, and on how to interpret the dance character of the theme and whether or not to apply that same character to variation 10.

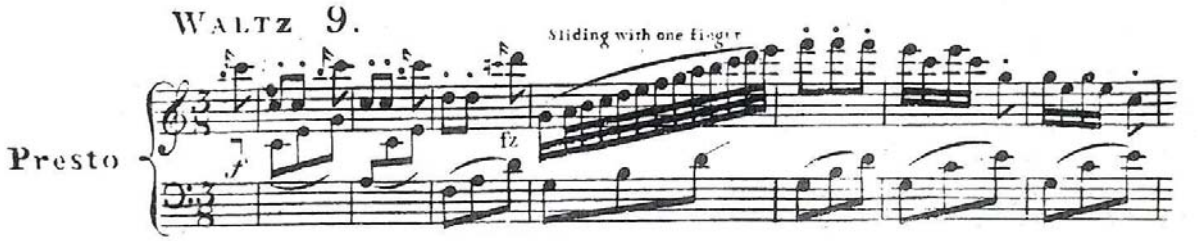
If the octaves and chords are intended as glissandos, they are certainly the most difficult yet in the history we have drawn so far. The upward octave glissandos end on the first note of a new glissando in the opposite direction, which asks for a very fast and accurate change of direction as well as change of the position of the thumb and 5th (or 4th) finger. The chord glissandos are less problematic in that respect (they rest on each first note of the next glissando), but the middle note of the chords needs the flesh of the third or fourth finger to glide over the keys. The last glissando is the most difficult of all: if the 5th finger is bent (to be able to hit the keys sideways with the nail), then the 2nd finger for the middle note – bent for the same reason – puts the whole hand in an almost cramped position.

The level of difficulty of the glissando technique in these instances may indicate that they were not meant to be played as glissandos. After all, the work was supposed to be "easy" with "variations of a gradual difficulty". Nevertheless, it is true that, on a contemporary instrument, the shallow key dip and key weight would make these difficulties much less of an obstacle compared to present day instruments. Moreover, Vogel was a renowned keyboard virtuoso, keen to surprise his audiences with dazzling effects and it is not clear either how far the gradations were to lead the pianist studying these pieces.
The conclusion is, once more, that even at the end of the 18th century, and with more and more examples of the glissando technique being explored, it is still sometimes impossible to be sure about whether or not we are actually dealing with a glissando.
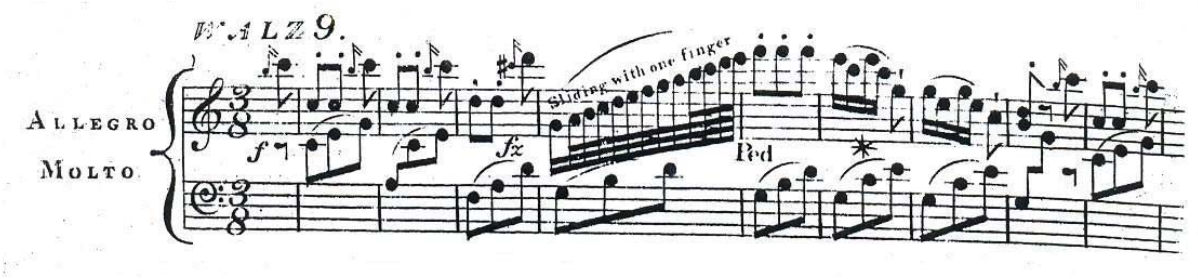
3.2.6.1.11 1798 Muzio Clementi: waltzes for pianoforte, tambourine and triangle

Between 1784 and 1802 Clementi lived in London, writing amongst others *Twelve Waltzes for Pianoforte with accompaniments for tambourine and triangle opus 38* (1798).[489] No manuscript of the waltzes survived[490], but they existed in several editions by different publishers.[491] It is interesting to see how different editors had different opinions concerning the metric division of a glissando. (Compare ex. 3.71 and 3.72.)

[488] See McKay 1993 (p. 11), referring to Vogler's *Clavér-Schola*.
[489] Tyson 1967, p. 78.
[490] Tyson 1967, p. 112: none of the autographs from which Clementi's published works were engraved appears to have survived, and doubtless he (or his publisher) simply threw them away.
[491] Tyson 1967, p. 78: originally "for Pianoforte, Tambourine & Triangle", a "new edition" for pianoforte and flute was added later. Even though if Tyson does not mention them, there have been several versions for keyboard solo.

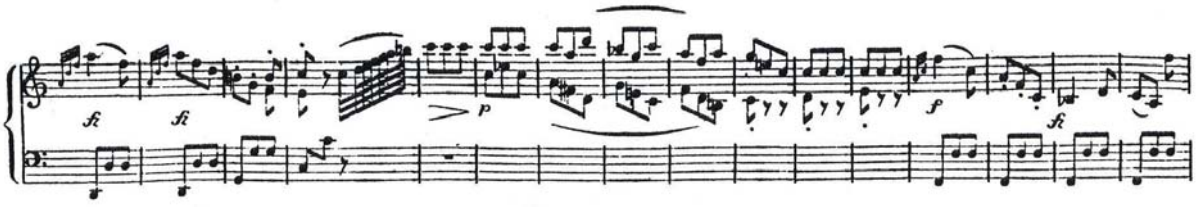


Example 3.71. M. Clementi: *Waltz* opus 38 nr. 9 (1798), Clementi & co edition (ca1805[492]), opening bars.



Example 3.72. M. Clementi: *Walz* opus 38 nr. 9 (1798), Clementi & co edition (ca1817[493]), opening bars.
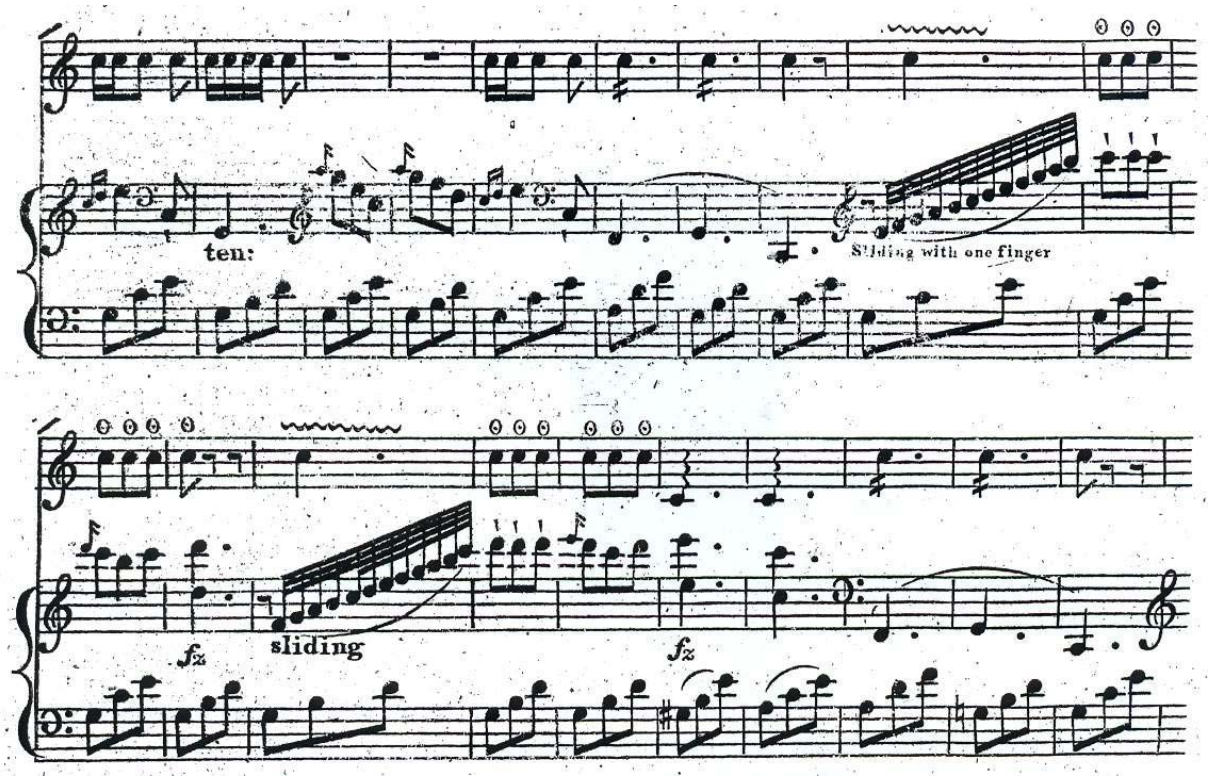
The earliest of these editions printed the glissando indication at every run it was relevant to, the other only six out of ten times. In yet another edition of this Clementi waltz, printed in the early 19th century in Leipzig, the performance advice for the glissando is in French – "avec un seul doigt" – and printed only once, leaving it up to the performer to question whether or not some of the other runs in this piece should also be played with one finger. (Ex. 3.73)



Example 3.73. M. Clementi: *Walze* opus 38, nr. 9 (1798), Leipzig edition by Breitkopf & Härtel (1813), bars 69-84.
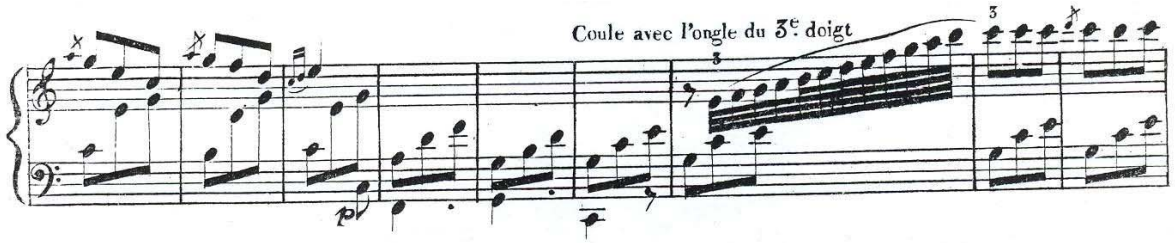
Clementi's next opus number was again a set of waltzes and, again, the ninth contains glissandos. The idea of an upbeat *tirata* is here part of the melodic material, as evidenced by the ornament of the main theme. (Ex. 3.74.)

[492] GB-Lbl g.323.h. Reproduced by permission.
[493] GB-Lbl g.141.gg. Reproduced by permission.



Example 3.74. M. Clementi: *Waltz* for piano, tambourine & triangle, opus 39 nr. 9 (1798), Clementi & co edition (ca 1807[494]), bars 9-28.

This second glissando waltz is found in another version also, this time published in Rotterdam and called *Valze* [sic] *Comique pour Pianoforte par M. Clementi*. Some of the glissandos are to be played crescendo, and if some of the *p* indications are still valid for the glissandos that follow (though this is not clear), then this edition shows quiet glissandos that are very rare in this period. More importantly in this chronology, however, is the fact that the glissando indication is again French but now specifies the use of the nail. (Ex. 3.75.)



Example 3.75. M. Clementi: *Valze Comique* [opus 39 n° 9] (1798), Dutch edition by Plattner (1800[495]). bars 11-19. "Glide with the nail of the 3rd finger"

The differences in the choice of words and layout show us how editors or publishers must have had a say in the way the glissando was indicated. Even in the first English editions, over which Clementi could certainly have exercised control, the indications differ from one to the other publication (if only slightly). Of the European editions it has been said: "there is nothing to show that such editions were anything but *Nachdrucke*, copied (directly or indirectly) from the English ones [...]."[496] From at least our perspective, this is obviously not completely accurate. Regarding the cooperation between Clementi and

[494] GB-Lbl g.270.t.(9.) Reproduced by permission.
[495] Edition L. Plattner 787, Rotterdam 1800. Reproduced from NL-Dhnmi 72 D 206 by permission.
[496] Tyson 1967, p. 19-20. No critical edition of the waltzes has been issued yet.

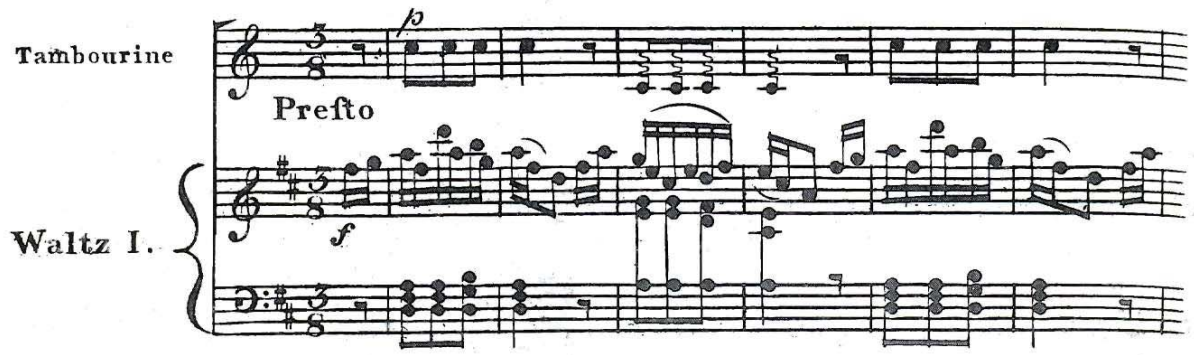
Breitkopf & Härtel we know that Clementi had planned to improve many of the pieces that were selected for this complete edition – possibly also the waltzes – but that this did not happen for the volume in which the little dance pieces were published. For these, "unrevised versions" were used, i.e. "inaccurate *Nachdrucke* of works published elsewhere."[497] We therefore do not know if Clementi would have "improved" the glissando indication by for instance applying it to every relevant run, or by having it translated from the English differently (e.g. to German) or not at all. In short: we cannot say to what extent the glissando indication was considered (by Clementi at least) to be the responsibility of the composer. The indication may have been considered a mere added value for the buyer of the score and not an essential and crucial part of the composer's musical communication. If it had been important to Clementi whether or not some run was performed by gliding over the keys, he might have wanted to control its indication more, even in commercial music for the amateur market.

It may be impossible to try and find out how and where Clementi got the idea to include the glissando in these pieces. We know that Mozart's K.V. 264 was circulating in London around the second part of the 1780's[498], and that Clementi had been very impressed after hearing Mozart improvise[499]. Haydn's weight on London concert life in the early 1790's may have put his *Fantasie* or piano concerto within reach of Clementi's ears.[500] Certainly Scarlatti's keyboard music had been around in London for decades, though it is not clear whether the ones with the "con dedo solo passages were among them.[501]

Such direct connections with other composers' music are most likely irrelevant, however. Clementi was a great enough pianist to have discovered the glissando independently. That he used it only in two little waltzes, and not in any other and more 'serious' work, says more about the status of the glissando. His waltzes were actually sometimes referred to as "sonatas" or "sonatinas"[502], but they were undoubtedly written to serve the amateur market. This link between the glissando and the amateur repertoire brings out two aspects of the late 18th and early 19th century glissando that will prove to be of further value. Some have found that "the best of Clementi's keyboard music of the 1790's is as good – and the worst as bad – as the decade has to offer" and that "at times Clementi seemed bent on publishing indiscriminately everything that came to hand."[503] The "wild fluctuations" in the quality of his music in this period seems to have been confusing for his contemporaries. Specifically reviewing the waltzes opus 38, some called it "nothing but wretched trash"[504] while others praised the "skill and invention of the author."[505] With hindsight colouring our judgement, it is easy to decide which reviewer to take serious, but it is a fact that these kinds of pieces were very much in vogue at that time. And Clementi jumped on the wagon, not only with the format of the waltz for the amateur, but also, more specifically, with the novel instrumentation of piano and percussion. Both opus numbers 38 and 39 are sets of twelve waltzes originally published for pianoforte, tambourine and triangle[506], a setting that he was the only composer to

[497] See Tyson 1967, p. 19 and 125-126.
[498] Eisen 1990, p. 186.
[499] Steptoe 1990, p. 124-125.
[500] Plantinga 1977, p. 147-151.
[501] Kirkpatrick 1953, p. 411 lists 16 London editions of Scarlatti sonatas and *Essercizi* between 1738 and 1800. In 1791 Clementi himself published some of these "Chefs-d'oeuvres, for the harpsichord or the piano-forte; selected from an elegant collection of manuscripts, in the possession of Muzio Clementi". (Quoted from Tyson 1967, p. 130). Ten of them are actually Scarlatti's (K. 378, 380, 490, 400, 475, 381, 206, 531, 462, 463 – none of which contains glissandi), one is Soler's and another one is unidentified. In France these pieces were later published as 'Douze Sonates Pour Clavecin ou Forte Piano. Composé dans le stile du célèbre Scarlatti par Muzio Clementi.'
[502] Plantinga 1977, p. 188, footnote 36.
[503] Plantinga 1977, p. 159-162.
[504] In the Allgemeine musikalische Zeitung of 1799, as cited in Platinga 1977, p. 160.
[505] In the Monthly Magazine of 1798, as cited in Plantinga 1977, p. 161.
[506] Platinga 1977, p. 161. The accompaniments were dropped in some of the later editions.

write for. In March of 1798, the virtuoso pianist Daniel Steibelt (1765-1823) had enamoured London audiences by introducing his pastoral rondo *l'Orage*. It didn't take long before it was more popular in the salons than *The Battle of Prague*, which says a lot, considering that no battle piece – in itself a popular genre – was to be published in more versions and editions than Kočžwara's.[507] At some point, Steibelt married a young English woman Catherine, "described as possessed of considerable personal attractions" and had her accompany him on stage with the tambourine.[508] This resulted in many dozens of bacchanals, waltzes and divertissements for the piano-forte with ad libitum tambourine or a combination of tambourine and triangle (ex. 3.76), even several waltzes for these solo percussion instruments and orchestra. The repertoire was apparently large enough for the couple to take on a yearlong tour of Europe from October 1799 onwards.[509] Most of Steibelt's pieces for this chamber music instrumentation are published after 1800, except a March that may have been written as early as 1796.[510] It is not clear whether Clementi took Steibelt's pieces as the model for his own waltzes or the other way around.[511] In any case, the genre became most popular and many waltzes for piano and this combination of percussion were printed around 1799.[512] It is this combination of unpitched percussion and piano that will prove most interesting for future reference in our investigations – the pages to come will demonstrate that this is not just a question of giving a spouse something to do with an instrument that is only percussion by coincidence.
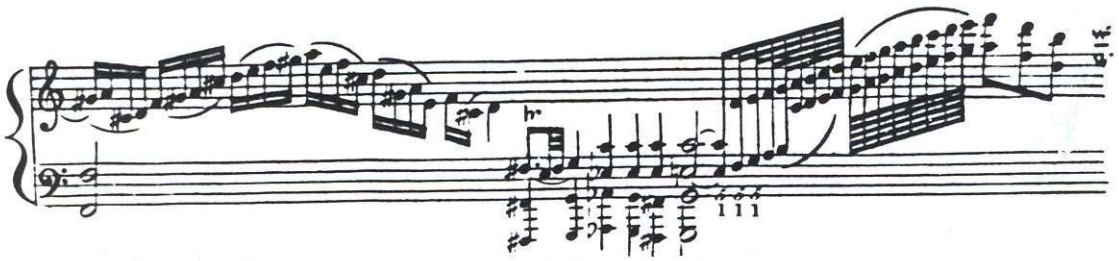


Example 3.76. D. Steibelt: *Twelve Waltzes for the Piano Forte or Harp, with an accompaniment for a flute, tambourine and triangle* opus 34 (1808), nr. 1, opening bars.[513]

[507] Schulin 1986, p. 27 and 35.
[508] Müller 1973, p. 29.
[509] Harasim 2002, p. 1379-1380.
[510] According to the list in RISM (and one set of serenades in the State Library at Munich), Steibelt's works for the piano and tambourine (with or without triangle) start with his opus 34 and end with opus 78, totaling 13 sets with more than 80 compositions, a few of them without opus numbers. These opus numbers seem unreliable to deduce any chronology from, but the earliest publication – opus 34 – is dated 1801. One march for piano and tambourine – 'La Grand Marche de Buonaparte en Italie' (Paris, Imbault) without opus number – could be from as early as 1796, since that was the year Napoleon conquered Italy. (From the listings of French publisher's plate numbers, one could only extrapolate 178X/179X.) It is likely that Steibelt wrote the piece right after this historic fact, since he settled in London near the end of that year and the French threat towards the English would have made it undiplomatic to write music in honor of Napoleon. We do not know when exactly Steibelt married (or met) Catherine.
[511] If Clementi didn't know Steibelt's piano and tambourine music specifically, or the success of his concert playing, he certainly knew of his music for he published one of his operas.
[512] In the British Library alone we found such compositions by A. Betts, J. Dale, G. Masi, T.A. Rawlings, J. Sanderson, even "Mozart."
[513] GB-Lbl g.231.(8.) Reproduced by permission.

As for the glissando, there are none in the works by Steibelt, which number in the hundreds for pianoforte alone. For a composer so infatuated with effect, vanity and extravaganza, this seems odd. The reason for it may be found in his predilection for English pianos, though. Greater key-dip and key-weight made the English piano action less attractive for working out any interest in the glissando. This may be why we find so little of it in England altogether in comparison with the continent.

3.2.6.1.12 1803 Simrock's edition of Mozart's K. 264

About 25 years after Mozart wrote his variations on *Lison Dormait,* German publisher Simrock issued a score of the composition that shows how at least *he* was convinced that the run in sixths should be played by gliding with a fixed hand position. Simrock had published Beethoven's trios opus 1 and 2 but had not printed any specific glissando indication for the double octave run in opus 1 nr. 3 (see 3.2.6.1.5), nor for the passages in opus 2 nr. 3 (see 3.2.6.1.6). About a year before Beethoven seems to have thought of it for his opus 53, Simrock introduces repeated indication of fingering (*515151*) in the Mozart edition to define a glissando. (Ex. 3.77.)
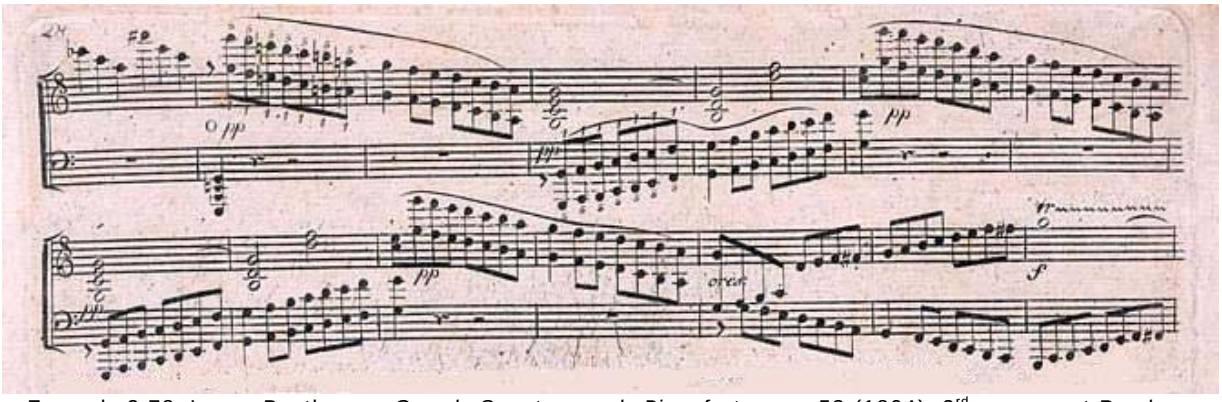


Example 3.77. W.A. Mozart: *Ariette Variée: No. 1* K.V. 264 (1778), Simrock edition (1803), end of the cadenza in variation IX.[514]

Contrary to the original, the run is here metrically divided in two sections. In a glided movement, this actually makes no sense. Simrock may have changed it for reasons of graphic design, preventing the upward stems to run into the staff of the left hand.
This is the earliest edition we found in which a publisher decides to clarify the presence of an extended technique.

3.2.6.1.13 1804 Ludwig van Beethoven: sonata opus 53

Since the Iberian "dedo solo" and the rare English "gliding" indications, few of the glissando issues as discussed above have been clear-cut cases due to the composer's lack of clear performance practical clues. This changes with the third part of Beethoven's opus 53, containing the first unequivocal indication of an octave glissando. There are several hints at glissando playing: the one set of stems for double notes written on one staff with rests in the other staff (to indicate that the runs are to be played by one hand), and the high tempo in combination with the legato slurs, but it is Beethoven's own indication of repeated fingering that eliminates all possible doubt. (Ex. 3.78.)

[514] Edition Simrock N° 288. Reproduced from a microfilm at NL-DHnmi (call number mf IV/778). The original edition is at the library of the University of Amsterdam, special collections, call number "Toonkunst-collectie Zz Moz-314". Reprinted by permission.



Example 3.78. L. van Beethoven: *Grande Sonate pour le Pianoforte* opus 53 (1804), 3rd movement *Rondo – Allegretto moderato,* bars 464-477.[515]

It had taken about a decade for Beethoven to return to the device he had explored in his opus 15. Whether or not the publication by Simrock of Mozart's variations in 1803 (see 3.2.6.1.12) reminded him of the double note glissando and made him decide to use it himself once again is up for speculation. As for the repeated fingering in the Simrock edition, Beethoven may well have been inspired to use it as a performance indication for the glissandi in his own new sonata[516], or Simrock and Beethoven may have discussed this aspect of glissando notation during the publishing process for opus 53. That such possible discussion might have taken place earlier and have led to the inclusion by Simrock of the *515151* fingering in the Mozart variations seems unlikely: if Beethoven would think of *515151* for an octave glissando, we would expect him to advise *313131* or *414141* for gliding in sixths.

Contrary to the concerto opus 15, this time we are discussing the glissando beyond a doubt.[517] Not only is the tempo too fast and are both hands continuously occupied, the fingering that Beethoven included in his manuscript clearly represents a gliding technique over any kind of individual legato octave playing.

It is tempting to see this glissando instance as part of a shift in idiomatic piano writing. Indeed, many passages in this work indicate that Beethoven moved away from the classical keyboard performance style. The trill plus melody in one hand (the "Beethoven trill")[518], the left and right hand together in the uppermost reaches of the keyboard[519], the use of the left hand over the right hand to play a melody that is actually typically right hand material while the accompaniment (in the right hand) is more typical for the left hand[520], the use of the damper pedal for bars on end while harmonies change[521], big orchestral chord writing[522]: these are all idiomatic devices Beethoven used for the first time on such a grand scale compiled in one work. On a closer examination of the

[515] First edition : Bureau des Arts et d'Industrie, 449. D-BNba Sammlung H. C. Bodmer, HCB C op. 53. All excerpts reproduced by permission.
[516] We found no evidence that Beethoven saw the 1803 Simrock edition of Mozart's variations K.264, but Beethoven's relation with this publisher was a long-standing and productive one, having started in 1793 with WoO 66 and including the publication of many works each year, among them his trios opus 1, the sonatas opus 2 and the concerto opus 15. It is therefore likely that he would be kept abreast of new Simrock editions of other composers' works.
[517] We will therefore not here include Czerny's 1842 remarks on this instance, but rather in the chapter on the 19th century. See 3.3.2.3.3.3.
[518] See third movement bars 54-60, 167-173, 336-339, 484-513.
[519] E.g. first movement, bars 69-73, 230-233.
[520] See the main theme of the third movement.
[521] See the main theme of the third movement.
[522] See third movement, bars 377-384.

spreading of his idiomatic writing for the piano, we find that most of the novelties mentioned above can already be found in the *Fünfzehn Variationen mit einer Fuge* opus 35.[523] It is not the amount of idiomatic novelties that make opus 53 a new departure, nor is it the essence of each single technique itself, but rather the more general approach towards keyboard writing. With this sonata, Beethoven introduced a "stile concertante" in the piano sonata as he had in the violin-piano literature with his *Kreutzer* sonata for violin and piano opus 47. There is another connection to the *Eroica* variations opus 35 worthwhile investigating in the present framework, if only more of symbolic nature than actual analytical value. Beethoven used the theme and variations of opus 35 for his third symphony opus 55, one of the key works in Beethoven's successful strive for finding and taking a new path. All which this symphony stands for – new ways of creating thematic material, new ways in orchestral instrumentation, new ways of organically manipulating form – can be found in the sonata opus 53, from its opening first theme (totally devoid of typical melodic characteristics) to the second theme (in itself the most basic of melodies, enhanced only by impressionistic harmonic support), and from the formal unification of the three movements to the new approach in keyboard instrumentation.

The presence of novelties in passage playing and formal innovation do not satisfactorily explain why there are octave glissandi in the final movement, neither does the idea of a concerto style provide a strong enough link with his C major piano concerto written so many years before. We need to look at yet three more remarkable aspects of this sonata to shed some light on the glissando instance of opus 53. First, the work exhumes a new array of colors. For the first time, Beethoven (and, to our knowledge, for the first time in the history of keyboard repertoire) uses the dynamic marking *ppp*.[524] He herewith extends the dynamic range of the instrument and does so towards the soft side. In fact, the softer dynamics are overly dominant in the whole sonata. From the opening of the first movement and both of its main themes to the majority of the themes in the second and third movement, *pp* is by far the most occurring dynamic marking. Roughly counting, there are approximately 240 bars in *pp*, while some 160 are *ff* (not including in either count the bars with crescendo and diminuendo). Combining this fact with the specific and abundant use of the damper pedal – a first in Beethoven's sonata movements – this amounts to the realization of a color pallet as never heard before in piano music. It is in this respect that the octave glissandi – all in *pp* – are revealed as one more way to extend the timbre of the instrument into the ethereal, the fantastical and the impressionistic.

As for the instrument for which Beethoven intended opus 53 – the second contextual clue – there is a definite relation between the composition and the Érard pianoforte that came into his home in 1803. The sketches for the sonata date from in between the moment the instrument arrived and the time his enthusiasm about it was reported and it is clear that Beethoven was influenced by this piano when composing his sonata.[525] Compared to the works from the previous years, scoring that is disadvantageous to the Érard action or that specifically compensates for weaknesses in the sonority of German and Viennese pianos is strikingly lacking in opus 53. The ease with which the damper pedal on the Érard could be held down for a long time (compared to keeping a knee up against the levers of late 18th century Viennese pianos) must have enticed Beethoven to find a way to experiment with this advantage. In total, it is hard to deny that the Érard, with its different timbre, and action as compared to the pianos Beethoven was used to write for and play on[526], had a decisive influence on the way Beethoven composed opus 53. The influence of the Érard on the writing of opus 53 explains the soft dynamic prescribed for the glissandos in the finale: the Érard's tone was superior and fuller than a Viennese or

[523] The "Beethoven trill" was used already in the variations WoO 40 (published in 1793). See Skowroneck 2007, p. 368-369.
[524] At bar 460 of the third movement, right before the glissandi.
[525] See Skowroneck 2007, p. 171-187.
[526] Skowroneck 2007, p. 144.
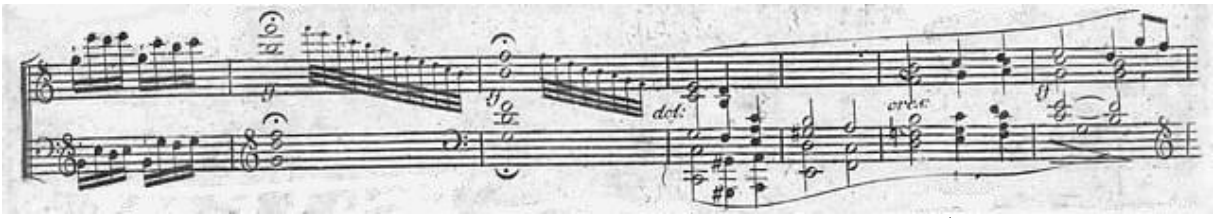
German instrument, especially in the bass.[527] This allowed for softer dynamics without losing body of tone, hence the *ppp* (starting in the bass) and the first known glissandi in *pp*.

The presence of an Érard in Beethoven's house can explain the *way* he wrote the glissandi in opus 53, but not *why* they are there in the first place. Even if the sonata can – to a point – be seen as a compilation of experimental keyboard scoring, the choice to include glissando writing is not necessarily the most logical one. In fact, the Érard had a heavier action and a deeper key-dip than the Streicher and Walter pianos of the time[528], so the new instrument did not specifically make it any *easier* to glide over keys. There are actually two musical reasons. First of all, the octave glissandos can be related to other C major runs in the sonata. They are in fact directly related to the upward scales of the characteristic left hand accompaniment to the Beethoven-trill variation of the main theme in the third movement. (Ex. 3.79.) The relation is motivic above all: it is impossible to know whether the fact that Beethoven used a glissando indication for the octaves in the finale (which would be impossible to play by individual articulation) excludes the technique when he does not indicate such fingering.



Example 3.79. L. van Beethoven: *Grande Sonate pour le Pianoforte* opus 53 (1804), 3rd movement *Rondo – Allegretto moderato,* bars 54-60.

Similar associations are possible between the glissandi and other passages in the other movements of the sonata. Apart from the accompaniment of the melody-with-trill in the last movement, there are few straight C major runs in this entire sonata, but in the first movement we do find three instances worthwhile looking at. In the coda there is a double fermata with two downward runs, the first of which just seems to be perfect for the glissando technique. (Ex. 3.80.)
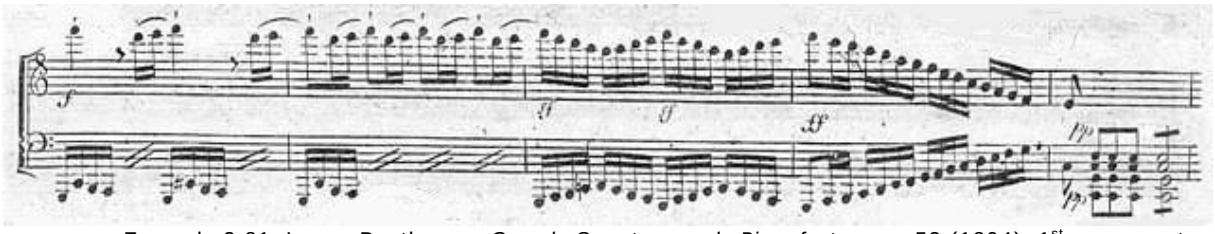


Example 3.80. L. van Beethoven: *Grande Sonate pour le Pianoforte* opus 53 (1804), 1st movement *Allegro con brio,* bars 280-286.

The first of two two-hand contrary motion double runs in the *Allegro con brio* movement can also be considered fit for glissando playing, especially as it reminds us so easily of the concerto opus 15 (a glissando with a prolonged first note leading the development section to the recapitulation). But in ex. 3.81 the running 16th notes are part of the motoric rhythm that characterises the well-known opening theme as much as the rest of the fast material of the first movement. The inability of a glissando technique to articulate subdivisions of metre would disrupt the general steady quarter note drive,

[527] Skowroneck 2007, p. 159
[528] Skowroneck 2007, p. 159.

perhaps most easily imagined when considering the last comparable instance of the first movement. (Ex. 3.82.)
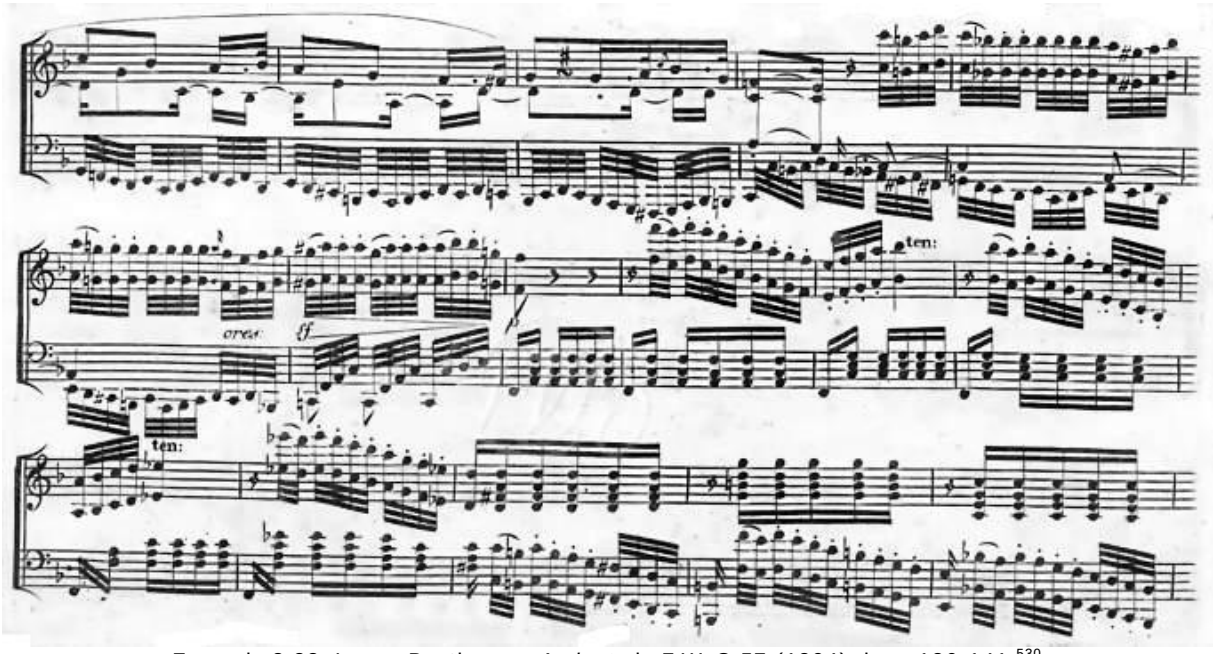


Example 3.81. L. van Beethoven: *Grande Sonate pour le Pianoforte* opus 53 (1804), 1st movement *Allegro con brio,* bars 151-155.
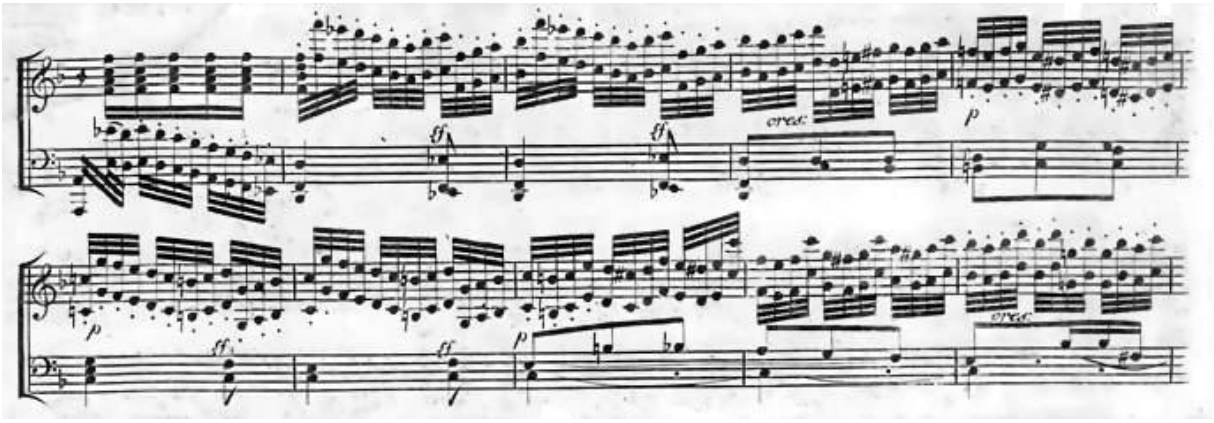


Example 3.82. L. van Beethoven: *Grande Sonate pour le Pianoforte* opus 53 (1804), 1st movement *Allegro con brio,* bars 296-300.

Even without the glissando technique these C major runs from the opening movement can be associated with the finale's octave runs. However, it is much more interesting and rewarding to consider the complete sonata in the way it was originally conceived structurally – another remarkable facet of this glissando instance's context, revealing the second musical reason for the inclusion of the octave glissandi. Initially, Beethoven had written an *Andante* as a middle movement. When playing the finished sonata for a friend, the comment was that the middle movement was too long and didn't fit the entire sonata. After careful consideration, Beethoven left out the original slow movement and wrote the *Introduzione – Adagio Molto* as we know it.[529] We shouldn't forget that the initial *Andante* was at first found fit to stand between the first and third movement and that – even if maybe not all three movements were composed in the final order, creating each with the previous movement in mind - all three were approved by Beethoven and found to fit with each other in a coherent whole. This makes it worthwhile to take a closer look at the original second movement, discarded by Beethoven in favor of the shorter, more transitional interlude we know as the actual second movement of opus 53. The original *Andante* was then published separately and is now known as the *Andante* in F WoO 57. When looking at it with the rest of the sonata in mind, it is the variation with the octaves that strikes us. (Ex. 3.83-84.)

[529] The story was published by Beethoven's pupil Ferdinand Ries and Franz Gerhard Wegeler in 1838 in *Biographischen Notizen über Ludwig van Beethoven*, and can be confirmed by the autograph score (see www.beethoven-haus-bonn.de → digital archives → Works by Ludwig van Beethoven → Pieces for two hands → Sonate für Klavier (C-Dur) op. 53 → Music manuscripts, Autograph, op. 53. Accessed on December 24, 2008.)



Example 3.83. L. van Beethoven: *Andante* in F WoO 57 (1804), bars 126-141.[530]



Example 3.84. L. van Beethoven: *Andante* in F WoO 57 (1804), bars 142-151.

The theme is in the left hand and the right hand plays long strings of staccato octaves. Even when stretching the tempo of the andante, these octaves are not for the amateur. They are both delicate (staccato in p) and fast. Czerny, who had studied the sonata with Beethoven, would later say of this octave passage in he *Andante*:

> The octave passage in the 2nd part is to be performed very lively and with bravura. All the rest with sensitively and with cheerful and tender feeling, in the approximate movement of a minuet.[531]

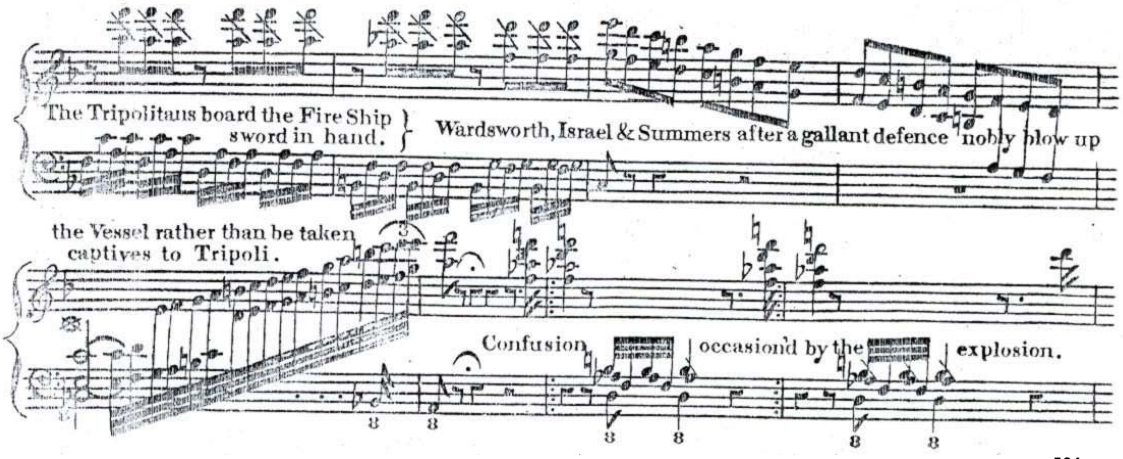
When thinking – and playing – the entire sonata with the andante as a middle movement – as Beethoven had done for his friend – one can see how one of the centerpieces of technical material in this sonata is the octave. From melodic to broken octaves, from

[530] First edition : Bureau des Arts et d'Industrie, 506. D-BNba Sammlung H. C. Bodmer, HCB C WoO 57 (a). Reproduced by permission.
[531] Badura-Skoda 1963, p. 62 (70 in the facsimile of Czerny's page numbering): "Die Octavenpassage im 2ten Theile ist sehr lebhaft un mit Bravour vorzutragen. Alles Übrige mit Zartheit und heiterm, zärtlichen Gefühl, ungefähr in der Bewegung eines Menuets."

staccato to glissando, from *pp* to *FF*, it seems as of Beethoven explored the octave in more aspects than ever before in one work. In that way, the octave glissandos in the third movement can be seen as a fitting apotheosis at a structural highpoint in this sonata. If Czerny's remarks are historically accurate, the glissandos in the finale can even be considered the reverse of the lively and bravura octaves in the *Andante*, and to be played as sensitively as the rest of the discarded middle movement. More importantly here, the glissandos are also a pivotal point in the history of the glissando: it is the first time the glissando is not only useful to the performer as a practical alternative to proper fingering or to the composer for descriptive reasons, but as a compositional tool that can be meaningful within the structural development of musical material.

3.2.6.1.14 1805 Benjamin Carr: *The Siege of Tripoli*

Benjamin Carr (1768-1831), son of the music publisher Joseph and nephew to the London instrument-maker Benjamin had immigrated to the US in 1793, where he became the most important and prolific US music publisher of the 1790's, earning him the honour of being called "Father of Philadelphia Music."[532] For the pianoforte he wrote salon pieces as well as significant pedagogical works (amongst which *The Analytic al Instructor* (1826), and *Short Methods of Modulating from One Key to Another*) and sometimes-virtuoso sonatas. One of these – *The Siege of Tripoli*[533]*: An Historical Naval Sonata for the Piano Forte* opus 4 (1805) – is of interest to us here. (Ex. 3.85.)



Example 3.85. B. Carr: *The Siege of Tripoli* (1805), bars 47-54 of the *Allegro Spirito* section.[534]

[532] Siek 2002, p. 185

[533] At the time the United States won its independence, the Maghrib states of the so-called Barbary Coast -- Tripoli, Algiers, Morocco, and Tunis – had been controlling the Mediterranean sea lanes by force since the 16th century. American merchants were no longer under the protection of British warships or British-paid tributes and were forced to pay tribute to the sultans for immunity. Hostilities broke when the pasha of Tripoli demanded a rise in the amount of tribute and president Jefferson revisited. In 1801, hostilities broke out and started the Tripolitan Wars or Barbary Wars. The Battle of Tripoli was a naval blockade that started in October 1803. When the frigate USS Philadelphia ran aground on an uncharted coral reef, the Tripolitan Navy captured the ship along with its crew and captain. In February, a captured Tripolitan vessel – renamed the Intrepid – was used by the American navy in a successful raiding party to destroy the Philadelphia and deny her use by the enemy. In July the Intrepid was packed with explosives and floated into the harbor with the intention of being blown up in the midst of the Tripolitan fleet. The plan failed and the crew perished in a premature detonation. The hostilities of this first Barbary War were ended with the capitulation of Tripoli on June 4, 1805. Despite a treaty exempting the United States from paying annual tributes, the conclusive end to the practice of paying off the corsairs came only with the Second Barbary War of 1815 (known also as the Algerian War). See Tucker 2003, vol. III, p863-865 and Buel Jr. 2006, p. 30-31.

[534] Edition G.E. Blake, Philadelphia, 1810.
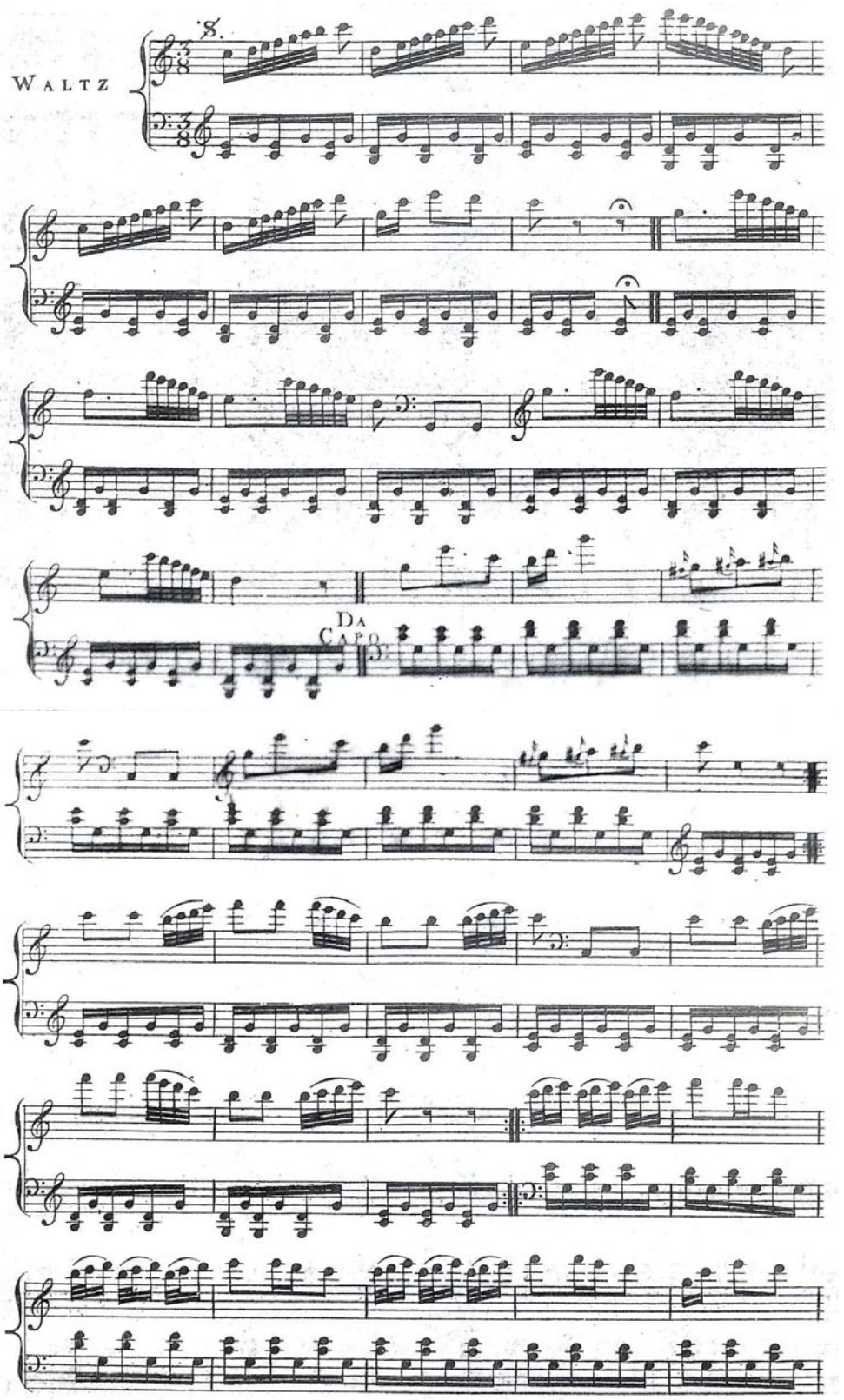
The glissando in 6^{ths} is accompanied by a footnote explaining the technique:

> Place the little finger on C and thum [sic] on E, slide up keeping the same position all the way.

Even without the footnote, it is clear that the run cannot be executed in any other way, unlike its counterpart in Mozart's variations on *Lison Dormait*. Interestingly, Carr's glissando is developed organically from a preceding passage in 6^{ths} just as in Mozart's cadenza, making us wonder whether K.V. 264 may have been known to Carr, who's father had published music for 20 years in London, where Mozart's variations were known.

3.2.6.1.15 ca1805 Anonymous: *The Celebrated One Finger'd Waltz*

A very special case in the early history of the glissando is the one-finger waltz by an as yet unidentified composer, issued in England at the beginning of the 19th century. It was published quite a few times afterwards and eventually became known as *Tartine de beurre* or *Das Butterbrot* "by Mozart." That both these later titles refer to the action of spreading butter on a slice of bread needs no explanation when considering the long and short back and forth sweeps over the keyboard. It is in fact a little study on what can be done on a keyboard with one finger as well as with the gliding action. (Ex. 3.86.) Not only do we find the conventional up and down glissandos (bars 1-6), there are also glissandos that start after a leap (i.e. with an open beginning – bars 9-15) or end with a leap (bar 27-28 and 31-32), and small ones of no more than three notes (bars 33, 35, 37). As everything is to be played with one finger, the idea of a glissando is extended to the appoggiaturas from a black to a white key (bars 19 and 23).
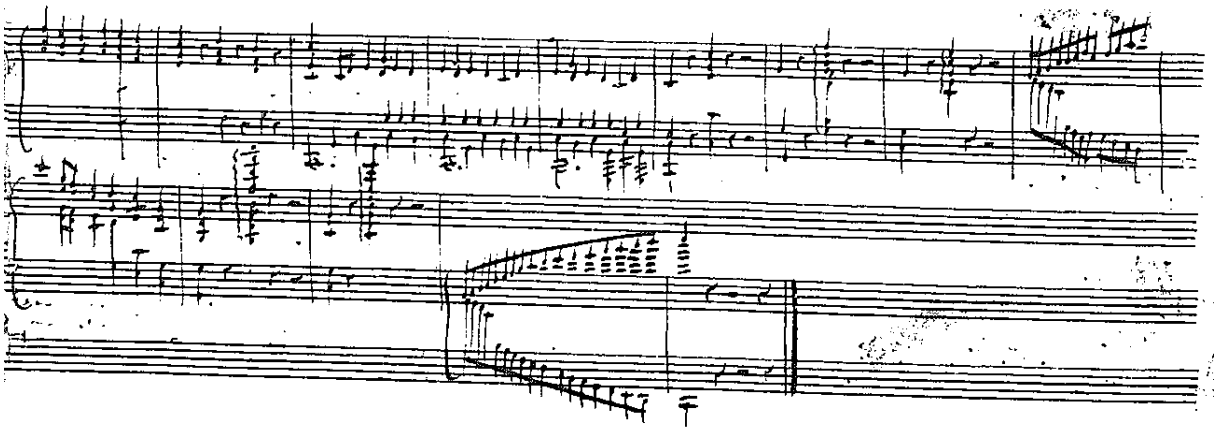


Example 3.86. Anonymous: *The Celebrated One Finger'd Waltz* (ca1805), bars 1-31.[535]

[535] GB-Lbl g.230.p.(8.) Reproduced by permission.

3.2.6.1.16 1808 Hans Georg Nägeli: *Toccatas*

Swiss composer and publisher Hans Georg Nägeli started issuing a *Repertoire of Harpsichordists* in 1803, featuring at first compositions by Clementi, Cramer, Dussek, Steibelt and Beethoven, later by Wölfl, Reicha, Tomášek, Liste an others. In 1808 he added twelve toccatas of his own to the list, perhaps written as early as 1805[536] and with each one dedicated to one of the composers of the series. Apparently Nägeli wanted "piano solos in the grand style", with "pianistic artifice" for the piano virtuoso.[537]

It is not indicated in the manuscript which toccata is supposed to correspond to which composer in the rest of the series. The first, second and fourth piece in the set of Nägeli toccatas contain an interesting and surprising variety of glissandos. In the first piece – in 3/2 – the ending irregularly combines 17 right-hand and 16 left-hand notes in what is likely a double contrary motion glissando. (Ex. 3.87.)
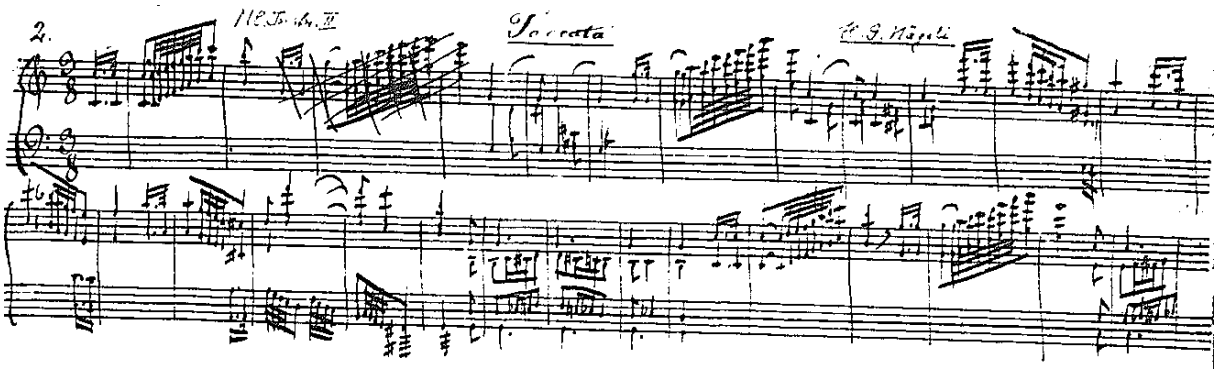


Example 3.87. H.G. Nägeli: *Toccata* 1 (1808), final bars.[538]

The second toccata is much more bold in the way it requires glissando playing. If the opening theme can be played with both hands, and if the answering downwards octaves (containing B♭'s in bar 13) can still get by on individual articulation, glissando technique quickly becomes inevitable. (Ex. 3.88. and 3.89.)
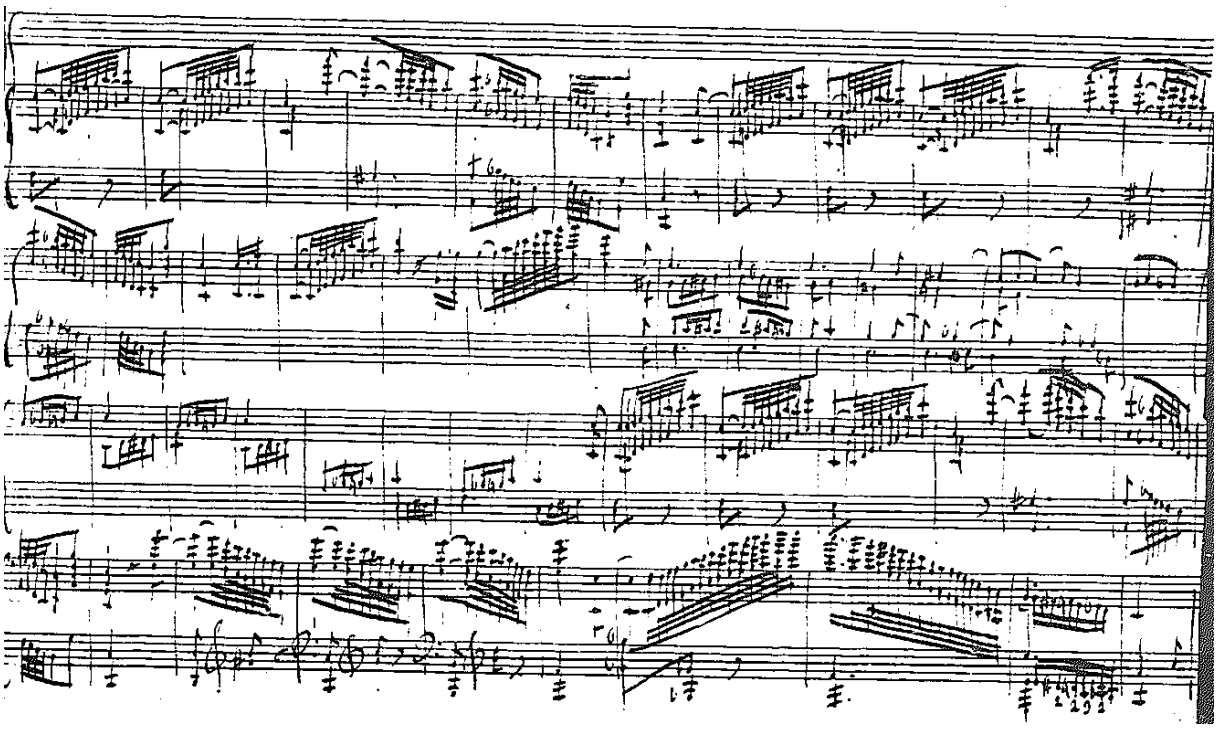
[536] On the top of one of the toccatas in the manuscript set (page '11'), the year 1805 is added. (CH-Zz Ms. Car XV 211.II:1-25.) The manuscript set has page numbers at each beginning of a composition; the total number of pieces is unclear (sketches are intermingled with complete pieces) and seem to surpass 12.

[537] „Es ist mir zunächst um Klavier-Solos in grossem Styl, von grossem Umfang, in mannichfaltigen Abweichungen von der gewöhnlichen Sonaten-Form zu thun. Ausführlichkeit, Reichhaltigkeit, Vollstimmigkeit soll diese Produkte auszeichnen. Contrapunktische Sätze müssen mit künstlichen Klavierspieler-Touren verwebt seyn. Wer in den Künsten des Contrapunkts keine Gewandtheit besitzt, und nicht zugleich Klavier-Virtuos ist, wird hier kaum etwas namhaftes leisten können. […]" See http://www.hug-musikverlage.ch/news/images/Hug_Verlag.pdf (accessed August 16, 2008) for the very little information on Nägeli and this series. In 1807 Nägeli's publishing house became Hug Verlag, which is still extant.

[538] All Nägeli examples are from CH-Zz Ms. Car XV 211.II:1-25. Reproduced by permission.
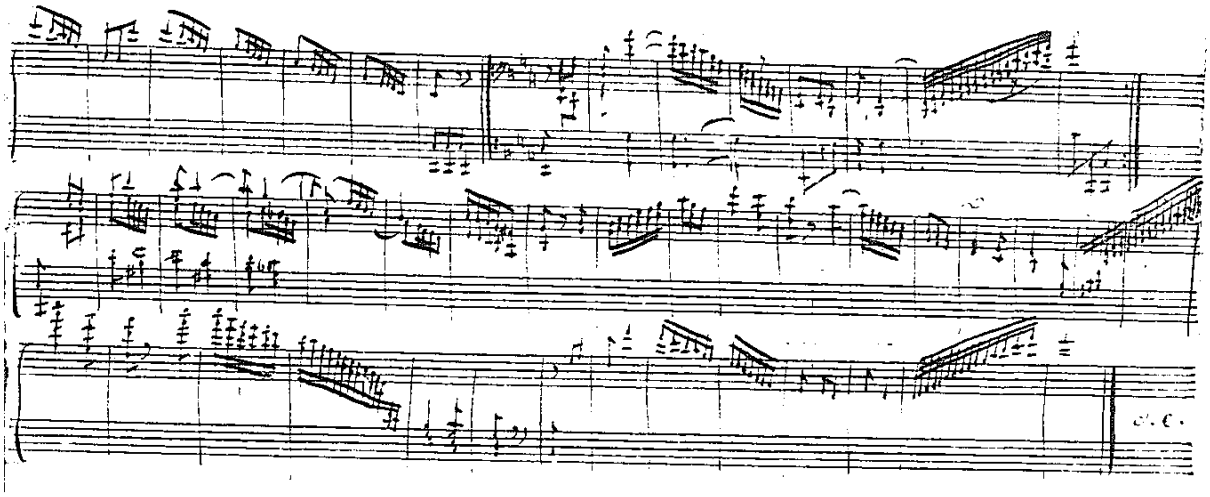


Example 3.88. H.G. Nägeli: *Toccata* 2 (1808), opening bars.



Example 3.89. H.G. Nägeli: *Toccata* 2 (1808), bars 59-109.

21 bars before the end, a two-octave sweep takes the right hand up to the high C as an upbeat to an even longer downward glide. The rhythmic notation is worked out with care, an aspect that is much less present in the fourth toccata. There, the difference between individually articulated thirds and glissandos in thirds is not without doubt. (Ex. 3.90.)

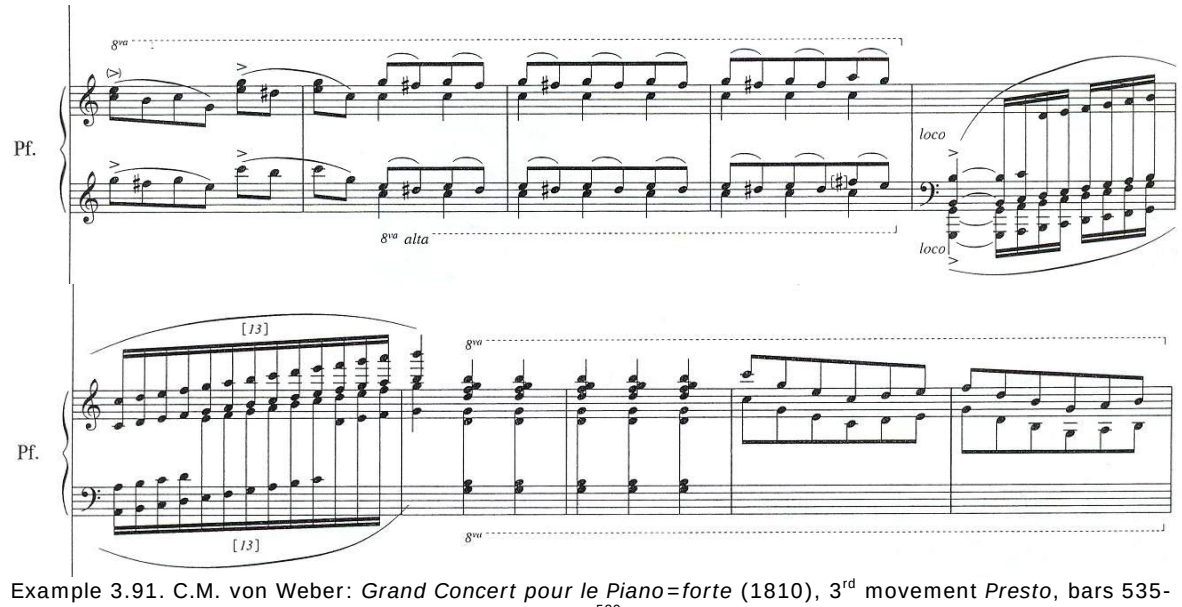


Example 3.90 H.G. Nägeli: *Toccata* 4 (1808), bars 61-107.

The tempo is never indicated in Nägeli's toccatas, though coherence between the sections is implied. The opening eight note sequences (one harmony per bar) of this fourth toccata suggests a lively tempo, which seems to end up in requiring glissando technique in at least bar 74. Bars 93, 97 and 106 each also have 14 to 15 note runs but in principle as well as in practice, these latter three runs could be played with both hands: the left hand staff is conspicuously empty from bar 80 onwards. It is difficult to say in how far the compositions in manuscript represent completed ideas, with quite a few crossed out bars, sketches and pieces left unfinished. Apart from a few pieces at the end (in different handwriting), none of the toccatas have any indication of tempo or character.
We know little of Hans Georg Nägeli. Whether he could play what he wrote or saw his toccatas as the result of a more theoretical line of thinking about virtuosity is food for more research into the life and works of this obscure composer.

3.2.6.1.17 1810 Carl Maria von Weber: *Grand Concert pour le Piano=forte*

The octave glissando in Beethoven's piano concerto opus 15 is followed up eagerly by his successors in their own virtuoso piano concerti. In the third movement of Carl Maria von Weber's 1810 C-major *Grand Concert pour le Piano=forte* (opus 11 in the 1812 first edition by Offenbach, opus 18 in Weber's own catalogue), we encounter a three octave-long ascending 2-hand double octave glissando, a third apart. (Ex. 3.91.)



Example 3.91. C.M. von Weber: *Grand Concert pour le Piano=forte* (1810), 3rd movement *Presto*, bars 535-36.[539]

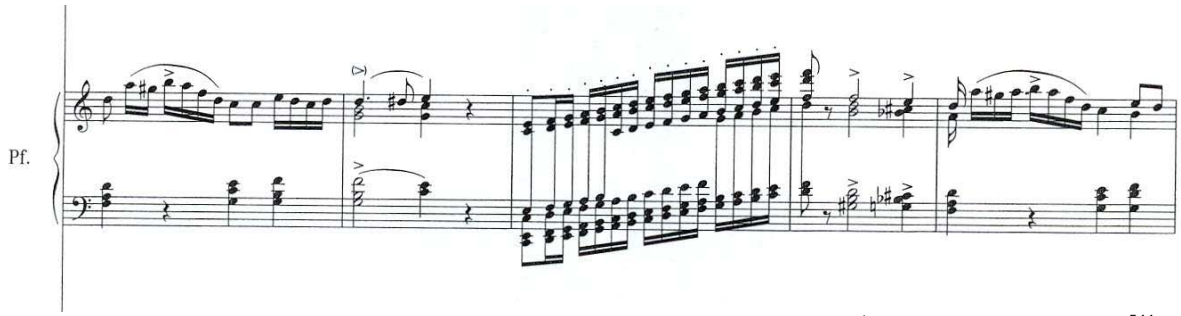
There is no direct indication of these runs being glissandi, but the stressed and prolonged first octaves, the irregular number of notes (thirteen 16th notes over three beats) and the high tempo (*Presto*) makes gliding over the keyboard practically the only way to realize this passage without breaking down the finale's moto perpetuo character with its continuous metric stress. The slurs over the notes may be an added clue as to the legato manner, ergo glissando technique, of this long sweep over the keyboard.

According to Weber's, the finale specifically was finished on May 22nd 1810 in Mannheim. It puts the concerto in between his position in Stuttgart (which ended in 1810) and his appointment as Kapellmeister in Prague (1813), right in his years of travel as an established virtuoso of international renown.[540] Weber (1786-1826) played his concerto until 1821, and with great success, leading to requests for further works as well as tours. Critics applauded the "delightful and irresistibly captivating wit and originality" of the finale, marking "this composition as among the most successful of its kind, very distinctively from the general run of such concertos."[541]
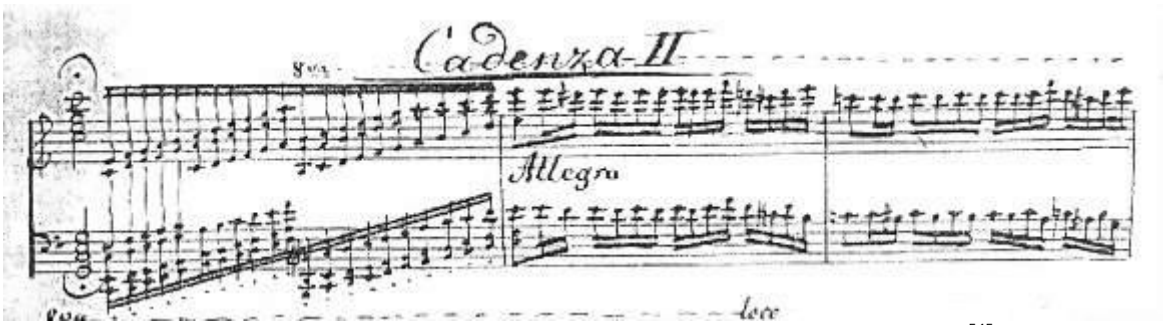
We know that von Weber had bought a copy of Beethoven's E-flat concerto opus 73, but we don't know whether he knew opus 15. [542] At any rate, Weber had had lessons with Abbé Vogler as a boy, in Vienna from the fall of 1803. He mostly studied the analytical side of music, but also made the piano reduction of Vogler's opera *Samori*. In spring 1804 Vogler recommended the 17-year old Weber for the position of Kapellmeister in Breslau, which he took up between July 1804 and June 1806. During the fall and winter of that year, he travelled to Karlsruhe to enter the service of the Duke of Württemberg; at the end of February 1807 he changed to become house- teacher and private secretary of the Württemberger king Friedrich I. At the end of February 1810, he reunited with Vogler in Darmstadt for one more year of lessons, together with (amongst others) former co-student Meyerbeer. Vogler had become court Kapellmeister there in 1807 and had established once again a *Tonschule*. These lessons led to Weber's compositions of the one-act *Abu Hassan* and the first piano concerto.

[539] Carl Maria von Weber, Complete Works, series V, volume 4a, Schott 2006. Reproduced by permission of Schott Music GmbH & co. KG.
[540] Warrack 2006, p. 119.
[541] From the review in the *Morgenblatt für gebildete Stände*, 15 December 1810. As quoted (and translated) in Warrack 2006, p. 126.
[542] Alberti 1959, p. iii.

Musically, the double octave glissando is quite different from the way Beethoven used the technique in his opus 15, but it is akin to the octave glissandi in the sonata opus 53 by its – however slight – formal integration in a multi movement composition. Von Weber's two-hand glissando echoes the staccato chord run in bar 76 from the concerto's first movement (finished on September 24th, composed after the second and third movements) as well as in one of two cadenza's that may have been intended for this concerto[543], *and* at the end of the development section, where the downwards version of the triple-thirds-run – now confidently heralding the recapitulation – reminds us all too well of Beethoven's opus 15. (Ex. 3.92 and 3.93.)



Example 3.92. C.M. von Weber: *Grand Concert pour le Piano=forte* (1810), 1st movement, bars 74-78.[544]



Example 3.93. Cadenza for C.M. von Weber's first concerto, opening bars.[545]

Different from any Beethoven glissando, the Weber opus 11 instance would be the first two-hand glissando to be found, and certainly a rare double octave glissando (the only one we have encountered). It is also the first ascending long octave glissandi we could find. At least as far as performance technique is concerned, this is noteworthy. All previous Beethoven octave glissandi were inwards, which is the easiest direction to play octave glissandi in, both in forte and piano dynamics. Going inwards, the surfaces of the thumb's nail and of the flesh of the pink finger are ample for attacking the keys sideways. Going outwards on the keyboard, the pianist only has the little nail of the fifth finger and the flesh of the thumb, both of which are less comfortable and more dangerous to harm then the inward octave glissandi.

In September 3rd 1811, another performance of this first concerto featured von Weber playing its first and second movements, followed by the newly finished finale from his second concerto. The reviewer noticed the difference in character and von Weber himself concurred, stating that the new rondo (taken from the second concerto) was "much more brilliant and more difficult than the former" (from the first concerto). No review or contemporary comment is found regarding the original rondo and the impression its

[543] The authenticity of these cadenzas is disputed. See Warrack 2006, p. 128-130.
[544] Reproduced by permission of Schott Music GmbH & co. KG.
[545] As reproduced in Carl Maria von Weber, Complete Works, series V, volume 4a, p. 129 (Schott 2006). Reprinted by permission of Schott Music GmbH & co. KG.
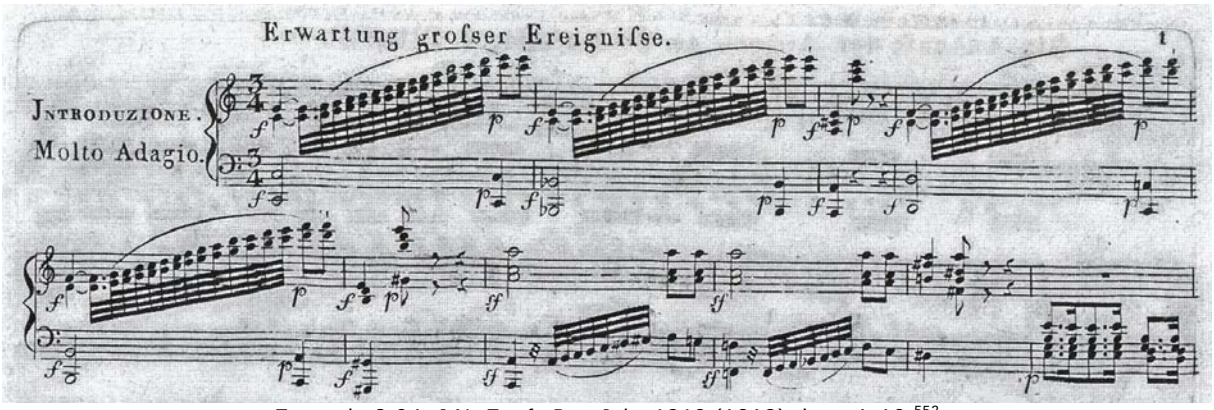
double octave glissando may have made on the audience. Physically, the performer cannot but change his posture to execute the glissando passage, something that must be noticeable even with the most impressionistic of a pianist's expression at the keyboard in the rest of the performance. Apparently, the finale with the octave glissandi was not regarded as extremely demanding by von Weber, who considered the finale of his second concerto – devoid of such ergonomical virtuosity – much more difficult.

Difficult or not, this concerto with its parallel octave glissandi knew not only great acclaim at performances by Weber, it must have been played many times over by his colleagues and successors. The first publisher – André – issued an extraordinary number of editions and reprints well into the second half of the century[546], in versions for piano with orchestra as well as for piano with string quartet, two piano's and piano solo. Others published a large number of competing editions and arrangements from as early as the 1830's to as late as 1959, when the first printed score of the concerto was published in the Eulenburg Series. One of these editions was Reinecke's "Clavier-Concerte alter und neuer Zeit" with works by Bach, Beethoven, Chopin, Dussek, Field, Henselt, Hummel, Mendelssohn, Mozart, Reinecke, Ries, Schumann, Weber and for use "at the conservatory of music in Leipzig." Weber's concerto clearly was a great and constant success throughout the 19th century, both on the stage and in the pianist's collective memory.

3.2.6.1.18 1813 Johann Nepomuk Zapf: *Das Jahr 1813* (I)

Born in Mondsee, Johann Nepomuk Zapf (1760-1831) went to live and work in Vienna in 1784, to Linz in 1789, to Brünn in 1800, to Graz in 1801, and again to Vienna as music teacher from 1806 on. Next to stage works, he came to the foreground especially with a diverse array of programme music for the keyboard.[547] We know of several such compositions of his, e.g. *The big storm in Vienna in 1807*[548]*,The Quarrel – a domestic marital scene in 8 characteristic variations*[549] or *The battle at Leipzig or Germany's liberation*[550]*.* One other such of Zapf's works especially concerns us here (and some more in the pages to come): *The year 1813*, which he specified in the subtitle to be an *essay on a musical representation of a few war events in this remarkable year*[551]*.* This is an extensive piece, probably the longest battle piece for piano, with 271 bars for the first part and 457 in the second part. At this point in our investigations we only need to touch upon the very first bars: here the emotions this introduction is announced to portray – *anticipation of great events* – coincide admirable with the fact that we now encounter the first glissandos in thirds in the piano repertoire. (Ex. 3.94.)

[546] Not counting reprints, there were new editions by André in 1822, 1828, the 1830's and the 1850's. See Warrack 2006, p. 130-136.
[547] Boisits 2007, p. 1339-1340.
[548] *Der grosse Sturm in Wien im Jahre 1807. Eine Karakteristische Schilderung* (1808).
[549] *Der Zwist. Eine häusliche Ehestands-Scene in VIII charakteristischen Veränderungen.* (No date was found.)
[550] *Die Schlagt bey Leipzig oder Deutschlands Befreiung* (1813).
[551] *Das Jahr 1813. Versuch einer Musikalischen Darstellung einiger Kriegs Begebenheiten in diesem Merkwürdigen Jahr.*



Example 3.94. J.N. Zapf: *Das Jahr 1813* (1813), bars 1-10.[552]
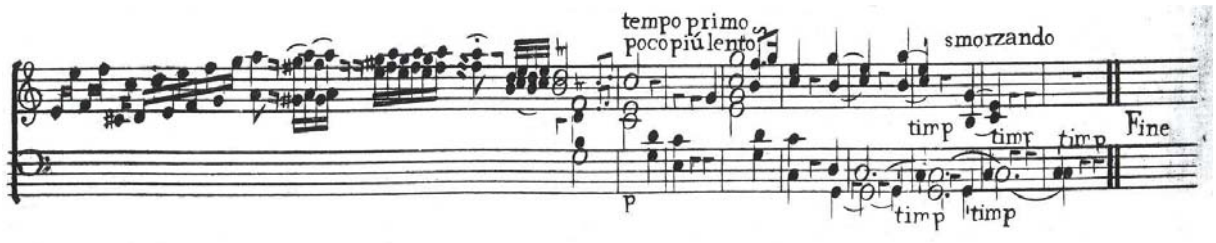
3.2.6.2 Extending the keyboard interface

3.2.6.2.1 Friedrich Wilhelm Rust (1739-1796)

The dates of Haydn's, Rust's and Mozart's lives encase each other completely. The musical environment of this era is also completely Rust's: with shifts from "gebundener" to "free" style, from objective to subjective music, from static to developmental principles, from terrace to transitional dynamics, from polyphony to homophony, from courtly to civil music and from the collective to the individual sentiment, his works mirror general but fundamental changes in musical aesthetics.[553] But Rust has furnished the musical repertoire with some strikingly individual contributions as well. Surrounded by the surf of the new, he was at one point ridden by a very singular wave indeed, having written what seems to be the first music for keyboard that requires extending it beyond its proper self.

3.2.6.2.1.1 1791 *Allegretto grazioso con Variazioni*

At the very end of the *Allegretto grazioso con Variazioni per il Cembalo* (circa 1790, 1791 at the latest)[554], we notice several indications *timp*. (Ex. 3.95.)



Example 3.95. F. W. Rust: *Allegretto grazioso con Variazioni*, final bars.[555]

[552] Publication of the first part of this composition: Wien Capri, Nr. 1592. (D-Mbs 4° Mus. Pr. 32796/1 – reproduced by permission). The second part was issued by Wien Capri as Nr. 1593.
[553] Czach 1927, p. 156.
[554] Czach 1927, p. 68

These *timp* indications necessitate a technique whereby an already depressed key is hit again, by another finger. At least that is what can be deduced from the sonata for clavichord that Rust wrote in 1792 (see 3.2.6.2.1.2), where the technique is explained in the performance practice notes preceding the score. When, on a clavichord, a key is kept down with one finger and then hit upon with another finger, the force of the second finger's impulse travels through the key and the action all the way up to the string, making it vibrate (again). Physically this is only possible when the tangent of a depressed key keeps pushing against the string for as long as the key remains depressed. Any new pulse emanating from that key will cause a sound because the tangent and the string are still connected to each other. On a harpsichord (and a pianoforte for that matter) this is out of the question because the action does not provide a "live" link between key and string after the key has been depressed. Therefore, the *timp* technique in the 1791 *Allegretto* gives the unpitched percussion sound of a finger hitting the wood of the key.

There is no clear trace of why and whence this technique suddenly appears, and without any explanation as to its performance practical aspects. It may be that this technique was known enough not to need any such guidance, or – more likely – this set of variations was written after the clavichord sonata to which we now turn our attention.

3.2.6.2.1.2 1792 *Sonata* in G Czach 23

3.2.6.2.1.2.1 The techniques

In the performance practice notes on the first page of his manuscript of the *Sonata per il Clavicordio all Imitazione de Timpani, del Salterio e del Liuto*[556], Rust lists and explains four effects which he relates to and names after three instruments:

- [a] Timpani [tr ~~~~~]. One plays tremolo alternately with the right or with the left hand on the lowest bass strings, with the left it is to be on the cloth in the bass, which imitates the timpani in a very natural way
- [b] Muted Timpani. One keeps two bass notes, e.g. C-G in the bass, with the 1st and 5th finger of the left hand depressed, and beats on these notes alternately with the 4th and the 2nd finger of the same hand, which makes the timpani sound as from far away.
- [c] Psalterium. One keeps with one hand (mostly with the left hand) a chord depressed, and runs with the other hand lightly over the strings, or plays pizzicato as if on the lute of the Zitter.
- [d] Lute or Harmonic Tones. One lays the index finger of the right hand lightly over the middle of the string (counting from the cloth to the bridge) and plays with the left hand only, which gives the tones an octave higher, and which produces a lute-like sound.[557]
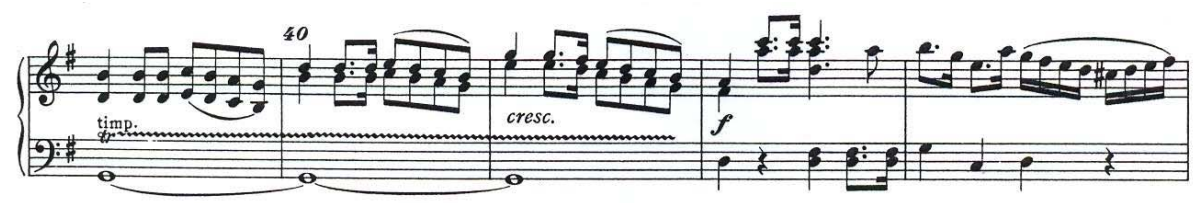
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[555] Manuscript on microfilm at NL-DHnmi mf IVa/114 (1). The original is at B-Bc (11730). Reproduced by permission.

[556] In his dissertation on Rust, Rudolf Czach added a thematic catalogue of most of Rust's known instrumental compositions. According to his numbering, the clavichord sonata bears number 23 – in the d'Indy edition it is number 9. This sonata is also mentioned in Friskin & Freundlich 1954, p. 160 were it is called sonata N°. 11.

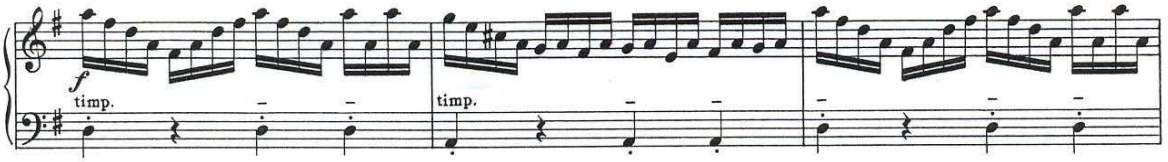
[557] 'Pauken [tr---------]. Man tremulirt wechselweise, bald mit der rechten, bald mit der linken Hand auf den tiefen Baßsaiten, mit der linken geschieht es auf der Betuchung im Baße, welches die Pauken sehr natuerlich imitirt.
Gedaempfte Pauken. Man haelt zwey Baßtoene, als z.Beispiel C_G im Baß mit dem 1sten und 5ten Finger der linken Hand niedergedrueckt an, und paukt auf die angehaltenen Toene wechselweise mit dem 4ten und 2ten Finger derselben Hand, welches die Pauken wie von weiten hoeren laeßt.

He calls this set of performance notes "explication of signs"[558], referring to the notation of these effects in the score. When comparing these explanations with the notation in the score, we can categorize the effects according to the following improper keyboard performance techniques:

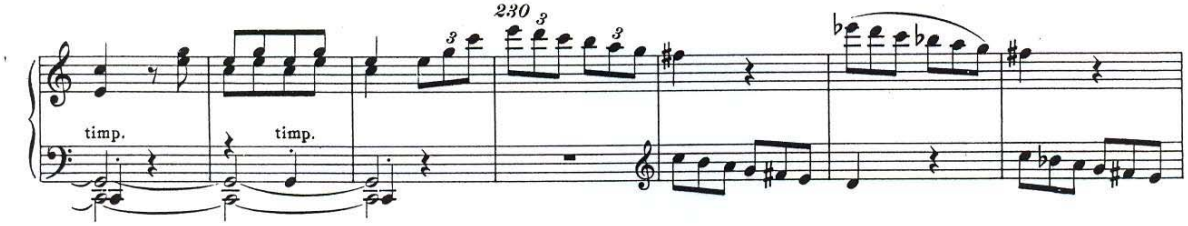
	TECHNIQUE	EX.	PERFORMANCE NOTE
1.	Tremolo on a string	ex. 3.96	[a]
2.	Tapping on a string / cloth	ex. 3.97	not "explained"
3.	Tapping on an already depressed key	ex. 3.98	[b]
4.	a. Plucking one string	ex. 3.99	[c], "Zitter" mode
	b. Plucking several strings simultaneously	ex. 3.100	[c], "Zitter" mode
5.	Glissando on the strings	ex. 3.101	[c], "Psalterium" mode
6.	Producing the 2nd harmonic on a string	ex. 3.102	[d]



Example 3.96. F. W. Rust: *Sonata* for clavichord Czach 23 (1792), 1st movement *Marcia*, bars 39-43.[559]



Example 3.97. F. W. Rust: *Sonata* for clavichord Czach 23 (1792), 2nd movement *Allegro*, bars 40-42.
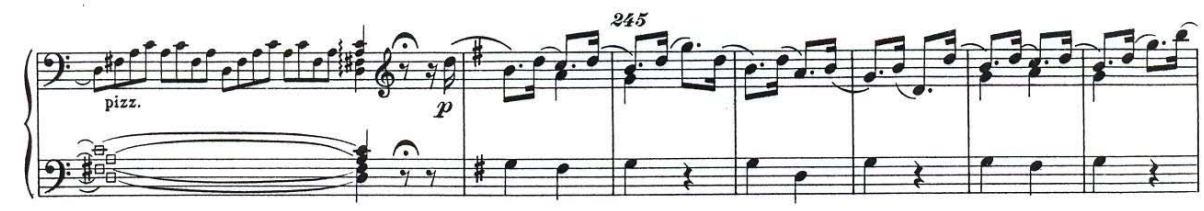


Example 3.98. W.F. Rust: *Sonata* for clavichord Czach 23 (1792), 3rd movement *Rondo*, bars 227-233.
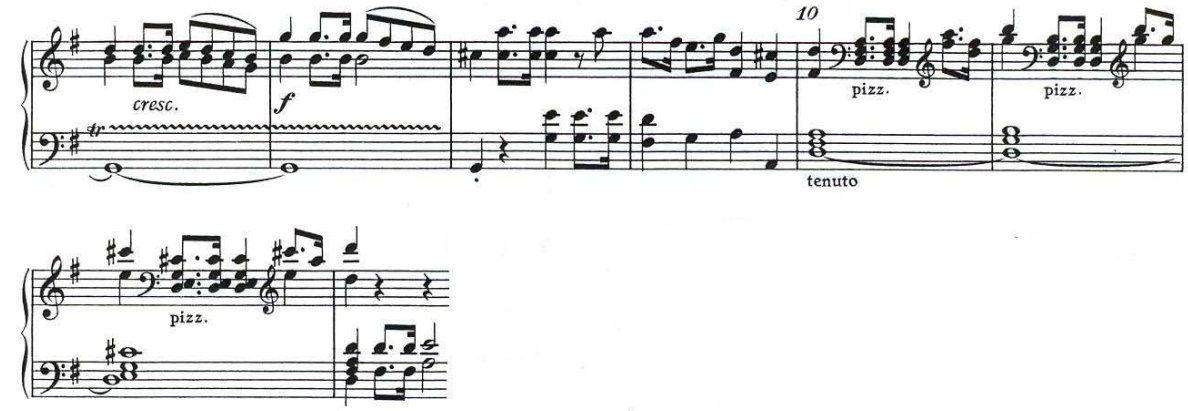
Psalterium. Man haelt mit der einen Hand (am gewoehnlichsten mit der linken) einen Akkord aus, und faehrt mit der andern leise ueber die Saiten, oder pizzikirt wie auf der Laute oder Zitter.
Laute oder Harmonische Toene. Man legt den Zeigefinger der rechten Hand leise ueber die Haelfte der Saiten (vom Tuche nach dem Stege gerechnet) und spielt mit der linken allein, welches die Toene eine 8ve hoeher angiebt, und einen lautenaehnlichen Ton hervorbringt.'

[558] 'Erklärung der Zeichen'

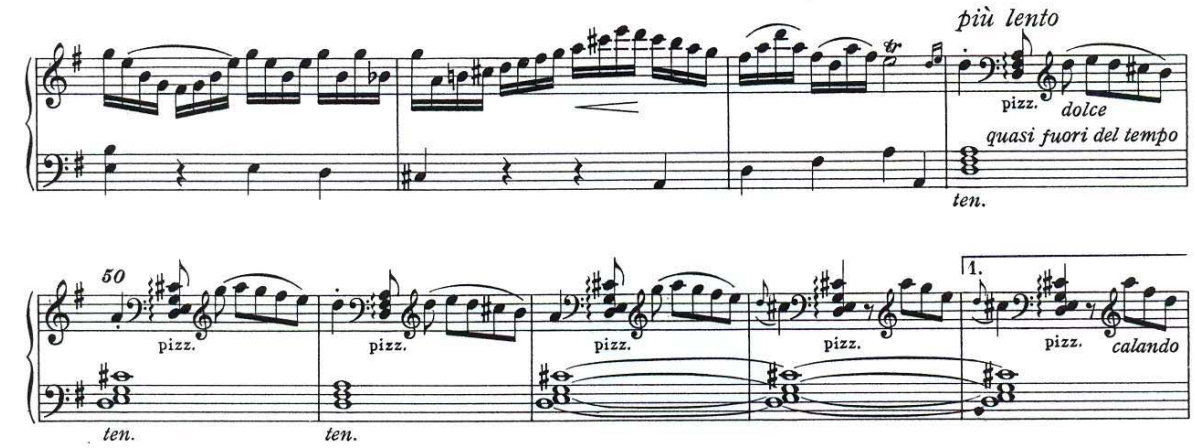
[559] Landschaftsdenkmale der Musik Mitteldeutschland. Band 1. Wolfenbüttel & Berlin: Georg Kallmeyer Verlag, 1939, edited by Rudolf Czach. Reproduced by permission.
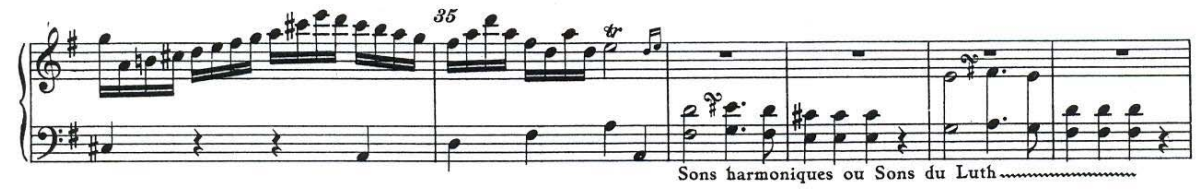


Example 3.99. F. W. Rust: *Sonata* for clavichord Czach 23 (1792), 3rd movement *Rondo*, bars 243-249.



Example 3.100. F. W. Rust: *Sonata* for clavichord Czach 23 (1792), 1st movement *Marcia*, bars 6-13.



Example 3.101. F. W. Rust: *Sonata* for clavichord Czach 23 (1792), 2nd movement *Allegro*, bars 46-54.



Example 3.102. F. W. Rust: *Sonata* for clavichord Czach 23 (1792), 2nd movement *Allegro*, bars 34-39.

At first sight, some of the techniques don't seem to match the notation in the score. The combined indication of pizzicato and arpeggio (ex. 3.101) does not immediately relate to the use of glissando technique. It would be impossible to retain any coherent tempo, however, if one were to perform a sequence of individual pizzicatos here. Rust undoubtedly meant to glide over the strings in the way a guitar player does, effectively

"plucking" at each string in a row. But our present day habit of thinking about the concept of a glissando as gliding from one tone to the next (which feels like the opposite to individual pizzicatos) makes the idea of a "pizzicato glissando" seem contra intuitive and even impossible: how to avoid the notes in between those that form the chord that is to be played glissando, then? When we put the technique in the light of the construction of the clavichord, more becomes clear. The action of a clavichord does not have an escapement mechanism, which means that the hammer stays pressed against the corresponding strings for as long as its corresponding key is depressed. This means that these particular strings are pushed upwards, whereby they protrude from between all the other strings. The consequence of this is that, from where he is sitting, the performer can very easily detect any string that needs to be plucked: it sticks out above the other strings. Because of this advantage, an arpeggio of pizzicatos can be executed by a glissando: since only one hand is available to depress the necessary keys, the chord will not be very large and the corresponding strings lay in each other's neighborhood. It is then easy to glide over the protruding strings without even hitting the strings in between. On a piano, there is first the noise of the finger(s) gliding over all the strings (which all lay on the same level and are all touched by the gliding finger), after which only those strings that are free to vibrate (because the corresponding keys are depressed) keep on sounding. Together, these freely vibrating strings form the sound of the chord that is depressed on the keys, and that sound "emerges" from the general glissando-noise that is made by the finger(s). On a clavichord, this sound emerges instantaneously and cleanly as there is no (or little) much noise produced by the movement of the finger(s) on those strings that are not part of the depressed chord. A glissando in this instance also enables the performer to play a pizzicato-arpeggio quickly and without risk, which in turn enables the composer to write swift sequences of passages to be played on the keyboard and on the strings. This is why Rust indicated an arpeggio of pizzicatos while the performance technique in such instances is in fact the glissando on the strings.

For the same mechanical reasons, if a chord is struck and held, one could pluck all the corresponding strings in one pizzicato and play a chordal pizzicato, as ex. 3.100 might be interpreted. The relatively high tempo and the fast dotted rhythm, however, make such a chordal pizzicato unlikely, and an arpeggio action is probably what Rust meant it to be, as in ex. 3.101.

The "muted timpani" is an evolved state of the technique that Rust had employed in the *Allegretto grazioso con Variazioni* the year before (see 3.2.6.1.1). The present technique is only possible on an instrument like the clavichord, because of its light and small action. When one hits an already depressed key, the energy of the hitting is carried all the way to the string and is making that string vibrate, thereby converting the impact of the hitting into a sound that corresponds to that key. On a piano, the mechanical action is too complex and heavy to carry such a tiny impulse so far. Furthermore, with this technique, the depressed key is hit by a finger from the same hand that has a finger holding that the key (see ex. 3.98). The distance between the hitting finger and the hit key is therefore small and so is the energy that is released upon impact. By the time this energy reaches the string of a piano, it is too small to make such a high-strung string vibrate. In nature, this technique is similar to the silently depressed keys in for instance Ligeti's 4th piano study *Touches Blocquées*. The essential difference is that the aim of Ligeti was to use the depressed keys to eliminate the sound of a note when it is played (adding a slight atmosphere of sound because of the sympathetic resonance created by other notes). Rust actually gives the function of the sound activator to the fingers instead of to the hammer.

The technique of "muted timpani" is not specifically indicated in the score. As we have seen, "timp." can mean both the tapping on the string (or cloth) and the tapping on a depressed key. As with many keyboard glissandi of this period, only the context provides confirmation of the one or other possibility. Here, Rust means "muted timpani" because tapping on the string is impossible at that very moment. (Ex. 3.98.)

One more remark regarding the performance notes is to be made. When explaining the timpani sounds, Rust emphasizes that with the left hand, "it is to be on the cloth in the bass", suggesting that with the right hand it would have to be on the strings. In the score, there is no indication of why there should to be a difference, but it is again the construction of the instrument that reveals the reason. In a clavichord the strings are all attached to the left side of the soundboard and run parallel with the keyboard. (In the piano the strings are perpendicular to the keyboard). This means that the cloth that is woven between the strings at the pegs is situated on the left side of the instrument. When one plays a tremolo with two fingers of the left hand on one string (or on one chorus), the hand and forearm can be kept in the normal playing position. When the right hand is used to tremolo, it cannot play on cloth on the right hand side because there is no cloth on that side. To tremolo on cloth, he right hand would have to play on the left side of the instrument's inside, moving over or under the left hand playing on the keyboard (Rust did not use timpani sounds without any regularly played notes sounding at the same time). This would force the right hand and forearm to be parallel to the strings and thus hardly able to play with two fingers on the cloth of one string (or chorus) without hitting parts of the cloth upon or under which other strings are strung. As with the muted timpani, the construction of the clavichord is such that hitting the cloth at the pegs of a certain string produces a sound that relates to that string.

3.2.6.2.1.2.2 Statistics

The clavichord sonata consists of three movements: a *Marcia*, an *Allegro* in sonata form and a *Rondo*.

Of the total of 492 bars (49 + 147 + 296), 162 contain the extended techniques (24 + 54 + 84). This is 1/3 of the composition: half of the first part of the sonata is using improper timbres, more than a third of the middle movement form uses unconventional effects and the Rondo counts the least number of bars using extended techniques. Broken down per technique, this gives us the following statistics:

- 75+ bars of tapping strings[560]
- 26 bars of glissando
- 24 bars with flageolets
  - 21 bars of double note flageolets
  - 3 bars of single note
- 22 bars of tremolo
  - 3 bars of right hand tremolo
  - 19 bars of left hand tremolo
- 9 bars of pizzicato
  - 9 bars of chord pizzicato
  - 1 bars of single pizzicato
- 4 bars of muted timpani

As for kinds of techniques per movement:

The *Marcia* has

i. Tremolo (long single handed as well as alternately left and right hand)

[560] the '+' serves to indicate the margin in counting bars. It is not always clear whether or not a sequence of tapping is continued in a certain bar but was not indicated due to the composer's oversight

ii. Pizzicato chords (triple and quadruple note chords)
iii. Double note flageolets
iv. Tapped strings

The *Allegro*:

v. Left hand longs tremolo
vi. Double note flageolets
vii. Tapped strings
viii. String glissando

The *Rondo*:

ix. Tapped strings
x. Flageolets (double and single notes)
xi. Left hand long tremolo
xii. String glissando
xiii. Quadruple note chord and single pizzicato
xiv. Muted timpani

From this we see that the first movement uses the most effects compared to its length; the *Rondo* highlights a wider range of effects and the middle movement, the *Allegro* (the most "complex" structure), uses the least amount and the smallest range of extended techniques.
All pizzicatos and string glissandi are in the right hand while the left hand holds the chord on the keyboard (with a *tenuto* indication) – even though Rust wrote in his performance notes that the psalterium effect required the chord to be "usually" held with the left hand.

As for register: The pizzicatos go up to $e\#^1$, the string glissandi up to c^1. The tremolos are all situated between *D* and *G*, the tapped strings between *D* and *e*, the flageolets between *G* and a^1. Cross referenced with the statistics of occurrence, we can safely state that the majority of extended techniques are in the lower half of the clavichord's range.

Except for three bars of broken chords in the bass and a number of instances were grupetto signs indicate fast ornaments (which may not be meant to be performed as flageolets), all the flageolets are double notes (thirds, fifths and mostly sixths)

The effects are used within a dynamic range from p to f, including crescendo (during some of the tremolo passages). As for the agogic, Rust prescribes deviations from the tempo for the glissando passages only: *quasi fuori del tempo*, *più lento*, *calando*, *quasi senza tempo*, *senza tempo* and one cadenza bar.

3.2.6.2.1.2.3 Aesthetics

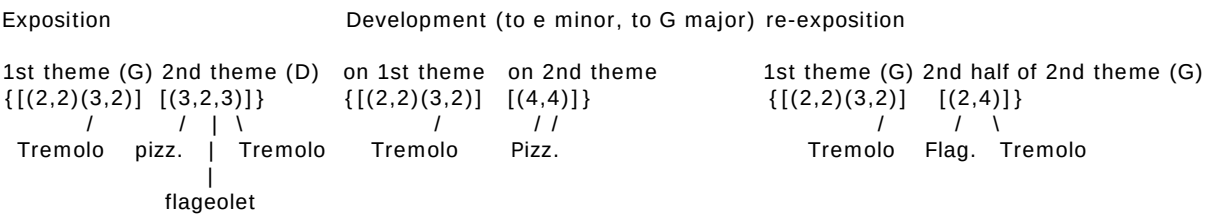
We will analyze the use of the effects according to two of their functions:

a) The integration of improper timbre
b) The demarcation of structure

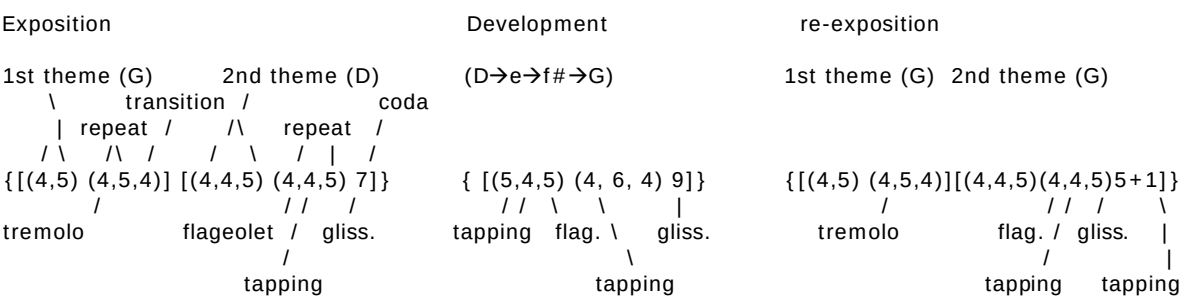
Regarding the use of timbre, the first thing that strikes us is the absence of indications pointing to *Bebung* or *Tragen der Töne,* techniques that are proper to the clavichord. Perhaps Rust did not want to juxtapose proper and improper timbres, or he decided that the three movements – all relatively fast – presented too little occasion for expressive moments suitable to the more typical clavichord effects. Besides this particular issue – which only leads to speculation due to our limited knowledge about these clavichord

techniques in the late 18th century[561] – other aspects of Rust's incorporation of extended techniques into his music draws our attention. First of all, he uses the effects as a means of instrumentation. One could even imagine the score as a kind of piano reduction for a work in a larger setting, albeit only in theory because the score clearly shows that Rust didn't intend this piece to be a reduction. Many of the effects are used to put thematic material in a new timbral perspective only after it had been presented with the proper keyboard sounds. Looking at the composition's structure and development of its thematic material[562], we arrive at the following analysis:

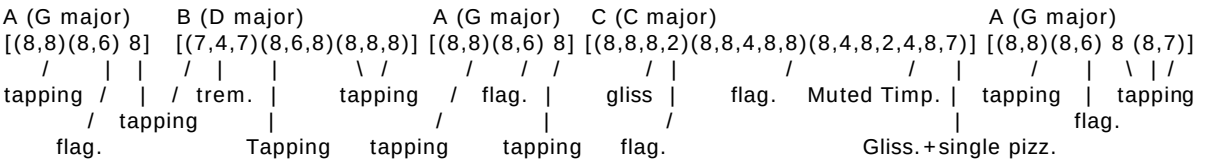
Marcia (simplified sonata form)



Allegro (sonata form)



Rondo (Italian Rondo)
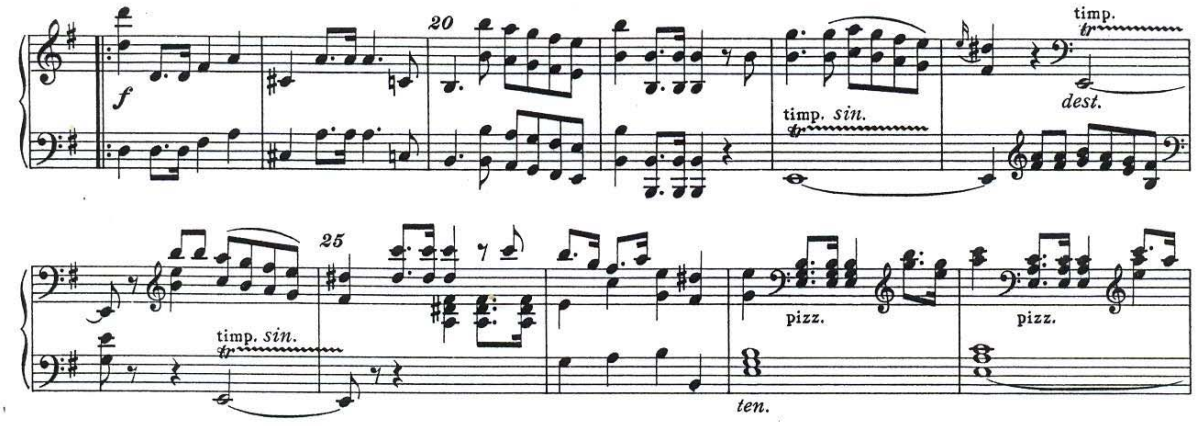


[561] See Brauchli 1998, p. 274-275.

[562] The numbers are the actual amounts of measures; the different kinds of brackets indicate how and on what level the sets of measures are structured. {[(2,2)(3,2)] [(3,2,3)]} means a phrase of four measures divided in two parts, followed by a second phrase consisting of a motive of 3 measures and one of two measures long. These two phrases, put together in square brackets because of their musical closeness, are taken together with the next three motivic sets (3+2+3 measures) to form the exposition of the first movement.
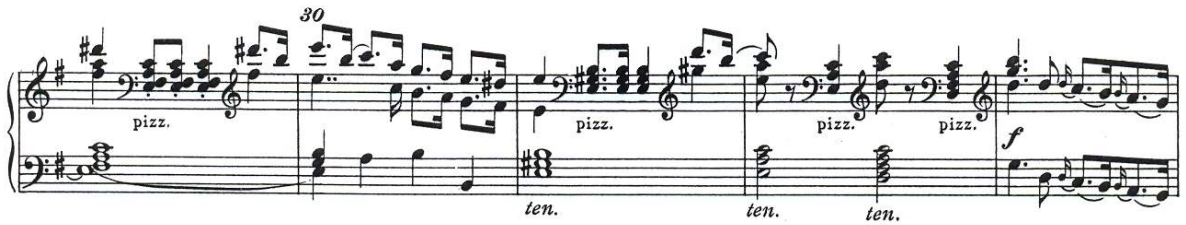
From this simple structural-motivic layout, we can deduce the following:

- The first and second movements are in sonata form; the final movement is a classical rondo. Both forms are used traditionally, in the ways in which Rust conceives, juxtaposes and develops material as well as in the ways the material is structured;

- In the march, the effects are used as part of the identity of the motivic material. The tremolo in the second phrase of the 1st theme is its accompaniment whenever that phrase turns up. And when the melodic content of this phrase is developed, the tremolo is developed accordingly (compare ex. 3.96 and ex. 3.103). The same goes for the chord pizzicatos (compare ex. 3.100 and ex. 3.104). The flageolets do not occur in the development and section and only differ in tonality according to the structure of the sonata form: in D in the exposition (ex. 3.98) and in G in the recapitulation (ex. 3.106).
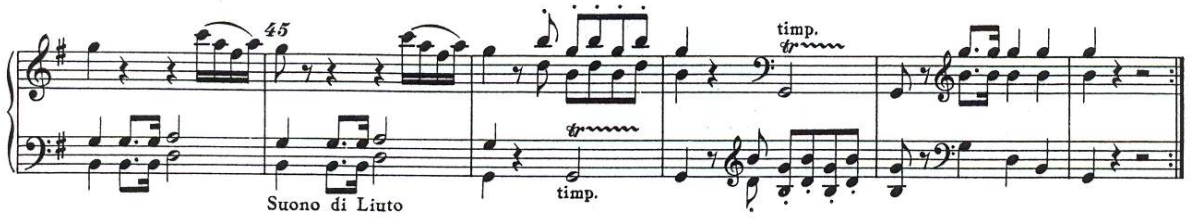


Example 3.103. F.W. Rust, *Sonata* for clavichord Czach 23 (1792), 1st movement *Marcia*, bars 18-28.



Example. 3.104. F.W. Rust, *Sonata* for clavichord Czach 23 (1792), 1st movement *Marcia*, bars 29-33.
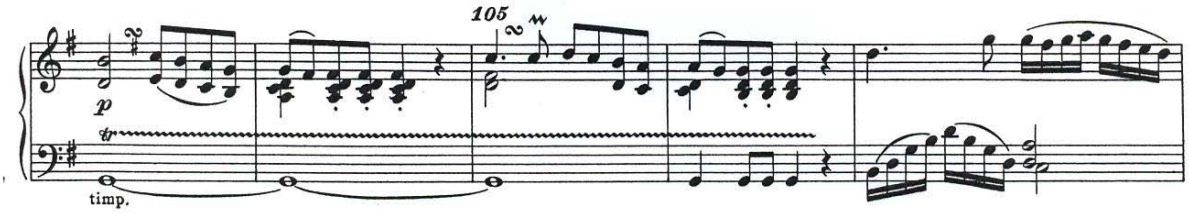


Example 3.105. F.W. Rust, *Sonata* for clavichord Czach 23 (1792), 1st movement *Marcia*, bars 12-17.

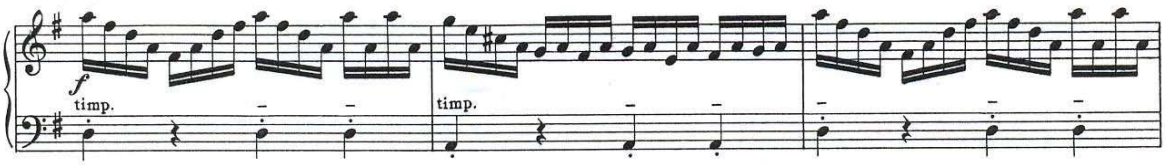


Example 3.106. F.W. Rust, *Sonata* for clavichord Czach 23 (1792), 1st movement *Marcia*, bars 44-49.
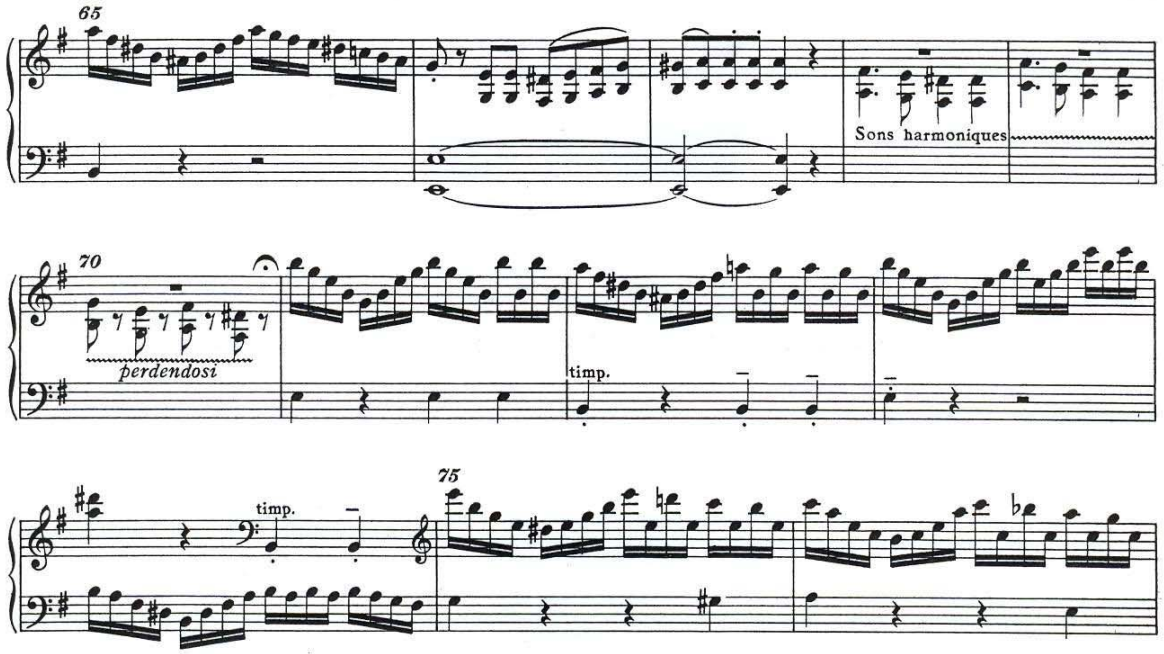
- In the *Allegro*, the effects are used more sparsely, only occurring when thematic material is recapitulated, to add timbral variation to it rather than to be essential to its identity. Nevertheless, each effect remains loyal to a specific idea: the tremolo is applied to the repeat of the first theme (ex. 3.107.), the flageolet to the repeat of the second theme (ex. 3.102). The tapping is used to accompany the more transitional passagework (ex. 3.108) and the string glissandos are reserved for the coda in each of the three sections (e.g. ex. 101). The classical ideal of two main themes that are contrasting in melodic and rhythmic form as well as in mood and atmosphere while retaining some kind of organic link is here reflected in the way Rust chooses the effects he attributes to the themes. Of all the effects in play in the *Allegro*, the tremolo and the flageolet are each others most opposite and they are used to enhance the contrast between the first and second theme, as much as they are actually developed from the same material. (Compare theme 1 in ex. 3.107 and theme two in ex. 3.102). The time that is needed to perform the pizzicatos and glissandos is usefully incorporated into the idea of a cadenza (ex. 3.99) or a coda *quasi fuori del tempo* and *calando* or *perdendosi*. (E.g. ex. 3.101.) As with the first movement, the effects are developed as much as the traditional material. (E.g. ex. 3.109.)



Example 3.107. F. W. Rust: *Sonata* for clavichord Czach 23 (1792), 2nd movement *Allegro*, bars 103-107.
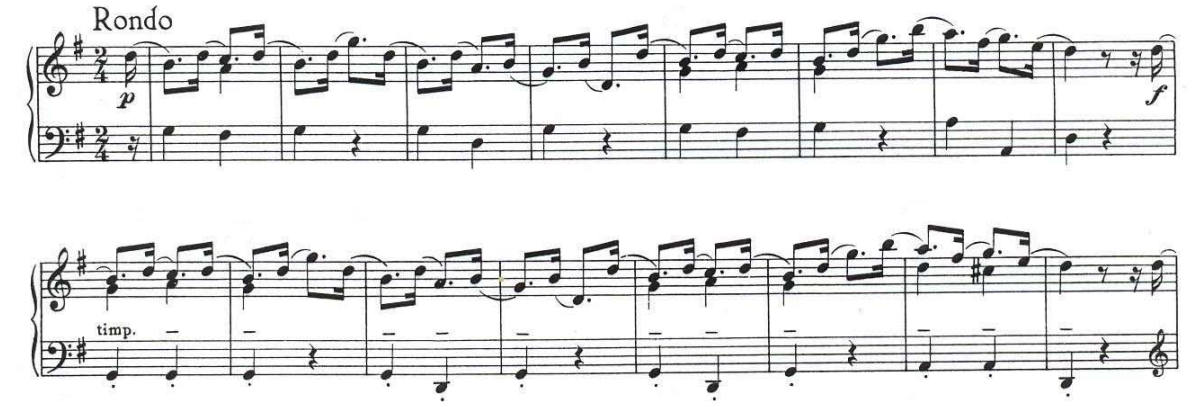


Example 3.108. F. W. Rust: *Sonata* for clavichord Czach 23 (1792), 2nd movement *Allegro*, bars 40-42.
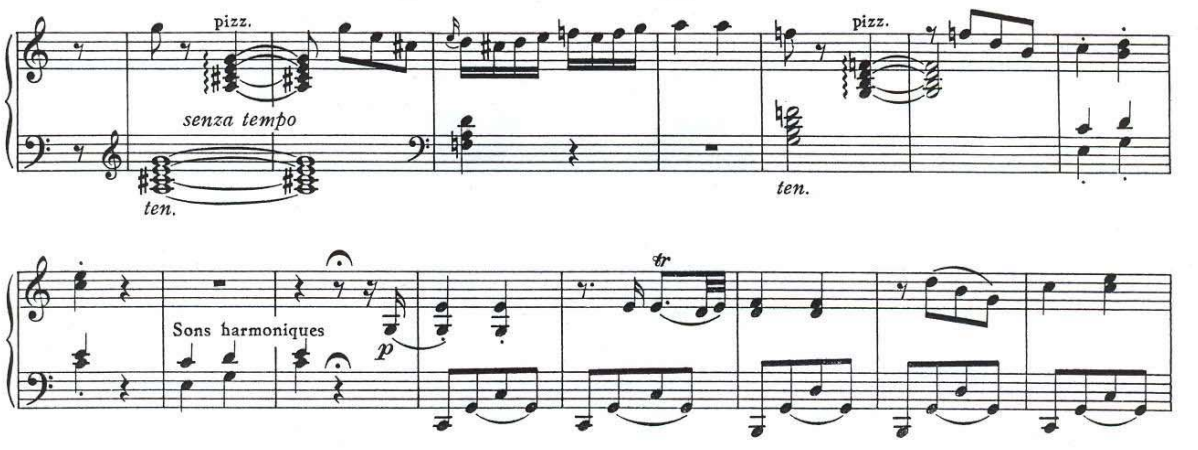


Example 3.109. F. W. Rust: *Sonata* for clavichord Czach 23 (1792), 2nd movement *Allegro*, bars 65-76.
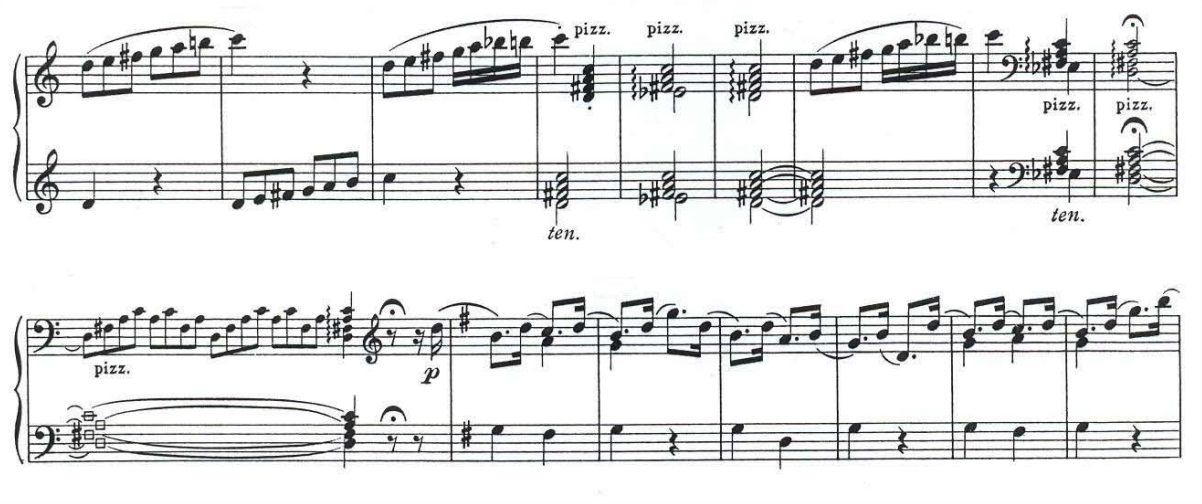
- In the *Rondo*, the most common effect – the tapping on a string – is used as the accompaniment of the repeat of the main theme. The theme is often *p*, while the repeat – with the tapping of the string in the bass – mostly *f* (ex. 3.110). The tapping occurs throughout the rondo to accentuate bass notes similar in function as in the main theme. The first verse (B) is focused on basic harmonic progressions with sequences based on motivic cells rather than any kind of real thematic material. (E.g. ex. 3.115.) The second verse (C) has new thematic material and profits from the most advanced use of some of the effects: the glissandi are on dominant and diminished seventh chords in passages that tend to halt the flow of the structure (two fermatas, *senza tempo*, a cadenza) (ex. 3.111 and 3.112), there is the only use of single note pizzicatos (ex. 3.114), the only use of the muted timpani effect (ex. 3.98) and the only use of flageolets on single notes (a three measure long broken chords sequence – ex. 3.113). Undoubtedly linked to this most individual part of the sonata (in terms of extended techniques), it is also in this second chorus that Rust searches for the more daring moves (albeit relative) on the modulatory level in the otherwise conventional treatment of tonality in this work: it is here that we find dominant chords on VI, diminished seventh chords, surprise modulation to VIb and an inkling of chromaticism.
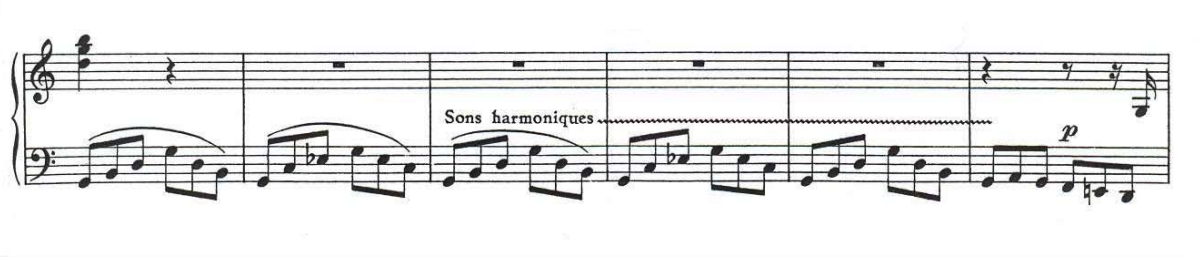


Example 3.110. F.W. Rust: *Sonata* for clavichord Czach 23 (1792), 3rd movement *Rondo*, bars 1-16.



Example 3.111. F.W. Rust: *Sonata* for clavichord Czach 23 (1792), 3rd movement *Rondo*, bars 157-171.
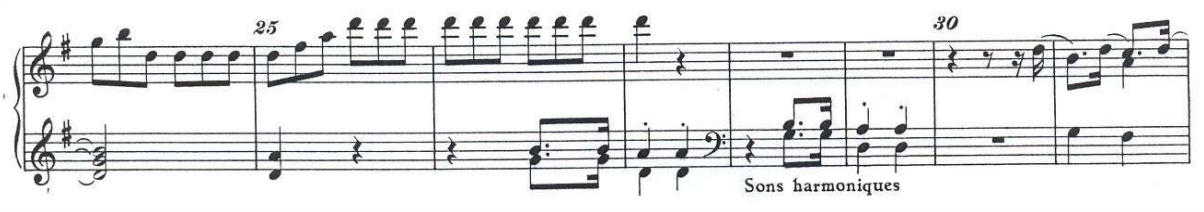


Example 3.112. F.W. Rust: *Sonata* for clavichord Czach 23 (1792), 3rd movement *Rondo*, bars 234-249.
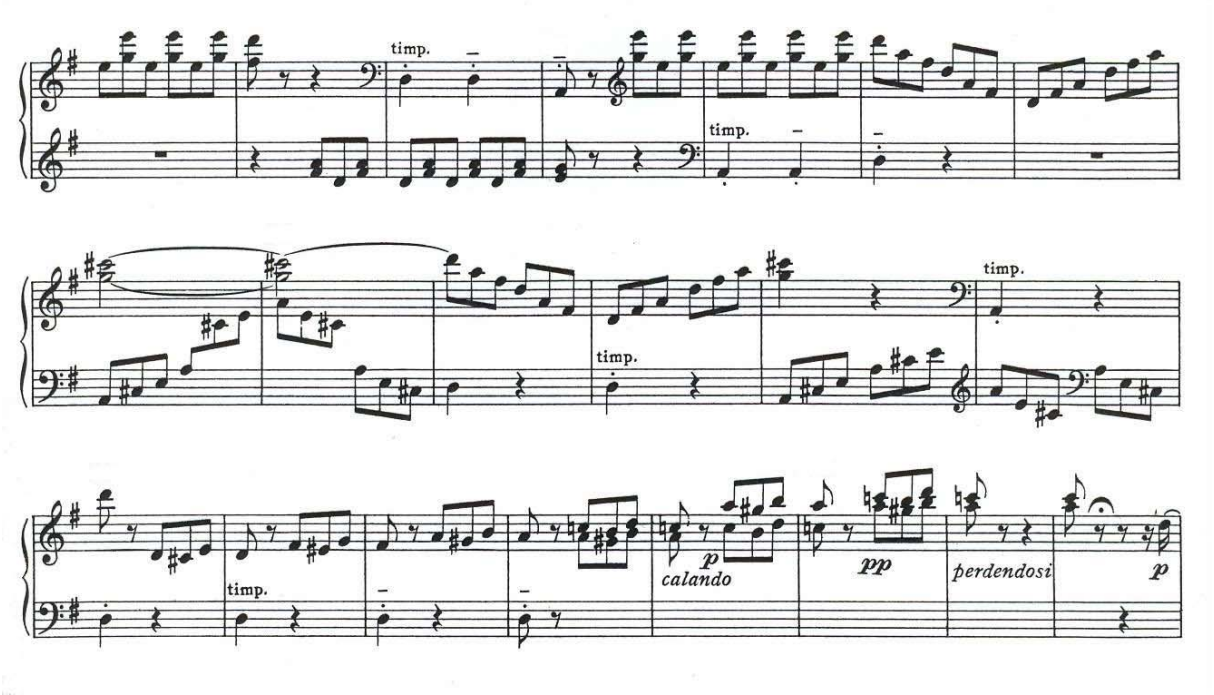


Example 3.113. F.W. Rust: *Sonata* for clavichord Czach 23 (1792), 3rd movement *Rondo*, bars 197-202.

- It is also in the rondo that some of the effects return with the material they were associated with in the other two movements: the flageolet in the small horn-like echo (ex. 3.114 - as in the first movement) and the tapping on V-I or insistently repeated bass note strings in passage work (ex. 3.115 - as in the second movement).



Example 3.114. F. W. Rust: *Sonata* for clavichord Czach 23 (1792), 3rd movement *Rondo*, bars 24-31.



Example 3.115. F. W. Rust: *Sonata* for clavichord Czach 23 (1792), 3rd movement *Rondo*, bars 82-102.

- Strikingly, the only crescendos in this sonata is used to accompany the three bar long tremolo in the *Marcia* (*p* to *f*, each time this occurs); in the first and last movement, the double note flageolets are clearly meant to be the echo of the immediately preceding (properly played) rhythmic horn-motive in the first and last movement, even if only one instance is indicated *p*. In the second movement, the double note flageolets (used for and linked to the repeats of the second theme) only once (in the development section) have a performance indication: *perpendosi* followed by a fermata. When the tapping carries a dynamic marking, it is consistently *f* (only once there is also *dolce* - it must be said that it is not always clear how long a dynamic level is to be maintained). The pizzicatos never carry any dynamic indication and neither do the glissandi (although sometimes the intervening regularly played notes are to be played *dolce* or *perpendosi*).

- Rust uses the techniques to a definite level of virtuosity. If he sometimes allows for a slower tempo (as with the glissandos) to facilitate moving back and forth between keyboard and the inside of the clavichord, the lack of time in between playing the keyboard and playing the flageolets makes the latter exceedingly difficult to perform accurately and musically. The harmonic nodes on the strings also have to be found immediately and without help from the mechanical action pushing up strings in time for the performer to see the right string arise from all the strings. The same level of virtuosity applies to some of the switching between left hand and right hand tremolo (ex. 3.103 and ex. 3.104) requires much more control than the long tremolo that accompanies main themes and which are preceded and followed by half an empty measure to give ample time to move from the inside of the clavichord to the keyboard.

From these observations of details we can come to some conclusions regarding Rust's aesthetic use of extended techniques:

1. The effects are part of the basic compositional material:
    i. To establish or emphasize thematic identity
    ii. To enforce aspects of form
    iii. To help unifying different movements
    iv. To demarcate structural points

2. They are used as compositional tools:
    i. For timbral instrumentation (colorizing associative motives / "orchestrating" simple ideas)
    ii. For development
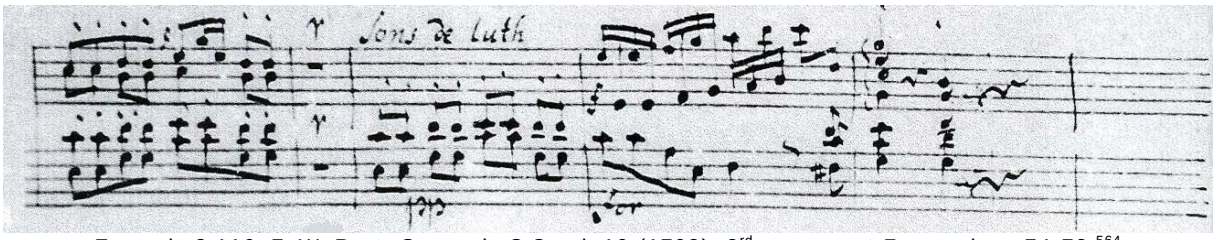
3. Their individual performance-practical aspects are taken into compositional account
    i. The time needed to play the glissandi is used to structural advantage
    ii. The tapping is used in instances were musical material benefits accentuation
    iii. The effect which is by nature the softest of the ones here used (the flageolet) is either suggested or in fact indicated *p*; the only effect to be used in a transitional dynamic is the one that can be played continuously (the tremolo)
    iv. The potential poetic nature of the string glissando is exploited to the full by Rusts harmonic and agogic treatment

All in all, this work shows a remarkable command of the compositional and performance practical aspects of extended techniques, an almost overwhelming sense of differentiation in their use and a deep integration on several levels of them. It is very hard to believe that this sonata would have been the sole result of a one-time interest in the potential of these effects. That Rust developed this level of maturity in the mastery of the techniques without previous experiments and that he left it at that. To encounter the next such composition in the history of piano writing requires a gigantic time leap into the second half of the 20th century. It would be of definite worth to search the archives vigorously for more information on Rust's position in the musical society around him, on the works that he wrote and which might not be lost, on his private and public writings and on the reception of his works.

3.2.6.2.1.3 1792 *Sonata* in C Czach 10

Rust's sonata in G (Czach 23) could only be played on a "simple clavichord"[563] because some of the effects cannot be achieved on other instruments, e.g. the (muted) timpani and zither mode. But Rust did try out other keyboard instruments, as witnessed in the third movement – *fugato* – of the sonata in C (1792, Czach 10), which is explicitly dedicated to the harpsichord. Here we find the "Lute Sounds" again (ex. 3.116), preceded by a whole bar of silence to provide the time to prepare the right hand for pressing the necessary nodal points on the strings. The same kind of French horn motive as in the clavichord sonata (ex. 3.114) can then be heard as a faint echo of the accompaniment figure two bars earlier.
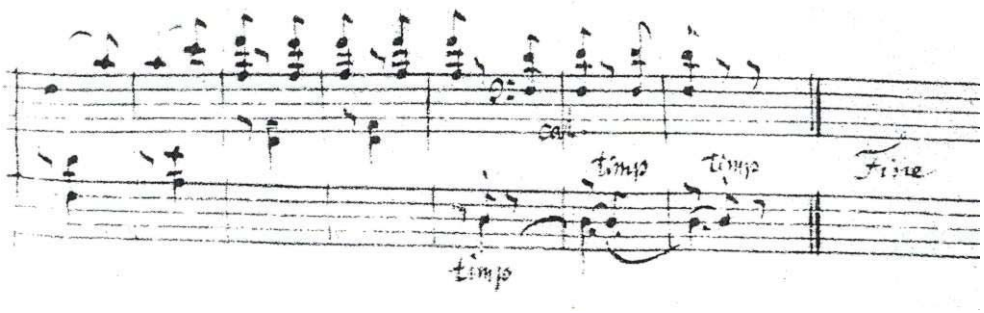
[563] "Anm: Diese Sonate kan nur auf einem simplen Clavichord auf diese Art executirt werden." Rust probably referred to a ‚simple' clavichord as opposed to one that is fretted.



Example 3.116. F. W. Rust: *Sonata* in C Czach 10 (1792), 3rd movement *Fugato*, bars 74-78.[564]

3.2.6.2.1.4 1794 *Sonata* in D Czach 11

Like in the 1791 set of variations (see 3.2.6.2.1.1) the "timp" indications in the final bars (ex. 3.117) refer to the effect of hitting an already depressed key. As the title page of this sonata specifically mentions *per il Clavicembalo ò Fortepiano*, and as the technique of muted timpani from the 1792 clavichord sonata is here not possible, only the percussive noise of the finger hitting the key is heard, without repeating the actual tone as would have been the case on a clavichord (see 3.2.6.2.1.2.1).



Example 3.117. F.W. Rust: *Sonata* in D Czach 11 (1794), final bars.[565]

In this instance both hands are not occupied constantly (as they were in the variations) so tapping on strings – the second possible effect of Rust's *timp* indication in the clavichord sonata – is theoretically feasible on the piano and the harpsichord, though the notation suggests it to be far from easy. When tapping with the left hand on the string, the tied *d* cannot be held but it is possible that the staccato *d*'s in the left hand are supposed to be tapped on the strings by the right hand (which also has to play the sixths on the keyboard). However, the tempo of this final rondo movement is not indicated but most likely at least an *allegro*, possibly a *presto*. The *calando* at the end may lessen the tempo but the distance between the keyboard and the strings is still considerable. All in all there seem to be several possible solutions to the conundrum: 1. on a (tangent-)piano the technique is that of the muted timpani; 2. on a pianoforte the right hand plays the sixths *and* the tapping on the strings (adjusting the tempo); 3. on a harpsichord there are several possibilities: A. producing a noise by hitting the depressed *d* key again with another finger (as in the 1791 *Allegretto grazioso con Variazioni*); B. on a harpsichord with two manuals and two different registers, the tied *d* and the right hand sixths are played on one manual while the staccato *d*'s can be played on the second manual; C. on a two manual harpsichord, one manual can be disengaged so that a *d* can be hit on the

[564] Manuscript at the Staatsbibliothek zu Berlin – Preussischer Kulturbesitz, Musikabteilung mit Mendelssohn-Archiv. (D-B Mus. ms. autogr. 28.) Reproduced by permission.
[565] Manuscript at the Staatsbibliothek zu Berlin – Preussischer Kulturbesitz, Musikabteilung mit Mendelssohn-Archiv. (D-B Mus. ms. autogr. Fr. W. Rust 7.) Reproduced by permission.

mute manual most easily, making an unpitched noise. In view of the similarity to the *Allegretto grazioso con Variazioni,* solution 3.A. seems most likely.

3.2.6.2.1.5 Rust and extended techniques

These are the earliest examples we could find of keyboard music that involves playing on the strings. No composer contemporary to Rust or from earlier times and stylistic periods seems to have gone were he ventured, not with the piano or the harpsichord or the clavichord in mind. Rust's search for new sonorities can even be called professional. As much as some problems of instrumentation remain, the effects were carefully worked out and explained in notable detail. To say the least, it is remarkable that so many extended techniques appear out of the blue in just a few pieces in just three years time, and to see them so finely implemented and matured in one single composition. It urges us to find out where this man had gotten the inspiration to devote his attention and energy to something completely new and mostly for an instrument that does not seem to be his preferred keyboard instrument.[566]

In the surviving sketches[567], we find indications such as "gerutscht" (glissando), "pizz", "sons harmoniques", "pianofortezug", "con timpani", "flageolet", "salterio" and "Fortepiano con Variazioni harmonice." It is neither clear whether all of these refer to music for the keyboard, nor whether the drafts were written before or after the 1790's sonatas. And they still do not explain where he got the ideas.

Born in Wörlitz, near Dessau, Rust learnt to play the violin as a small child, encouraged by his elder brother Johann Ludwig Anton, who was himself considered an excellent violinist[568] and who undertook the responsibility for his brother's education after their father died in 1751. Rust also certainly learnt how to play the piano, as he claims he could play the first part of J.S. Bach's Das wohltemperirte Clavier from memory when he was 16.[569] In 1762, after studies with Wilhelm Friedemann Bach (composition) and with Gottlieb Friedrich Müller (clavier) while he studied law in Halle, he studied the violin with Carl Höckh (concertmaster at the court of Zerbst) for about six months. From July 1763 onwards he stayed in Potsdam for six months, were he was "primarily interested in studying the adagio technique of violinist Franz Benda"[570] and where he became known as "unquestionably the most individual and in creative aspects the most significant of Benda's students."[571] In addition to the violin, he studied composition with Benda and clavier with Carl Philipp Emanuel Bach. In October 1765, he traveled to Italy, which was particularly significant for Rust, and "from this time a curious synthesis was established between the "gallant" but serious style of the German musicians and the graceful

[566] Of all of Rust's keyboard works, only one piece (the sonata in G from 1792) was composed expressly for the clavichord.
[567] D-B Mus.ms.52 ("Skizzen") and Mus.ms. 51 ("Studien"). See also Czach 1927, p. 59-61.
[568] He had made the acquaintance of J.S. Bach while a student in Leipzig from 1744 to 1745, and had played the violin in some of Bach's performances. See Ridgway 1981, p. 18.
[569] Buchmann, 2002 in TNG II, vol. 22, p. 35. According to Ridgway 1981, p. 19, the boy would only have been thirteen.
[570] Ridgway 1981, p. 21.
[571] "der eigenartigste und in schöpferischer Hinsicht bedeutendste Künstler aus Franz Benda's Schule ist unstreitig Rust gewesen." From 'Andreas Moser, *Das Violinspiel von 1800 (Deutschland) bis in die erste Hälfte des 20. Jahrhunderts*, Vol II of *Geschuchte des Violinspiels*, 2nd ed. Hans-Joachim Nösselt (Tutzing: Schneider, 1967)' as cited in Ridgway 1981, p. 21.

playfulness of the Italians."[572] More significant to us here is the fact that Rust was welcomed in Padua by the master violinist Giuseppe Tartini, "and the two sat together for at least one known musical discussion."[573] In Venice, Rust also met Georg Benda, brother of his Potsdam teacher, and traveled with him to Ferrara and Bologna, where they met Padre Martini and the castrato Carlo Broschi (better known as Farinelli). In Naples, Rust played several times with the violinist Emanuele Barbella and in Turin and Livorno, he enjoyed short visits with resp. Gaetano Pugnani and Pietro Nardini (reputedly Tartini's finest student[574]). Rust seems to have kept in touch with Nardini for, in 1773, he was "expecting to receive several sonatas from Nardini."[575]

With such connections, it should not surprise us that Rust has been portrayed as a "rare virtuoso" on the violin[576]. But he seems to have been one on the keyboard as well, and also "among the last virtuosi on the lute and the viola d'amore."[577] In Rusts works, we can easily detect the importance of these instrument in his life: he wrote no fewer than 25 sonatas for keyboard and obligato violin, 24 sonatas for violin and figured bass, 3 solo violin sonatas, 25 sonatas and sets of variations for solo keyboard, 11 works for viola and viola d'amore, 5 for accompanied lute, next to many chamber music works including strings.

Rust's own performance technical abilities are witnessed in many of these compositions: as in Bach's solo violin works, Rust's pieces display a complete array of high level technical mastery.[578] His sonata for cello and continuo shows how he intended to integrate the highest performance requirements of his day, including double notes, flageolet tones and pizzicatos on open strings while the other strings are played upon with the bow. In his compositions for the lute he searches for conscious changes of timbre, asking for e.g. *al ponticello*, and requires the highest proficiency from the performer.[579]

It is also remarkable how Rust seems to have liked the idea of investing in the potential of the clavichord, lute and viola d'amore right before they became extinct. This tendency of his has been called old-fashioned[580], but it fits the mind of a progressive maybe better, especially when aligning that tendency with his writing a work for the Nagelgeige[581]. This "friction idiophone consisting of metal, wooden or glass rods (which are in some cases bowed, in others struck) fastened at one end to a sounding board"[582] was invented by Johann Wilde, a German violinist, in St Petersburg in 1740. In 1780 it was improved by the addition of sympathetic strings in the "violino harmonico" of Senal of Vienna, who also excelled upon it as a performer. In 1791 an oblong keyboard form, the Nagelclavier, was produced in Saxony. Late 19th century variants of the nail violin, which are struck, rather than bowed, are the toy piano and the chimes in some household clocks. Rust wrote a quartet for nail violin, two violins and cello, which was first performed in Dessau in 1787. It may be the only composition for this instrument in which it is integrated in a chamber music setting.[583]

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[572] "A partir de ce moment un curieux alliage s'établit chez lui entre le style 'galant' mais sérieux des musicians allemands et le gracieux enjouement des italiens." From p. 1 of the preface of Vincent d'Indy's edition *F.W. Rust : Douze Sonates pour Piano* (Paris, Rouart, Lerolle, 1913).
[573] Information from Clara Pfäfflin's *Pietro Nardini: Seine Werke und sein Leben.* Stuttgart, Find, 1935, p. 67. As cited in Ridgway 1981, p. 23.
[574] According to TNGII, vol. II, p. 629, Nardini: Rust was a disciple of Nardini.
[575] Stated in a letter dated February 1773, to Breitkopf's publishing firm
[576] As cited in Ridgway 1981, p. 30.
[577] Ridgway 1981, p. 40.
[578] Czach 1927, p. 110.
[579] Czach 1927, p. 118.
[580] Czach 1927, p. 69: 'Antiquierende Züge'.
[581] Fr. Violon de fer / It. Violino di ferro / Ger. Nagelgeige, Nagelharmonika, Eisenvioline
[582] Heron-Allen & Davies 2002, p. 594-596.
[583] Czach 1927, p. 123.

The Nagelgeige was not the only novelty instrument Rust is associated with. He also wrote for the Musical Glasses, the "bell-type instrument made of glass or other brittle material that if rubbed in a certain fashion will respond like the strings of a bowed instrument, though with less capacity for nuance. They may also be struck, with moderate force, for quasi-plucking and melodic tremolo effects as on a xylophone."[584] Although the earliest known musical glasses in Europe date from the 15th century, this instrument apparently came into serious musical use in the 18th century. Gluck reportedly played a concerto on 26 glasses in a London concert in 1746 and in Copenhagen in 1749. The instrument seems to have enjoyed a growing popularity in England in the 1750's. In 1761 Ann Ford wrote the first method for the instrument while Benjamin Franklin was impressed enough by the glasses that he decided to improve it and propose to call it "armonica." His version of the instrument achieved a certain popularity in America but exercised far more influence in Europe, where virtuoso Marianne Davies began touring with it in 1768, moving in the highest society and even becoming known to the Mozart family in 1773. Another virtuoso performer – the blind Marianne Kirchgessner – became famous throughout Europe between 1790 and her death in 1808 and was the dedicatee of Mozart's quintet K617 for armonica, flute, oboe, viola and cello (1791). Because of the deranging effects the eliciting of sounds from the revolving bowls could have on the nerves of the player, various improvements were attempted, aiming to eliminate the fingers as the means of contact: several types of keyboards were devised in St Petersburg (1782), Pressburg and Görlitz (1784) and in America (1787). As early as 1769 one virtuoso player had introduced pads and in 1779 Mazzucchi applied a form of violin bow to the instrument. The heyday of the armonica in Europe lasted until about 1830. Its distinctive tone of vibrant, piercing sweetness caught the imagination of various French and German romantic writers, among whom Goethe. But even while the armonica was at the height of its popularity, the earlier form never quite lost its appeal. Ann Ford still played the musical glasses in 1790. After the armonica became a museum piece, the glasses lingered, at least in Britain throughout the 19th century.
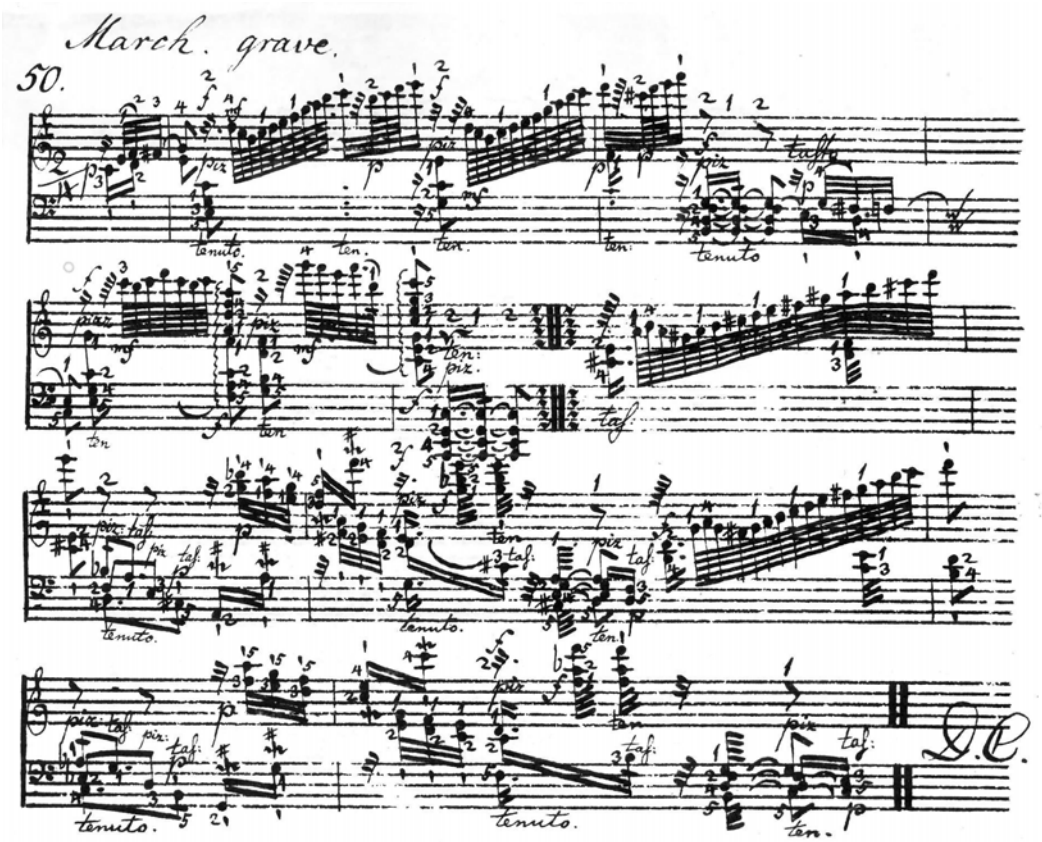
We should not be surprised that (many) more "serious" composers – other than only Mozart and Rust – were interested in participating in the development of these novelty instruments and their repertoire. We should therefore also not be surprised that Rust's extrapolation of this phenomenon into the investigation of any hidden potential of (what we now perceive as) the more traditional keyboard instruments was less obscure than the one clavichord sonata and its related instances in three more works seem to suggest. As much as there are other compositions for the nail violin and the musical glasses by other composers, there might also have been more pieces or improvisations than we know of in which the insides of the piano, clavichord of harpsichord were explored. That we don't read about them may have to do with a general "Zeitgeist" – which included (amongst others) a special kinship between the lute and clavichord[585], and builders' experiments with hybrid keyboard instruments of all possible kinds – that was perhaps predisposed towards experiments of Rust's kind to the point that his endeavors were not deemed special enough by his contemporaries to comment on them in writing.

All this does not explain the exact moment Rust decided to go about exploring the insides of the keyboard instrument, but we can see how he got the general impetus to merge some of the string techniques with a keyboard instrument. As a virtuoso violinist, a composer up to date with what goes on around him in Europe, with clear signs of an experimental attitude and in an age where performers as well as builders and composers had their hands in the evolution of instruments, it must not have been outrageous to try and see how a keyboard instrument could be approached as an instrument with more to it than a keyboard alone.

[584] King 2002, p. 471-473.
[585] See Crowell 2006 for a detailed article on the clavichord as a plucked string instrument.

3.2.6.2.2 1797 Israel Gottlieb Wernicke: *Arietta con 50 variazioni*

In the final March of Wernicke's large-scale set of variations on the folksong *Gestern Abend war Vetter Michael dar*, we find 14 pizzicato indications in 8 bars. (Ex. 3.118.)
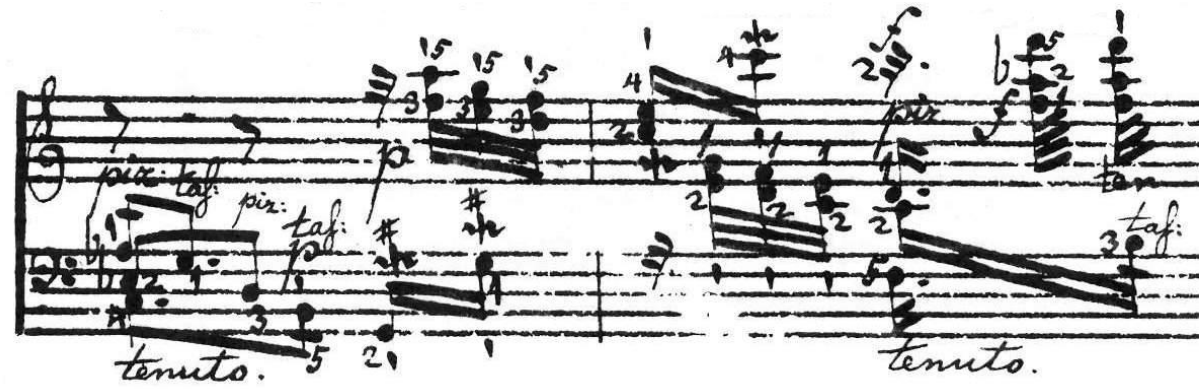


Example 3.118. I.G. Wernicke: *Arietta con 50 variazioni per il clavicembalo* (1797), final variation *March*, final variation.[586]

This variation – the last of the set – is the only piece in the extensive composition that incorporates extended techniques and is puzzling a number of ways. The first left hand chord has both *tenuto* and *pizzicato* indications, not really telling us exactly how the *tenuto* should be performed and what it is for, or whether or not the pizzicato is of the "zither" or glissando type.[587] The fingering (*2*) and dynamic (*f*) specifically written above the right hand staff over that chord suggest a right hand glissando with the chord held by the left hand, much like what Rust also used. (See 3.2.6.2.1.2.1.) Brushing over strings, of which a few are free to vibrate because their corresponding keys are depressed (hence the *tenuto*), leaves only those open strings to sound; the rest of the strings fall silent once the glissando is finished. This technique works well on the piano and on the clavichord but, in a footnote on the manuscript, Wernicke states " instead of pizzicato on the Clavier use the pedal on the pianoforte."[588] The first problem with this comment is that the composer advises an alternative technique for performance on a pianoforte while the perceived original intention is perfectly applicable to that instrument. Moreover, the only kind of pianoforte pedal use that would make sense here, would be one or other mutation stop to change the colour of the piano timbre at the "piz" moments (e.g. the

[586] Manuscript in the N-Oum 9283-742.
[587] Hogwood 2002 p. 263 states the appropriate technique to be 'brushed chords', not explaining how he came to the conclusion.
[588] "Istedendfor pizzicato for Klaveret brukes pedalen for pianoforte."

bassoon or lute register). However, the effect of such a stop would certainly be less striking than any kind of pizzicato playing. Secondly, the term "Clavier" was generally used for a clavichord whereas Wernicke specifically titled this composition *per il clavicembalo*. Even though "Clavier" was sometimes also used for organ or harpsichord (or even any keyboard instrument), the least likely stringed keyboard instrument on which to perform any pizzicato technique is nevertheless the harpsichord. On the piano and clavichord any string can be opened by more or less silently depressing its key (at least silently enough to not disturb the improper sounds by adding proper sounds to them). On the harpsichord the plucking sound would always be too prominent to grant the glissando sound its own specific character. As with the Rust pieces, Wernicke must have intended the whole set of variations to be principally for the instrument he considered most likely to be used in his time and geographical environment. The extended techniques would then be a little extra, to be used when the occasion arises.

Wernicke varied his "piz" technique throughout the little piece. In the second and fourth bars he uses the glissando pizzicati in a dotted rhythm, with the fingering *2-1-2* indicating a guitar-like strumming action using both upward and downward directions for the glissandi. Less clear are the instances where playing on the strings (*piz*) is alternated with proper keyboard technique (*tas* as in *sul tasto*). In bar five there is still a fingering (*2*) added to the first pizzicato, the second pizzicato and those in bar seven have no particular fingering. The questions that remain are whether or not these pizzicati are glissandi (over the whole chord on the second 8th note as well?) or perhaps single notes plucked from the strings instead of brushed, and why Wernicke would ask the right hand *spiccato* chords (in bars six and eight) to be *tenuto*. (E.g. ex. 3.119.)



Example 3.119. I.G. Wernicke: *Arietta con 50 variazioni per il clavicembalo* (1797), final variation *March*, bars 7-8.

Not much is known about Wernicke (1755-1836). Having been ‘opposed to new music’ and having described "Haydn as a joker and charlatan, and Mozart as an incoherent and dirty smearer"[589], he was a strange fellow indeed. We do not know whether there may have been a connection between Rust and Wernicke. The southernmost city the latter has been known to have lived at – Bergen – is still more than 400km from Rust’s Dessau but, at that time, the Danish King’s realm (while enjoying its own dynamism[590]) - reacted to German fashion and changes. The whole set of variations is modelled on Bach’s Goldberg variations and its canons, double and triple counterpoint – perhaps Wernicke also knew of Rust’s works for the extended clavichord.
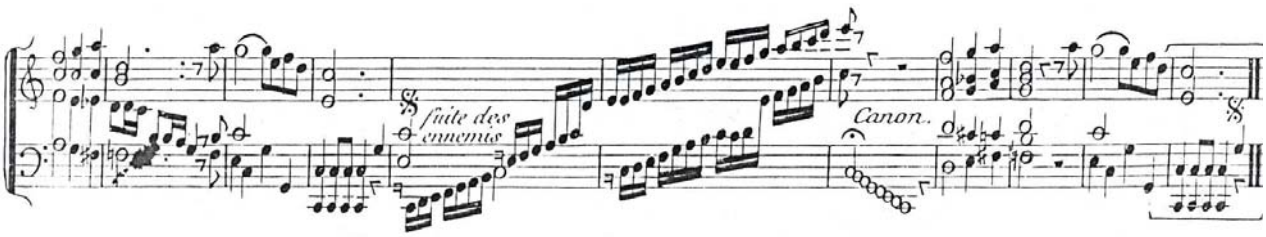
3.2.6.3 Of canon shots and thunderclaps

[589] As cited in Hogwood 2002, p. 263.
[590] Hogwood 2002, p. 249.

3.2.6.3.1 The piano cluster

3.2.6.3.1.1 1793 Balbastre: *Marche des Marseillais et l'air Ça-ira*

As we have already remarked, in 1793 Claude-Bénigne Balbastre produced his *Marche des Marseillais et l'air Ça-ira arrangés pour le forte-piano.* In it we find the same kind of descriptive cluster in the same kind of notation as in his 1777 manuscript. (Ex. 3.120.)
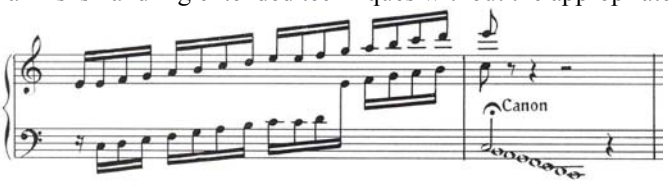


Example 3.120. Cl.-B. Balbastre: *Marche des Marseillais et l'air Ça-ira arrangés pour le forte-piano*, manuscript, final bars[591]

The shot of the canon appears at the end of a buildup that is represented by the fast upward scales depicting the flight of the enemy. Balbastre's revolutionary song may have been intended to support his claim as a defender of the burgher's new aspirations, a claim not altogether self-evident, in view of his past connections with royalty. The position of major organist – a function representative of the old regime – was a dangerous one to have held.

The more typical battle pieces were different and perhaps more innocent in their elaborate and adulatory descriptions of what can be heard in war. Amongst the compulsory audible evidence of combat, such as trumpet signals, rallying cries, flying bullets, the firing of rifles and the galloping of horses[592], is of course the cannon. Expertly fit to symbolize ultimate power to decide the outcome of a conflict, and known to most for its deafening sound sooner than for its concrete impact, the cannon is a perfect compositional vehicle to impress and surprise the listener as well as to fulfill show-stopping needs.

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[591] Comparing this original edition (F-Pn VM BOB- 10605) with the 1973 Heugel & cie publication (edited by Alan Curtis – reproduced by permission), we are painfully made aware of how 20th century editors sometimes ran risks handling extended techniques without the appropriate care:



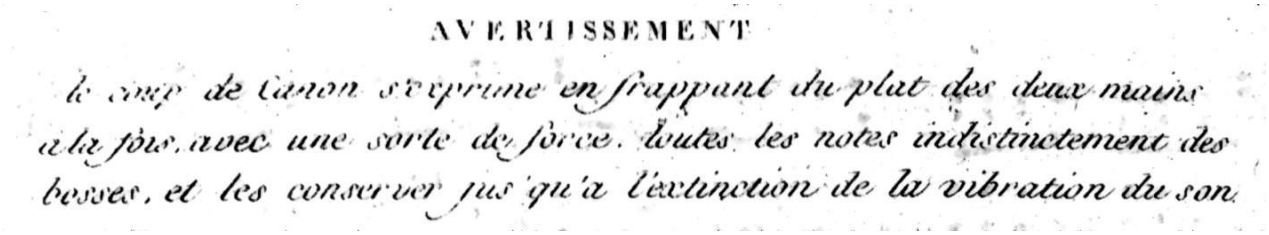
The stem of the 1793 cluster in the original edition serves to unite all the notes underneath it, an essential indication of the note value of the cluster and something the editor seems to have missed. The original cluster occupies the second beat of the bar: the 8th note, quarter and half note rests in the top stave belong to the right hand passage, the bottom 8th note rest in that stave belongs to the left hand, together with the bottom stave half note cluster and quarter note rest. In the original, the pulse of the rhythm is syncopated and there is enough time for the performer to play the cluster with the palm of the hand. According to the 20th century edition, which has only three beats in the left hand bar, the cluster would have to be played with the elbow on the first beat, a mistaken idea which unfortunately lives on through the otherwise excellent work of Herbert Henck (Henck 2004, p. 37).

[592] See Braun 1999, p. 1300-1303 and Brown 1990, p. 915-917.

The battaglia genre, which had almost disappeared by the middle of the 18th century, reappeared in full glory from right before the 1790's.[593] London, Paris and Vienna were the most important places for the distribution of the battle piece in the late 18th and early 19th century, though the American reprints of European battle music as well as original pieces are not to be disregarded.[594]

3.2.6.3.1.2. 1792/94[595] Pièrre Antoine César: *Bataille de Gemmap*

In the early 1790's, the *Bataille de Gemmap Ou la Prise de Mons Par les Français, composé pour le Forte Piano*[596] was published with a "warning" at the beginning of the score telling the player how he should achieve what is the most powerful effect in this piece, indeed in the genre of battle music (ex. 3.121):
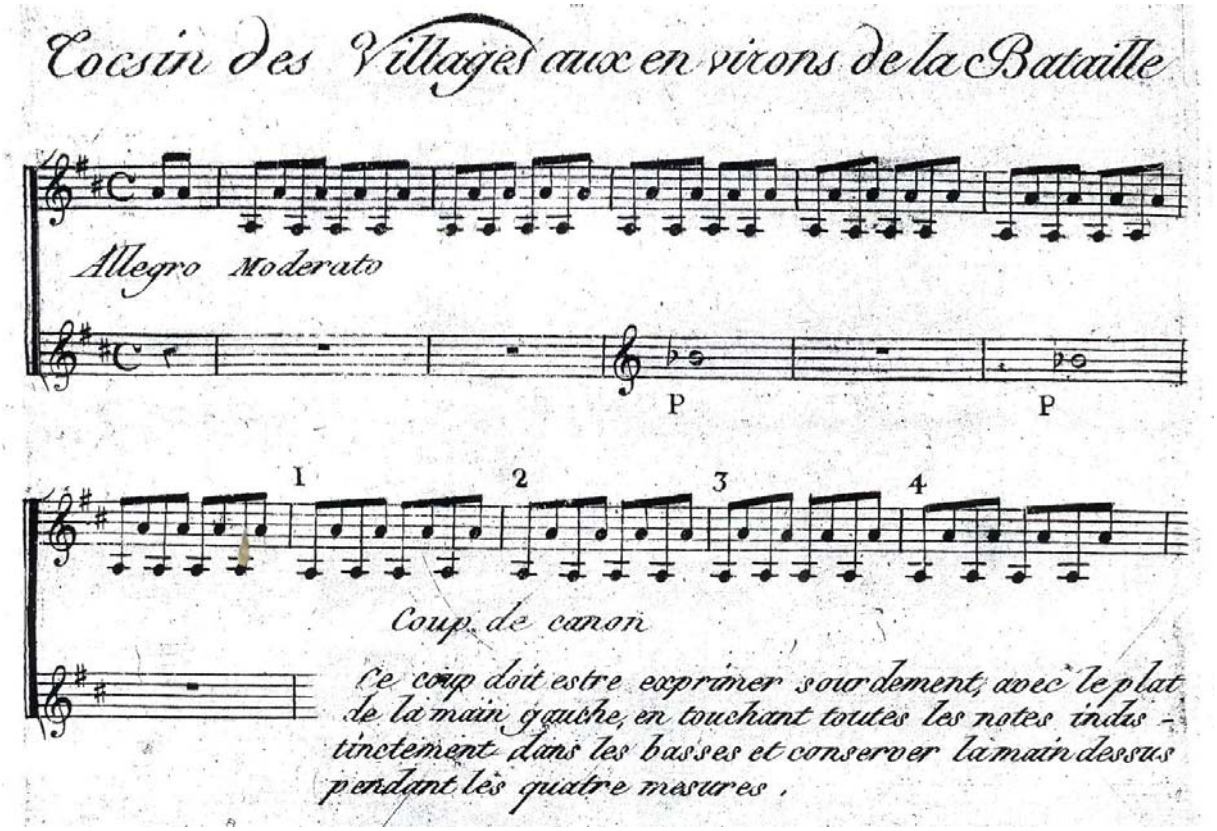

AVERTISSEMENT

le coup de canon s'exprime en frappant du plat des deux mains à la fois, avec une sorte de force, toutes les notes indistinctement des basses, et les conserver jus qu'a l'extinction de la vibration du son

Example 3.121. P.A. César: *Bataille de Gemmap*, top of the first page of the score. "The cannon shot is expressed by hitting with the flat of the two hands together, with some force, all the bass notes indistinctly, and kept depressed until the extinction of the sound's vibration."[597]

The cannon shots thus played are written in otherwise empty bars, indicated by fermata signs with the words 'coup de canon' added. There is some degree of integration in the rest of the piece, however: in the actual battle scene – the middle section – the cannon shots are fired by the left hand only, while the right hand plays broken octaves to keep the momentum going. The shots are to be played quietly as well, with the previous bars containing the distant "tocsins of the villages in the neighborhood of the battle." (Ex. 3.122.)

[593] Schulin 1986, p. 13.
[594] Schulin 1986, p. 20.
[595] Battle pieces were generally written and published soon after the historical facts. The 1794 date refers to the first edition, as it is based on the 1961 'Dictionnaire des éditeurs de musique français' by A. Devries and F. Lesure (Genf 1979), as cited in Schulin 1986, p. 271.
[596] This battle took place on November 6, 1792, near the town of Jemappes, close to Mons in the Belgian province of Hainaut. General Charles François Dumouriez, intent on invading the Austrian Netherlands, led the French revolutionary army against the Austrians under the command of the Duke Albert of Saxe-Teschen and François Sebastien Charles Joseph de Croix, Count of Clerfayt. Dumouriez won and overran the Austrian Netherlands within a month, but lost it again at the Battle of Neerwinden in March of the next year. See also fn. 107. (Scott & Rothaus 1985, vol. I, p. 77-78).
[597] Editions Durieu, P-Bn VM[12] 9074.



Example 3.122. P.A. César: *Bataille de Gemmap*, top of page 6 of the score. "Cannon shot. This shot must be expressed quietly, with the flat of the left hand, by striking all the bass notes indistinctly and holding the hand on them during the four bars."[598]

Ample use is made the musical and developmental capacities of the canon shot. Not only does the composer imagine 9 pieces of artillery fired, he brings them into action at moments that are strategically sound and were the listener might expect canons to be put to use in storytelling. All canons are fired during the battle itself: after the inaugural part with the trumpet signals, march and fanfares, and before the cries of the wounded, which announce the closing victory fanfares. The canon clusters start the attack, cover troops during "running fire" and seem to carry their sound far enough to alarm inhabitants of the neighboring villages. As it is nowhere said that canon shots are necessarily sounding loudly, echoes of far away troops can be expressed. As the bells are played by a left hand B♭ right above the top note of the right hand broken octaves, there is even a hint – however theoretical – of removal from tonality with the following soft bass clusters. All in all, the anonymous composer presents us with a more integrated form of cluster usage than anyone before did, even if it still rudimentary and limited as a pictorial device.

Around the same time, perhaps a little later, German publisher Nikolaus Simrock issued a *Bataille de Neerwinde. arrangée pour le Piano-forte* without mentioning the "arranger" (1793/94)[599]. The music is exactly the same as César's *Bataille de Gemmap*[600] only the battle subject is different (at least from the perspective of the publisher's nationality): whereas the French had won the territory of the Austrian Netherlands in the fight at Gemmap, the lost it again at the battle of Neerwinde.[601] Any further nationalistic pride is

[598] Editions Durieu, P-Bn VM[12] 9074.
[599] Dating is based on the O.E. Deutsch 'Musikverlag Nummern' (Berlin 1961) as cited in Schulin 1986, p. 272.
[600] See also Schulin 1986, p. 272.
[601] The village Neerwinden is part of the municipality of Landen, between Maastricht and Brussels in the present-day Belgian province of Flemish-Brabant. The village gave its name to two battles one hundred years

suppressed, and the performance practical advice on how to play the cannon shots is taken over from the French score, now written both in French and German.

3.2.6.3.1.3 1800 Pierre Antoine César: *Bataille de Maringo*

A few years after his *Bataille de Gemmap*, César wrote another piece "where one will hear everything that happened in this action"[602] concerning – once again – the fighting between the troops of Napoleon and the Austrian army: a *Bataille de Maringo*[603]. There is a prefatory performance note explaining in exactly the same way as before the technique of the cannon shots. And here also, they start after a march and fanfare, and they are notated as empty bars with "Coup de Canon" written over it. In total, there are five such instances, all in the *allegro* depiction of the battle. This time there are no far away bell sounds in counterpoint to cannon shots as in the *Bataille de Gemmap*, but César did write the word "canon" over some D major and A major chords in the bass. It is not clear whether he meant these chords to be played with the flat of the hand.

3.2.6.3.1.4 ca1800 Bernard Viguerie: *Bataille de Prague* and *Bataille de Maringo*

Bernard Viguerie (1761-1819) had studied with Jean-Jacques Beauvarlet-Charpentier, one of Balbastre's colleagues in the post-classical Parisian organ scene and father to Jaques-Marie Beauvarlet-Charpentier, himself composer of three battle pieces[604]. Viguerie has two such compositions to his name, one of which concerns the battle of Prague[605] and is in fact an exact copy of the famous piece from the 1780's by František

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apart: the first in 1693, considered the bloodiest of that century, between the catholic French army of Louis XIV and the Allied forces under William III of Orange, king of England and Stadtholder of the main provinces of the Dutch Republic (an episode from the Nine Years War 1688-1697), and the second – relevant here – on 18 March 1793, fought between a coalition army (Austrians, Dutch, English, Spanish, Prussians and Sardinians - under the command of prins Friedrich Josias of Coburg-Saalfeld and general Karl Mack, Freiherr von Leiberich) and the revolutionary army of the French (under general Charles-François Dumouriez). This second battle was the Austrians' successful attempt at reconquering their rule over the Austrian Netherlands (after the French had won the 1792 battle at Jemappes – see fn. 101). In 1794 the Austrians were again defeated at Fleurus, whereby the Austrian Netherlands and Liège came under French rule in 1795 (until 1815). (Scott & Rothaus 1985, Vol. I, p. 79.)

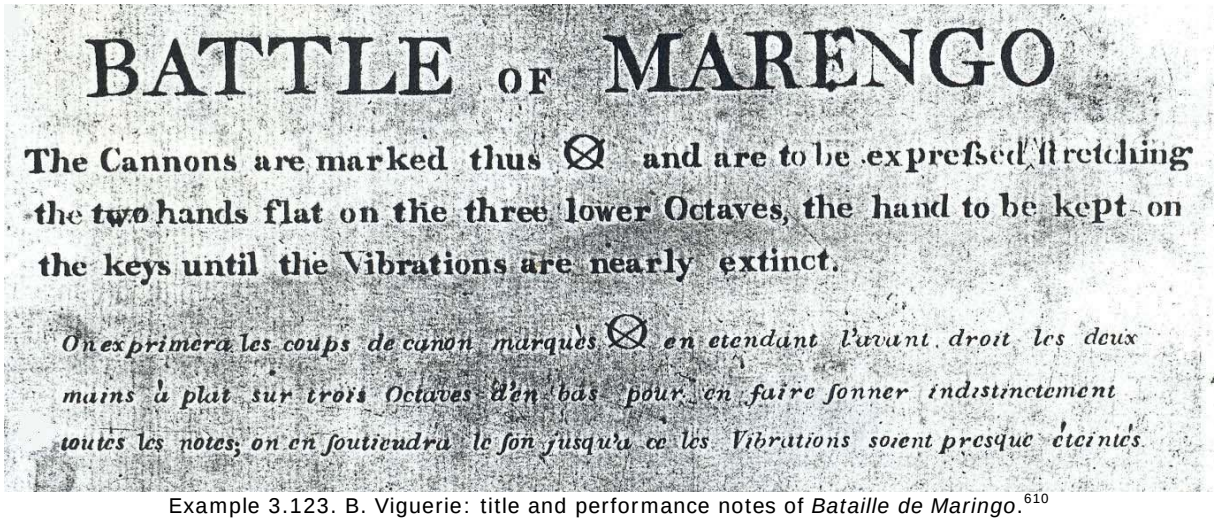
[602] The full title of the piece: Bataille de Maringo / Gagnée Par le General / Bonaparte / Premier Consul de la Republique francaise / Ou l'on entendra a tout ce qui s'est passée dans cette action / Composé / Pour le Forte Pinao [sic] / Par P.A. Cesar / Professeur et Auteur de la Bataille de Gemmap ou / Prise de Mons. We saw the copy at the Paris national library: Editions Durieu, P-Bn Acp 4419.

[603] The battle of Marengo, as it is spelled now, took place at the village of that name in Piedmont, northern Italy, on June 14th, 1800. This major engagement of the French Revolutionary wars was initiated by 1st Consul Napoleon to throw the Austrians back from positions they had recently regained in Lombardy and Piedmont. A surprise attack by the enemy at Marengo caught Bonaparte with his forces scattered and a French defeat seemed imminent until Bonaparte sent a division under General Desaix de Veygoux to lead a successful counterattack in which the artillery played an important role. Quite a few sources, both 21st century and historical, show July 14th to be the date of the action. Most seem to find consensus in June 14th however. Some 1500 men were lost, among whom the French General. (Pigeard 2004, p.519-526.)

[604] The battle piece by Jean-Jacques Beauvarlet-Charpentier that we saw - *Victoire de l'armée d'Italie ou Bataille de Montenotte* – contains no signs of clusters: the cannonades are clearly defined tonal chords.

[605] On May 6, 1757, the Prussian King Frederick the Great fought against the Austrians in the battle of Prague. There was another historical battle of Prague, in 1648 when the Swedes unsuccessfully tried to enter Prague at

Kočzwara[606]. As Kočzwara's piece, Viguerie's *Bataille de Prague* (+/- 1800), sometimes also published as a 'military sonata', contains no indications of cluster techniques, though. When the battle's authenticity requires signals of a cannon, the score indicates merely simple low octaves in bars that are encased in double bar lines. At one point, Viguerie writes "powerfull cannonade"[607] and "Cannon & Drums in general" but here also there is no sign of improper techniques.[608] This is in fact surprising for Viguerie's second battle piece, the *Bataille de Maringo, pièce militaire et historique pour le Forte Piano avec accompagnement de violon et basse*[609] dates from about the same time (1800) and here we find the same kind of *avertissement* as Pierre Antoine César and Heinrich Simrock had written, now with a specific sign for playing cannon shots. (Ex. 3.123)


BATTLE OF MARENGO

The Cannons are marked thus ⊗ and are to be expreſsed ſtretching the two hands flat on the three lower Octaves, the hand to be kept on the keys until the Vibrations are nearly extinct.

On exprimera les coups de canon marqués ⊗ en etendant l'avant droit les deux mains à plat sur trois Octaves d'en bas pour en faire ſonner indistinctement toutes les notes; on en ſoutiendra le ſon juſqu'a ce les Vibrations soient presque eteintes.

Example 3.123. B. Viguerie: title and performance notes of *Bataille de Maringo*.[610]

The parameters of Viguerie's cluster are the same as in the battle pieces we discussed earlier, except that here the compass of the cluster is specified: in stead of "all the base notes", the three lower octaves are required. The demands for letting the sound die out and for striking the keys "indistinctly" are telltale signs of how Viguerie copied the performance notes of Pierre Antoine César.

Viguerie's canons appear four times: first after the opening *March* (in between the *Word of Command* and the *Trumpet Call*), then before the ensuing *Attack* and in between the

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the end of the Thirty Year's War, but Kočzwara's mentioning of the 'Prussian Imperialists' leaves no room for doubt that it was the more recent battle he was referring to in his composition.

[606] Neither Schulin 1986 nor the RISM list such a piece by Viguerie, but we found four editions in the national library in Paris: P-Bn F1610 (Paris: Le Duc), F1611 (Paris: Sieber père), F1614 (Paris: les frères Gaveaux) and F1620 (Paris: Pleyel). The remaining two editions listed in the online catalogue of the national French library – P-Bn F1609 (Paris: Viguerie) and F1612 (Paris: Imbault) – could not be found.

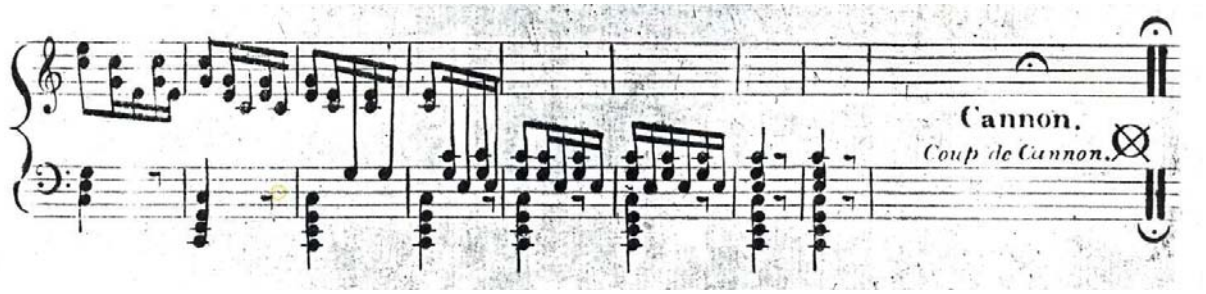
[607] "Forte Canonade", over bar 111.

[608] Together with 'running fire', the 'Cannon & Drums in general' are the only english indications in the otherwise completely French edition (P-Bn F1611), showing how Viguerie plagiarised the original british publication of the battle piece by Kočzwara.

[609] Some French and English editions spell it 'Marengo'. We compared P-Bn F 1617, F1618 and F1619. The Boston edition from which we took excerpts (Graupner Nr. 6 - c1803) says *Maringo* on the title page and *Marengo* inside.

[610] This particular American edition (Boston: G. Graupner) provides us with the original performance practice note as well as the translation. Interestingly, the New World pianists were deprived of the subtle original intention to sound the notes 'indistinctly' and to stretch the forearm. (The French text omitted the word 'bras', a mistake that was not made in the French editions, e.g. P-Bn F1618).

sections *Trumpets announcing the Victory* and the *1st Air after the Victory,* and finally at the very end of the piece. (Ex. 3.124.)



Example 3.124. B. Viguerie: *Battle of Maringo*, final bars.

Oddly enough, there are no cannon blasts during the battle itself, at least not of the "cluster" type. There are some C major chords in the bass (once accompanied by the word 'cannons' at the fourth bar of the attack) and some bass notes for the right hand to be played while the left hand is playing *Alberti* patterns in the middle of the keyboard, both these kinds of passages being typical cannonades in many battle pieces where no clusters are used. The rest of the battle noises – attacks with swords, horses galloping, charges with the bayonet, the cries of the wounded – is painted with the "regular" techniques as found in most keyboard battle pieces. Apparently, Viguerie uses the most eye- and ear-catching performance technique not so much for its potential to realistically portray a typical battle sound but rather to symbolically announce and emphasize the most glorious moments of the narrative. Early on in the piece the "cluster bombs" puts the audience on the edge of the seat before leading it to a long and thrilling sequence of action. When the right side has finally overcome the odds, the effect is brought back into play to emphasize the glorious entrance of the three victory airs.

This composition was announced at the end of July 1800[611] and gained rapid and widespread success, enjoying the second largest number of editions of known battle pieces for the piano[612]. One manuscript copy has the instruction translated into Italian and the work described as "for young ladies."[613] Considering that three octaves is a huge stretch for any two hands[614], and knowing that most keyboard music printed in the late 18th and early 19th centuries was intended for amateurs, one must conclude that performance practice standards in this kind of "secondary" or "light" repertoire were not intended to be the highest. That some battle pieces mentioned the notion of indistinctness regarding the clusters may be interpreted by us – with 20th century use of the technique in mind – as pertaining to the unclear identity of the cluster's timbral characteristics, but back then it may only have been a remark to reassure potential performers (and buyers) that utter technical mastery was not a first requirement. The popular repertoire was not only intended for the non-professionals, it also had a firm reputation for being performed as such, as is evidenced in this excerpt from Mark Twain's *A Tramp Abroad* (1880):

[611] In the Journal de Paris from 28.7.1800, as cited in Schulin 1986, p. 318. Schulin further dates the piece 'ca1801', probably meaning the date of the first edition.
[612] See Schulin 1986, p. 34-35. It was *The Battle of Prague* (1785) by František Kočžwara (1730-1791) that took first place in popularity, with more than 40 editions for piano (with or without accompaniments) to prove it 'indispensable to climax every concert' (Kidd 1990, p. 136.)
[613] Ms. 2533 (Olim: 0.IV. 110), fols. 22-39, at the Biblioteca Casanatense in Rome.
[614] Mobbs 2001, p. 29: the average octave span on English and Viennese pianos from between 1790 and 1850 varied from 15.9cm to 16.5. (On French pianos from between 1836 and 1850 it was +/- 16.4cm). Three octaves would be at least over 47cm.

> There was a small piano in this room, a clattery, wheezy, asthmatic thing, certainly the very worst miscarriage in the way of a piano that the world has seen. In turn, five or six dejected and homesick ladies approached it doubtingly, gave it a single inquiring thump, and retired with the lockjaw. But the boss of that instrument was to come, nevertheless; and from my own country,- from Arkansaw. She was a bran-new bride, innocent, girlish, happy in herself and her grave and worshiping stripling of a husband; she was about eighteen, just out of school, free from affectations, unconscious of the passionless multitude around her; and the very first time she smote that old wreck one recognized that it had met its destiny. Her stripling brought an armful of aged sheet music from their room,- for this bride went "heeled," as you might say,- and bent himself lovingly over and got read to turn the pages.
>
> The bride fetched a swoop with her fingers from one end of the keyboard to the other, just to get her bearings, as it were, and you could see the congregation set their teeth with the agony of it. Then, without any more preliminaries, she turned on all the horrors of the "Battle of Prague," that venerable shivaree, and waded chin deep in the blood of the slain. She made a fare and honorable average of two false notes in every five, but her soul was in arms and she never stopped to correct. The audience stood it with pretty fair grit for a while, but when the cannonade waxed hotter and fiercer, and the discord-average rose to four in five, the procession began to move. A few stragglers held their ground ten minutes longer, but when the girl began to wring the true inwardness out of the "cries of the wounded," they struck their colors and retired in a kind of panic.
>
> There never was a complete victory; I was the only non-combatant left on the field. I would not have deserted my countrywoman anyhow, but indeed I had no desires in that direction. None of us like mediocrity, but we all reverence perfection. This girl's music was perfection in its way; it was the worst music that had ever been achieved on our planet by a mere human being.
>
> I moved up close, and never lost a strain. When she got through, I asked her to play it again. She did it with a pleased alacrity and a heightened enthusiasm. She made it *all* discords, this time. She got an amount of anguish into the cries of the wounded that shed new light on human suffering. She was on the warpath all the evening. All the time, crowds of people gathered on the porches and pressed their noses against the windows to look and marvel, but the bravest never ventured in. The bride went off satisfied and happy with her young fellow, when her appetite was finally gorged, and the tourists swarmed in again.[615]
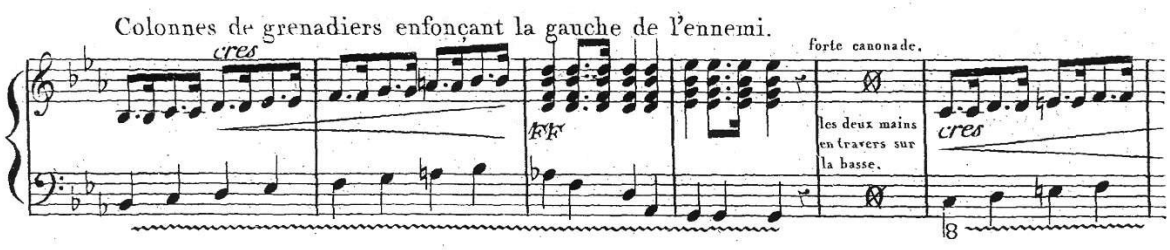
Twain does not give us the name of the composer of this *Battle of Prague*, but this does not matter at this point. It is all too clear that Twain presented us with a caricature of performance practice in the very kind of repertory that we are discussing here. The bride starts her show with a broad sweep on the keyboard though neither Kočžwara's nor Viguerie's piece contains any glissandi. For Twain, the glissando was clearly something worthwhile to incorporate in the description of a scene that was embarrassingly ridiculous and incompetently improper. In the eyes and ears of Twain and his readers, the rising number of wrong notes and the overly vivid impression of the anguish of the wounded belong to amateur performance practice just as much as cheap glissandos and – why not – cannon shots. The battle piece itself, as a genre, was intentionally picked by Twain as a realistic example of a repertoire that was typically subjected to bad piano playing. This particular piece was obviously famous enough for Twain to drop the name and for readers to have heard of it as part of the "household" repertoire played by well brought-up girls. The piece was also partial to household virtuosity: not difficult for the average

[615] Twain 1880, p. 223-225. The scene is set at the Jungfrau Hotel in Interlaken, Switzerland.

professional pianist – even in those days – but a perfect vehicle for the amateur who wishes to displaying virtuosity without much advanced finger work. In the original scores of *The Battle of Prague* pieces, there are only single bass notes or octaves designated as cannons, but the way Twain described the whole performance to be even more of a massacre than the score intended, it could very well be that those cannons were more often than not performed as clusters.

3.2.6.3.1.5 1806 Jacques-Marie Beauvarlet-Charpentier: *Bataille d'Austerlitz*

Subtitled *the day of the three emperors*[616], this battle piece on Napoleon's Austerlitz campaign[617] by Jacques-Marie Beauvarlet-Charpentier (1766-1834) has some interesting developments in the use of clusters. When the story tells of how the columns of grenadiers penetrate the left flank of the enemy, the pianist is asked to imitate a loud cannonade by playing the keyboard with "the two hands crosswise on the bass." (Ex. 3.125.)
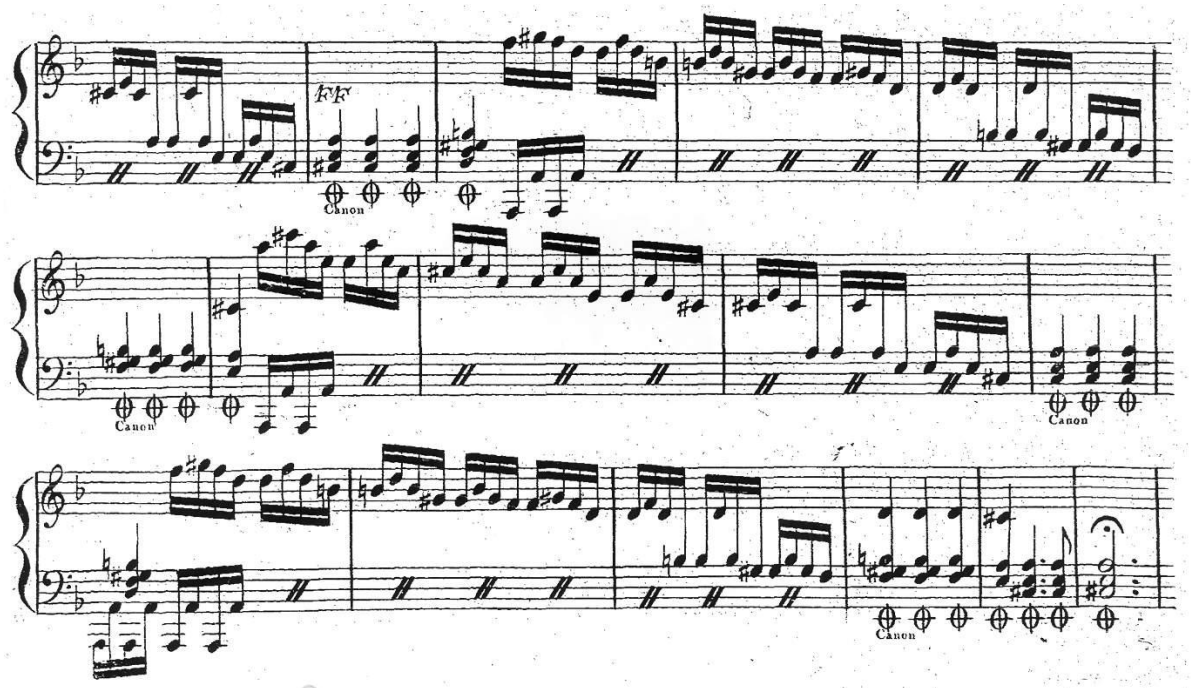


Example 3.125: J.-M. Beauvarlet-Charpentier: *Bataille d'Austerlitz* (1806), bars 57-62.[618]

Two more of such sequences end with this kind of solo cluster, after which the charge of the Russian and French cavalry is prepared. No more canons are fired for about two and a half pages, until the music depicts the Russians being "overrun into immense lakes." Beauvarlet-Charpentier here follows historical events quite accurately, as the Russian army had in fact intended to withdraw towards Vienna over frozen ponds. Napoleon showed superior tactical insight by directing his artillery to fire at the ice. In the score the canons resound again, this time combining the cluster with tonal harmonies. (Ex. 3.126.)

[616] The title page of the score reads *Bataille d'Austerlitz / Surnommée la Journée / Des Trios Empereurs. / Pièce Militaire et Historique / Pour le Forté-Piano / Avec Accompagnemnt de Violon / Précédée des Réjouissances du Camp Français / pour l'Anniversaire du Couronnemen de S.M. / l'Empereur Napoléon. / Dédiée / à la grande armée, / Par Beauvarlet-Charpentier.* In fact, the Austrian emperor Francis was not present. (Chandler 1995, p. 433.)
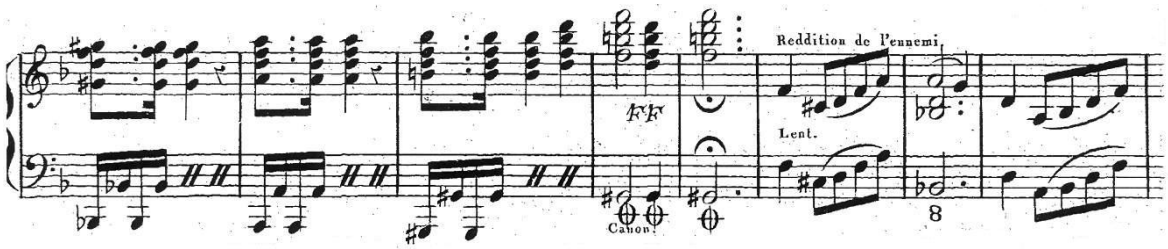
[617] On December 2, 1805, Napoleon and his army of 80.000 entered combat with the Russian and Austrian emperors and their 105.000 soldiers at about 6 miles south of the Moravian city of Brno. According for the text preceding the score, it took Napoleon and his army only 4 hours to be covered in immortal glory by destroying the opponent and take 50.000 men prisoner. The numbers may have been exaggerated, the battle was a decisive victory for Napoleon, effectively ending the third coalition war and still regarded as a tactical masterpiece. See Chandler 1966, p. 413-433.

[618] Reprinted from an edition found at D-Mbs, call number 2° Mus. Pr. 1939. All excerpts reproduced by permission of the music division of the Bayerische Staatsbibliothek (Munich).
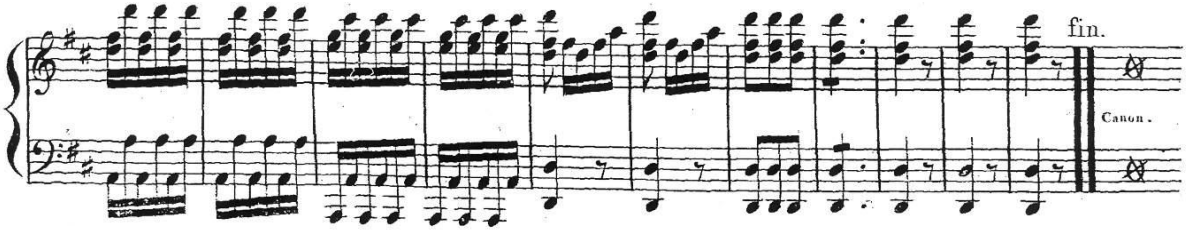


Example 3.126: J.-M. Beauvarlet-Charpentier: *Bataille d'Austerlitz* (1806), bars 110-125.

When the Russian soldiers drown in the vicious cold, the French canons herald the actual end of the battle. (Ex. 3.127.)



Example 3.127: J.-M. Beauvarlet-Charpentier: *Bataille d'Austerlitz* (1806), bars 143-150.

After the obligatory trumpet motifs celebrating victory, the slow cries of the wounded and the final march and dance, a cluster is once more required, just after the last bar of the piece. (Ex. 3.128.)



Example 3.128: J.-M. Beauvarlet-Charpentier: *Bataille d'Austerlitz* (1806), final bars.

Beauvarlet-Charpentier's piece starts like César's and Viguerie's: the clusters are played in otherwise empty bars. Soon, however, the clusters are combined with chords, reminding us of Foucquet's implementation of clusters onto harmonic functions (see above, p. 16-18). Reminiscent of Viguerie also, is the cluster at the end of the piece. Here it is not metrically defined, though, rather timed *ad libitum*. Remarkable is the realistic incorporation of clusters into the actual historical canon fights as they are mentioned in the accompanying texts. Equally striking is that there is nothing relevant to our topic in the violin part that accompanies the main piano score: when the piano has an empty bar to play a cluster, the violin is silent; it has normal notes when the piano combines clusters with chords; and there is nothing for the violin while the piano strikes the last cluster of the piece.

3.2.6.3.1.6 1816 Peter Ricksecker: *The Battle of New Orleans*

The success of Viguerie's *Bataille de Marengo* is evidenced by its being published in Paris, Amsterdam, London, Copenhagen and Hamburg, to mention only the European editions.[619] Like César's *Bataille de Gemappe* was "arranged" by Nikolaus Simrock and Daniel Steibelt (both dedicating it to another battle)[620], Viguerie's piece also left traces in pieces by other composers. In 1810, German composer Heinrich Simrock (1754-1839[621]) seems to have written *The Battle of Wagram, A favorite sonata for the piano forte*[622]*.* The music – including the cluster moments - is that of the *Bataille de Neerwinde* (published by his brother Nikolaus Simrock), the battle is again a Napoleonic war (against the Austrians), and the subtitle with the performance explanation of the three-octave cluster is that of Viguerie's (César's and N. Simrock's only demanded two octaves), though without the new symbol.

It remains interesting to note that, despite the success of the battle pieces in Europe, no clusters have been located in English composers' scores. One Anglo-Saxon country did have a concrete interest in cluster playing and battle pieces, though: the young United States of America. Viguerie's piece had been distributed there as well as in Europe, with publishers in New York, Boston and Philadelphia issuing it at least 17 times from 1802 until at least 1831.[623] In 1805, it was even billed at the New York New Theatre.[624] Simrock's *The Battle of Wagram* also made it to the US[625], but it is Viguerie's symbol for cluster playing that we can detect for the third time in someone else's music. *The Battle of New Orleans for the Piano Forte* is the first cluster piece we found to be composed by
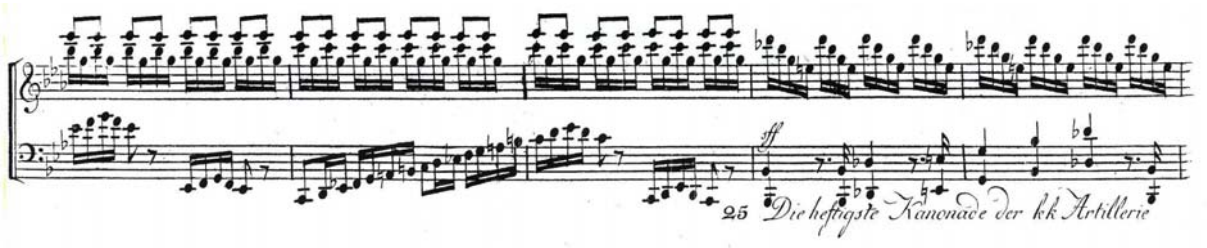
[619] See RISM and Schulin 1986, p. 318. The piece appears to have been in print until the 1870's (according to Clark 1988, p. 231). This distributional succes may in part be due to the fact that Viguerie himself was a music dealer and had opened a shop in 1795.
[620] Simrock issued it as *Bataille de Neerwinde* before 1801; Steibelt put his name under a *Bataille de Nerwinde* [sic] in 1807 or after 1818. See Schulin 1986, p. 272.
[621] Niefind 2006, p. 836.
[622] According to Wolfe 1964, p. 813 and RISM A/I/8, p. 91 ([S 3509). The edition we saw lacks the title page with the composer's name. In this battle (5-6 July 1809), Napoleon's French forces defeated the Austrian army near Vienna. The battle centered on the town of Deutsch-Wagram. Artillery was a major factor in this battle, the largest yet of the Napoleonic wars, involving over 300.000 men and resulting in more than 10% casualties. Wagram was the last time Napoleon won a decisive strategic battle that ended the war in his favor. All his later campaigns, including that already afoot in Spain, ended in French defeats. See Pigweed 2004, p. 912-925.
[623] Wolfe 1964, p.922-923.
[624] "The great battle of Maringo, or, The apotheosis of General Dessau", was presented on Wednesday, May 15, 1805 at the New Theatre in New York, as listed on MS Thru 479, part of a collection of 18th and 19th century printed playbills at the Harvard Theatre Collection, Houghton Library, Harvard College Library. The playbill's credits actually lists Hewitt in its reference to the music of the evening, an American composer of two battle pieces and in 1804 also one of the Philadelphia publishers of Viguerie's *Battle of Marengo.*
[625] Published by J. Hewitt in New York. See RISM A/I/8, p. 91 ([S 3509).

an American composer: Peter Ricksecker (1791-1873). It was published and sold in Philadelphia in 1816[626] by George Willig, whose music store had also issued Viguerie's *Bataille de Maringo*[627].
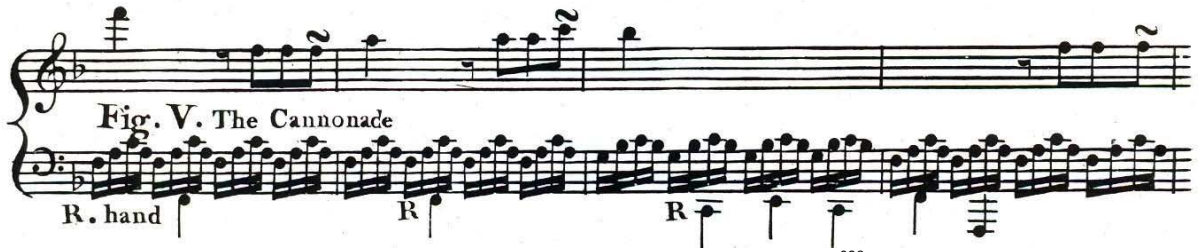
With this chain of events, the sign as well as the cluster can be said to have entered the repertoire of notational and compositional tools in battle piece writing. An explanation of the symbol is apparently not deemed necessary anymore for no written comments elaborate on cluster playing. The canon shots appear only in between sections, making them predictable and, as such, ready to be considered standard equipment of the genre. Ricksecker's limited use of them – when the rest of the battle rages, only tonal chords in the bass are to make clear how the British are 'repulsed by the American Infantry and Artillery' – shows no more room for evolution in the cluster's compositional potential.

3.2.6.3.2 Octaves or palms?

It is remarkable that – except for the American Ricksecker – only the French composers seem to have really liked the cluster as the ultimate ear-catcher in battle music. Despite some German editions (e.g. Simrock - see above), most battle pieces outside of France use only the simplest of performance practical means to depict even the "fiercest canonade": octaves (ex. 3.129), right hand bass notes (ex. 3.130), fast repeated octaves (ex. 3.131) or "drum roll" type upbeats (ex. 3.132).
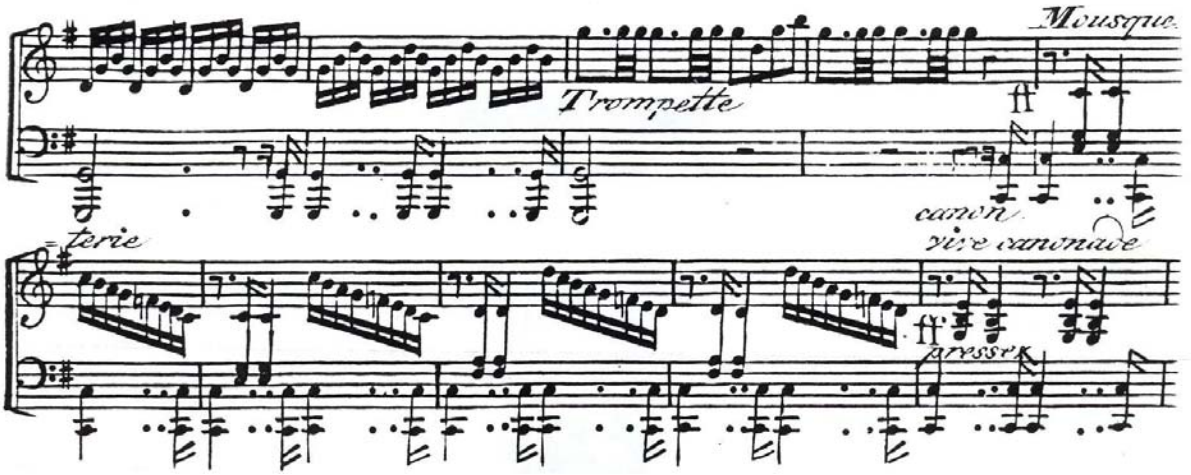


Example 3.129. J. Vanhal: *Die Schlagt bei Würzburg* (1796), bars 217-221.
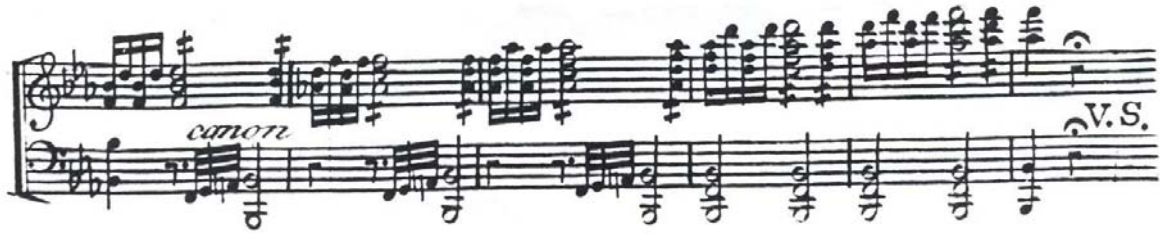


Example 3.130. F. Kauer: *The Conquest at Aczacow*, (?1789[628]) bars 85-88.

[626] The Battle of New Orleans took place on January 8, 1815. It was the final major battle of the War of 1812. With Napoleon defeated in Europe in 1814, the British were in the position of sending troops to America, hoping to starve New Orleans into submission and seize America's western lands. American forces under General Andrew Jackson decisively defeated the invading British army. The Treaty of Ghent had been signed on December 24, 1814, but news of the peace would not reach New Orleans until February 1815. (Tucker 2003, p. 619-621.)

[627] From 1804 to 1807. See Wolfe 1964, p. 923. The Viguerie battle piece was available in Philadelphia from at least three different publishers - Willig, G. Blake and J. Hewitt (whose edition was sold through Blake) – between 1804 and 1804. G. Blake seems to have taken pride in the number of battle pieces he had on offer, printing a list including pieces based on the incidents at Trafalgar, Austerlitz, Maringo, Trenton, Tripoli, Waterloo and others.
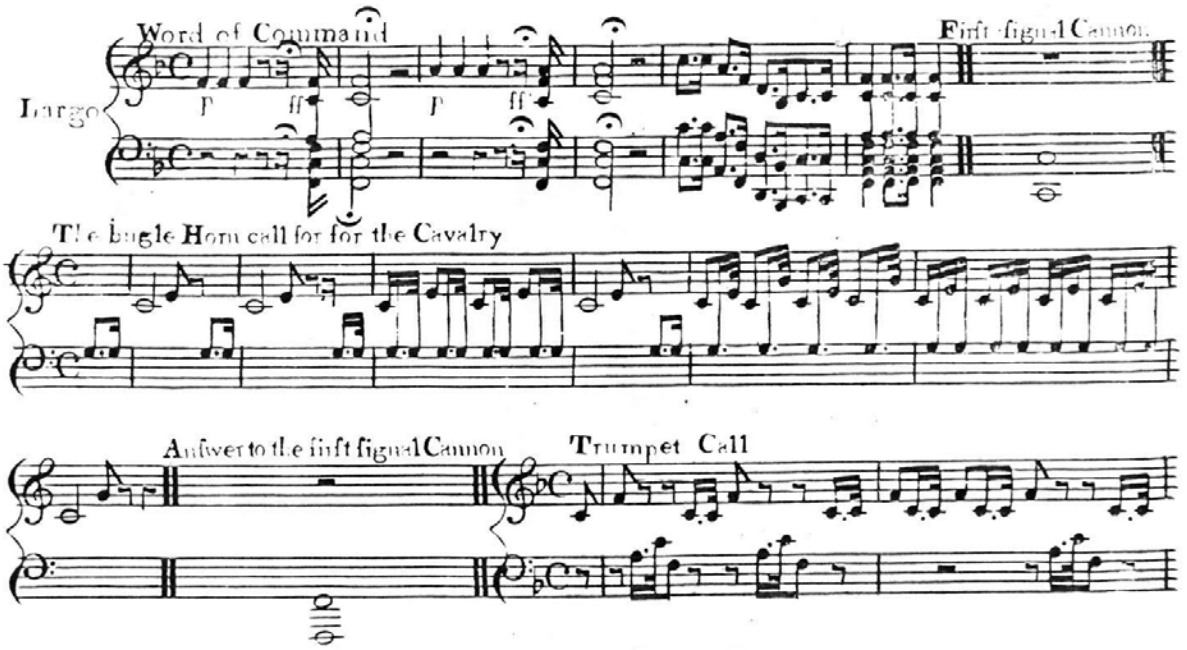


Example 3.131. J.-F.-A. Lemière: *La Bataille d'Jena* (1806[629]), bars 567-575.
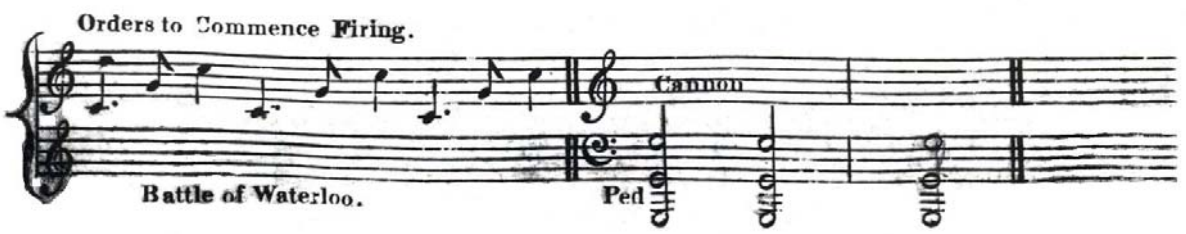


Example 3.132. L.-E. Jadin: *La Bataille d'Austerlitz* (1806[630]), bars 218-223.

In some of these pieces, such a simple canon instance can look suspiciously like the cluster moments of a Viguerie or a Ricksecker, making us wonder whether or not the performer was allowed or even considered to take action as he saw fit and use the palm of his hand(s) to fill up a canon octave. (Ex. 3.133 and ex. 3.134.)

[628] Branscombe 2002, p. 417 wonders about the date but does not say why. This excerpt is taken from *Bland's Collection of Sonatas, Lessons, Overtures, Capricios, Divertimentos &c.&c. for the Harpsichord or Piano Forte* (London).
[629] The piano solo version is an arrangement of Lemière's *La grande bataille de Jéna gagnée sur les prussiens, symphonie militaire* for orchestra opus 36. Cook 2002, p. 540 wonders about the date of 1806 for the orchestra piece but is sure about that year for the piano arrangement.
[630] Amsterdam edition (Nolting & fils 114; NL-DHnmi 27 A 41 – reproduced by permission). This piece was originally for 'grand orchestre'. See Schulin 1986, p. 286.



Example 3.133. Fr. Kočžwara: *The Battle of Prague* (ca 1785), bars 17-33.[631]



Example 3.134. J. Blewitt: *The Battle of Waterloo* (1816-18[632]), bars 62-64.

The idea of a performer deciding to use the technique he himself considers appropriate at a given moment in a given piece is one we have encountered before when pondering the identity of the glissando. With the canon shot there is a similar reason to believe that this could have been the case, and it may be more than the question of using the palm to play a cluster that is not expressly notated as such.

3.2.6.3.3 Piano and drums

It is on the borderline of our subject, but very worthwhile to stop for a moment and consider percussion registration on the early piano. Not really an extended performance technique or an extension of the proper resources of the "piano" as we have determined at the outset of our investigation, but very much an intention of extending the sound world of the piano through construction by piano builders and the use of it by composers, and above all significant in relation to the future of the extended techniques as will be

[631] This excerpt comes from the New York edition published by P. Weldon (US-NYp M1.A1 K), ca 1800 (dating New York Public Library). Reprinted by permission of the Music Division, The New York Public Library for the Performing Arts, Astor, Tilden, and Lenox Foundations.
[632] Excerpt from G.E. Blake edition (Philadelphia), dated by Wolfe 1964, p. 90. US-NYp. Reprinted by permission of the Music Division, The New York Public Library for the Performing Arts, Astor, Tilden, and Lenox Foundations.

verified in the 20th century part of our story. Percussion stops show the urge to find ways to depict noise (percussion sounds) while avoiding improper playing. From this perspective, pieces using these stops are within the range of our interest, especially if it turns out that the percussion registers can be seen as an alternative that composers considered for depicting artillery noise in early 19th century piano music.

Hummel's *Coda La Battaglia* from 1807 contains the composer's remark

> N.B.: The sign ~~~~~~~~ means Blotton Fire, and ⊕ the canons, which can, at least in social circles, be alternatively accompanied at the piano by a big ratchet and a big drum at the indicated moments. [633]

Later on in this piece, when the Hungarian Garde calls to the fight, Hummel writes "Tambour" above some 32nd notes trill in the bass. It only looks like one of those typical verbal suggestions in battle pieces, suggestive to the performer of the extra-musical idea behind the notes rather than to be taken as indicative of concrete percussion performance. But, in social circles, an innocent bystander might well have felt compelled to pick up a tambourine and join in. In Hummel's previous opus number, he had already prescribed an accompanying tambourine in a *Militair Minuett*[634], reminding us of Clementi's and Steibelt's salon pieces (see 3.2.6.1.11). In the trio of Hummel's third minuet from his 1811 *Tänze componirt für den Apollo Saal*, an asterisk and a footnote explain how it is intended to be accompanied by Jingle Bells[635], even if no further advice is indicated as to exactly when the instrument is expected to be played. František Kočžwara's most famous *Battle of Prague* for solo piano was published in many different arrangements, among which orchestra or Turkish Music[636], but also in the composer's own versions for pianoforte, violin, cello and tambourine[637] or for piano trio and bass drum[638]. One 1802 New York edition is for piano and "accompaniments for the drum, violin and bass", with "The Cannon to be performed on a drum" in the lower half of page 3 of the "basso" part.[639]

Some of the editions of Viguerie's *Bataille de Maringo* were issued for piano with the accompaniment of the violin and the bass[640] but these had no drum part and when the pianist plays clusters, the string parts have nothing to play. Some of the editions of his *Battle of Prague,* on the other hand, also have a cannon part included in the part for double bass.[641] That bass and the violin again have nothing to play when the piano plays octaves for the cannon signals, but the 130 bar long cannon part has many notes – all of them *c*. The part is added only for the *Allegro* (anything before and after that is *tacet*),

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[633] Schulin 1986, p. 24. ""NB: Das Zeichen ~~~~~~~~ bedeutet das Blotton Feuer, ⊕ die Kanonen, und kann allenfalls in Gesellschaftszirkeln am Klavier mit einer grossen Ratschen und einer grossen Trommel bei gezeigten Stellen begleitet werden." We have not been able to find any definition for 'Blotton Feuer'. The reference to a ratchet indicates it to be a rapid or ‚running' fire and the term Hummel uses could very well mean 'platoon fire', the tactic of disciplined mass firing of muskets by alternating platoons. Such consecutive volleys made for a constant hail of bullets on the enemy formation. The *Coda la Battaglia* is part of *12 Deutsche Tänze mit Anhang einer Bataille. Componiert, fürs Pianoforte eingerichtet* opus 25, announced 28.1.1807 (Zimmerschied 1971, p. 48).

[634] Number 10 of '*12 Minuetten und Trios*' Op. 24, announced on 28.01.1807. (Zimmerschied 1971, p. 46).

[635] 'Schlittenschellen'.

[636] See Schulin 1986,p. 295-296.

[637] See RISM A/I/5, p. 69 – [K 1100-1105 and RISM A/I/12, p. 326 – KK 1105a.

[638] RISM A/I/12, p.326 – [KK 1104a, an Amsterdam edition for piano-forte, accompanied by violin, cello "et grand-caisse". Some editions simply state "…with accompaniments for a violin, bass &c."

[639] As described in Wolfe 1964, p. 494.

[640] E.g. P-Bn F1618.
(RISM A/I/5, p. 69 - [K 1089).

[641] E.g. P-Bn F1614. Not all editions available at the Paris library are preserved with the complete parts.

but is not synchronized with the piano writing: except for the two cannon signals, the piano has no cannons to play each time the drum part indicates “C”. This drum part is clearly intended for the bass player, as both these instruments are never to be played at the same time, and as the drum part is written in between the bass parts on the same pages. Although it is nowhere indicated specifically, we can assume that the bass player was allowed the creativity of playing on a percussion instrument just as much as bowing the cannonball notes on his bass depending on the direct availability of percussion instruments.
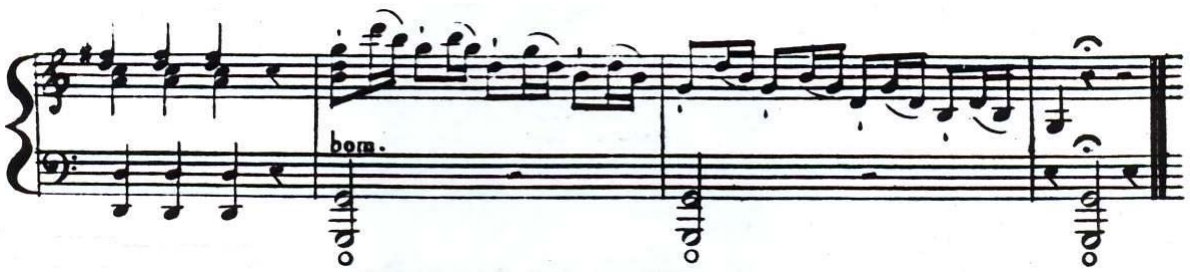
Another piece, Dussek’s *Combat naval*, existed in an 1807[642] edition for pianoforte with accompaniments for violin, cello and "grand Tambour ad libitum." There should be no doubt that social circles were accustomed to chamber (or "salon") music settings including percussion instruments, which could be distributed, ad libitum among those present.

It would not be surprising that, in case such specific instruments were not available but the piano at hand was equipped with percussion pedals, the score would have been interpreted according to the potential of the piano just as easily as it could have relied on the percussionist talents of those present. Even if the piano part did not always indicate what the drummer should play (as in the *Battle of Prague*), it would have been obvious to use a percussion pedal when the word ‘cannon’ appeared above and in between the piano staffs.

3.2.6.3.4 The percussion pedal
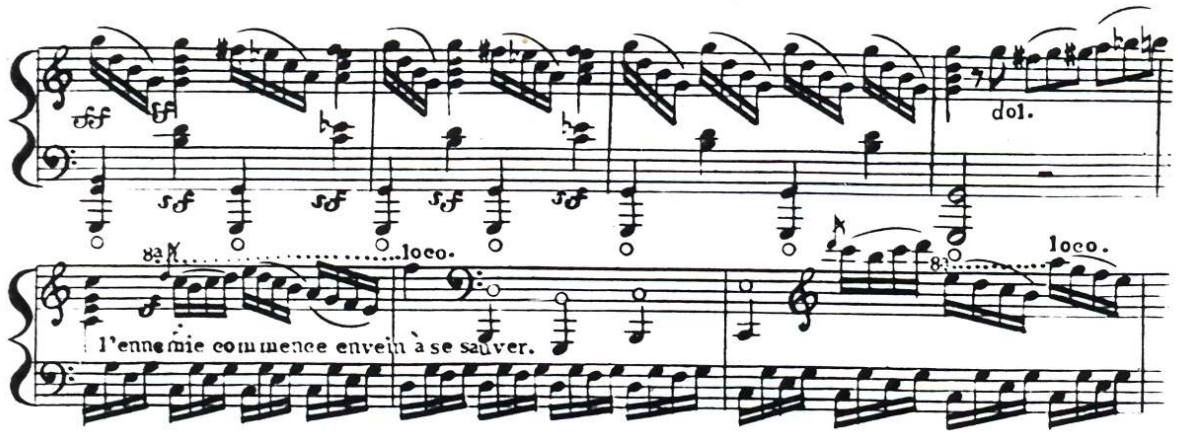
3.2.6.3.4.1 1807[643] Johann Vanhal: *Le Combat Naval de Trafalgar*

Not all composers seem to have thought it necessary to explain their notational symbols, perhaps relying on performers’ sense of appropriateness in combination with developing notational and performance traditions and routines. In his description of the 1805 naval battle in which Lord Nelson defeated a combined French and Spanish fleet at Trafalgar, Viennese composer Johann Vanhal (1739-1813) left us tiny marks like "o" and "bom." (Ex. 3.135 and ex. 3.136.)



Example 3.135. J. Vanhal: *Le Combat Naval de Trafalgar et la mort de Lord Nelson* (1807), bars 24-27.[644]

[642] Schulin 1986, p. 278.
[643] Dated according to M. v. Dewitz, *J. Vanhal*, p. 132 (as cited in Schulin 1986, p. 322). There is supposed to be a German edition of this piece that is announced on 13.9.1806, but no score has been located (id.).
[644] Excerpts from the Rotterdam ‘Chez Plattner’ edition. (Ca1818 according to NL-DHnmi 44 F 14.)



Example 3.136. J. Vanhal: *Le Combat Naval de Trafalgar et la mort de Lord Nelson* (1807), bars 106-112.

In a chaotic battle scene with octaves and right hand notes in the deep bass, these o-markings are put in places that are typically associated with cannon fire. These instances are unlikely to be intended for cluster playing: throughout the piece, the symbol appears over octaves that support C, G, D, B and A major as well as G, E and A minor harmonies. At some points, it would even be impossible to play a cluster because the symbol appears at the end of a 16th note run. More probably, the symbol points to registration practice, as does the word "basson" written underneath a broken chord in the bass of the fourth bar of this piece. If such written out references like "basson" or "bom" would be meant to suggest a mere timbre mutation, there would not have been a need for an additional bomb-symbol like the little "o."

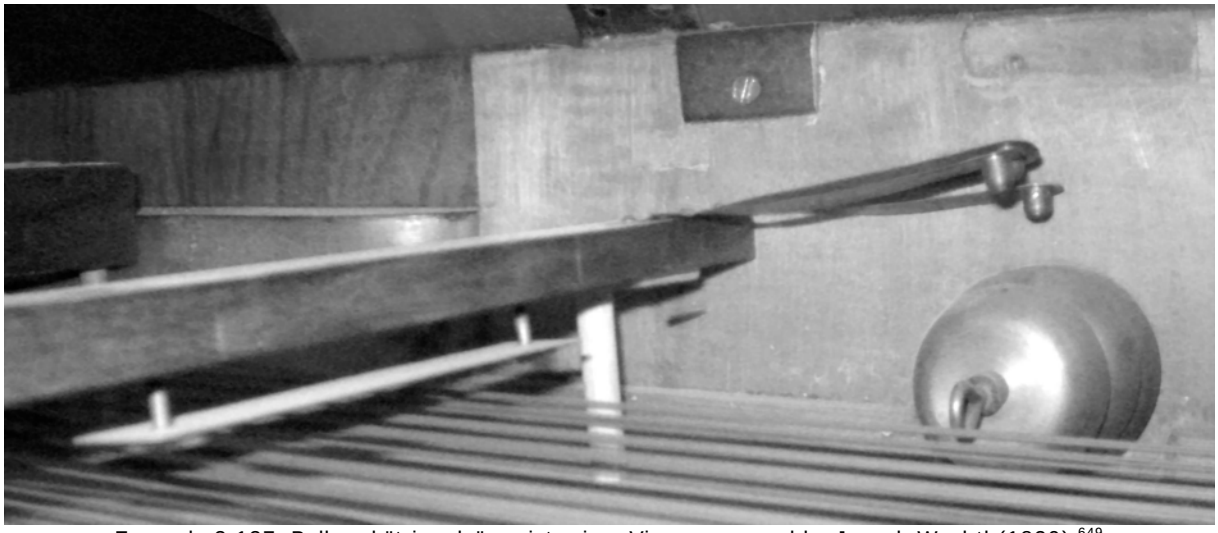
In some keyboard instruments stops were built to enrich the instrument's pallet with all kinds of orchestral colors. One such kind consisted of bell and drum sounds associated to the then popular "Turkish" or "janissary" music.[645] Kočzwara's 1780's *Battle of Prague* (and Viguerie's ca. 1800 copy of it) contains a *Quick Step* with the title *Turkish Music*, and some editions of this piece are for piano, violin, cello and drum (tambour according to some title pages, generic in others[646]). Nothing in this piece points at the use of janissary pedals, however. Nevertheless, around the turn of the nineteenth century, "alla turca" music was so popular that piano manufacturers made pianos with a specific "janissary" or "military" stops. The most common janissary register on the early-romantic Viennese grand consisted of a combination of two percussion effects: the "drum", as a drumstick which was made to hit the underside of the soundboard or a drum skin, and one or more bells, also named "triangle" often combined with a messing strip hitting a few bass strings to imitate the sound of a cymbal.[647] (Ex. 3.137.) When simultaneously

[645] The janissaries were the Ottoman sultan's elite troupes, originated in the 14th century and abolished in 1826. The Turks were well known to the citizens of Vienna as military opponents, and the many Turkish invasions may have led to a fascination among the Viennese for the cultural Ottoman identity. The music of the janissaries was known in Europe from the 17th century onwards. Around the middle of the 18th century, a big bass drum was the most important instrument associated with the janissaries, during the last quarter of the century, cymbals and triangles were added. Hence, the Viennese musical style modeled on the music of the janissary military bands called upon percussion instruments that were 'exotic' when compared to the classical orchestration. Among the composers noted for their musical implementation of such 'Turkisms' were Mozart (the finale of the fifth violin concerto K.219 (1775), the rondo *Alla Turca* K.331 (1778), *Die Entführung aus dem Serail* K.384 (1781/82)), Haydn (his opera *L'Incontro Improvviso* (1775) and the *Military Symphony* (1793/94)), Beethoven (The variations on the march's theme opus 76 for piano (1809), the Turkish march from *Ruinen von Athen* (1811), the Turkish-music versions of the British and French battle songs in *Wellingtons Sieg* (1813), the finale of the *Ninth Symphony* (1817-24), and the March WoO 20, the *Polonaise* WoO 21 and the *Ecossaise* WoO 22, the latter three all for military band), but also, earlier on, Lully, Gluck, Michael Haydn and Speer. See Pirker 2002 for more on the subject of janissary music.

[646] See Schulin 1986, p. 293-296.

[647] Lelie 1995, p. 292.

using the damper pedal, the sound of the drum could be reinforced and the cymbal strings could keep reverberating. By a more reserved use of the damper pedal, the drum sounded much less or not. Sometimes the triangle had its own pedal, as on the pyramid grand by Van der Does (Amsterdam c1820) at the Victoria and Albert Museum in London.[648]



Example 3.137. Bell and "triangle" register in a Viennese grand by Joseph Wachtl (1820).[649]

Besides the registers pertaining to "Turkish music" effects, other forms of percussion were applied to the piano, such as the 1818 "tambourin et sonailles" in some French instruments (ex. 3.138), or a drum mechanism fitted on a 1798 upright square with stickers extending over a range of 32 notes, and a triangle mechanism extending over 24 notes. On this latter instrument, not only can individual notes be accentuated rhythmically, strings and percussion can sound together for entire melodies.[650] Interest in such melodic-percussive playing on the piano still aroused builders in the 1840's, as witnessed by for instance the 1841 'Piano Basque' by Parisian Paul-Joseph Sormani ("consisting entirely of tambourines whose beaters were worked from a keyboard") and the "Melodicon with drums", patented by Nunns and Fischer in New York in 1847 ("combining a series of kettle drums with an ordinary pianoforte, so that strings and drums should sound simultaneously")[651].

[648] From the collection of Chris Maene.
[649] American private collection. Photo taken from Lelie 1995, p. 177.
[650] Mobbs 1984, p. 474.
[651] Harding 1931, p. 67-68.



Example 3.138. Tambourin stop underneath a square piano (Pfeiffer, Paris, 1818), collection of the Musical Instrument Museum, Brussels. (© MIM)

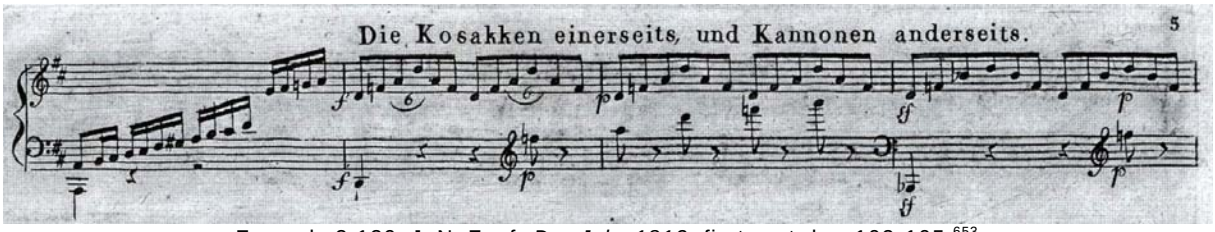
Registration markings for any stops other than the sustaining and una corda pedals in piano scores are rare. If encountered, the use of timbral addition stops such as the bassoon register is logically indicated for certain lengths in music rather than for specific notes. A mere textual indication by use of he name of the stop is usually sufficient for the performer to know what to do. Without a doubt, the o-symbol in Vanhal's 1805 naval combat piece (ex. 3.135-136) points to *rhythmical* use of stops, requiring a symbol to be efficient. We have not seen the word 'bom' pop up in any other piano score after the one by Vanhal; a symbol like the one he used does return, however, as we will see in some pieces by lesser as well as more well known composers.

3.2.6.3.4.2 1813 Johann Nepomuk Zapf: *Das Jahr 1813* (II)
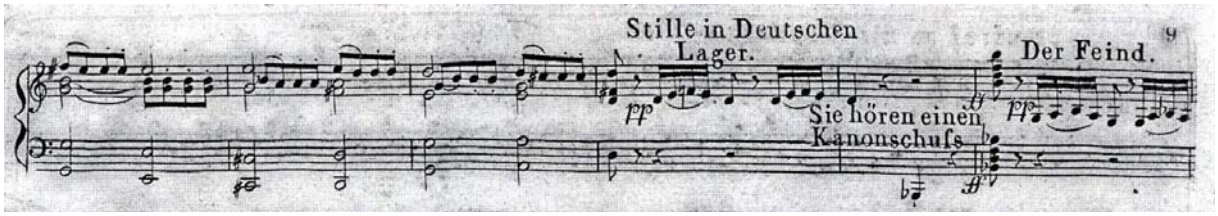
Viennese composer Zapf's compositional "Essay on a musical representation of a few war events in this remarkable year" is written in two "timeframes": "Until the truce after the battle at Bautzen" and "From the battle at Peterswalde until the Bavarian court joining the German alliance."[652]

[652] *Das Jahr 1813. Versuch einer musikalischen Darstellung einiger Kriegs Begebenheiten in diesem Merkwürdigen Jahre für das Piano-Forte. Erster Zeitraum. Bis nach der Schlagt bey Bauzen abgeschlossenen Waffenstillstande. Zweiter Zeitraum. Von der Schlagt bey Peterswalde bis zum Beitrit des Bayrischen Hofes aum Deutschen Bunde*. (D-Mbs 4 Mus.pr. 32796) The war events are part of Napoleon's Saxon campaign in 1813.

If Zapf used a complete novelty such as the glissando in thirds to capture the attention of his audience (see 3.2.6.1.18), the other extended technique that usually thrives in such pieces – the cluster – is nowhere to be seen. In fact, there is not a single battle piece in the repertoire that contains both the glissando and the cluster. For the unavoidable cannon shots, Zapf turns to the simplest of means, just like so many other composers of this genre: the bass note or the loud chord. (Ex. 3.139 and ex. 3.140.)
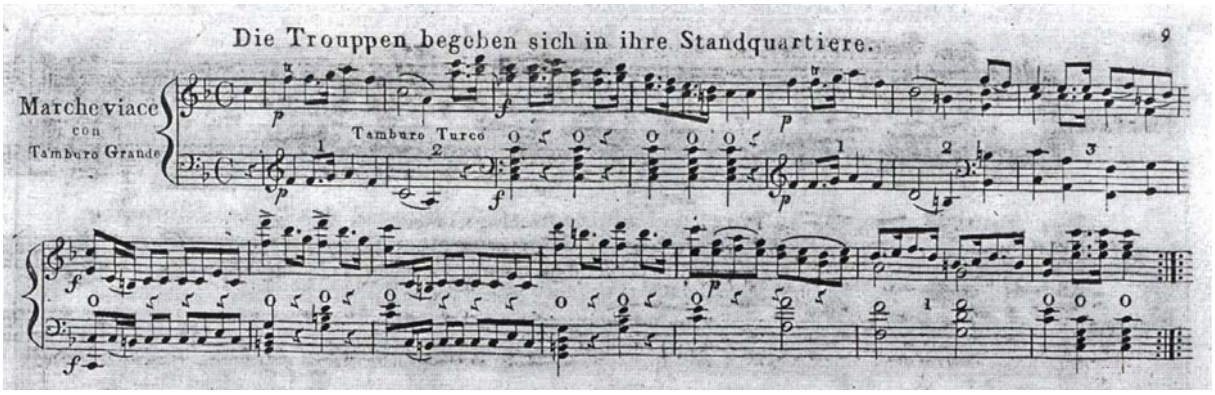


Example 3.139. J. N. Zapf: *Das Jahr 1813*, first part, bar 102-105.[653]



Example 3.140. J. N. Zapf: *Das Jahr 1813*, second part, bar 197-202.

Whether his interests as a "Klaviermacher"[654] had anything to do with it is not known, but between the staffs – and different from the texts that merely entertain the pianist with information on the progress of the battle – this music shows definite signs of percussion instruments commanded from the keyboard by the pianist: the o-mark is here defined as a "Tamburo Turco." (Ex. 3.141 and ex. 3.142.)
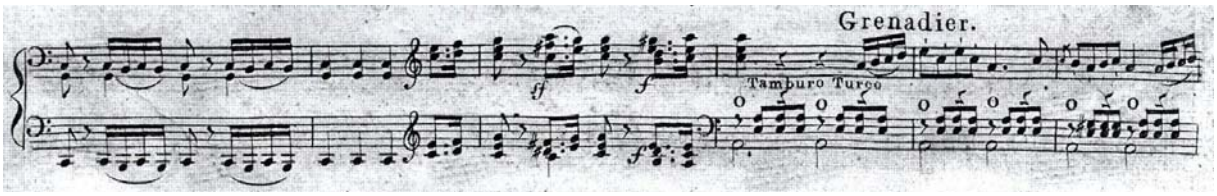


Example 3.141. J. N. Zapf: *Das Jahr 1813*, first part, bar 208-221.

After the disaster of the failed French war on the Russians in 1812, he defeated the Prussian-Russian army in Bautzen, a town of Saxony, on May 21, 1813. (Pigeard 2004, p. 104-113.) This led to a short cease-fire after which Austrians, a Russian-Prussian army and Swedish-Russian legions join forces against Napoleon in August of 1813. Zapf starts his second part with the battle at Peterswalde on September 17th, but in the score he tells the story of the battle of Kulm on August 29-30th (after which the French General Vandamme is captured by the Russians), followed by the death of General Moreau, who was mortally wounded on the battle field of Dresden on August 27th and died on September 2nd. (Pigeard 2004, p. 431-435 and 248-254.)

[653] D-Mbs 4 Mus.pr. 32796. All excerpts reproduced by permission.

[654] Boisits 2007, p. 1339.



Example 3.142. J. N. Zapf: *Das Jahr 1813*, second part, bar 113-118.

The Tamburo Turco appears to be the first – and very rare – direct reference to the Turkish registration in the piano repertoire.

3.2.6.3.4.3 1816 Ludwig van Beethoven: Wellingtons Sieg

For an extended period in his compositional life, Beethoven expressed interest in the musical connotations to military activities on several levels. Since the middle of the nineties of the 18th century, in between the French Revolution and the onset of the Napoleonic Wars, Viennese music had started to respond to the stormy currents of contemporary history. In the line of what – amongst others – Beethoven's teachers Haydn and Salieri had put forward in their patriotic cantatas, symphonies, anthems, incidental music, arias and masses[655], Beethoven had written nationalist battle songs in 1796-97[656], improvised on *God Save Emperor Franz* in 1803 and expressed political allegiance through dedications of his works[657]. With his third symphony (1804), Beethoven permitted "aggressive and disintegrative forces to enter musical form" and introduced "elements into instrumental music that had previously been neglected or unwelcome", going beyond the "pleasure principle of Viennese classicism" to develop his own concept of musical heroism. His grand fifth piano concerto in E♭ opus 73, composed for the greater part during the second French occupation of Vienna (May 1809-November 1810), shows evidence of his patriotic frustrations on the sketches and in the eventual dedication[658] as well as in what Einstein called the "apotheosis of the military concept" in Beethoven's music.[659] During this period, Beethoven also composed several minor pieces for military band (the marches, polonaise and ecossaises WoO 18-23) and worked on the incidental music to Goethe's story of national liberation and personal sacrifice - *Egmont*. Soon afterwards, in 1811, he wrote the music to Kotzebue's *Die Ruinen von Athen*, used mythology as an excuse to pay homage to the emperor Franz and containing a march in the popular "Turkish" style, and to "König Stephan, oder Ungarns Erster Wohltäter" by the same author and equally transparent in its patriotic intentions. On top of that, other composers in Vienna also expressed their interest in the military politics of the age, e.g. Philipp Jakob Riotte (1776-1856), writer of several battle pieces. He wrote three of them after he settled in Vienna, between 1810 and 1814, one of which compositions was called *Bombardement der Stadt Wien*, another one – *Der Schlagt bei Leipzig* was published in several versions and more than 12 editions. Riotte became one of the most played composers in Vienna in the 1820's.

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[655] Haydn's 'Military' and 'Drum Roll' Symphonies (resp. 1794 and 1795), the 'Gott, erhalte Franz den Kaiser' (1796), 'Alfred, oder der patriotische König' (1796), the aria "Lines from the Battle of the Nile" (1796 - inspired by Nelson's victory at Aboukir Bay), the 'Masses in Time of War' (1796) and 'Nelson Mass' (1798); Salieri's 1799 cantata 'Der Tyroler Landsturm'; Franz Xaver Süssmayr's 'Der Retter in Gefahr' (1796), Maria Theresia Paradis' 1794 grand funeral cantata on the death of Louis XVI, etc.

[656] *Abschiedsgesang an Wiens Bürger* WoO 121; *Kriegslied der Österreicher* WoO 122.

[657] Solomon 1998, p. 178.

[658] See Küthen 1996, p. 41. When the concerto was finished in early 1810, Beethoven dedicated it to Archduke Rudolph, then returning from exile.

[659] Einstein 1958, p. 247. As cited in Solomon 1998, p. 268.
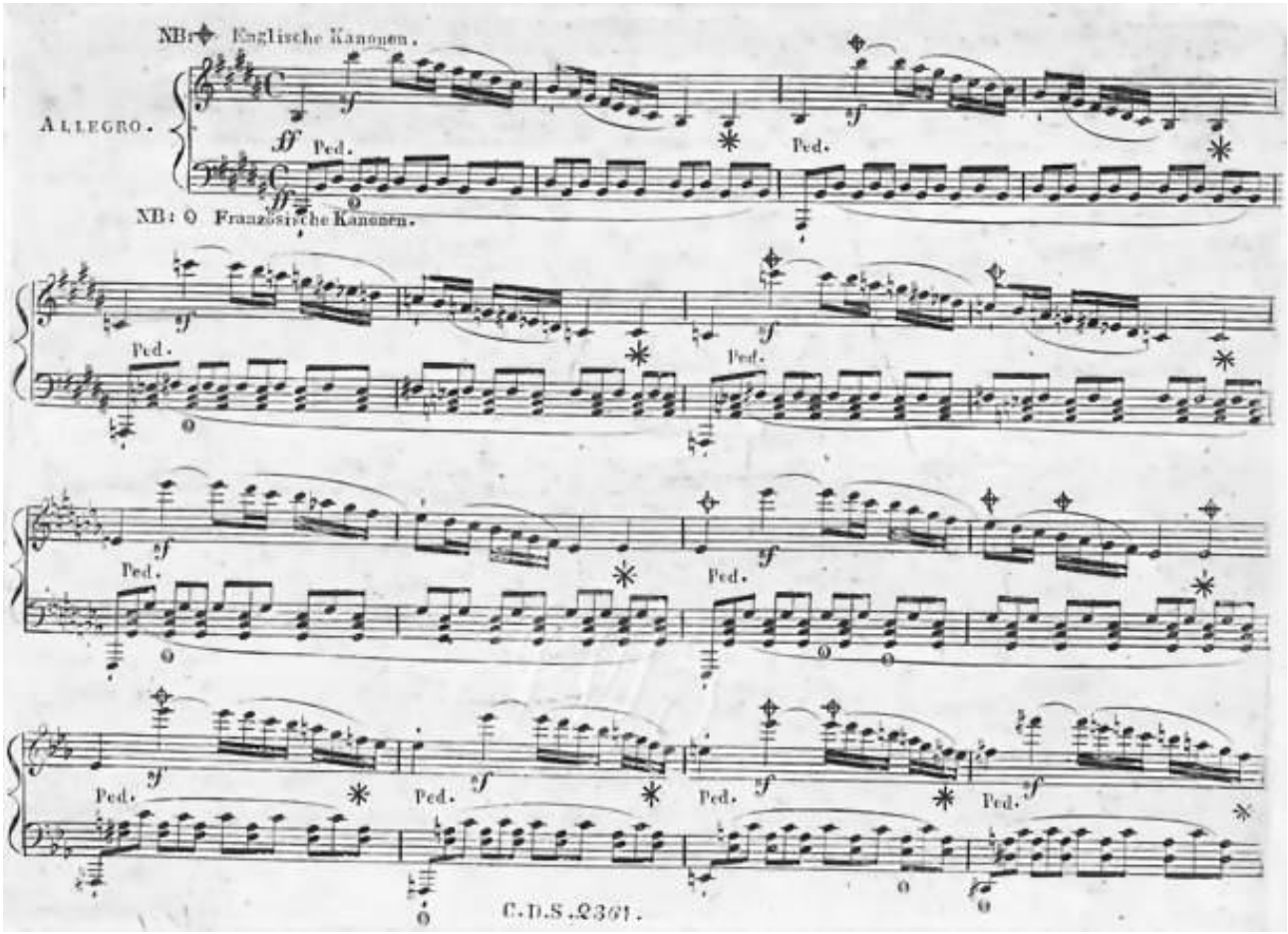
Many influences of French revolutionary music have been traced in Beethoven's post-1800 style, which led one commentator to see how

> Ironically, Beethoven's "heroic" style, which came into being as a collaboration between Vienna and France, expired in the years 1813-1814 as a vehicle celebrating victory over Bonaparte and France" [660]

The vehicle referred to is the opus 91: *Wellingtons Sieg oder die Schlacht bei Vittoria*, occasioned by the defeat of the French troops on the plains of Vitoria on June 21st, 1813, by the troops of Sir Arthur Wellesley, Duke of Wellington. When the news of the victory reached Vienna, inventor and music mechanic Johann Nepomuk Mälzel, then a friend of Beethoven as he manufactured ear trumpets for the composer, convinced Beethoven to compose a victory symphony for his mechanical orchestra, the so-called "Panharmonikon." When transferring the music to his machine, Mälzel must have noticed some extra potential for he suggested Beethoven should adapt the piece for grand orchestra, add a battle music and an introduction. The resulting composition for orchestra proved a great success for Beethoven and Mälzel. It not only lead to a dispute on the copyright because both wanted to market the highly popular composition, it also made Beethoven want to milk it to the full by arranging it for the piano as well as a host of other instrumental settings. The Panharmonikon version was written between August and October 1813, the orchestral version in the next three months. In the end, that piano version was ready in the autumn of 1814, to be published in February 1816.[661] The popularity of the piece is measured in part by counting the number of versions Beethoven made: next to Panharmonikon, orchestra and piano, arrangements for two pianos, piano four-hand, piano trio, string quintet and for 'full Turkish Music' were all published in 1816.

In the piano version, from the battle onwards, two "nota bene" indications explain the signs with which Beethoven designates the cannon shots that are sounded on side drums in the orchestral version: "o" for the French cannons and "⊗" for the English ones. (Ex. 3.143.)

[660] See Solomon 1998, pp. 179-180.The influences concern Gossec, Grétry, Kreutzer, Berton, Méhul, Catel and Cherubini as well as the French violin school.
[661] Schulin 1986, p.268-269, fn. 39 and 41.



Example 3.143. L. van Beethoven: beginning of the actual battle in the piano arrangement of *Wellingtons Sieg* (1816).

During 173 continuous bars, 71 English and 59 French canon shots need to be fired at irregularly timed moments, the English sign printed over the right hand staff, the French one underneath the left hand staff. (The damper pedal is indicated in between both staves.) It has been suggested (sarcastically) that the palms of the hands may have to be employed[662], but both hands are too very busy continuously detailing the cacophony of the battle action for clusters to be intended here. Beethoven must have had in mind the Janissary stops, evidenced by the use of the same sign as in Zapf's piece from 1813-1815[663] and by the anecdote that he frequently played upon a piano equipped with janissary accessories owned by the Prague advocate Dr. Johann Kanka.[664]

The orchestral version of *Wellingtons Sieg* demands side drums to be put on each extreme side of the stage and the stereophonic effect is to take care of simulating the geography of a battlefield. If the piano does not have two suitably different stops to be used in playing the arrangement, the listener would not be able to distinguish between the movements of the English and French opponents. Beethoven must have had a particular set-up on a specific instrument or from a specifically popular builder in mind when arranging the artillery sounds for the piano version. When looking closely to the score, and especially when playing the piece, it is immediately clear that practicality demands two separate stops. With the continuous use of the damper pedal, only one foot is left to operate the canons. In general, combinations of one drum-and-bell-pedal and the damper pedal make it possible to manipulate the dynamic of the drum part of the

[662] Loesser 1954, p. 171.
[663] Dating according to Schulin 1986, p. 326 (based on O. Deutsch's 'Musikverlags Nummern', p. 11).
[664] Harding 1931, p. 67.

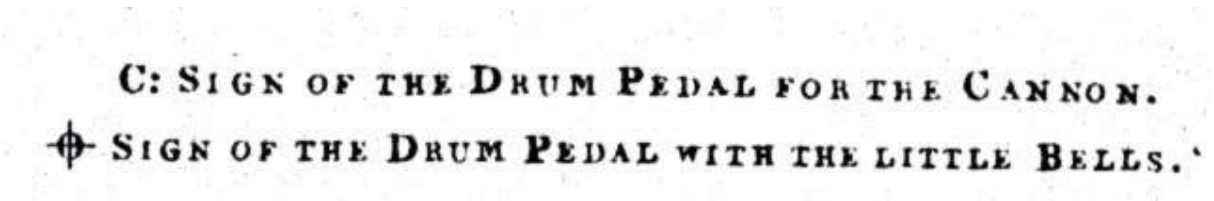
register in order change the character of the drum sound. With the dampers lifted, there is the basic bell-with-drum sound; when the strings are dampened, there can be a bell-with-muted-drum sound. Given the distinctly different timing of the use of the three indicated stops in the score, and with one foot needed to operate the damper pedal in its usual function, it is impossible to play this piece with such combinations of the damper pedal with one drum-and-bell stop. There were pianos available in Vienna at that time, though, on which the more regular stops (including the dampers) were operated by pedals while more than one percussion stop was manipulated through knee-levers.[665]

Despite the lack of clusters in Beethoven's works, this piano arrangement does show another bit of French influence on his music. Regardless of the unrealistic expectancies that came with such a piece – requiring the performer to possess a more than normally equipped and thus expensive instrument – Beethoven clearly did not see it appropriate to publish a battle piece without canon shots in it. And they were preferably to be sounded in timbres that are not typical of the piano, properly speaking.

3.2.6.3.4.4 1816 Denis-Germain Etienne: *Battle of New Orleans*

From the early 19th century onwards, Viennese composers appeared to have found a way to enrich the battle genre with an effect of their own, countering the more typically French cluster. Contrary to the fact that no clusters seem to have been used outside of France, there was at least one French composer who used percussion pedals in one of his works. In about 1814-1815, when Beethoven was busy arranging his most mercurial music for the piano, Paris born Denis-Germain Etienne (1781-1859) settled in New York. It was also the time of heavy fighting in Louisiana between American and British troops over the control of New Orleans. The American victory inspired Etienne to immediately write a *Battle of New Orleans for the piano forte composed and dedicated to the American Nation.*

There are no clusters in it, but performance notes indicate the requirement of Turkish Music registration (ex. 3.144):


C: SIGN OF THE DRUM PEDAL FOR THE CANNON.
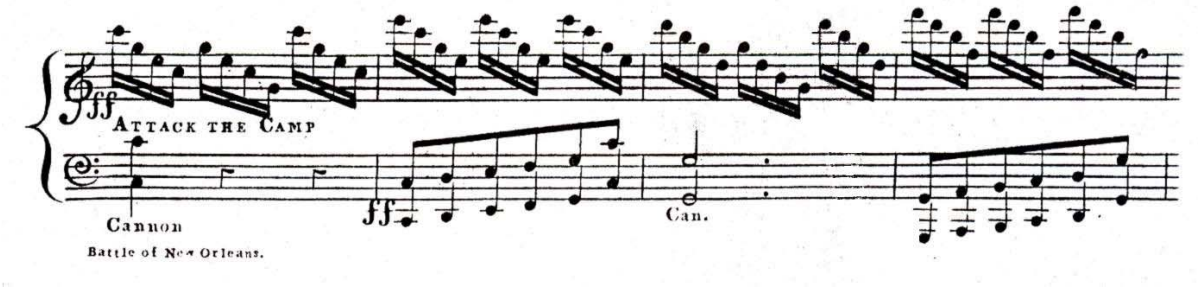
⊕ SIGN OF THE DRUM PEDAL WITH THE LITTLE BELLS.'

Example 3.144. D.-G. Etienne: *Battle of New Orleans,* registration notes. [666]

The canon comes in to the extended piece after the preliminaries, consisting of *Night Calm*, *Dawn of Day*, *Distant March of the Enemy*, *Beat to Arms*, *Charge of the Trumpets in the American Camp*, *Turning out and Mustering of the Arms*, *Order of Battle under Arms*, *Profound Silence* and the *British Advance*. When the battle actually commences, the word "cannon" is used to indicated the drum stop (ex. 3.145), with its abbreviation as a specific symbol entering the action a few bars later.
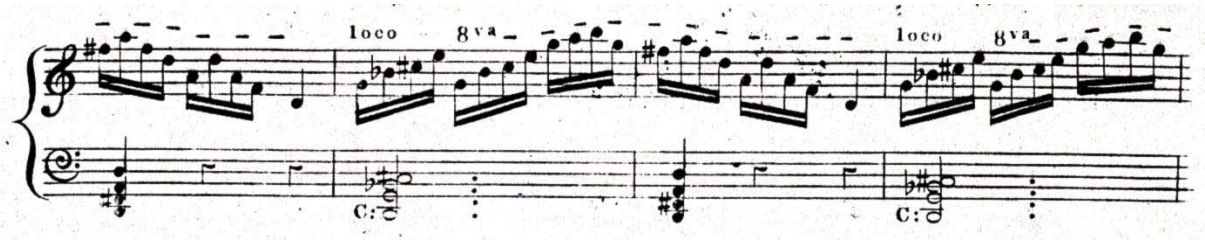
[665] Good 1982, p. 79 shows such an instrument, a grand piano by Nanette Streicher (Vienna, 1814). Two knee-levers operate bell and drum, four pedals operate una corda, bassoon, dampers and moderator. The instrument is at the Germanisches Nationalmuseum in Nurenberg.

[666] Boston: G. Graupner (US-NYp JPG 78 44 – all excerpts reprinted by permission of the Music Division, The New York Public Library for the Performing Arts, Astor, Tilden, and Lenox Foundations.)
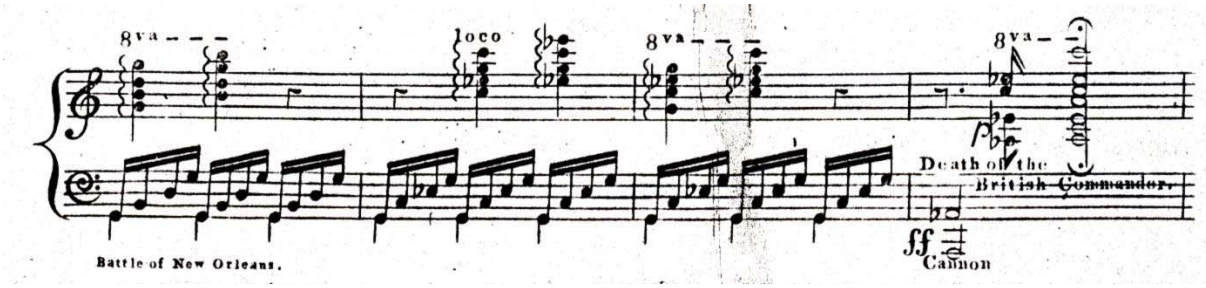


Example 3.145. D.-G. Etienne: *The Battle of New Orleans* (1816), bars 126-129.
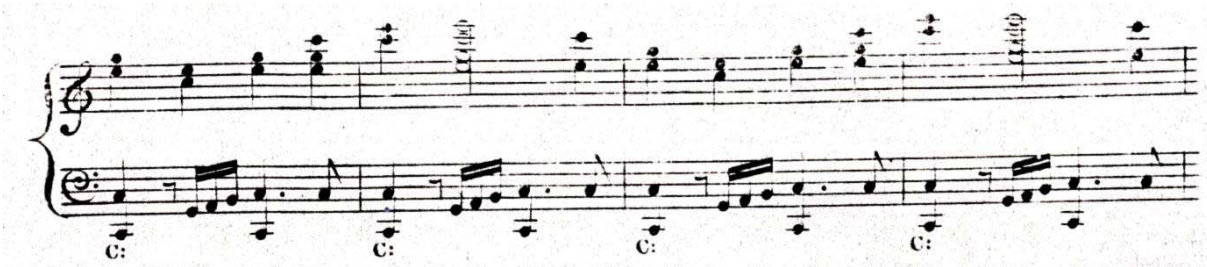
The cannons are employed for a long while and enforced with differently chosen musical material, such as octaves, chords (ex. 3.146) and highpoints (e.g. the death of the opponent's commander as in ex. 3.147 or at the moment of total British defeat – ex. 3.148 or the "terrible carnage" in ex. 3.149).



Example 3.146. D.-G. Etienne: *The Battle of New Orleans* (1816), bars 178-181.
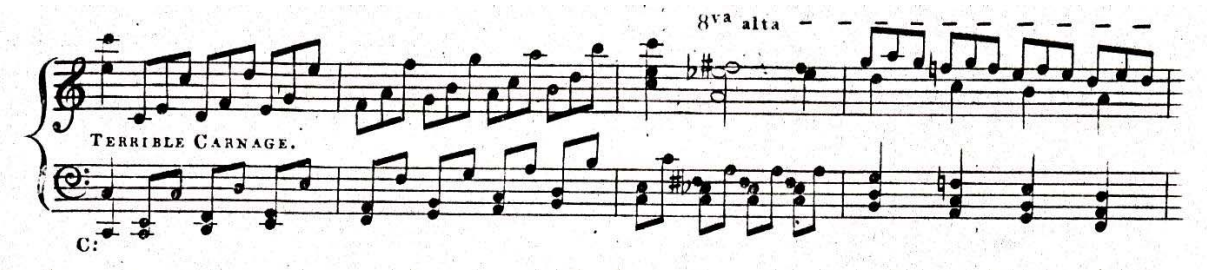


Example 3.147. D.-G. Etienne: *The Battle of New Orleans* (1816), bars 221-224.
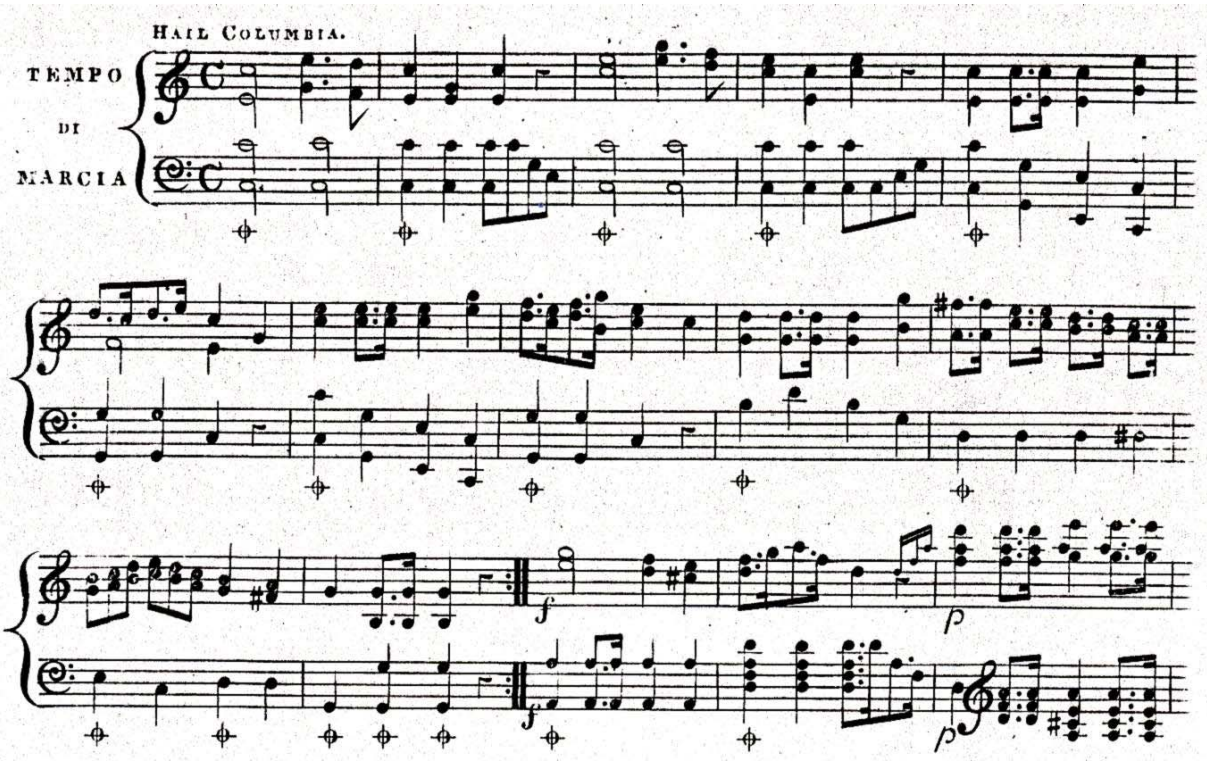


Example 3.148. D.-G. Etienne: *The Battle of New Orleans* (1816), when the British are facing "total defeat", bars 340-343.

It is odd that all cannons are timed to shoot on the first beat of the bar, even at the most chaotic of times, when one would expect the artillery to loose all sense of rhythm and pound the enemy with whatever frequency is possible (ex. 3.125). Maybe the technical demands in the "Terrible Carnage" are too high for the envisioned performer to add to it with multiple registration impulses.



Example 3.149. D.-G. Etienne: *The Battle of New Orleans* (1816), bars 276-279.

The second sign only comes into play after there is no more use for cannons, when the "Shouts of Victory" are accompanied by swelling tremolos on the dominant seventh chord in C major to announce the triumph. This march "Hail Columbia" is steadily paced by the "drum with the little bells." (Ex. 3.150.)



Example 3.150. D.-G. Etienne: *The Battle of New Orleans*, bars 364-78.

An *Allegro* joyfully containing "La Victoire est à Nous" and "Yankee Doodle" finishes Etienne's homage to the new nation he had left Europe for.

Whereas Vanhal, Zapff and Beethoven are the only European composers we have found to indicate percussion stops in their scores, Etienne's battle piece seems to be the only American one.[667] Such evidence is decidedly limited to draw many conclusions relating to such uses and performance practices. It is abundantly clear, however, that these stops were used, that music was written with them specifically in mind, and that their use may have depended on performers' moods and whims as much as on those of composers. Furthermore, the known historical aversion by the musical establishment against the 'toy pedals' must also be put in perspective. Czerny, Fétis, Schmitt and Hummel have all

[667] Clark 1988, p. 251.

reacted negatively against them[668], but Hummel himself used one such instrumental accessory himself when he prescribed the bassoon register in the first of his *Trois Amusements* opus 105 (1824)[669]. Such inconsistent behavior was not unique: in the pages to come we will see Henri Herz dismiss the glissando in the 1820's while voluntarily applying it in his own works at the same time. It has been stated (without offering proof) that the "more influential pianists and composers" did not own or play an instrument provided with these percussion extravaganzas.[670] Nevertheless, this does not mean that they would not have been interested in them or that they would have minded their occasional use. Beethoven is known to have played on such instruments without condemning them.[671] In his music, he provided for them at least once. And even if the piano version of *Wellingtons Sieg* can be seen as a slip of the habit, with money in mind maybe more than much else, many other composers can be expected to have done so too. That we cannot find much direct evidence of it in scores is not necessarily proof to the contrary. The fact alone that these instrumental extensions were built, and that quite a few of such instruments have survived, is ample proof of a market having at one time demanded them.

Concerning stops on the Viennese grand piano, the beginning of the 19th century saw knee levers disappear in favor of pedals while the number of standard devices increased. After ca1805, it was customary for the Viennese piano to have four or five pedals. The Streicher firm (successors to Stein) and Graf included five pedals on pianos until about 1818. On a Streicher piano, the fifth device was often (if not always) a Turkish music pedal. "Other firms are reported to have followed suit with the exception of a few makers such as Haschka who seems to have specialized in instruments with up to seven or eight pedals."[672] In England, refinements of the una corda and sustaining mechanisms seem to have dominated the registers 1760 and 1850. From the turn of the century until the late 1820's, France began to make grands with four pedals, of which three were standard (damper raising, una corda, moderator) and one either bassoon or lute (sometimes in the form of a knee-lever).[673] By the 1830's, pedals other than the sustaining, una corda and moderator largely died out.[674]

Of course, pianos with added-on percussion would have been expensive to purchase. But the Hummel dances could show as how this problem may have been handled flexibly, at least in social circles. As much as the janissary pianos were part of higher society, the entertaining genre of the battle piece did not reside on the higher plains where the more serious and ancient forms and formats are working hard to shape the piano repertoire for the ages to come. When in the hands of a master, the potential of the extended colors can be glimpsed, as we saw with Beethoven's opus 53. Etienne's imagination still could not see more benefit from percussion sounds than predictable appearances on the strongest beat, as if to help the pianist to keep track of metronome time. In contrast, Beethoven immediately grasped the canon's characteristic lack of rhythmic reality (see ex. 3.143 for the unpredictably timed cannon shots), bringing *Wellingtons Sieg* as close to real integration of noise in piano music as possible before the 20th century.

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[668] Rowland 1993, p. 155 refers to Czerny's 'Vollständige theoretisch-practische Pianoforteschule' opus 500 (vol. III, p. 65 of the English translation, London 1939-39), Hummel's 'Ausführliche, theoretisch-practische Anweisung zum Pianoforte-Spiel' (vol. III, p. 62 of the English translation, London, 1828), Fétis' 'Improvements in the Construction of Pianos' (in 'Harmonicon' 5, 1827, pp. 158-9) and H. Schmitt's Das Pedal des Clavieres (Vienna 1875, p. 85 of the English translation, Philadelphia 1893).
[669] As mentioned in Rowland 1993, p. 155.
[670] As stated in Rowland 1993, p. 154.
[671] See Harding 1931, p. 67. Dr. Johann Nepomuk Kanka was a Prague lawyer with whom Beethoven had contact for legal matters between the fall of 1814 and April 1817. According to Kanka, Beethoven frequently played upon his (Kanka's) grand piano, which was equipped with Turkish Music.
[672] Rowland 1993, p. 18-19.
[673] Rowland 1993, p. 20-23.
[674] Rowland 2002, p. 273.

All in all, going on the information we gathered, the piano cluster was used mainly in France or by composers brought up there, while mechanical percussion accessories to the piano were in vogue in Vienna more than anywhere else. The reasons for this dichotomy are clear: the French continued a tradition of keyboard cluster playing that had started with Dandrieu, while Viennese composers were influenced by the popularity of "Turkism" and its "exotic" percussion instruments.

What unites both perspectives is the fact that all the pieces for stringed keyboard instruments in which we find evidence of cluster playing or percussive registration are descriptive. Furthermore, they are all linked to warfare, and the clusters refer directly to the sounds of cannons while the percussion stops are used to reinforce the idea of cannon shots as well as the general presence of drum in battlefield situations.[675]
At the beginning of the 18th century, there had been some notable exceptions to this latter observation: Rebel's *Chaos* was not about war but about nature, Corrette used the cluster as 'thunder', and besides the scores for stringed instruments, there were the organ pieces or improvisations linked to the religious theme of the apocalypse. Both these programmatic devices are continued around the turn of the 18th century with the further development of the cluster as an imitation of thunder.

3.2.6.3.5 Thunder on the organ

Just as the early 18th century clusters on the piano and harpsichord were used and (slightly) developed until the first 20 or so years of the 19th century, so did the early organ cluster maintain its position as the device to create thunder on this instrument, evolving throughout the 19th century.

3.2.6.3.5.1 1794 Justin Heinrich Knecht: *Die durch ein Donerwetter unterbrochne Hirtenwonne*

Justin Heinrich Knecht (1752-1817) was born in Biberach and der Riß, a town in Baden-Württemberg in South Germany. He knew Vogler, was influenced by him[676] and made him the dedicatee of his symphony *Le portrait musical de la nature* (1784) – considered a precursor of Beethoven's 6th and containing a "shepherd's idyll with storm." It may be that Knecht based his *musicalische Schilderung* on Vogler's improvisation of the same title, even though he once claimed "I have never heard the thunder that Abbé Vogler played everywhere on the organ: so it is here my own invention."[677]

This "Shepherd's bliss, interrupted by a thunderstorm" is probably the earliest published organ storm scene.[678] In the foreword to the score, Knecht gives a

[675] See Pirker 2002, p 801. Military bands were present on battlefields to inspire soldiers as well as to communicate commands. In case of the janissaries, their music was so vital to the battlefield action that, if and when it stopped playing, the soldiers would stop fighting.
[676] Some of Knecht's writings were based on Vogler's ideas (Henck 2004 p 42, fn 107); Knecht's gallant and classical aesthetics are attributed to Vogler (Syré 1984, foreword).
[677] "Ich habe das Donnerwetter, welches Abbé Vogler aller Orten auf der Orgel spielte, niemals gehört: es ist also gegenwärtiges meine eigene Erfindung." See above 3.2.2.7., and Henck 2004, p. 42, fn. 107 for the chronology between Vogler's and Knecht's interrupted pastorals.
[678] Jakob 1976, p. 39.

Complete and necessary explanation of how the thunder is expressed on the organ:
It is well known to me what sort of objections critics make against such pieces; only the space here is too small, and destined for something else, to consider the matter of musical painting, and to explain in detail which kind of picturing falls into the foolish, childish and ridiculous, and which, on the other hand, are clever and effective. I have to keep this for another occasion. In the mean time, the musical audience will trust me with enough taste and judgment to know how to choose a worthy and able subject for a musical painting. At least my present picture found unequivocal acclaim anywhere I played it (even where Vogler played his three years ago).

When, on the organ, one takes together *several half* tones next to one another in the bass, and holds them for a while, this will produce a strong trembling like the thunder. This is possible on either the manual or the pedal, or both at the same time. To express a thunder from f a r a w a y, one looks for an 8' or better a 16' wooden register for the manual, which must not stand in front but in the back of the case. In this respect the stopped flute, the coupler, the bourdon and the like, in short, the kind of a register that has the weakest and most muted tone. The manipulation happens as follows. One takes with both hands and all fingers the complete first octave on the Great Organ or on another manual where such a register is available, from the great C on to the small c with all the half notes in between, and keeps this for a few seconds. To amplify the thunder one uses the pedals next to the manual, taking at first a very muted and wooden 16' pedal register, like the sub-bass. One then pulls ever more manual- and pedal-registers, which all however have to be 16', 8' and at most 4'. The reed pipes, the mixture- and other shrill, sharp and cutting registers are not suitable. At any rate, in the pedal the Bombarde can be pulled for several seconds to express the clapping of the thunder. One depresses *C D E F* together with the left foot crosswise on the pedal, and with the right, also crosswise, *Cis Dis and Fis*.[679]
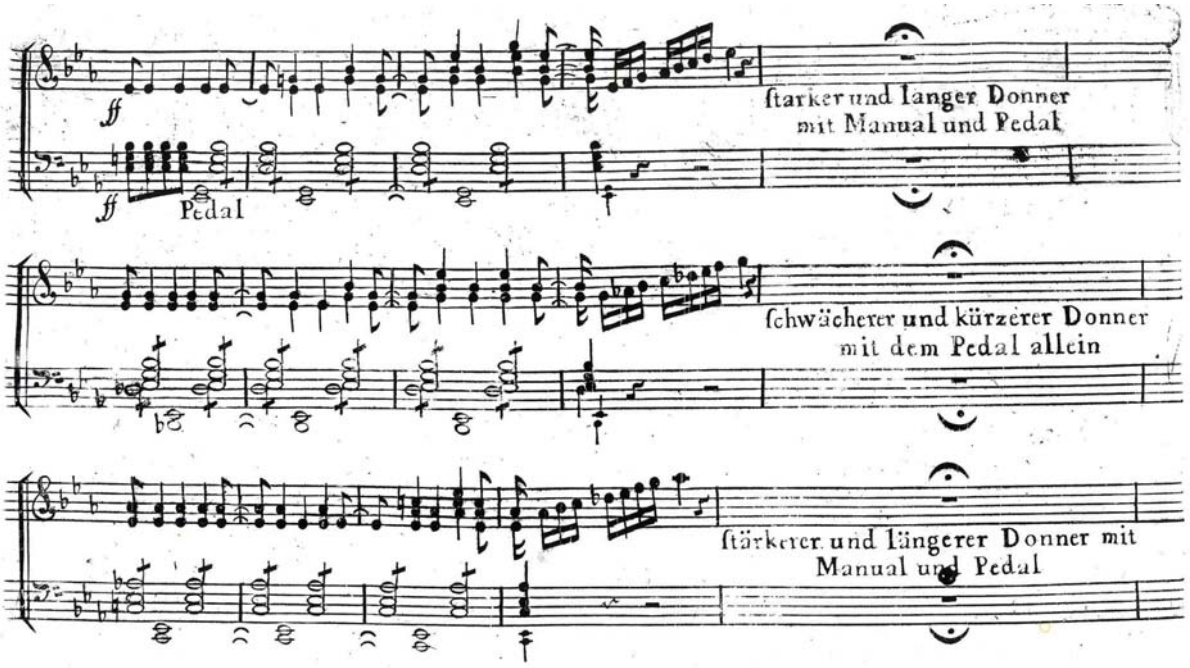
The increase of thunder happens partly by pulling more and more registers, partly by depressing the black and white keys with the right forearm gradually until the elbow, the decrease of the same is realized partly by gradually pushing back the registers for the pedal as well as for the manual, and partly by gradually raising the right forearm which lies on the keys, also by slowly lifting the heels of both feet from the pedal. Thunderclaps can be executed when the keys of the manual are depressed together with the right forearm, and released again while the pedal is held. This is obtained easily by practicing. So far the general instructions. As the organs are not always the same, one will have to adjust by making the necessary changes here and there.[680]

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[679] The italics are original and meant to indicate generic notes instead of specific pitches.

[680] Facsimile reproduction of Knecht's own foreword to this composition in the 1982 edition by Breitkopf (Höhnen 1982): „Vorrede samt der nöthigen Erklärung, wie der Donner auf der Orgel ausgedrükket wird. Woll bekannt ist mir, was für Einwendungen manch Kritikaster gegen dergleichen Stükke machen; allein der Raum ist hier zu enge, und zu etwas anderm bestimmt, um die Materie von der musikalischen Malerei auseinander zu sezzen, und ausführlich darzuthun, welche Art von Schilderungen in das Ungereimte, Kindische und Lächerliche falle, und welche hingegen vernünftig und zwekmäsig sey. Dieß muß ich mir auf eine andere Gelegenheit vorbehalten. Inzwischen wird mir das musikalische Publikum so viel Geschmak und Urteilskraft zutrauen, daß ich einen der musikalischen Schilderung würdigen und fähigen Gegenstand zu wählen wisse. Wenigstens fand meine gegenwärtige Schilderung allenthalben, wo ich sie nur spielte, (auch sogar da, wo Vogler die seine vor 3 Jahren aussführte, unzweideutigen Beifall. Insbesondere gefielen die Hirtengesänge, welche man auch sonst einzelf spielen kann, ohne allemal das Ganze im Zusammnhange spielen zu dürfen. Wenn man auf der Orgel *mehrere halbe* nebeneinaner liegende Töne in der Tiefe zusammen nimmt, und eine Zeitlang aushält, so bringt dieß eine starke, dem Donner ähnliche Bebung hervor. Dieses kann auf dem Manual und Pedal entweder allein oder mit beiden zugleich geschehen. Um einen f e r n e n Donner auszudrükken, sucht man sich ein 8 oder besser 16 schühiges, hölzernes Manualregister aus, welches aber nicht vornen, sondern zuhinderst im Orgelwerk stehen

In the score, the thunders are indicated by little bits of texts in between the staffs and with fermata signs above and underneath. (Ex. 3.151.)



Example 3.151: J.H. Knecht: *Die durch ein Donerwetter unterbrochne Hirtenwonne* (1794), bars 255-269.[681]

During the 522 bar long piece, there are 20 such indications, all occurring in the second, third and fourth of the symmetrically designed set of five scenes.[682] In "The gradual

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muss. Zu dieser Absicht ist das Gedakt, (Gedekt) die Copula, der Bourdon und dergl. dienlich, kurz, ein solches Register, welches den weichsten und dumfesten Ton hat. Die Manipulation gehet auf folgende Art vor sich. Man nimmt mit beiden Händen und allen Fingern die ganze erste Octav im Hauptmanual oder in einmen andern, worin sich ein solches Register befindet, vom grossen C an bis zum kleinn c samt allen dazwischen liegenden halben Tönen, und hält wenige Secunden lang aus. Zur Verstärkung des Donners bedienet man sich nebst dem Manual auch des Pedals zugleich, wo man anfänglich ein sehrdumpfes, hölzernes 16 schühiges Pedalregister, etwa den Subbaß, nimmt. Hernach ziehet man immer mehrere Manual- und Pedalregister heraus, die aber alle 16, 8, und höchstens 4 schühig seyn müßen. Die Zungenregister, die Mixtur- und andere spizzige, scharfe und schneidene Register taugen nicht dazu. Im Pedal mag allenfals der Bombard auf ein Paar Secunden lang gezogen werden, um das Schmetternde des Donners auszudrükken. Auf dem Pedal tritt man mit dem linken überzwerchgesezten Fusse auf einmal *C D E F*, und mit dem rechten, ebenfalls in die Queere gerichteten Fusse zugleich *Cis Dis* und *Fis*. Das Anwachsen des Donners geschiehet theils durch Ziehung immer mehrerer Register, theils dadurch, wenn man mit dem rechten Vorderarme allmälig bis zum Ellenbogen hin die obere und untere Tasten niederdrükket, das Abnehmen desselben abe wird bewerkstelliget, theils wenn man sowohl die Pedal- als Manualregister nach und nach wieder hineinschiebet, und theils, wenn man den auf den Tasten liegenden rechten Vorderarm allmählig auflupfet, auch dadurch, wenn man die Absäzze beider Füsse auf dem Pedal langsam aufhebt. Donnerschläge kann man dadurch hervorbringen, wenn die Manualtasten mit dem rechten Vorderarme auf einmal niedergedrükt, und wieder aufgehoben werden, indess man mit dem Pedal anhält. Dieses gibt sich durch die Uebung von selbst. So weit gehet die allgemeine Vorschrift; da aber die Orgelwerke nicht allenthalben von gleicher Beschaffenheit sind: so muss sich ein Jeder nach seinem Werke richten, und hie und da nöthige Abänderungen treffen."

[681] Höhnen 1982. Reproduced by permission.

[682] "1. Die Hirtenwonne in angenehmen, mannigfaltig abwechselnden Gesangen;
2. Die allmählige Herannahung eines Donnerwetters, welches sich sowohl durch ein fernes Donnern, als durch die schwüle (mit dumpfen Harmonien ausgedrükte) Luft ankündiget, und die frohen Gesänge der Hirten störet;
3. Der heftige Ausbruch des Donnerwetters selbst, unter welchem einigemale die in Jammern gekehrte Lieder der Hirten vernommen werden;

approach of a thunderstorm, which announces itself by a faraway thunder as well as by the sultry air (expressed with clumsy harmonies), and which disturbs the happy song of the shepherds"[683], there are five occasions:

- short and very far away thunder without pedal[684] (bar 98, after the 2. repeat)
- a little longer but far away thunder without pedal[685] (bar 106, after the 2. repeat)
- a little louder and longer thunder without pedal[686] (bar 119)
- shorter and weaker thunder without pedal[687] (bar 127)
- louder and longer thunder with manual and pedal[688] (bar 128)

The third movement – "The violent outbreak of the storm itself, during which the plaintive shepherd's songs are heard a few times"[689] - has twelve in a clearly structured sequence:

- the loudest thunder with manual and pedal[690] (bar 160)
- thunder as before[691] (bar 163)
- the loudest thunder with claps[692] (bar 197)
- weaker and shorter thunder with pedal alone[693] (bar 200)
- louder thunder with manual and pedal[694] (bar 203)
- short thunderclaps[695] (bar 212)
- louder thunder with manual and pedal[696] (bar 232)
- louder and longer thunder with manual and pedal[697] (bar 259)
- weaker and shorter thunder with pedal alone[698] (bar 264)
- louder and longer thunder with manual and pedal[699] (bar 269)
- weaker thunderclaps with manual and pedal[700] (bar 283)
- weaker thunder with pedal alone[701] (bar 288)

The fourth movement – "The slow retreat of the same, and the following clearing of the sky, at last"[702] - has another three:

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4. Der langsame Abzug sesselben, und die darauf folgende Aufheiterung der Luft, endlich;
5. Die Fortsezzung und der Beschluß der vorher unterbrechnen, wonnenvollen Hirtengesänge."

[683] See previous footnote, second title.
[684] "Nach der 2. Repetition kurzer und sehr ferner Donner ohne Pedal."
[685] "Nach der 2. Repetition etwas längerer aber ferner Donner ohne Pedal."
[686] "etwas stärkerer und längerer Donner ohne Pedal"
[687] "kurzer und schwacher Donner ohne Pedal"
[688] "stärkerer und längerer Donner mit Manual und Pedal"
[689] "Der heftige Ausbruch des Donnerwetters selbst, unter welchem einigemale die in Jammern gekehrte Lieder der Hirten vernommen werden"
[690] "der stärkste Donner mit Manual und Pedal"
[691] "Donner wie vorher"
[692] "der stärkste Donner mit Schlägen"
[693] "schwächerer und kürzerer Donner mit dem Pedal allein"
[694] "stärkerer Donner mit Manual und Pedal"
[695] "kurz daurende Donnerschläge"
[696] "stärker Donner mit Manual und Pedal"
[697] "starker und langer Donner mit Manual und Pedal"
[698] "schwächerer und kürzerer Donner mit dem Pedal allein"
[699] "stärkerer und längerer Donner mit Manual und Pedal"
[700] "schwächere Donnerschläge mit Manual und Pedal"
[701] "schwächerer Donner mit Pedal allein"
[702] "Der langsame Abzug sesselben, und die darauf folgende Aufheiterung der Luft, endlich"

- weak thunder without pedal[703] (bar 299)
- far away thunder[704] (bar 315)
- very far away and short thunder[705] (bar 324)

To summarize: Knecht develops several individual characteristics of the thunder cluster to bring the differentiation to an unprecedented level. He makes a difference between duration, volume and keyboard versus pedal cluster, he distinguishes between short and longer continuous thunder and between continuous thunder and thunderclaps (apparently, a short thunder is not the same as a thunderclap). Knecht also discriminates between the volume of the sound (louder/weaker) and the idea of distance (at least at the beginning of the piece). Further manipulation of individual characteristics of cluster playing is seen in the use of the manual only, the pedals only, and the combination of both to achieve contrast as well as build-up.

The indications in the score are not always well defined (e.g. it is not clear whether or not some of the thunderclaps (third movement) and thunders (fourth movement) are for manual and pedal) but the foreword adds greatly to the performance practical details necessary to interpret the score. We learn for instance, how changing the number of notes depressed by the arm – and thus changing the needed length of the arm or foot – helps control the volume of the thunder. Above all, Knecht's subtle use of registration is a key to managing the different musical requirements for the cluster: differences in thunder sounds are achieved by virtuoso combinations of pedals, manuals and stops.[706]

The powerful organ in Biberach – where Knecht stayed for most of his life, and where he wrote the composition under consideration here – had three manuals, a pedal of two octaves, four very large bellows and 36 registers.[707] In the registration prescriptions to his pictorial pieces, Knecht counted on the rich potential of so-called "Schnurrpfeifereien", the toy stops of many of the south-German organs from the late 18th century. In his *Orgelschule* he compiled a chapter on registration, allowing the reader valuable insights into the habits and wealth of stop-use around 1800, such as the Glockspiel[708], the bird whistle stops[709] (Nightingale and Cuckoo), timpani, "Cimbelnstern"[710] and how to combine them with other stops.[711] Knecht was the first one to admit that not all his registration suggestions could be complied with on just every organ, but his alternative –

[703] "schwacher Donner ohne Pedal"
[704] "ferner Donner"
[705] "sehr ferner und kurzer Donner"
[706] See foreword in Höhnen 1982, p. VI-VIII. Another example of Knecht's technical mastery is the diminished seventh chord in the pedal, with four notes to be depressed by two feet.
[707] Höhnen 1982, postface.
[708] According to the Encyclopedia of Organ Stops (http://www.organstops.org/c/Cymbelstern.html - accessed September 28, 2008), the Glockspiel is "a percussion stop whose tone resembles the orchestral glockenspiel. It is formed of dish-shaped bells, spiral rods, bars, or tubes made from steel, copper or bronze, and struck by hammers actuated by a pneumatic or electric mechanism. It is usually of short compass."
[709] According to the Encyclopedia of Organ Stops (http://www.organstops.org/c/Cymbelstern.html - accessed September 28, 2008), the bird whistle stop is a "stop which imitates the warbling of birds. Most sources describe the construction of these stops as consisting of two or more small metal pipes whose ends are immersed in a vessel of water or light oil."
[710] According to the Encyclopedia of Organ Stops (http://www.organstops.org/c/Cymbelstern.html - accessed September 28, 2008), the 'Cimbelnstern' is "a metal or wooden star or wheel on which several small bells are mounted. When the stop is engaged, the star rotates, producing a continuous tinkling sound. The star was often visible on the exterior of the organ case; when not visible, it may or may not have a star shape. It was common in northern Europe, Germany in particular, throughout the 16th, 17th and 18th centuries. Williams suggests it was introduced 1585-8 at Münster Cathedral by Lampeler van Mill, though Osiris contains at least one older example (see below). After 1700 the bells were sometimes tuned to particular notes. The name *Zymbelstern* means "cymbal star"."
[711] Syré 1984, "Vom Gebrauche der Orgelregister", e.g. § 47, §48 and §88.

"sapienti fat"[712] – shows how he nevertheless expected creativity to match the subtleties of the cluster use in his score.

Despite Knecht's self-expressed taste for program music and the great quantities of Singspiele, operas, incidental music and melodramas[713], he did not apply the cluster effect throughout his oeuvre. In another piece of his for the organ, *Die Auferstehung Jesu*, Knecht advised the "timpani" stop for the *Triumphgesang der Engel*[714] but it is significant to see that, for *das Beben der Erde*, elsewhere in this biblical account, no effect is seen or heard, as much as for instance a cluster would seem to be as appropriate for such a dramatic scene as for any of the interrupted pastorals that led to the use and development of these effects in Knecht's pastoral scene. Apparently, religious subjects were less open to worldly means of expression than the more innocent descriptions of nature. At any rate, Knecht is the first composer after Foucquet to investigate the cluster as a performance technique with a potential for diversification.

3.2.6.3.5.2 1801 Abbé Georg Vogler: *Spazierfahrt auf dem Rheine, vom Donnerwetter unterbrochen*

Abbé Vogler has been called "the father of all organthunderstormexecuters."[715] Regretfully, there is no direct evidence connecting such a title to the cluster use by Vogler in his music. The reputation seems to rest on one or two improvisations that are said – always long after Vogler's death – to have contained cluster techniques and that are then projected back to the days of the young Vogler. (See above 3.2.2.6.) The point here is not to doubt that Vogler used clusters in his improvised or written music at some time, rather that we cannot assess what he did with the technique, and what his place and role were in its development. More than 100 years after his death, Vogler was said to have "pushed down with both arms so many keys as he could reach, and this with all registers open" in the depiction of the walls of Jericho tumbling down[716], but it is impossible to judge how historically accurate this comment is regarding the status of the cluster's development (and the knowledge thereof by the commentator) at the time Vogler played the piece – whenever that was. The only source contemporary to Vogler that cited the cluster technique was an early 19th century newspaper article referring to a piece first called *Spazierfahrt auf dem Rheine, vom Donnerwetter unterbrochen*, which we know Vogler played already in November 1801 at a concert in the Berlin Marienkirche. In February 1806, the *Allgemeine musikalische Zeitung*, reporting on a series of organ concerts in Munich, criticized the musical performance:

> The thunder has really overtaken me. For instance, Mr. Vogler depressed three to four pedal keys at the same time, in this way letting the wind of the trumpets and other resounding bass registers roar along without harmony or rhythm, without playing on the keyboard. I would have believed it was a trick played upon him by the one handling the bellows.[717]

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[712] As in Höhnen 1982, p. VIII.
[713] Höhnen 1982, postface.
[714] Foreword to the piece, I Syré 1984, p. 24.
[715] As cited in Jakob 1976, p. 16 from an 1859 source.
[716] Cited in Henck 2004, p. 42 from a 1966 MGG edition going back on a 1918 Swedish source: "[...] mit beiden Armen so viele Tasten niederdrückte, als er erreichen konnte, und zwar auf dem vollregistrierten Manual"
[717] As quoted in Jakob 1976, p. 18 and in Henck 2004, p. 42: "Das Donnerwetter hat mich wirklich – überrascht. H[er]r Vogler trat z[um] B[eispiel] drey bis vier Pedaltasten zu gleicher Zeit nieder, und liess so den Wind der Trompeten und anderer braussenden Bassregister ohne Harmonie und Rhythmus, ohne Spiel auf der Klaviatur, lange fortsausen. ich [sic] hatte geglaubt, diesen Streich habe ihm der Calcant gespielt!".

Of course, these pedal keys are diatonically or chromatically apart: otherwise it would be a chord. At any rate, relevant to the chronology of the cluster's development, it has been remarked that the loudness of the "roaring" cluster, due to the trumpet register, was something new.[718] Apparently, an age-old register would have had the same effect, though in the *piano* sphere: the "Trommel" or "timpani" stop, often an actual drum activated by pedal levers, though "more usually the many drum-effects were produced by two or more large-scaled wooden pipes out of tune with each other".[719] Such a register frequently produced quasi-A and –D pitches to allow for combinations with a trumpet register, a practice that goes back to the 16th century. It seems unlikely to us, however, that organists before Vogler's *Spazierfahrt* would have been satisfied with quiet clusters. It is true that the organ, as a wind instrument, has significant limitations in the production of clusters. A builder testifies:

> For a long time, to test whether an organ possesses "good lungs", a sufficient wind provision, all stops were pulled and full chords were played, i.e. ten voices on the manual and two on the pedals. If no lack of wind was shown in this process, the organ was considered healthy. On the other hand, the cluster-technique necessitates more wind. Old organs surely did not take into account such techniques, so that they could sound "consumptive" during the "storms."[720]

Nevertheless, previous organists playing clusters must have done or at least tried everything in their and the organ's power to produce loud clusters as well as soft ones, at least when considering that we have only encountered clusters that were used to imitate thunder or the wrath of God.

It has further been argued that Vogler thundered not only on the organ, but that such effects belonged to his music in general: whether he played on the organ or wrote for the orchestra, whether it was a storm scene or a battle piece.[721] However, none of the surviving music for keyboard that we saw contained any clusters, and while programmatical effects would certainly have been part of his tone paintings, sound effects can be realized with proper playing techniques as well. It therefore seems possible that Vogler was some kind of champion of the cluster, though more in the sense that his concerts drew record audiences wanting to hear the sounds he made[722] rather than that he actually left any evidence of contributions to the development of the technique.

3.2.6.3.5.3 1809 Guillaume Lasceux: *Essai théorique et pratique sur l'art de l'orgue*

In 1809 Guillaume Lasceux (1740-1831) also wrote a theory – *Essai théorique et pratique sur l'art de l'orgue*[723]*.* In it, he describes his ideas on the *Judex Crederis* and indicates his wishes:

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[718] Jakob 1976, p. 39.
[719] Williams & Owen 2002, p. 666.
[720] Jakob 1976, p. 47: "Zur Prüfung, ob eine Orgel "gute Lungen", eine genügende Windversorgung besitze, zog man seit alters her alle Register und spielte volle Akkorden, also zehnstimmige Akkorde im Manual un zweistimmige Pedalakkorde. Zeigte sich hierbei kein Windmangel, so galt die Orgel als gesund. Die Cluster-Technik erheischt dagegen entschieden mehr Wind. Die alten Orgeln rechneten mit Sicherheit nicht mit derartigen Techniken, weshalb sie bei den "Gewittern" ab und zu "schwindzüchtig" wurden."
[721] Jakob 1976, p. 15-16.
[722] Jakob 1976, p. 14.
[723] Lasceux 1809: F-Pn ms.2249 (microfilm Bob 4369).

> If the organ comprised the Chinese instrument known as the Tam-tam, one could helpfully produce marvelous effects in the realm of the terrible.[724]

He considers that "this important piece requires an extended knowledge of harmony and of the keyboard, much genius and a great enthusiasm."[725] The latter must surely be necessary to create the "gruesome noise with which to paint the collapse of the heavens and the total annihilation of the universe."[726] In the last part of his essay, some performance practical "ideas" explain how to unleash the different kinds of tumult:

> The winds shall be imitated by all the registers of the organ, which will be attacked at the bass of the second manual by the left forearm and the flat of the right hand. With various movements of the arm and the hand, a kind of acoustical undulation (if one can express it that way) will be expressed. The effect of the thunder will be produced by all the Bombardes and the pedals, which shall be attacked at the deep bass with the full capacity of the feet.[727]

Lasceux' technique represents an advanced form of cluster technique when comparing his ideas to his predecessors. Evolved from the mere striking of keys (or pedals) with the flat of the hand or the foot, he proposes the use of forearms as well as hands, the combination of both, even moving them while playing. To produce the wind sounds, Lasceux thus realizes shifting sounds as opposed to the previously static cluster sounds.

Jacques-Marie Beauvarlet-Charpentier (1766-1834) expressed the same idea of a moving cluster in his undated *Théorie d'orgue*:

> The whistling of the winds are executed with the foundation stops, by laying the forearms on the keyboard of the Great Organ, and by pushing from left to right and from right to left."[728]

All Lasceux' performance practical advice can be found at the appropriate instances in a written out version of the *Judex Crederis Esse Venturus* at the end of the *Essai*.[729] Besides mere pictorial moments such as the imitation of the winds (ex. 3.152), he sometimes uses pedal clusters to free one of the hands to operate changes of registers (ex. 3.153).

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[724] Lasceux 1809, p. 37: "Si l'Orgue comportoit l'instrument chinois connu sous le nom de Tam-tam, on pourroit à son aide produire des effets merveilleux dans le genre terrible."
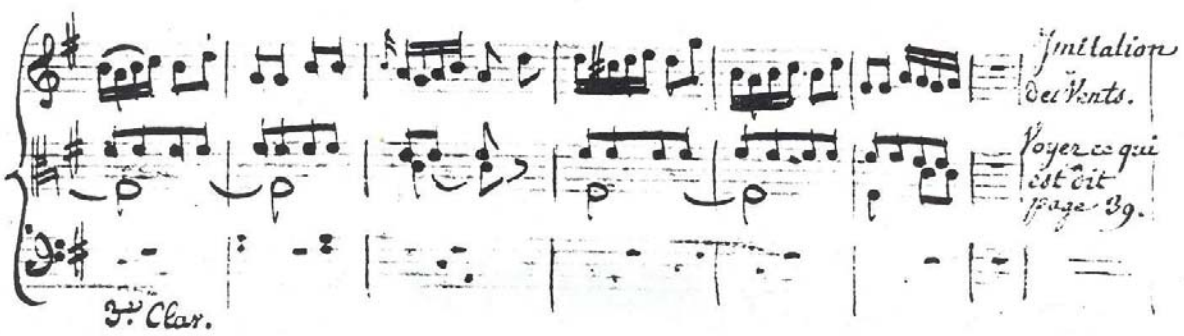
[725] Lasceux 1809, p. 40: " Cet important morceau exige une connaissance bien étendue de l'harmonie et du Clavier, beaucoup de génie, et un grand enthousiasme." Lasceux 1809, p. 40

[726] Lasceux 1809 , p. 38: "[...]un bruit épouvantable peindra la chûte des asters et l'anéantissement total de la création.", Lasceux 1809, p. 38.

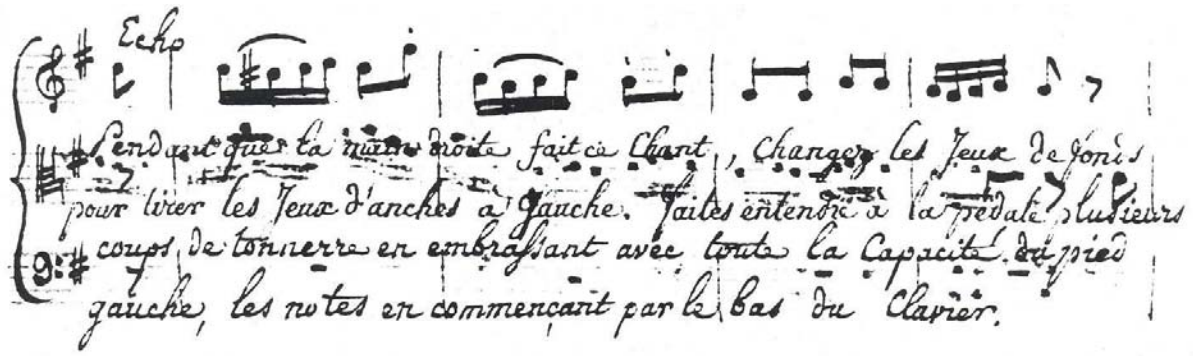
[727] Lasceux 1809, p. 39: "Les Vents seront imités par tous les fonds d'Orgue qui seront attaqués sur le bas du second Clavier par l'avant bras gauche et par le plat de la main droite. On exprimera par divers mouvements du bras et de la main, une espèce d'ondulation accoustique (si l'on peut l'exprimer ainsi). L'effet du Tonnerre sera produit par toutes le Bombardes, et les pédales qui seront attaquées aux fons graves, de toute la capacité des pieds."

[728] Jaffrès 1995, p. 93 , footnote 8 : « Le sifflement des vents s'execute avec les jeux de Fonds, en posant les avants-bras [sic] sur le clavier du Grand-Orgue, et en appuyant de gauche à droite et de droite à gauche[.]«

[729] Lasceux 1809, p.121-131. According to Seydoux 1977, p. 169-170, Lasceux would have written a *Te Deum* as early as 1786. We have not seen the sources for this work and cannot certify whether he wrote clusters at that time and how he prescribed them.
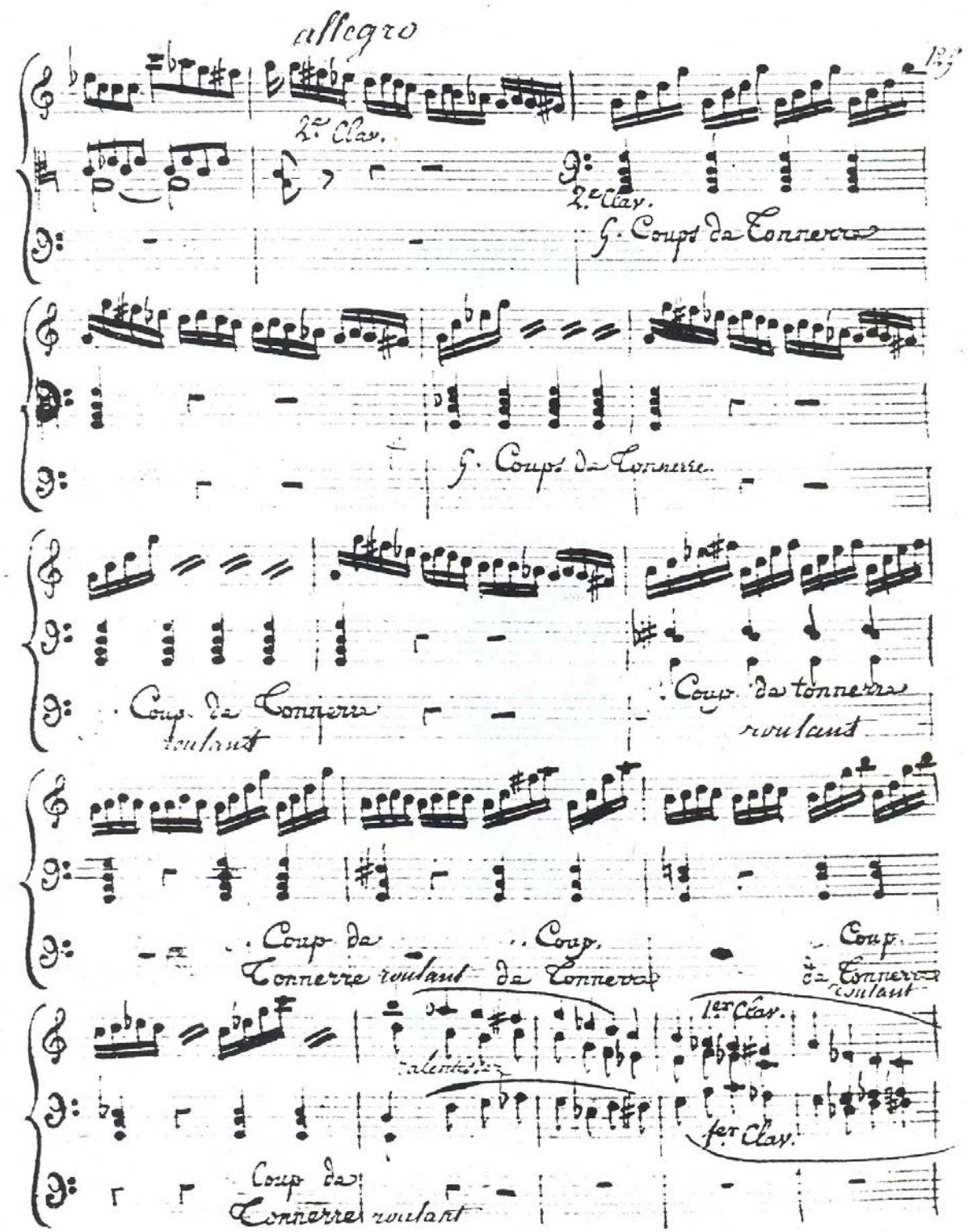


Example 3.152. G. Lasceux: imitation of the winds in *Judex Crederis Esse Venturus*, in Lasceux 1809, p. 122.
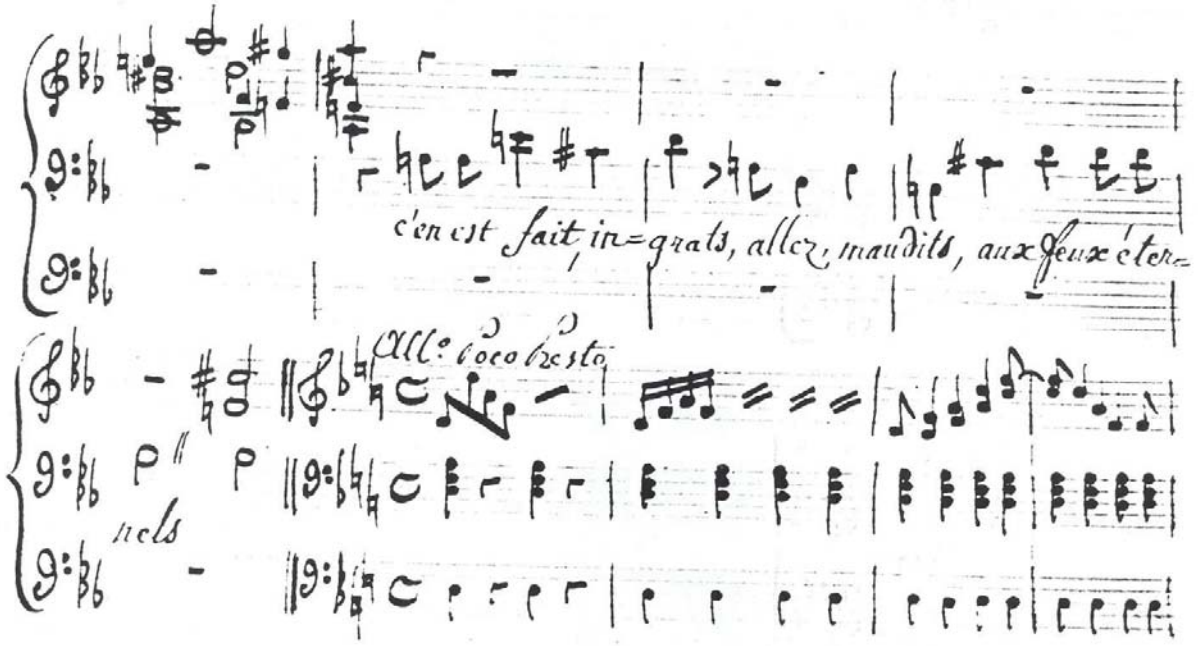


Example 3.153. G. Lasceux: pedal clusters in *Judex Crederis Esse Venturus* (1809), p. 122: "While the right hand plays this melody, change the foundation stops to add the reeds with the left hand. Sound several thunderclaps on the pedal, using the whole left foot and beginning at the low end of the pedals."[730]

In the score Lasceux makes a distinction between a thunder clap and thunder roll (ex. 3.154). It is not clear what the distinction consists of, and whether the clusters are to be played on the pedals (added to the chords in the left hand) or on the keyboard (replacing the written out chords). It is not very clear either at exactly what moment the "gruesome noise" is to be deployed which he intended to come at the phrase "go to the eternal hell, you cursed!" (Ex. 3.155.) Abundantly clear is the prolonged thunder at the end of the second to last piece, after which the "choir of the chosen and the predestined" closes the *Judex Crederis*. (Ex. 3.156.)

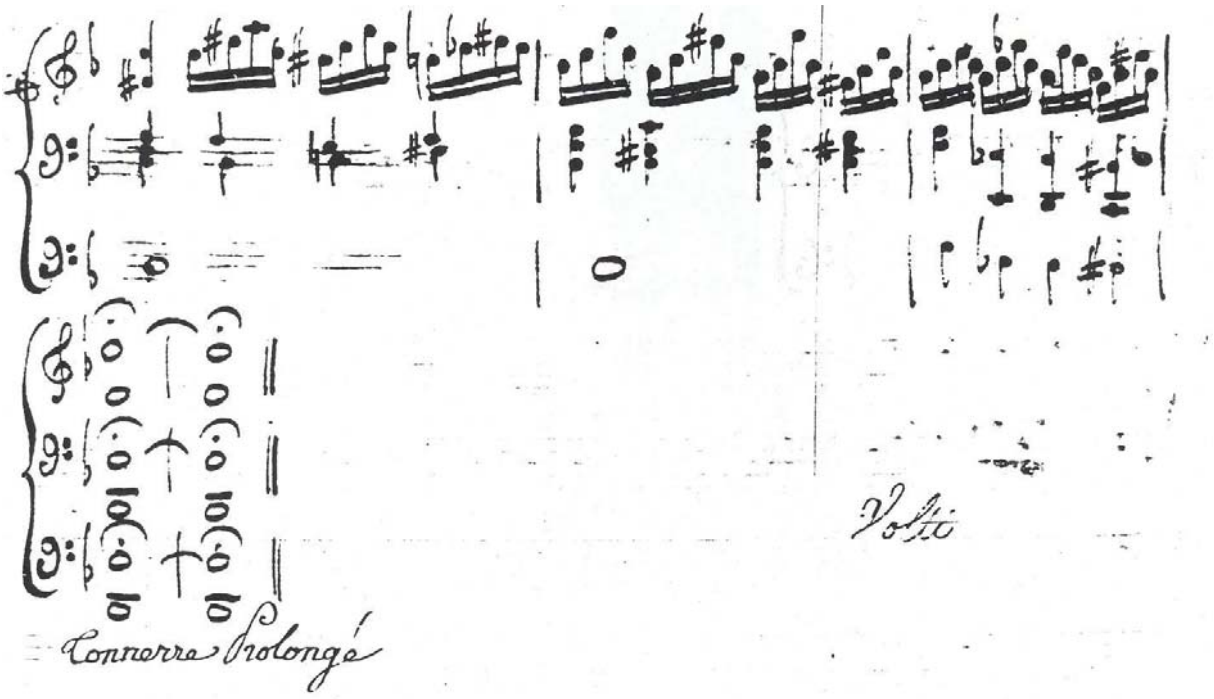
[730] Lasceux 1809, p. 129: “Pendant que la main droite fait ce chant, changez les Jeux de fonds pour tirer les Jeux d’anches à gauche. Faites entendre à la pédale plusieurs coups de tonnerre en embrassant avec toute la capacité du pied quache, les notes en commençant par le bas du clavier.”



Example 3.154. G. Lasceux: thunder claps and rolling thunder in *Judex Crederis Esse Venturus*, (1809), p. 125.



Example 3.155. G. Lasceux: "It is over, you ungrateful, go, you damned, to the eternal fires." (This is the spot where Lasceux advises to depict the collapse of the heavens and the total annihilation of the universe. In: *Judex Crederis Esse Venturus*, (1809), p. 129.



Example 3.156. G. Lasceux: final "prolonged thunder" in *Judex Crederis Esse Venturus* (1809), final bars of the second to last movement.

Worthwhile remarking here, is the fact that Lasceux included in his *Essai* a small chapter on the "Dignity of the organ", in which he states that

> On this grand instrument, it is not an insignificant and ridiculous piece for the piano, not the Airs with a profane title that can render the pious outpouring of the souls who humiliate themselves before the Supreme Being. In the Sacred Place all has to be grand, noble and august.[731]

That Lasceux considers the dignity of the organ to fit only significant, earnest and religious music is in itself not surprising. That he spends an entire chapter on the *Judex Crederis* and how to imitate winds, thunders and the scorn of that Supreme Being, shows how serious these effects and techniques were taken. If we can rely on the oral and aural traditions to effectively link Lasceux and his interpretation of the *Judex Crederis* to what he reports his predecessors Couperin and Séjan have done, we can judge the cluster to have been considered as part of a set of performance practical tools worthy of the best of intentions.

Ten years later, in 1819, Lasceux publishes his written version of the *Judex Crederis* once more: in the *Annuaire de l'organiste*[732]. The piece is basically composed of the same material, except the first bit, which is an andantino instead of an allegretto (but just as pastoral in character) and which ends not with pedal clusters to enable a free hand to change registers, but which is "interrupted by a prolonged thunderbolt for which one lays both hands across the lower side of the manual of the Great Organ and the whole capacity of the left foot on the pedals."[733]

[731] Lasceux 1819, p. 6: "[…] ce n'est pas une pièce de piano insignificante et ridicule sur ce grand instrument, ce ne sont pas des Airs d'un stile prophane qui peuvent rendre les pieuses effusions des âmes qui l'humilient devant l'Être-Suprême. Tout doît être grand, noble et Auguste dans le lieu Saint. »
[732] Lasceux 1819, F-Pn ms.2248
[733] Lasceux 1819, p. 120: "ce morceau est interrompu par un coup de tonnerre prolonger [sic], pour lequel on met les deux mains en travers sur le bas du clavier du gd. Orgue et mettre toute la capacité du pied gauche sur les pédales."

3.3 ca1815-ca1900 The age of the keyboard

3.3.1 Historical context: an age of expansion

Perhaps the most significant force to shape the 19th century was the concept of industrialization. Technology provided its momentum and unprecedented economic expansion was perhaps its most salient characteristic[734].

The development of steam power was literally one of the motors of the Industrial Revolution. In its mobile form, it changed transport of goods and personal travel. What Marx called "the crowning achievement" of the industrial economy[735] - the railway – replaced animals and sails as the basis for inland transport at a staggering rate: the number of railway kilometers grew 1000 fold in forty-five years, with 332km in 1831 to 309.341km in 1876[736]. By the 1830's, the construction of major railways in England started to link the larger cities and towns; in 1869 the USA trans-continental railroad was a fact. Steam had increased from about 14% of the world's carrying capacity in 1840 to about 75% by the end of the 1880s.[737] As mobile steam took care of distributing product, stationary steam became the engine of the factories built for mass-producing that product.

The second technological leap forward, perhaps most startling, was in the communication of messages through the electric telegraph: in 1837, the Morse code was developed in the US; less than a decade later – in 1844 – the first electric telegram was sent; the first transatlantic telegraph system was established in 1861, the first transatlantic one in 1866; within its first 29 years, the telegraph network crossed the oceans to every continent. In the 19th century, global communications became instant.[738]

Both transformations resulted in a gigantic export boom as witnessed in the sheer bulk of commerce. Between 1780 and 1840, less than three generations, the total trade of the western world tripled. In the next half century - between 1840 and 1889 – it grew to almost six fold. Over one century, this represents an exponential 18-fold growth.[739] During the first 7 years of the 1850s, British cotton piece-goods - the vanguard of market penetration for over half a century - actually increased their *rate* of growth over earlier decades. An entirely new economic world was added to the old and integrated into it, with the entire globe becoming part of it.

Together with the economic boom, and not unrelated to it, the world population had begun an unprecedented "explosion" that in the course of 150 years or so multiplied its numbers.[740]

Such changes in range and speed of transport, travel and communication could not but leave deep marks on the course of musical history. The direct consequences for musical life are easy to trace. As a traveling virtuoso, Carl Maria von Weber visited 84 cities in

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[734] See Hobsbawn 1975, p. 44-48.
[735] As cited in Hobsbawn 1975, p. 45.
[736] Hobsbawn 1975, p. 362.
[737] Hobsbawn 1975, p. 74-75.
[738] Hobsbawn 1975, p. 75.
[739] Hobsbawn 1962, p 211.
[740] Hobsbawn 1962, p. 208. "This remarkable increase in population naturally stimulated the economy immensely, though we ought to regard it as a consequence rather than an exogenous cause of the economic revolution. Without the economic revolution, so rapid a population growth could not have been maintained for more than a limited period."

the forty years of his life between 1786 and 1826[741]; Liszt traveled through 260 places in nine of his traveling years between 1838 and 1847 alone.[742] In the last 16 months of that period, he gave 63 concerts in 25 cities[743], comparable to Leopold De Meyer's 19 month touring in the US at the same time, when he performed 85 concerts in 26 cities.[744] Only a couple of years later, Henri Herz had already doubled this effort with 193 appearances in 59 cities in 20 months[745]. Less than a decade later, Sigismund Thalberg gave an astonishing 340 concerts in 75 cities in 12 months and a half[746]. If, in 1842, Liszt had given twenty-one concerts in ten weeks in Berlin[747], Thalberg averaged about 20 concerts a month in the spring of 1858,[748] performing 77 times in NY, 26 in Boston and 20 in Philadelphia during his US tours.

It has to be said that the numbers of Herz and Thalberg could most probably not have been realized without the help of the professional tour managers that started to appear, but the point is that these extensive blitz-tours were now possible. And that musicians actually undertook them, even to the point of taking one or more pianos with them on these voyages. The impact impresarios could have, and their main motive that drove them, is illustrated by the achievements of one of the biggest among them: Maurice Strakosch, Thalberg's tour manager for his first western tour. Between 1848 and 1857, Strakosch himself had given an estimated 1.755 concerts and had performed for over 900.000 people in the US.[749] These figures are impressive by even today's standards and clearly point in the direction of an industrialized approach. Such capitalist thinking was an inspiration to the traveling virtuosi themselves just as well, even if they announced their appearances as "in compliance with the desire of friends and connoisseurs" or "partly to obey my natural inclination to travel and partly in answer to the frequent pleas that I allow myself to be heard in the United States."[750]

Such intense performing schedules boosted the fame of these traveling virtuosos and made their music travel at least as widely. Audiences heard them play their own pieces and were excited to buying the scores that were published in the countries were the composer-pianists appeared. Some publishing figures reflect the extent to which such popularity could be spread around: in between 1838 and 1850, Hofmeister produced 6000 copies of Liszt's most popular *Grand Galop*, in print runs from 50 to 300 scores each[751]; in the 1860's, Henri Herz' *The Last Rose of Summer* was advertised in the US as selling at least 75.000 copies while Thalberg's *Home Sweet Home* appeared in a "100th" edition at some point in his lifetime.[752] The audiences that were to attend the concert halls that were being built after 1800 were multiple times the size of the aristocratic salon gatherings. We don't know whether the Paris opera Liszt rented in 1837 to play a solo recital was actually filled with the 3000 people it could fit[753], but in New York in 1846, a De Meyer concert was attended by 2000 people[754] while Herz drew 2600 to 2800

[741] Warrack 1976, pp. 14-15.
[742] Walker 1987, p. 292-295.
[743] Walker 1987, p. 429-431
[744] Between 1845 and 1847. See Lott 1986, p. 75, 131 and 141.
[745] Between 1846 and 1849. See Lott 1986, p. 243, 256, 280 and 307.
[746] Between 1856 and 1858. See Lott 1986, p. 339, 351, 466, 547, 564, and 572. Counted as concerts were evening concerts as well as solo matinees, benefit appearances and free school concerts.
[747] Plantinga 1984, p. 183.
[748] Lott 1986, p. 520
[749] Lott 1986, p. 465. In private correspondence (e-mail May 2009), Lott admits that some of these numbers seem a bit high, but the main principle is that they were reported as correct without being considered outrageous.
[750] Lott 1986, p. 509. The first quote is from De Meyer (1846), the second from Herz (1866). Quotes from private letters give a different picture with money very much on the mind of these pianists.
[751] Rink 2001, p. 79.
[752] Lott 1986, p. 325-327.
[753] Walker 1987, p. 237-238. Whether the hall was actually full is not known.
[754] Lott 1986, p.70-71.

music lovers[755]. In the mid-1850's, Thalberg's school concerts reached "audiences ranging in number from 2000 to 5000 per concert."[756] Next to exploding numbers of concertgoers, the democratization of musical concert culture opened the ways to the expansion of social space with more and diverse kinds of target audiences.

Aside from the physical expansion of the factors that determine music's distribution (geography, hall and audience sizes, printed editions), the development of music itself equally saw many of its aspects grow in size.[757] The orchestra changed in number of players as well as in number of different instruments. New instruments were added (piccolo, trombone, tuba, harp, percussion) and the circa 25 ad hoc people which made out an orchestra in around 1800 turned into a fixed institution of some 100 people a century later. If the average length of a symphony by Mozart was less than 18', one by Haydn was over 20' and one by Beethoven almost 40'. In the second half of the 19th century, a Bruckner symphony averaged more than an hour, a Mahler symphony over an hour and a quarter.[758] Comparing the measure of compositional structure between the average 18t century opera and Wagner's four-day long operatic cycle becomes almost pointless.[759]

Larger orchestras and bigger compositional structures are on a par with bigger volume and wider ambitus. In the orchestra this means double basses, contrabassoons, bass trombones and tuba's just as well as piccolo flutes and clarinets, while the piano's keyboard evolved steadily from 5 to over 7 octaves.[760] The expansion of the tonal space is seen in the compass of the melody itself as well: around 1800, a melody didn't need to go much over the range of an octave, a century later it can reach 5 octaves. Harmonic 'space' is extended through chromaticism and modulation, as they widened away from the tonal center until Wagner and Liszt put pointed towards the horizon of atonality.

Like the orchestra's tendency towards a greater range and greater volume, the larger performance spaces stimulated the piano to seek similar expansion of its force. Likewise, the cult of the piano concerto made the piano reach for the higher pitches of orchestras that aimed at achieving a more brilliant tone by raising the pitch of stringed and wind instruments.[761] Higher pitch and extended range meant more combined string tension challenging the resisting power of the frame.

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[755] Lott 1986, p. 202.
[756] Lott 1986, p. 444. See also footnote 516.
[757] This and the following paragraph are based on Sabbe 1995, p. 1-3.
[758] Timings based on the following recordings: the complete Haydn symphonies performed by the Austro-Hungarian Haydn Orchestra, conducted by Adam Fischer (2003 Brilliant Classics box set); the complete Mozart symphonies by the Mozart Akademie Amsterdam, conducted by Jaap ter Linden (2006 Brilliant Classics box set), the nine Beethoven symphonies by Nicolaus Harnoncourt and the Chamber Orchestra of Europe (1991 Teldec box set). Ten Mahler symphonies in recordings by Klaus Tennstedt and the London Philharmonic Orchestra (1998 EMI box set), nine Bruckner symphonies in the version by Herbert von Karajan and the Berlin Philharmonic Orchestra (1990 DGG box set). Of course, differences in interpretations (repeats or not; different versions of the same composition) will result in different lengths of these symphonies. However, the number of individual works is sufficiently high to compensate in the average for the possible deviations that other recordings may provide. On top of that, the main point, i.e. the difference between the classical and the late romantic symphonic durations, will remain despite the margins.
[759] Wagner's Ring was of course an exception, and comparing it with 'average' operas of a century earlier stretches the point somewhat, but the mere fact that such an undertaking was now possible and somehow realistic shows the extent of the 19th century composer's inclination towards large formats.
[760] In 1790, Broadwood extended the keyboard range to five and a half octaves – pianos with a compass of seven and a quarter octaves – 88 notes – had arrived before 1870. In the 1840's, Henri Pape had built a piano with an 8-octave range.
[761] Good 1982, 94

On top of the significant innovations in piano design that characterize the 1820s – repetition action, cross-stringing, capo d'astro bar[762], felt hammers and extension of the keyboard – the search for greater tension on the strings led to the introduction of metal as a major component, from metal tubes and iron string plates to one-piece full metal frames and steel strings.[763]

In the 1830's and 1840's, inventions were improved and patents extended[764], though these were not all adopted immediately, certainly not all into one instrument. It was the New York company of Steinway & Sons that combined the results and aggressively sought masses of buyers to purchase their instrument. Equally important was the change in manufacturing approach that took place in the second half of this 19th century: the advances in transportation and communication technology made it possible to exploit new means of distribution; the industry evolved from artisan shops to modern factories that profited from the introduction of division of labor; parts were manufactured separately by a supply industry, became standardized and in turn led to standardization of the piano design.[765] During the second half of the century, the production of pianos rose astronomically. Between 1850 and 1890, England and France doubled their output while the US multiplied its production by eight. In the 1860s, 50.000 pianos were produced in total; in 1910 the number was 650.000 – a 1200 percent rise.[766] A competitive marketing system gave birth to international exhibitions, of which the one in Paris in 1867 was a turning point for the piano's history. The international exposure, influence and acceptance of the Steinway grand piano as devised in the 1850s and the two following decades paved the way towards what would later be called the 'modern' piano.[767]

[762] Also known as the capo tasto bar, i.e. the metal bar (cast into the frame) that pushes down on the upper most strings and defines one end of their speaking length (the other end being defined by the bridge). The tenor and bass strings pass through an agraffe – a metal guide screw that spaces the strings and also defines their speaking length.
[763] Good 1982, 120-136.
[764] Good 1982, 163.
[765] Good 1982, 166-168.
[766] Good 1982, 183.
[767] Good 1982, 175-76.

3.3.2 The rise and fall of the glissando

If we are to see the 19th century general atmosphere of unbridled expansion reflected anywhere in the development of the extended piano techniques, it is to be in the realm of the glissando.

3.3.2.1 The 19th century glissando in statistics

As much as the lack of clear evidence of the glissando's presence in the 18th century repertoire weighed upon our attempt to define the chronology of its evolution, as easy it is to document the glissando in the next century. Contrary to the situation of our research material regarding the previous century, we can now build on enough evidence of our subject to establish some statistical insights into the glissando. Between 1816 and 1900, we found 746 definite individual glissandos in 111 compositions by 44 composers.[768] (Table 3.1.)[769]

Legend for table 3.1:

D	downward
U	upward
-8	glissando in octaves
-1	single glissando
-3	glissando in thirds
-6	glissando in sixths
-♯	Glissando on black keys
(6)	Glissandos in both hands simultaneously, a sixth apart
(8)	Glissandos in both hands simultaneously, an octave apart
(16)	Glissandos in both hands simultaneously, two octaves apart
(X)	Glissandos in both hands simultaneously, contrary motion
-♮♯	Double note glissando with one finger on black keys, another finger (of the same hand) on the white keys

e.g.

1*22n-D-R-8	1 downward octave glissando in the right hand, 22 notes long;
27*3à6n-D-R-1	27 downward single glissandos in the right hand, each between 3 and 6 notes long;
4(21n-U-R-1+21n-U-L-1)(6)	4 single note glissandos, both of 21 notes and upwards, one in the left hand, one in the right hand, both hands a sixth apart.

[768] In search of keyboard glissandos in 19th piano repertoire, we browsed through over 9,000 scores of individual pieces for or including keyboard instruments. (See also 1.2.) It is hardly possible to detect meaningful relations between the numbers of glissandi and the numbers of works checked. Especially in the 19th century, some works are in keys that allow for little use of glissandi (e.g. D♭ major), although modulations can rapidly bring the key close to G or C major, enhancing the chances for glissandi. At times, white-key glissandos can even appear as modulatory tools in between keys that are far removed from each other (and from the typical glissando key of C major). How these two factors are related to the total of checked works is not possible to tell, either, as long as no research provides us with solid statistical insights regarding compositions and their tonality.

[769] In the listing of these works, we did not include the isolated examples of glissandos in piano methods. Of the glissandi identified or added in scores of earlier composers by later editors, we only retained Liszt's elaboration of the glissandos in Weber's *Concert-Stueck*. In general, transcriptions of other composers' works were withheld, as were different versions of one piece by the same composer (e.g. Liszt's *Totentanz*) when the approach towards the glissando was different.

	Composer	Title of composition	Date	Number and types of glissandos	
1	J.N. Hummel	Piano concerto opus 85	1816	1	1*22n-D-R-8
2	J. Blewitt	*The Battle of Waterloo*	1816	4	4*14n-U-L-1
3	J. Gelinek	*Hummel's celebrated waltz*	1821	12	1*16-U-R-1; 4*8-U-R-1; 3*8-R-D-1 2(16-U-R-1+16-U-L-1)(8)
4	C.M. Von Weber	*Conzert-Stueck* opus 79	1821	3	?1*30n-U-R-1; 3*23n-U-R-8
5	Fr.D. Weber	Diabelli Variation Nr. 45	1823	1	1*16n-U-R-6
6	H. Herz	*Variations de Bravoure sur la romance de l'Opéra 'Joseph'* *de F. Méhul* opus 20	1826	1	1*16n-U-R-1; ?1(20n-U-R-1+20n-U-L-1)(8)
7	H. Herz	*Rondeau caractéristique sur la barcarolle de l'Opéra 'Marie' de Herold* op. 33	1826	1	1*24n-D-R-1
8	I. Moschelez	Concerto nr. 5 in C opus 87, 3d movement	1826	1	1*31n-D-R-1
9	C. Czerny	*Les Etrennes*	?1826	1	1*14n-U-R-3
10	H. Herz	*Grandes Variations sur le Choeur des Grecs de l'Opéra 'Le Siège de Corinthe'* de G. Rossini, op. 36	1827	6	1*13n-D-R-3; 1*15n-D-R-3; 2(15n-D-R-3+15n-U-L-3)(X)
11	H. Herz	*Variations brillantes sur la marche faborite de 'Moïse' de Rossini* op. 42	1828	4	1*21n*D*R*3; 1*13n-D-R-3; 1*13n-U-R-3; 1*18n-D-R-3
12	C. Meineke	*The Railroad. A Characteristic Divertimento.*	1828	3	1*16n-U-R-1; 1*18n-U-R-1; 1*29n-U-R-1
13	Anonymous	*The much admired Sliding Waltz*	1828	10	6*7n-U-R-1; 4*9n-D-R-1
14	C. Czerny	*Fantaisie sur des thêmes favoris de la Muette de Portici* op. 197	1829	1	1*29n-U-R-3
15	C.V. Alkan	*Les Omnibus. Variations Op. 2*	1829	9	2*14n-D-R-3; 1*23n-D-R-1; 1*10n-D-R-1; 1*15n-U-R-1; 1(13n-U-R-1+13n-U-L-1)(8) 1(13n-U-R-1+13n-D-L-1)(X)
16	C. Czerny	*Quatuor concertant für vier Piano-Forte* opus 230	ca1830	2	1*14n-U-R-3 1*23n-U-R-3
17	H. Herz	*Grande Fantaisie dur des airs de l'Opéra 'Le Comte d'Ory' de Rossini* op. 47	1830	1	1*20n-D-R-3
18	H. Herz	*Les Elégantes: Contredanses brillantes et variées* op. 49	1830	7	4*8n-U-R-1; 2*10n-D-R-1; 1*22n-D-R-1
19	H. Herz	*Variations sur une Cavatine de la Cenerentola: Non Più Mesta* opus 60	1831	1	1*14n-D-R-3
20	Fr. Liszt	*Songe d'une nuit du sabbat,* Nr. 5 from *Symphonie Fantastique* by Berlioz (ossia)	1833	5	1*17n-U-R-6 1*16n-U-R-3; 1*18n-D-R-3; 1*19n-D-R-3; 1*21n-U-R-3
21	H. Herz	*Variations brillantes di bravura sur le Trio favori du 'Préaux Clarcs'* op. 76	1833	3	1(19n-D-R-1+20n-U-L-1)(X) 1*15n-U-R-3
22	A. Bertini	*One Fingered Waltz*	1833	31	2*6n-U-R-1; 5*6n-D-R-1; 4*7n-U-R-1; 4*8n-U-R-1; 7*8n-D-R-1; 1*10n-U-R-1; 1*14n-U-R-1; 1*14n-D-R-1; 3*18n-U-R-1; 1(1*32n-U-R-1+28n-D-L-1); 1*30n-D-R-1;
23	W.A. King	*Hail Columbia*	1834	3	2*20n-U-R-1; 1*22n-U-R-1
24	H. Herz	*Fantaisie et variations sur la marche d'Otello de Rossini* op. 67	ca1835	2	1*29n-D-R-3; 1*26n-U-R-3
25	I. Moscheles	*Due Fantasie sopra de' motivi favoriti dell' opera Belisario del Donizetti*	1836	1	1*24n-D-R-1

	Composer	Title of composition	Date	Number and types of glissandos	
26	C. Czerny	*Eisenbahn-Variationen* *über J. Strauss beliebten Eisenbahn-Lust-Walzer* opus 431	1837	8	1*20n-U-R-1 1*20n-U-R-3 1*27n-D-R-3 2*26n-U-R-1 1*31n-D-R-1 1*34n-D-R-1 1*20n-U-R-1
27	H. Herz	*Variations brillantes sur une marche autrichienne* op. 97	1838	1	1*18n-U-R-1
28	C.V. Alkan	Etude op. 76 N° 3	1838	2	1(31n-U-R-1+31n-U-L-1)(16)
29	Fr. Liszt	*Marcia from Mélodies hongroises d'après Schubert*	1839	2	1(19n-U-R-8+19n-U-L-1)(8)
30	Fr. Liszt	*Magyar Dalok - Ungarische Nationalmelodie* # 9	1840	3	2*20n-U-R-6; 1*20n-U-R-3
31	Fr. Liszt	*Magyar Dalok - Ungarische Nationalmelodie* # 10	1840	1	1*15-U-R-1
32	Fr. Liszt	*Hussitenlied aus dem 15. Jahrhundert*	1840	2	1(31n-U-R-1+31n-U-L-1)(8)
33	J, Strauß I	*Wiener Carnavals-Quadrille* opus 124	1840	3	3*13n-U-R-1
34	Fr. Liszt	*Réminiscences de Lucrezia Borgia (1st version)*	1840	25	7*11n-D-R-3; 3*14n-D-R-3 1*19n-D-R-3; 1*10n-D-R-3 (ossia) 1*19n-D-R-3; 1*16n-D-R-3; (ossia) 1*14n-U-R-3; 1*15n-U-R-3 (ossia) 1*11n-D-R-6; 1*12n-D-R-6; (ossia) 1*14n-U-R-6; 1*15n-U-R-3 (ossia) 1*19n-D-R-3; 1*16n-D-R-3; (ossia) 1*36n-U-R-3; 1*16n-D-R-6; (ossia) 1*17n-D-R-6
35	Fr. Liszt	*Gaudeamus Igitur* (1st version)	1843	18	1(28n-D-R-1+28n-D-L-1)(8)
					1(33n-D-R-1+33n-D-L-1)(8)
					6*20n-U-R-6; 1*20n-U-R-3
					1*20n-D-R-3; 2*17n-D-R-3
					1*29n-D-R-3; 1*21n-D-R-3
					1(28n-U-R-8+28n-U-L-1)(8)
36	Wallace	*Midnight Waltz*	1844	8	8*11n-R-U-8
37	Fr. Liszt	Große Konzertfantasie über spanische Weisen	1845	10	1(29n-U-R-1+17n-U-L)(8)
					1*25n-U-R-1; 1*28n-U-R-1
					1(21n-U-R-1+18n-D-L-1)(X)
					1*26n-U-R-1#
					3*33n-U-R-1;
38	Fr. Kalkbrenner	*Grande Sonate Brillante opus* 177	1845	1	1*26n-U-R-3
39	H. Herz	*Empress Henrietta's Waltz*	1846	2	2*19n-U-R-1
40	Fr. Liszt	*Schwanengesang und Marsch aus Erkels Hundyadi*	1847	6	2(11n-U-R-1+11nU-L-1)(8); 1*27n-U-R-1; 1*36n-U-R-1
41	Fr. Liszt	*Ungarische Rhapsodien - Magyar Rapszódiák # 13 'Rákóczi-March'*	1847	5	5*15n-D-R-3
42	Fr. Liszt	*Ungarische Nationalmelodie - Rákóczi-Marsch (Erleichtert)*	1847	5	5*15n-D-R-1
43	H. Herz	*Variations et fantaisie sur des airs nationaux Américains* op. 158	1847?	2	1*6n-U-R-1; 1*6n-D-R-1
44	H. Herz	*Last Rose of Summer* , op. 159	1847	1	1*16n-D-R-3

	Composer	Title of composition	Date	Number and types of glissandos	
45	Fr. Liszt	*Zigeuner-Epos* #8	1847	2	1*20n-U-R-1; 1*22n-U-R-1
46	Fr. Liszt	*Zigeuner-Epos* #11	1847	1	1*15-U-R-1
47	Fr. Liszt	*Réminiscences de Lucrezia Borgia* (2nd version)	1848	30	2*23n-D-R-3; 1*26n-D-R-3
					1(21n-R-U-4+21n-U-L-1)
					7*11n-D-R-3; 3*14n-D-R-3;
					1*10n-D-R-3; 1*19n-D-R-3;
					(ossia) 1*19n-D-R-3; 1*16n-D-R-3;
					(ossia) 1*14n-U-R-3; 1*15n-U-R-3
					(ossia) 1*11n-D-R-6; 1*12n-D-R-6;
					(ossia) 1*14n-U-R-6; 1*15n-U-R-3
					(ossia) 1*19n-D-R-3; 1*16n-D-R-3;
					(ossia) 1*36n-U-R-3; 1*16n-D-R-6;
					(ossia) 1*17n-D-R-6
48	J. Raff	*Divertimento über Motive aus 'Die Jüdin' von J. Halevy* op. 43	1848	1	1*15n-D-R-6
49	Ch. Grobe	*Salut to NY*	1848	2	1*17n-D-R-1; 1*17n-U-R-1
50	J. Schulhoff	*Le Carnaval de Venise* op. 22	1849	2	1(27n-U-R-1+27n-U-L-1)(8)
51	Fr. Liszt	*Totentanz* for piano and orchestra, De Profundis Version	1849	22	3*21n-U-R-1; 1*23n-U-R-1
					2*24n-U-R-1; 1*25n-U-R-1;
					1*30n-U-R-1; 2*21n-D-R-1;
					1(26n-D-R-1+26n-D-L-1)(8);
					2(28n-U-R-1+28n-U-L-1)(8);
					3(27n-U-R-1+27n-U-L-1)(8)
52	Fr. Liszt	*Illustration du Prophète* #2 from Meyerbeer	1849	79	4*7n-U-R-1; 18*14n-U-R-1
					1*13n-U-R-1; 1*9n-U-R-1
					2*20n-U-R-1; 1*10n-U-R-1
					2*12-U-R-1; 11*14n-U-L-1
					2(21n-U-R-1+21n-U-L-1)(8)
					5*21n-U-R-1
					3(28n-U-R-1+28n-U-L-1)(8)
					1(35n-U-R-1+35n-U-L-1)(8)
					(ossia) 4*9n-U-R-1; 4*10n-U-R-1
					(ossia) 4*11n-U-R-1; 7*12n-U-R-1
					(ossia) 2*13n-U-R-1: 1*28n-U-R-1
53	A. Quidant	*Les Mystères du coeur* opus 32, Nr. 4: *Les Etoiles Filantes*	1851	22	1*18n-U-R-1; 8*14n-U-R-1
					2*16n-U-R-1; 3*21n-U-R-1
					1*11n-D-R-1; 1*12n-D-R-1
					1*28n-U-R-1; 1*14n-U-R-3
					4*14n-D-R-1
54	J. Raff	*Schweizerweisen* op. 60, Nr.4	1851	4	4*15n-D-R-1
55	A. Rubinstein	Concerto Nr. 2 Op. 35	1851	1	1*36n-U-R-1
56	Fr. Liszt	*Paganini Etude* #5	1851	8	4(21n-U-R-1+21n-U-L-1)(6);

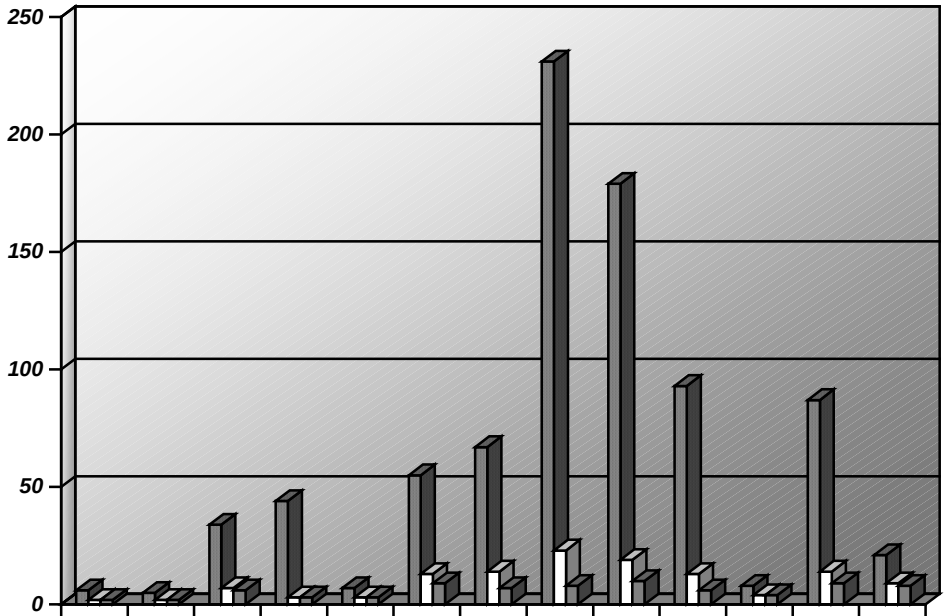
	Composer	Title of composition	Date	Number and types of glissandos	
57	A. Jaell	*Carnaval of Venice*	1852	34	27*3à6n-D-R-1; 1*11n-D-R-1; 2*10n-D-R-1; 2*12n-D-R-1; 1*15n-D-R-1; 1*24n-D-R-1
58	Fr. Liszt	*Fantasie über Ungarische Volksmelodien* for piano and orchestra	1852	4	2*20n-D-R-1; 2*18n-D-R-1;
59	Fr. Liszt	*X. Rhapsodie Hongroise*	1853	30	2*8n-U-R-1; 2*10n-D-R-1 4*15n-U-R-1; 2*18n-D-R-1 6*20n-U-R-1; 2*22n-D-R-1 2*25n-U-R-1; 2*17n-D-R-1 2*22n-U-R-1; 3(13n-U-R-1+13n-D-L-1)(X)
60	Fr. Liszt	*XIV. Rhapsodie Hongroise*	1853	3	2*25n-D-R-1; 1*20n-U-R-1
61	Fr. Liszt	*XV. Rhapsodie Hongroise*	1853	10	5*14n-D-R-3 (ossia) 5*17n-D-R-1
62	Fr. Liszt	*Totentanz* for piano and orchestra, earliest version	1853	22	3*21n-U-R-1; 1*23n-U-R-1 2*24n-U-R-1; 1*25n-U-R-1; 1*30n-U-R-1; 2*21n-D-R-1; 1(26n-D-R-1+26n-D-L-1)(8); 2(28n-U-R-1+28n-U-L-1)(8); 3(27n-U-R-1+27n-U-L-1)(8)
63	Fr. Liszt	*Andante, Finale und Marsch aus König Alfred* (J. Raff)	1853	14	2*24n-U-R-1; 12*17n-U-R-1
64	Van der Weyde	*Carnaval de Venise. Caprice burlesque*	1853	3	1*30n-U-R-1; 2*20n-D-R-1
65	F. Croze	*Polka, Etude de Concert*	1853	1	1*14n-U-R-1
66	Fr. Liszt	*Gaudeamus Igitur* (2. version)	1853	2	2*22n-D-R-1
67	C. Tausig	*Aufforderung zum Tanz*	1855?	2	1*15-U-R-1; 1*18n-U-R-8
68	C. Tausig	*Man lebt nur Einmal*	1855?	3	2*12n-U-R-1; 1*12n-D-R-1
69	B. Smetana	*Ballade*	1858	2	1(20n-U-R-8+20n-U-L-1)
70	Fr. Berwald	*Marche Triomphale in C*	1850's	2	1*21n-D-L-1; 1*21n-U-L-1
71	Fr. Liszt	*Totentanz* for piano and orchestra, solo version	ca1850'	12	3*21n-U-R-1; 1*23n-U-R-1 2*24n-U-R-1; 1*25n-U-R-1; 1*30n-U-R-1; 2*21n-D-R-1; 1*26n-D-R-1 1*28n-U-R-1
72	C. Tausig	*Das Geisterschiff* opus 1	1860	4	2(28n-U-R-1 + 20-U-L-1B)
73	Fr. Liszt	*Bacchanal - Hulanka*, Nr. 4 from *6 Polnische Lieder von Frédéric Chopin*	1860	4	2*31n-U-R-1; 1(31n-U-R-1+31n-U-L-1)
74	Fr. Liszt	*Mephisto-Walzer 1*	1861	2	1(31n-U-R-1+31n-U-L-1)(8)
75	C. Tausig	*Halka*	1861	15	8*9à11n-U-R-1; 6*7à11n-D-R-1; 1*32n-D-R-1
76	Fr. Liszt	Waltzes from Gounod's Faust	1861	7	3*14n-U-R-1; 2*17n-U-R-1; 2*18n-U-R-1

	Composer	Title of composition	Date	Number and types of glissandos	
77	Fr. Liszt	Concerto Nr. 2 for piano and orchestra	1861	8	2(29n-D-R-1+29n-D-L-1)(8); 1(28n-U-R-1+28n-U-L-1)(8); 1(28n-U-R-1+21n-U-L-1)(8)
78	B. Richards	O Luce di quest anima	1862	1	1*18n-U-R-1
79	J. Brahms	*Paganini-Variationen*	1862	4	3*9n-D-R-8; 1*10n-D-R-8
80	J. Raff	*Kunkel's Leonore March*	1864	4	3*14n-D-R-1; 1*17n-U-R-1
81	Fr. Liszt	*Totentanz* for piano and orchestra, final version	1865	30	3*21n-U-R-1; 1*23n-U-R-1 2*24n-U-R-1; 1*25n-U-R-1; 1*30n-U-R-1; 2*21n-D-R-1; 2(14n-U-R-1+14n-U-L-1)(8); 5(21n-U-R-1+21n-U-L-1)(8); 1(26n-D-R-1+26n-D-L-1)(8); 2(28n-U-R-1+28n-U-L-1)(8);
82	Fr. Liszt	*Weber Konzertstück*	1868	11	1*32n-U-R-1; 1(31n-U-R-1+31n-U-L-1)(8) 2(27n-U-R-1+27n-U-L-1)(8) 2(19n-U-R-1+18n-D-L-1)(X)
83	M. Balakirev	*Islamey*	1869	1	1*20n-U-R-8
84	J. Brahms	Hungarian Dance 8	1869>	2	1(13n-D-R-8+11n-U-L-8)(X)
85	A. Rubinstein	*Rousskaja et Trepak* Op. 82 N° 1	1870	1	1*27n-U-R-8
86	S. Smith	*Weber's Concertstück* (Paraphrase)	1874	2	1*24n-U-R-1; ossia: 1*24-U-R-8
87	Fr. Liszt	*Ranz de Chèvres* , Nr.3 from *Trois Morceaux Suisses* (2nd version)	1876	4	2*19n-U-R-1; 2*17n-U-R-3
88	B. Smetana	*Polka*	1877	1	1*13n-U-R-1
89	A. Rubinstein	*Toréador et Andalouse* op. 103 Nr 3	1880	1	1*17n-U-R-1
90	Fr. Liszt	*Liebesszene und Fortunas Kugel*	1880	14	7(20n-U-R-1+20n-U-L-1)(8)
91	C. Saint-Saëns	*Marche Militaire Française*	1880	1	1*9n-U-R-1
92	N. Rimsky-Korsakov	Concerto opus 30	1882	5	1*18n-U-R-1; 1*41n-U-R-1 3*14n-U-R-1;
93	F. Bonamici	34 Melodic Studies for the left hand op. 273, nr. 3	1882	18	7*16n-U-L-1; 3*13n-U-L-1; 3*14n-U-L-1; 2*21n-U-L-1; 1*28n-D-L-1; 1*42n-D-L-1; 1*35n-U-L-1
94	Busoni/Wagner	*Marcia Funebre* from *Götterdämmerung*	1883	4	2*14n-U-R-1; 2*26n-U-R-1
95	J. Paderewski	*Variations et Fugue sur un thème original*	ca1883	22	8*22n-D-R-1; 4*20n-U-R-1; 1*20n-D-R-1; 7*19n-D-R-1; 1*18n-D-R-1; 1*17n-D-R-1
96	C. Saint-Saëns	*Rhapsodie d'Auvergne* opus 73	1884	4	1*12n-D-R-1; 1*19n-D-R-1 1(1*17n-U-R-1+1*17n-U-L-1)(8)
97	M. Moszkowski	*Caprice Espagnol* opus 37	1885	1	1*14n-U-R-1
98	C.Saint-Saëns	*Carnaval des Animaux* , nr. 1 *Introduction et Marche Royale du Lion*	1886	4	1(35n-U-R-1+35n-U-L-1); 1(35n-D-R-1+35n-D-L-1)
99	C. Saint-Saëns	*Carnaval des Animaux* , nr. 7 *Aquarium* (transcription)	1886	4	4*14n-U-R-1
100	C. Saint-Saëns	*Carnaval des Animaux* , nr. 14 *Final*	1886	6	4*(14n-U-L-1); 1(26n-U-R-1+26n-U-L-1)
101	Fr. Busoni	Concert Transcription over the Opera Merlin	1887	1	1*26n-U-R-1
102	A. Glazunov	*Ruses d'Amour opus 61*	1889	2	1*14n-U-R-1; 1*12n-U-R-1

	Composer	Title of composition	Date	Number and types of glissandos	
103	Cl. Debussy	*Suite Bergamasque*	1890	1	1*24n-U-R-1
104	Cl. Debussy	*Fêtes Galantes: Fantoches*	1891	1	1*18n-U-R-1
105	S. Smith	*La vie pour le Czar*	1892	1	1*17n-U-R-1
106	P. Tchaikovsky	*Scène Dansante*	1893	2	1*14n-U-R-1; 1*14n-D-R-1
107	J. Paderewski	*Fantaisie Polonaise*	1893	4	1*27n-U-R-1; 1*20n-D-R-3; 2*14n-U-R-1
				3	1*16n-D-R-3; 1*17n-D-R-3; 1*18n-D-R-3
108	M. Moszkowski	*6 Phantasiestücke* opus 52, nr. 6	ca1894	1	1*27n-U-R-1
109	C. Saint-Saëns	Concerto Nr. 5 Op. 103	1896	1	1*38n-U-R-1
110	Fr. Delius	Concerto	1897	2	1*(42n-D-R-1+42n-D-L-1)(8)
				2	(40n-U-R-1+40n-U-L-3)(4)
111	L. Godowsky	*Concert-Paraphrase. Chopin's Valse* Op.18	1899	3	1*18n-D-R-6; 2*42n-D-R-X

Mapping the occurrences of glissandos in the 19th century onto a timeline divided in decades (starting a little earlier for perspective's sake), the arithmetic gives us an unmistakable idea of how and at what speed the glissando was developed, as well as how this is different from the previous century. (Fig. 3.1.)

The Rise and Fall of the Glissando 1770-1900



	1770s	1780s	1790s	1800s	1810s	1820s	1830s	1840s	1850s	1860s	1870s	1880s	1890s
number of glissandi	6	5	34	44	7	55	67	231	179	93	8	87	21
number of works	2	2	7	3	3	13	14	23	19	13	4	14	9
number of composers	2	2	6	3	3	9	7	8	10	6	4	9	8

Figure 3.1

After the boom at the end of the 18th century, there is clear gap in the second decade of the 19th century, after which the interest in the glissando picks up and leads to a remarkable peak, only to fall back during the remaining decades, with another gap in the 1870's. The highpoint of the 19th century coincides with the works of Franz Liszt.

When analyzing the numbers further, we can conclude several more and similar tendencies. There are not only increasingly more glissandi to be found per decade in the first half of the century, there are also more and more glissandi per composer and per composition up to and including Liszt. If Scarlatti and Beethoven each wrote three works with glissandi, and if among such works by Weber, Moscheles and Alkan we count two each before 1840, Czerny left us four from in between 1826 and 1837 (not counting pedagogical works) and Henri Herz – at the very least – twelve works with glissandi in them written between 1826 and 1847[535]. Liszt topped it all with 32 such compositions between 1833 and 1880. Of the rest of all the other 19th century identified glissando-composers, Saint-Saëns wrote four (1880-1896), three composers seem each to have written 3 works with glissandi: Joachim Raff (between 1848-1864), Anton Rubinstein (between 1851-1880), and Carl Tausig (in the 1860's) – all in roughly the second half of the century. Brahms, Busoni, Godowsky, Moszkowski, Paderewski and Smetana each

[535] We were able to check 128 of Herz' works for or including the piano. A published work list (Pazdirek 1967, volume V, p. 799-811) goes up to 224.

wrote 2 such works, again all in the second half of the century. The remaining 25 composers that we could find to have written glissandos in between 1816 and 1900 have each left us one such composition. The average for that period is about 2.5 glissando-works per composer.

Counting glissandi per work, we detect similar movements in the period under scrutiny: in 1821 Gelinek included 12 glissandi in a 32-bar long *Hummel's Celebrated Walz*, Bertini wrote 31 glissandos in a 2.5 minute piece in 1833, both in a quarter-century that averaged a little over 4 glissandos per work.[536] In between 1840 and 1860 that average peaked at over 10[537], with Liszt writing 30 glissandos in his *Réminiscences de Lucrezia Borgia* (2nd version) and 79 in the 1849-50 *Illustration du Prophète*. After this piece, the peak numbers of glissandos per work go down from 34 (Alfred Jaell's *Carnaval* – 1851) to 30 (Liszt's 1853 tenth *Hungarian Rhapsody*) to 22 (Paderewski with *Variations et Fugue*) around 1883, the last year of that century in which we see a composition with more than 4 glissandos.

The breakdown of the given data in percentages allows us to gain some insights in the preferences of the virtuoso composer-performers who mostly wrote these pieces.

Type	number	percentage of total glissandos (746), found between 1815 and 1900
Right hand upward	380	51%
Right hand downward	247	33%
Left hand upwards	99	13%
Left hand downwards	20	3%
Right hand	627	84%
Left hand	119	16%
Upwards	479	64%
Downwards	267	36%
Outwards	400	54%
Inwards	346	46%
Single	599	80%
3ds	99	13%
4ths	1	0%
6ths	22	3%
8ths	25	3%
Total	746	100%

Very much in accordance with intuition, an overwhelming majority of 19th century glissandos are written for the right hand. Equally logical – because it makes sense ergonomically – seems the fact that outwards and inwards movements are close to equally represented. This is a false conclusion, however, for it is merely the dominance of the right hand glissandos that makes for the high inwards number. That the left hand downwards movement seems to have found little interest from composers compared to the right hand upwards movement (in theory, symmetrical movements are comparably

[536] In between 1816 and 1840, we counted 127 glissandos in 29 works.
[537] In 38 works between Liszt's *Réminiscences de Lucrezia Borgia* (1st version) and 1860, we counted 401 glissandos.

easy or difficult and therefore comparably successful) may have to do simply with the ever greater focus in this period on the development of the right hand. It is further significant that most left hand glissandos are part of an upwards two-hand glissando combination. Apparently glissandos are written more on the basis of musical logic (up- or downwards movements) than bodily ergonomics (in- or outwards movements).

A little counter-intuitive is the high number of two hand combinations: over 20% of all glissandos found in this period is part of such a couple.

Glissandos as part of a two-hand combination	164	22% (on a total of 746 glissandos)

Type	couples	percentage
2-hands upwards	63	77%
2-hands downwards	9	11%
2-hands outwards	6	7%
2-hands inwards	4	5%

total: 82 couples or 164 glissandos

Within the two-hand type, the conclusions show a more polarized picture as compared to the one-hand instances. Three-fourths of the couples are upwards in movement and there is almost double the number of outwards glissando couples as compared to those inwards. For the 19th century, it looks like the upward two-hand glissando couple is the standard, while the remaining possibilities of the combinations are the exception.

Looking at the distribution of single-note and double-note glissandos, on their own or as part of a two-hand combination, we find the following:

	single alone	single in 2-H	3rds alone	3rds in 2-H	4ths in 2-H	6ths alone	8ths alone	8ths in 2-H	total
RH↑	260	65	24	0	1	12	15	3	380
RH↓	146	10	70	2	0	10	5	1	244
LH↑	36	62	0	3	0	0	0	1	102
LH↓	4	16	0	0	0	0	0	0	20
total	446	153	94	5	1	22	20	5	746

The neglect of the downwards left-hand glissando is confirmed here, with only a symbolic presence outside of the two-hand combination. That there are more left hand (78) than right hand single note glissandos (75) in the two-hand combination is due to the fact that right hand octave glissandos in two-hand combination are mostly paired with a single-note glissando in the left hand. The other way around (single-note right hand glissando coupled to a double-note left hand glissando) is extremely rare. The 2-hand glissandos in 3rds come from one and the same piece (Herz' opus 36), making this colorful combination an unexpected rarity.

On their own, these numbers do not reveal much more than what we have already found, or than that which is close to expectations. But when viewing them with the consequences for ergonomics in mind, we gain some striking insights. There are about three times as many downwards than upward right hand glissandos in thirds, in contrast

to the dominant upward right hand movement that we saw in general. There are also more downward octave glissandos in the two-hand combination than when they appear on their own. The reason for the majority of glissandos in thirds being downwards may have to do with fingerings. It is remarkable that – as we will see further on – almost all fingerings for these are *42*, which is only possible with the hand in the regular position (*4* for the upper note and *2* for the lower note), as a consequence of which only the flesh of fingers is used, no nails. In the case of octaves, downward motion is more comfortable than upward due to the bigger nail on the thumb than on the fifth finger. That the glissando in 6ths seems to escape this tendency may just as well have to do with the ergonomics of fingerings. This interval is large enough for a flat thumb and a rather vertical 3rd, 4th or 5th finger, harnessing the performer against harm with as much flesh as possible for the thumb, and as much nail for the upper finger. For a glissando in thirds, this is not the case: the narrow interval – smaller than the distance at the hand between thumb and third finger – does not accommodate a thumb laying down much while at the same time allowing the third (let alone fourth and fifth) finger to be vertical enough to avoid friction between the key and the flesh above the nail.

Significantly large gaps in the chronology show a lack of certain types of double note glissandi in certain periods: between 1848 and 1899, no glissandos in 6ths were found, and between 1849 and 1876, were we see no glissandi in 3rds or in 6ths. After 1876 we can detect no more octave glissandos in the 19th century.

Only one glissando is in fourths (nr. 47 in Table 3.1) and just three glissandos are on black keys: one left-hand upwards in combination with a right-hand white-key glissando (nr. 72) one right hand downwards in combination with a white key glissando *in the same hand* (nr. 111) and one solo (nr. 37). The latter is the only solo black key glissando in the whole of the 19th century and also the first one we could find in the glissando's history.

The average number of notes in individual glissandos between 1815 and 1900 is 18, which amounts to about two and a half octaves for white note glissandos. Divided over the different kinds of glissandos, we find the following:

Right hand upward	18
Right hand downward	15
Left hand upward	18
Left hand downward	23
Right hand	16
Left hand	19
Upward	18
Downward	16
Outwards	20
Inwards	16
Single	19
3ds	20
4ths	21
6ths	16
8ths	13

Interestingly, the average length of the left hand glissandos is longer than those in the right hand, glissandos in thirds are on average longer that single note glissandos, and the shortest (averages) are the lengths of the one-hand octave glissandos.

More important than the questions of average glissando length are the changes in the peak ranges. While the 3.5 octave glissando in Moscheles' 1826 concerto is not any longer than the one in Beethoven's first concerto some thirty years earlier, the lengths of the greatest glissandos – away from the basic average of 2 to 3 octaves – steadily increased over time from the 1820's onwards. It went from 4 octaves (1828 – Meineke's *Railroad*) to 4+ octaves (1830's and 1840's with Alkan's opus 76, Liszt's *Grosse Konzertfantasie*, *Totentanz* and *Hussitenlied*), 5 octaves (Liszt's *Illustration du Prophète* and *Schwanengesang*, Rubinstein's *Concerto*), 5.5 octaves in 1896 (Saint-Saëns 5th concerto) and one year later a full 6 octaves (Delius concerto).

One other noteworthy increase is the application of the glissando to the ever more chromatic context. The first glissandi were almost invariably imbedded in the key of C major (with an underlying harmony of either the tonic or the dominant) or in a related key but with the particular harmony always being "white-keyed." Scarlatti and Benjamin Carr had written the only exceptions we have found in the previously investigated period. For a long while, those instances remain isolated, but from the 1840's onwards, white key glissandos appear over harmonies that are increasingly non-"white keyed." If early glissandos (in one hand) were almost exclusively written over chords and harmonies (in the other hand) that were either C major or its dominant seventh on G, the second half of the 1840's sees Liszt writing white-key glissandos over E major harmonies and Jules Schulhoff finishing an overwhelmingly F major piece with a four octave long two hand glissando with explicitly notated B♮'s. In 1860 we see the first black key glissando combined with a white key one to form the first pseudo-chromatic glissando in Tausig's *Das Geisterschiff* in D♭. The general movement away from clear tonal definition of the glissando's context fits – and can stand symbolic of – the urge to push the boundaries of tonality as it is present throughout this century. This harmonic evolution of the glissando will be expressed in several more steps, symbolic of tonality's crisis in the beginning of the 20th century. (See below, 3.3.2.3.2.4 and 3.3.2.3.3.1.)

A last general remark concerns the compositional biotope of the 19th century glissando. If, in the preceding century, we could find glissandi in almost every genre and form, from waltz to sonata and from concerto to chamber and solo music, the 19th century glissando's appearance is much more limited to the most popular of formats and perhaps thriving best in the hands of the more populist of performer-composers. Mozart, Beethoven and Haydn did not seem as averse to the glissando as for instance Chopin, Schumann or Schubert, among whose many works for and with the piano we have not found a single glissando. As for compositional form, most of the data in the 19th century history of the glissando come from brilliant paraphrases, bravura sets of concert variations on popular (opera) melodies, reminiscent fantasies and dance pieces. Only one sonata – Kalkbrenner from 1845 – contains a glissando. The preceding century also saw only one sonata (Beethoven's opus 53), and the number of concerti with glissandi in the 19th century (about a dozen) is much larger than for the 18th century (2), but still the glissando's appearance in "serious" works in the 19th century in general is surprisingly minimal in relation to the total numbers of found glissandi. Of course we have to put these findings in an appropriate perspective: composed music in general was subjected as much to the dynamics of supply-and-demand as the traveling virtuoso pianist-composer needed to cater to the audience at large to provide for his income and the display of his talent. Judging the repertoire in which the glissando's development can be traced, it has for most of its 19th century presence been part of fashionable pianistic culture.

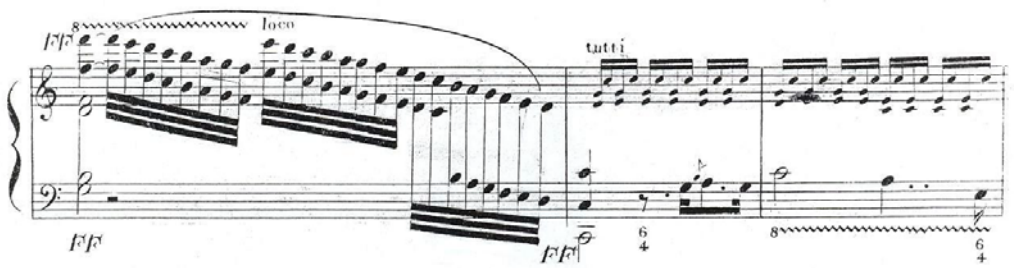
3.3.2.2 1820's-1830's: Consolidation and growth

Besides the consistent rise in the use of the glissando and its potential, the first half of this 19th century saw a clear tendency to consolidate attainments. What had been achieved at the end of the previous century would now more or less be perpetuated. The glissando – at least in the various forms of integration we saw then – enters the keyboard repertoire, so to speak. Leaving the general level of long-term development and bird's eye perspective, we will look at some of the smaller evolutionary steps the glissando made in the 19th century.

3.3.2.2.1 Continuation of known applications

3.3.2.2.1.1 Concerto glissandos I

In the last bar of the cadenza in the first part of Hummel's a minor *Großes Concert für das Piano-Forte mit vollständiger Orchesterbegleitung* opus 85 (ca. 1816, first published in 1821), we find exactly the same circumstance as in which Beethoven wrote his opus 15 glissando. (Ex. 3.157.)



Example 3.157. J. N. Hummel: *Grand Concerto pour le Piano Forte* opus 85 (later Paris edition by Schlesinger[538], true to the manuscript[539]), 1st movement, bars 256-258.
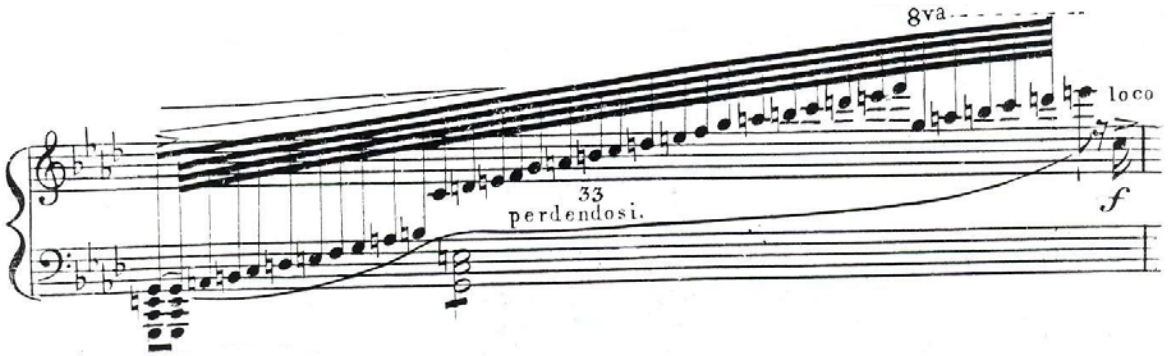
A firm dominant seventh chord in the left hand with the right hand starting from a prolonged fortissimo F octave to glide down over 3.5 octaves to the tonic in the ensuing orchestral tutti with which the development section begins. The difference with the Beethoven passage is that, here in the Hummel concerto, the left hand starts together with the right hand, in practice allowing for the glissando to be played as a two-hand fingered scale as well as a one-hand glissando. In Beethoven's concerto that is not possible as the right hand is already playing when the left needs to strike the chord in the bass.

That such a striking resolution from dominant to tonic at a major structural point in the composition appears in an early 19th century piano concerto suggests that it was modeled after Beethoven's opus 15. If the similarity goes any deeper than that, we could suppose the left hand rest to imply that this hand does in fact not play and that therefore all the notes in the right hand staff should be played with one hand.[540] (By the way, the tempo is too fast for these 32nds to be played as non-glissando octaves as Küthen suggested for the Beethoven passage.) Nevertheless, there is no conclusive evidence in

[538] B-Gc DS2979. Reproduced by permission.
[539] We checked the autograph at the Staatsbibliothek zu Berlin (D-B Mu. Ms. 10 986/3).
[540] Cf. above (3.2.6.1.5.) for this reasoning.

the score, and we have found very little glissando playing in Hummel's compositions, except for his pedagogical work.[541]

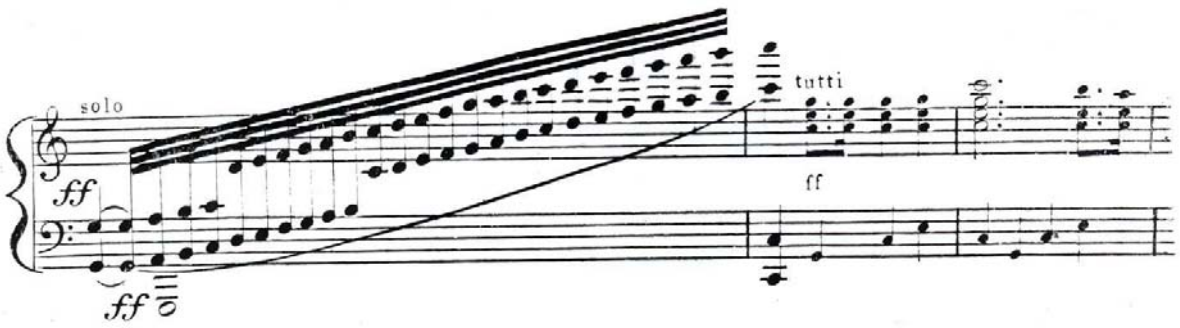
Similarly inconclusive as a glissando is the huge ascending run in the *Larghetto Affettuoso* of Weber's 1821 *Concert-Stueck* for piano and orchestra (ex. 3.158).



Example 3.158. C. M. von Weber: *Concert-Stueck* (1821), *Larghetto Affettuoso* bar 52. [542]

It might well have been intended as a glissando, but there is room for doubt in this first edition. The piece contains octave glissandos that are literally labeled as such in the score (ex. 3.160) – why then would the composer mean this first run to be a glissando and not add the appropriate indication, especially since the octave passages cannot be played without gliding while this earlier run needs specification to know which technique to use? Nevertheless, there are some indirect indications for glissando technique in this passage: the run is in C major and very long (4+ octaves), there is once again the stressed and prolonged first note, and any tempo based on rendering the main musical material intelligible would make this run extremely fast for regular fingering, especially if one wants the perpendosi to be effective.

In the march movement, the solo piano makes but one appearance: (ex. 3.159)



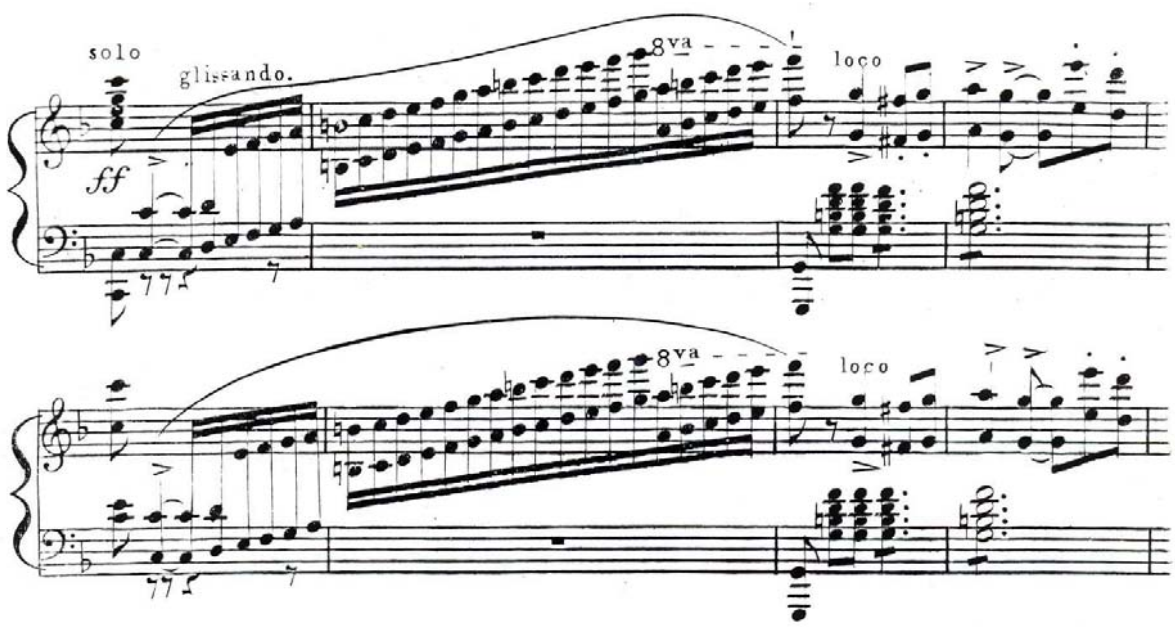
Example 3.159. C. M. von Weber: *Concert-Stueck* (1821), *Tempo di marcia*, bars 34-36.

Again, there is no unequivocal indication of glissando. The rhythmic division of the run exactly fits the three beats it is placed in, suggesting the possibility of a regular scale to be articulated in the proper way with both hands, especially since the prolonged first note gives time to leave the G in the low bass exactly were it is while applying the left hand to the execution of the run. However, that left hand whole note leads to an octave in the next bar, right at the moment when two hands are needed to finish the run in the right

[541] Cf. 3.3.2.2.4.1 for a discussion of his piano method, and 3.2.6.1.3 for the one piece in which Hummel may have incorporated glissandos (without specifying them, however).
[542] *Concert-Stueck für das Piano-Forte mit Begleitung des Orchesters*. Leipzig, C.F. Peters, 1823, N°. 1754. We saw a copy at the Beethoven Haus in Bonn, call number "Klingemann 16.7". Excerpts reproduced by permission of C.F. Peters Musikverlag.

hand if it is not played as a glissando. On top of this problem is the question of whether or not too much pedal (needed for the bass note to keep sounding if and when the left hand is needed upwards) may be ruinous to the sound. For those reasons (the former foremost), this must be an octave glissando. The lack of an unambiguous indication makes for the suspicion that the previous right hand long run (ex. 3.159) might then also be a glissando.

The finale – *presto giojoso* – contains two more right hand glissandos, both fortissimo 3.5 ascending octaves on a dominant harmony in C major, now with the reassuring indication "glissando." (Ex. 3.160.)



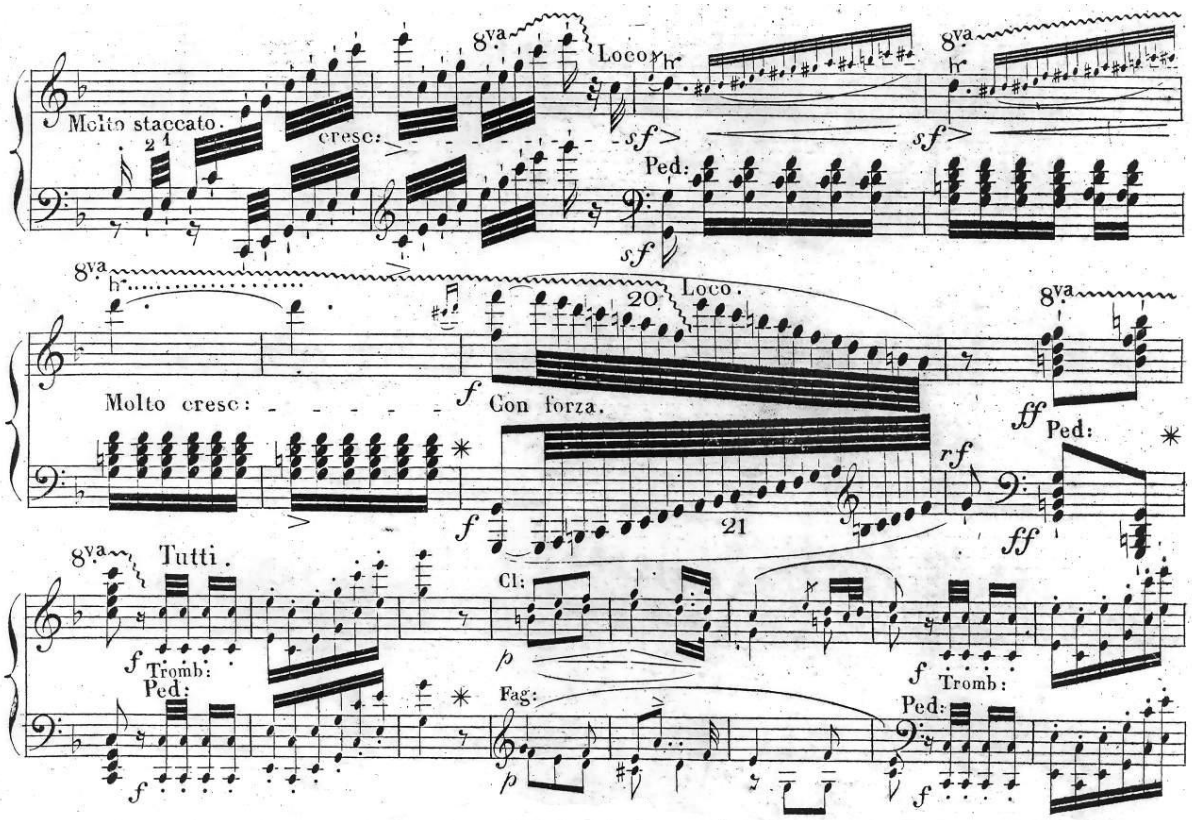
Ex. 3.160. C. M. von Weber: *Concert-Stueck* (1821), *Presto giojoso*, bars 100-107.

It is striking how Weber takes care that the left hand's unemployment in these two glissando moments is notated with precision, reminding us of the instance in Beethoven's piano trio. Likewise, the left hand whole note underneath the octaves in the march is reminiscent of what Beethoven prescribed for the left hand accompanying the octave run in his first concerto. That Weber clearly knew the term and still not applied it to the *Tempo di marcia* and *Larghetto Affettuoso* instances remains puzzling. The short chord right before the presto glissandos in the finale could possibly convince the player that the ensuing run was meant to be a two-hand fingered scale – hence necessitating a specific glissando indication – but such an impression is cancelled immediately by the fact that, here also, the ending of these octave runs coincides with the left hand needing to be many octaves lower. Could Weber have considered the octaves in the march as a clearer instance of glissando technique, not needing the extra indication? Whether or not this would then mean that the first instance – in the *Larghetto* – was conceived as a glissando or not remains unclear.

Weber's concerto glissandos are all upwards, in contrast to the ones in Beethoven and Hummel, but they serve the same function: drawing attention to the soloist at an important structural point in the composition where main themes are (re)introduced, either by the pianist or the orchestra.

In the 1820's one more concerto glissando shows the influence of Beethoven. The only differences between his opus 15 octave glissando and the 3.5 downwards glissando on the dominant seventh harmony in Moscheles' fifth piano concerto in C opus 87 (1828) is that the latter glissando consists of single notes instead of octaves, and that it occurs at the end of the very last solo piano passage.

Venturing away from the historical examples in Haydn and Beethoven was Henri Herz, who wrote a contrary motion two-hand glissando in the introduction to his brilliant 1833 variations opus 76 (ex. 3.161).

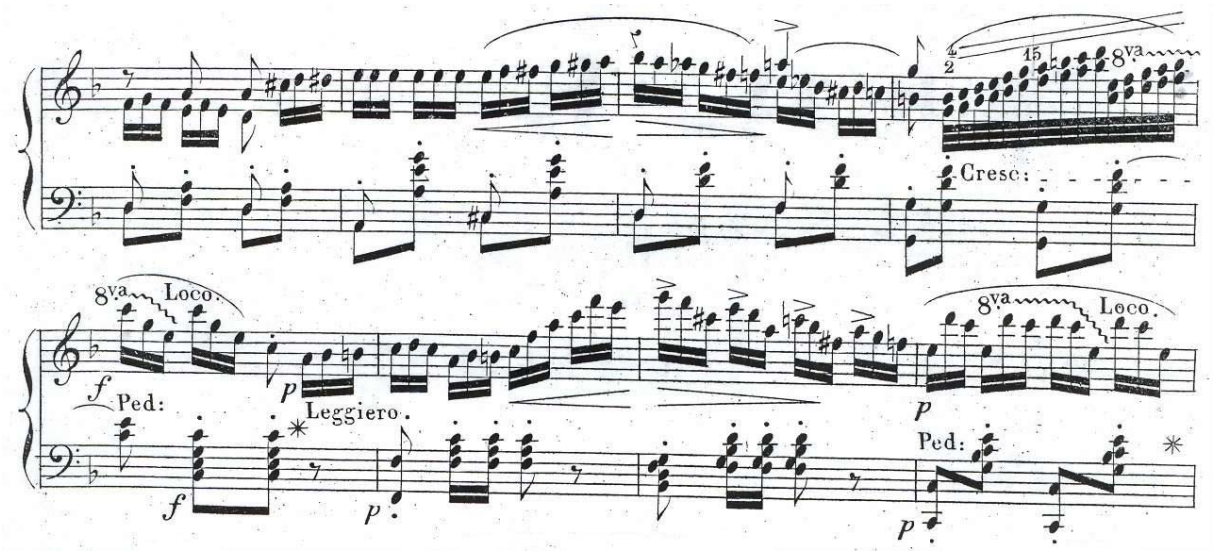


Example 3.161. Henri Herz: *Variations brillantes di Bravura pour le Piano-Forte avec accompagnement de Grand Orchestre sur le trio favori du 'Pré aux Clercs' de Hérold*, op. 76 (1833), *Introduzione*, bars 96-111.[543]

As there is no specific indication of glissando technique here, one could doubt that this is an example of contrary motion glissandos. However, some publishers left out such indications in Herz' music while other publishers included it (see 3.3.2.2.3). The tempo of this particular instance (ex. 3.144) is ♪=100, perhaps too fast for individual articulation in this context, and the irregularity of the number of notes in both hands (20 vs. 21) is a rarity in regularly articulated two-hand runs at this time.[544]

This type of glissando is new to the concerto repertoire, but its structural position in the composition is very much traditional: it ends a build-up in the solo part, emphasizing the releasing of the cadence's tension with a grand gesture before the tutti closes of the movement. Further into the piece, Herz uses a double note glissando equally stressing a cadence that is to end a phrase, though on a much smaller scale. (Ex. 3.162.)

[543] NL-Dhnmi 23 G 38 (2). Reproduced by permission.
[544] Two-hand runs with different numbers of notes per hand are not common before the exercises 1a-1f in Brahms' 51 Übungen WoO 6 (first edition 1893), 1a-1f.
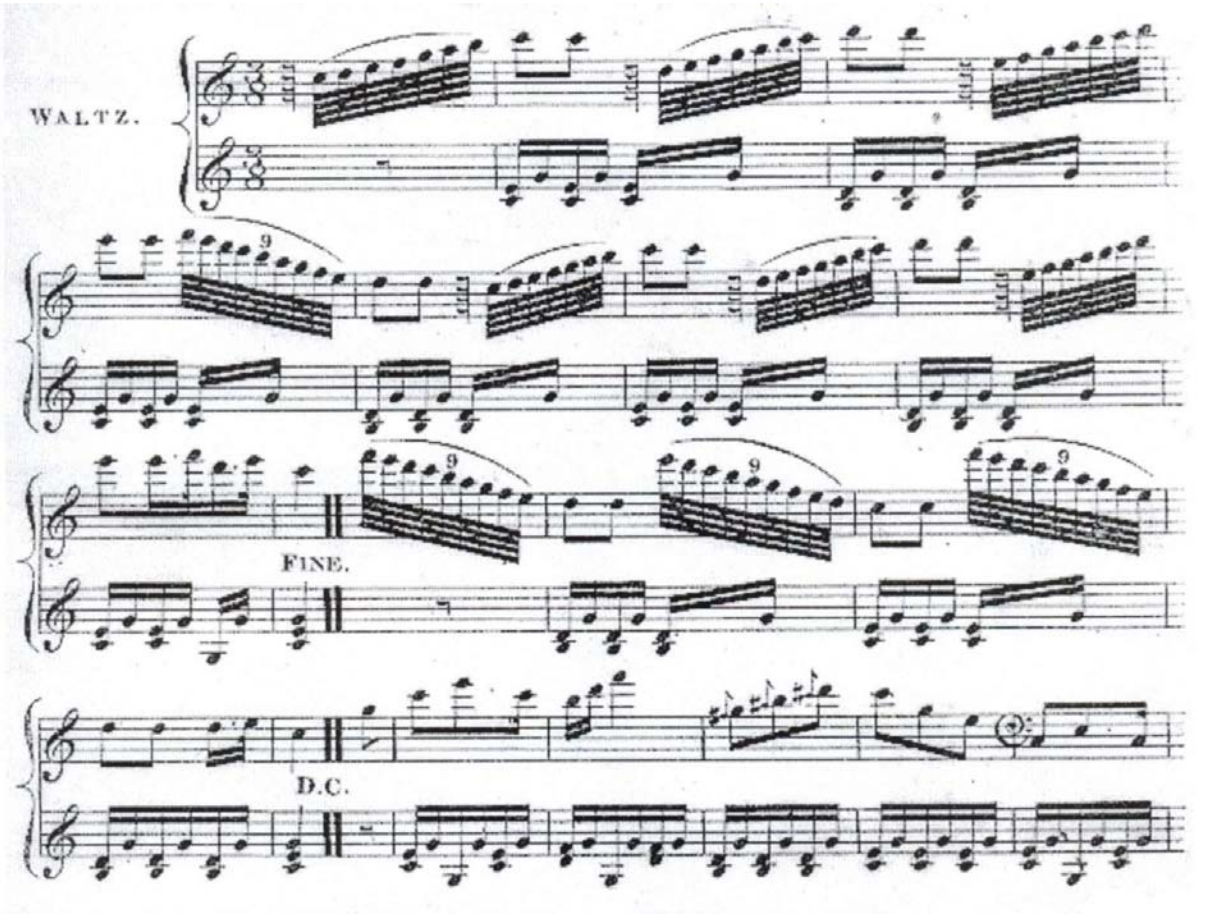


Example 3.162. H. Herz: *Variations brillantes di Bravura pour le Piano-Forte avec accompagnement de Grand Orchestre sur le trio favori du 'Pré aux Clercs' de Hérold*, opus 76 (1833), *Variation 1*, bars 12-19.[545]

3.3.2.2.1.2 Melodic integration

Next to the glissando being implemented in a large compositional form, such as the octave glissandos in concertos, it has also its particular place in the musical motivic material itself. In the 18th century we saw how it was mainly integrated like the regularly fingered runs they were mostly an alternative to: as part of ornamental melodic passage. Sometimes the glissando's own particular potential was exploited, with double note glissandos being needed to organically develop preceding (Mozart) or main (Beethoven opus 1/3) motivic material, or the descriptive glissandos in battle and revolution pieces. In the 19th century, the glissando's integration in the motivic building blocks that are needed to form musical phrases would be continued and further explored.

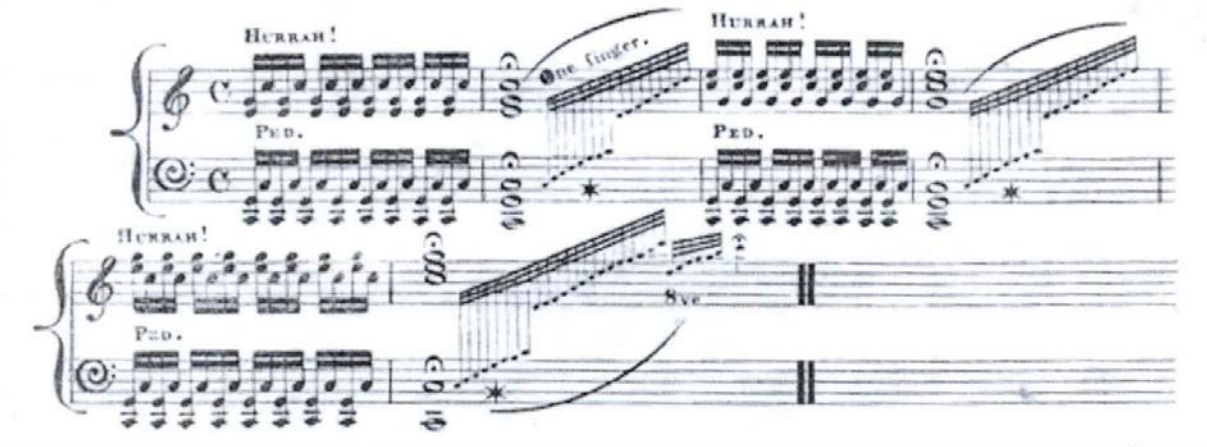
The most typical of melodic glissando use is found in upbeat, passagework and closure appearances. Upbeat glissandos vary from simple and short slides that remind us of (and are in fact disguised) proper finger technique, like the motivic upbeat glissandos in the 1828 anonymous *Sliding Waltz* (ex. 3.163), a take on the already much celebrated *One Finger'd Waltz* (3.2.6.1.15).

[545] NL-Dhnmi 23 G 38 (2). Reproduced by permission.
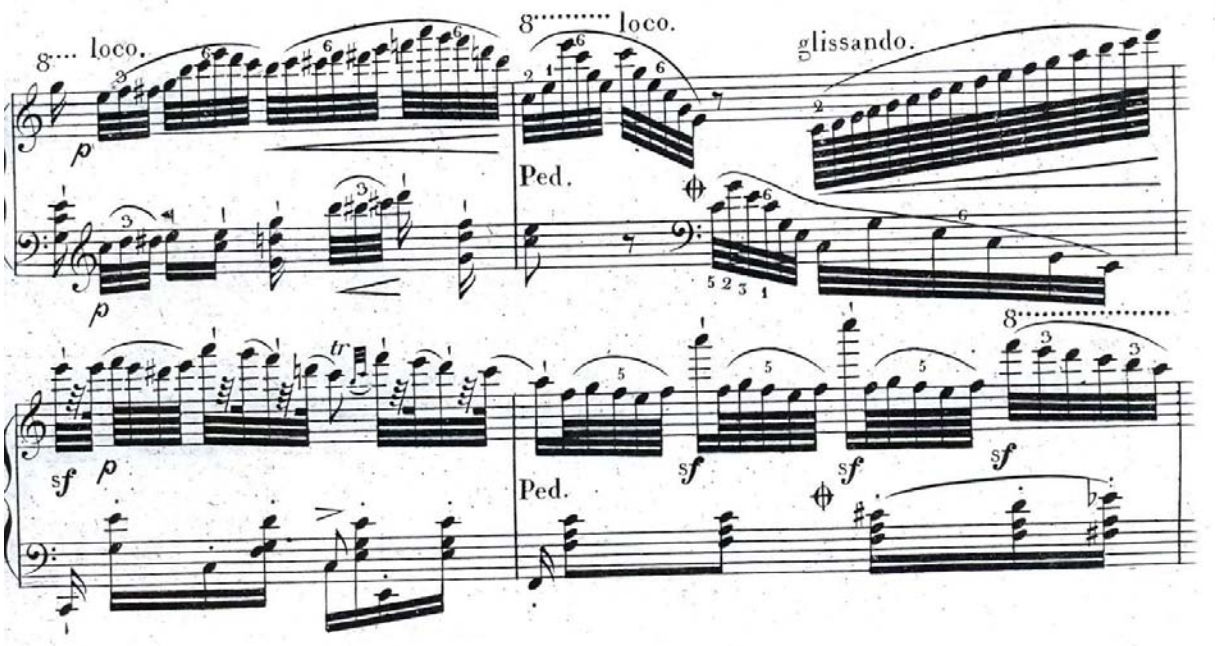


Example 3.163. Anonymous: *The Much Admired Sliding Waltz* (1828), bars 1-17.

Upbeat glissandos are easily found in more extended versions as well, such as in Meineke's *Railroad* divertimento (ex. 3.164) or the phrase-upbeat glissando as in Herz' opus 20 (ex. 3.165).
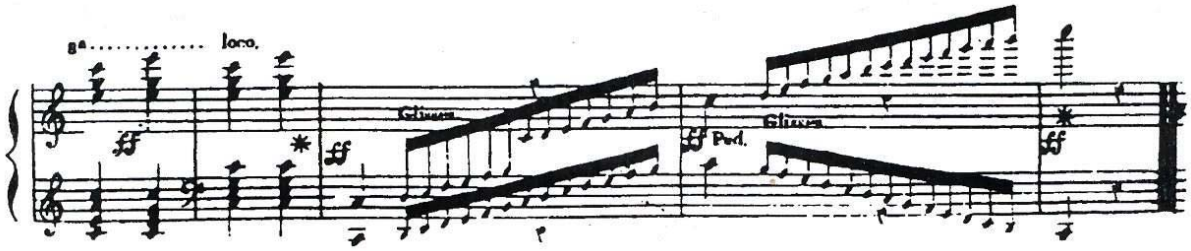


Example 3.164. C. Meineke: *The Railroad. A Characteristic Divertimento* (1828), bars 1-6.



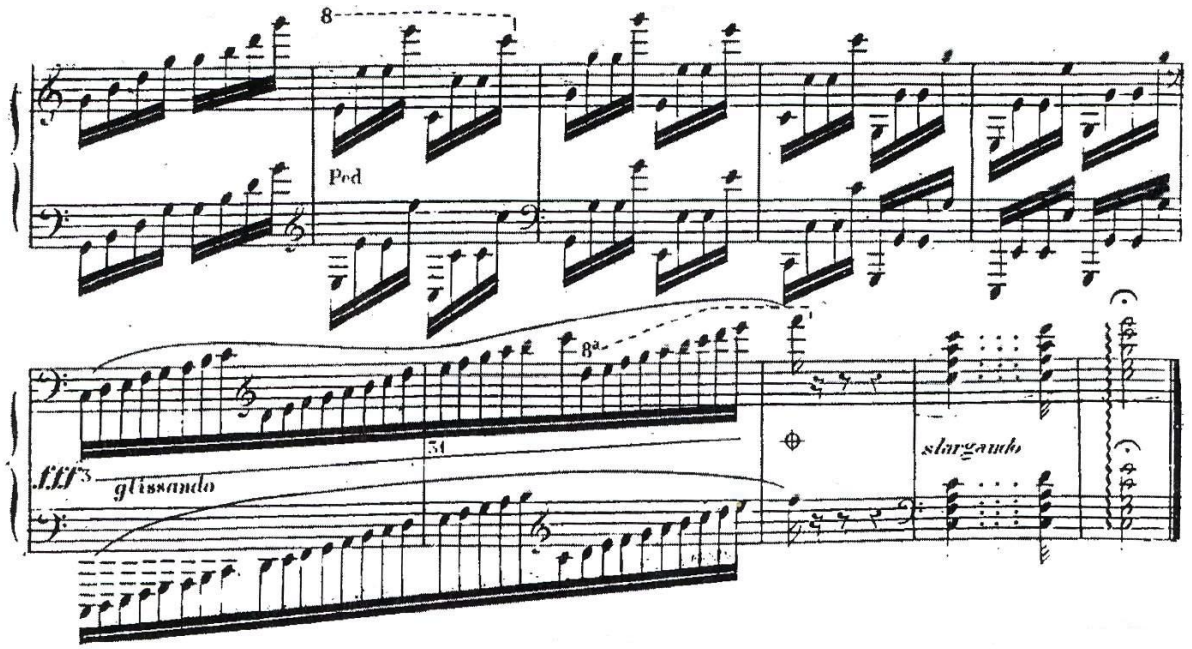
Example 3.165. H. Herz: *Variations de Bravoure sur la romance de l'Opéra 'Joseph' de F. Méhul*, opus 20 (1826), Variation 2, bar 3-6.[546]

The last glissando in Meineke's introduction features another common 19th century melodic glissando type: the downbeat glissando. Examples of such fireworks display – also reminding us of typical properly fingered finale runs – can be seen in diverse guises, such as the two-hand glissandos at the end of Alkan's opus 2 (ex. 3.166) and opus 76 nr. 3 (ex. 3.167), or the glissando in sixths in Fr. D. Weber's *con fuoco* contribution to Diabelli's famous multi-composer set of variations. (Ex. 3.168.)

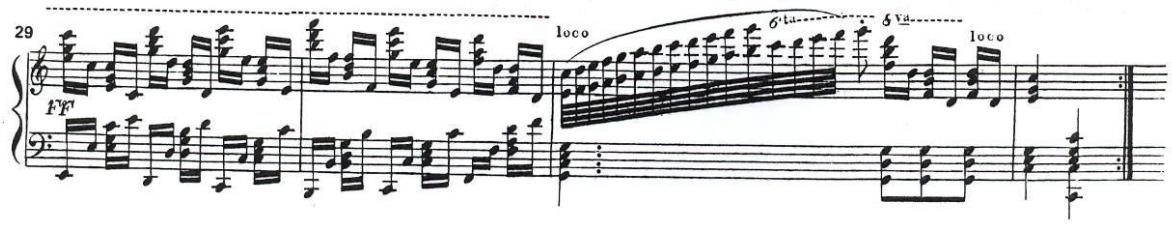


Example 3.166. Ch.-V. Alkan: *Les Omnibus. Variations* opus 2 (1829), final bars.

[546] NL-Dhnmi 34 G 39 (20). Reproduced by permission.

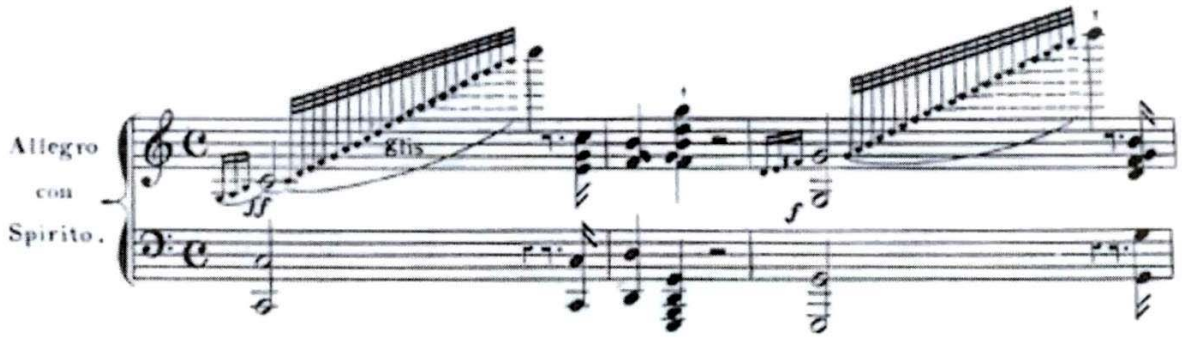


Example 3.167. Ch.-V. Alkan: *Etude* opus 76 nr. 3 (1838), final bars.



Example 3.168. Fr. D. Weber: Variation 45 (1823), *con fuoco,* final bars.

Downbeat glissandos are not always closing off a phrase, as King shows us in the introduction to his "brilliant fantasy" on *Hail Columbia,* the United States' unofficial national anthem in the 19th century. (Ex. 3.169.)[547]

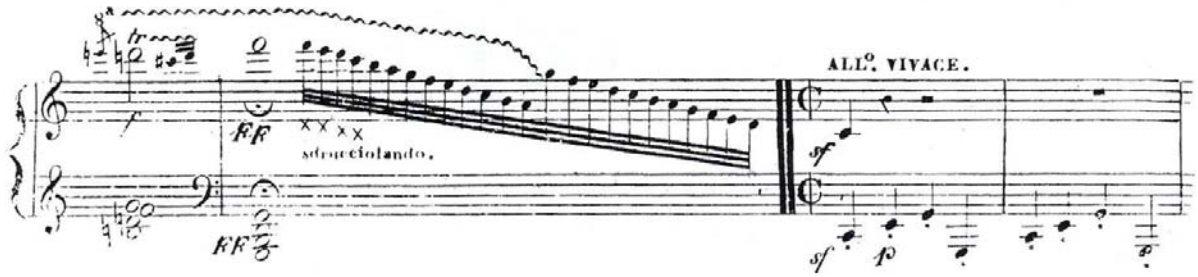


Example 3.169. W.A. King: *Hail Columbia* (1834), bars 1-3.

Not all glissandos can be categorized as belonging clearly to just such one type. Often they should be situated on the border between two types, such as in the Beethoven and Hummel concertos, but also in e.g. Moscheles' fantasy on Donizetti favorites (ex. 3.170 – *sdrucciolando* literally means "sliding," cf. Pasquali in 3.2.4.3). These glissandos are closing a phrase as well as introducing new material or structural sections. They are a

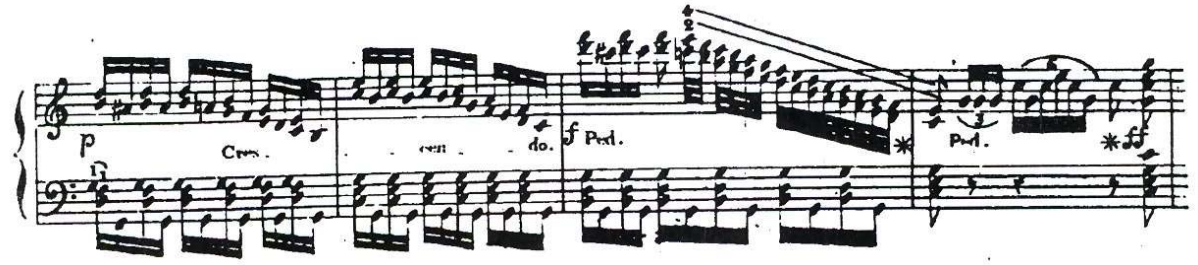
[547] King did close off this piece with a long glissando,

variant on the traditional cadential trill, and as the 19th century evolves, we can see the cadential glissando slowly gaining a position next to or even above the closing trill.
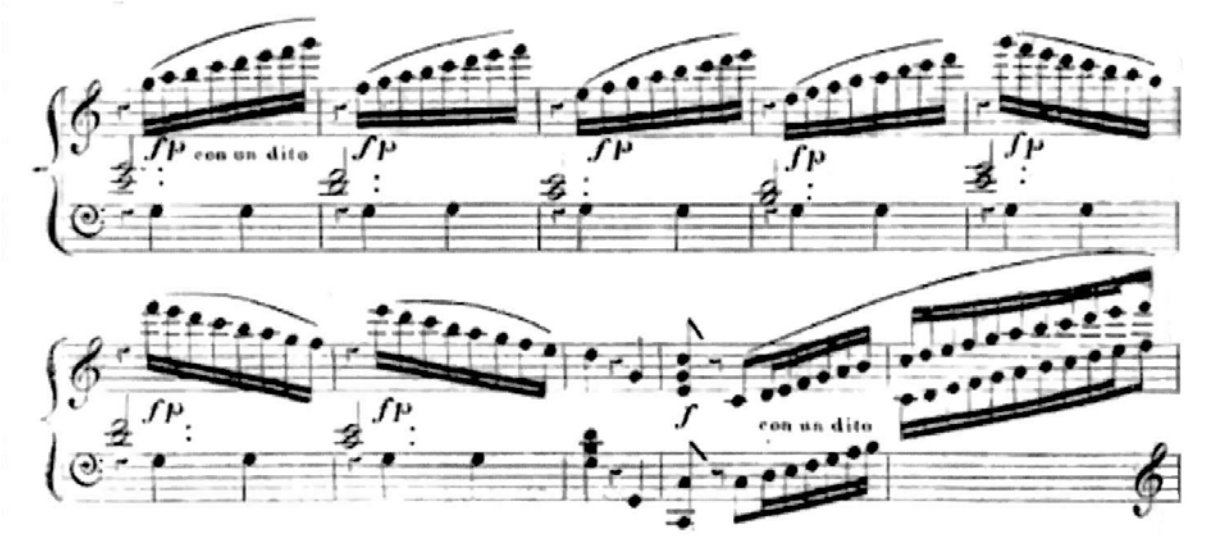


Example 3.170. I. Moscheles: *Seconda Fantasie sopra de' motivi favoriti dell' opera Belisario del M° Donizetti* (1836), bars 231-234.

On a smaller scale – within a single melodic phrase – such cadential glissando is also found, as in Alkan's opus 2 (ex. 3.171). Again, it is not really an upbeat, nor is it really closing a section (the first half of the phrase ends at the very end of bar 12, followed by a *piano subito* repeat of the material), but rather it intensifies the tension of the dominant in the cadence.



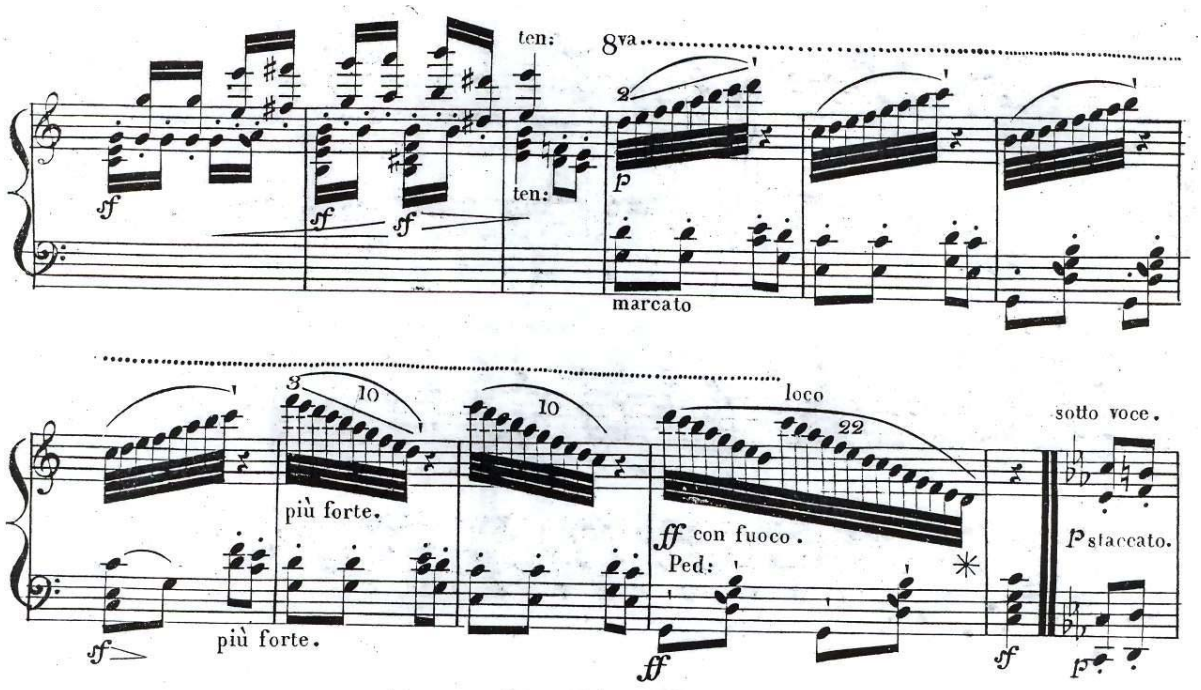
Example 3.171. Ch.-V. Alkan: *Les Omnibus. Variations* opus 2 (1829), variation 1, bars 10-12.

Hummel's celebrated waltz by Abbé Joseph Gelinek (1758-1825) shows the "traditional" passagework with glissandos as part of the melody much like what we saw from Scarlatti to Clementi, only more of it (ex. 3.172).



Example 3.172. J. Gelinek: *Hummel's celebrated waltz* (1821), variation 3, bars 17-26.

This example from Gelinek is dubious in its glissando use: they can be considered the melodic line because they are in the right hand and the left hand tenor voice is not much to speak of in terms of melodic quality. As a dance piece, the form consists of variations of an 8-bar building block, and in that respect this glissando passage can just as well be seen as a variation of a theme, much like the glissando passage in Vogler's dance we saw earlier (ex. 3.70), or in Herz' opus 49 (ex. 3.173).

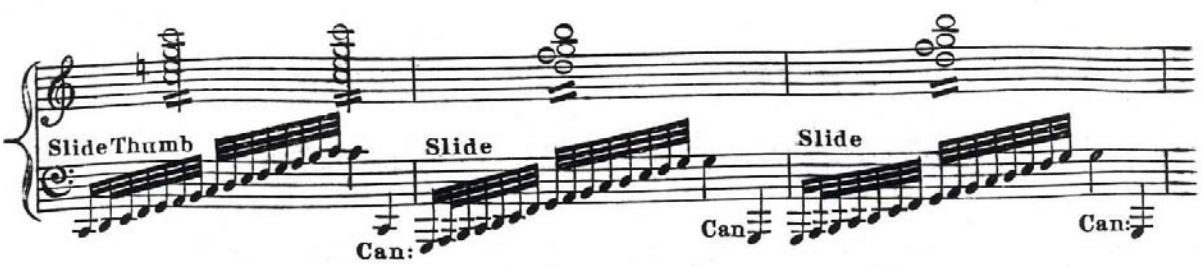


Example 3.173. H. Herz: *Les Elégantes: Contredanses brillantes et variées* opus 49 (1830), *Contredanse* n° 5: *Finale. Chassez-croisez et l'ÉTÉ*, bars 118-128.[548]

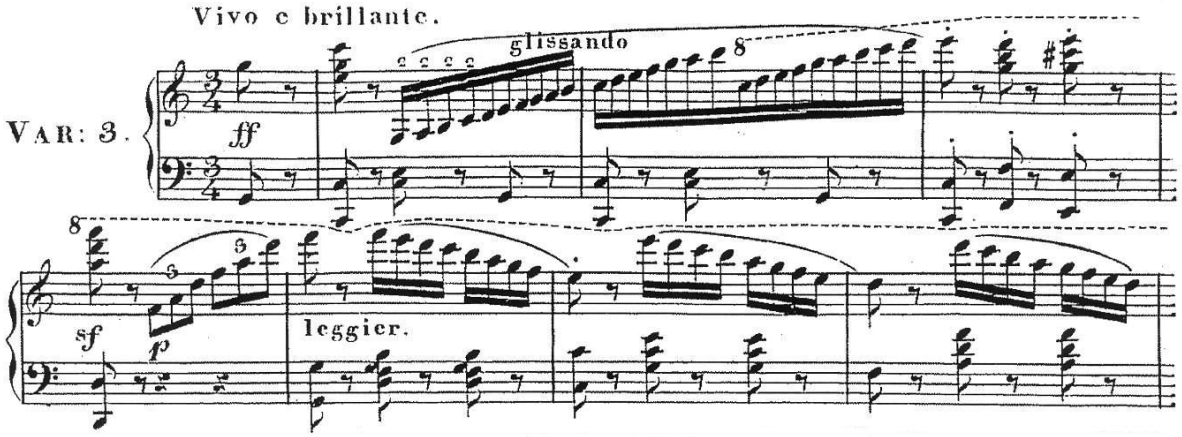
In the following decades, especially Franz Liszt will elaborate on such reoccurring use of the glissando within a single passage – as opposed to its more incidental appearance in most pieces.

One more type of known glissando use which was continued in the 19th century, was the descriptive glissando. Like 18th century examples used to depict the blowing up of a gunpowder magazine (Kauer) or beheading a queen (Dussek), the glissando's programmatical potential was now tried out further. Next to another example of a battle glissando by Blewitt (the arch of a canon ball flying through the air – ex. 3.174), we see a new – and historically apt – programmatical subject in the railroad pieces by Meineke (ex. 3.164), Alkan (e.g. ex. 3.166) and Czerny (ex. 3.175 and 3.179). The pictorial impact of the glissando in this music is slight, and if it hadn't been for the titles, no one would really have guessed. In the case of Czerny, the original waltz composition by Johann Strauß senior (his opus 85) contains nothing that reminds the listener of any gliding over the rails, not even in the piano score[549]. Nevertheless, it is striking how this subject enticed at least these three composers to use more glissandos than in any other of their works.

[548] NL-Dhnmi 26 E 28 (2). Reprinted by permission.
[549] A piano score was issued by Haslinger in Vienna, plate T.H. 6965 as seen in NL-DHnmi III G 55 (1).



Ex. 3.174. J. Blewitt: *The Battle of Waterloo* (1816-18), bars 227-229.[550]



Example 3.175. C. Czerny: *Eisenbahn Variationen über Johann Strauss beliebten Eisenbahn-Lust-Walzer* opus 431 (1837), opening of variation 3.

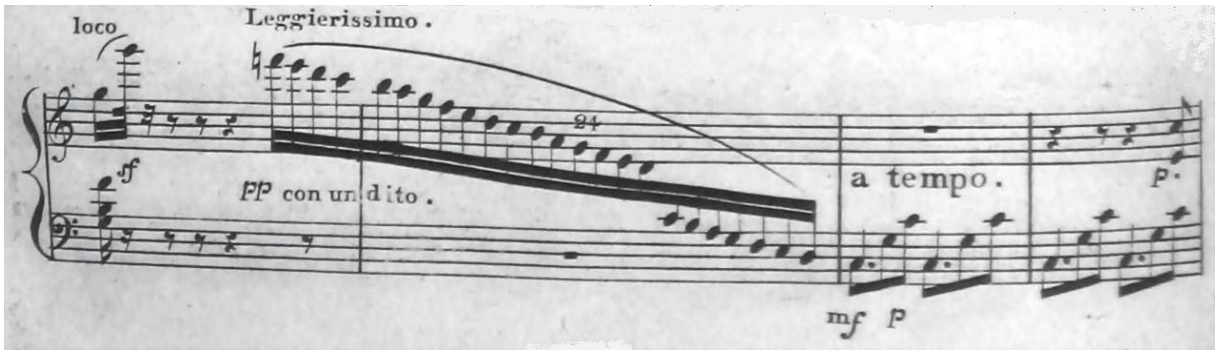
3.3.2.2.2 New functions and appearances

Besides the continuance and expanding of the earlier usage of the glissando, new ways of its integration in the musical texture were thought of as well.

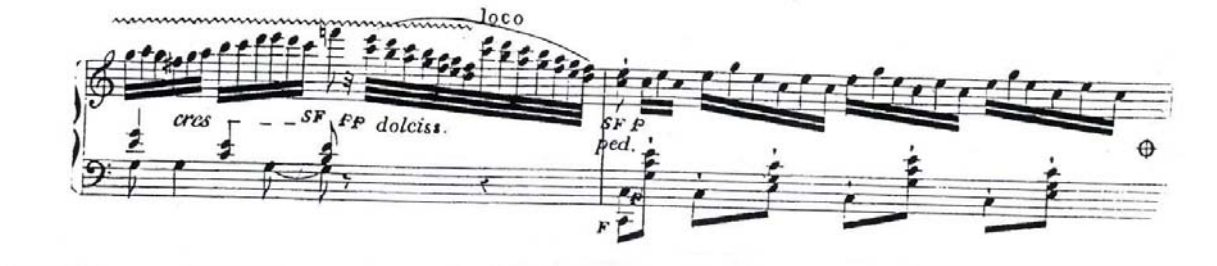
3.3.2.2.2.1 Surprise effects

Carefully timed usage of a glissando was not limited to the *ff* reintroduction of thematic material in the concerto form: we find it in other types of instances as well. Herz is twice found to come up with a very light and *pp* glissando to end a build-up and draw attention to a sudden return to stability (ex. 3.176 and 3.177).

[550] Reprinted by permission of the Music Division, The New York Public Library for the Performing Arts, Astor, Tilden, and Lenox Foundations.

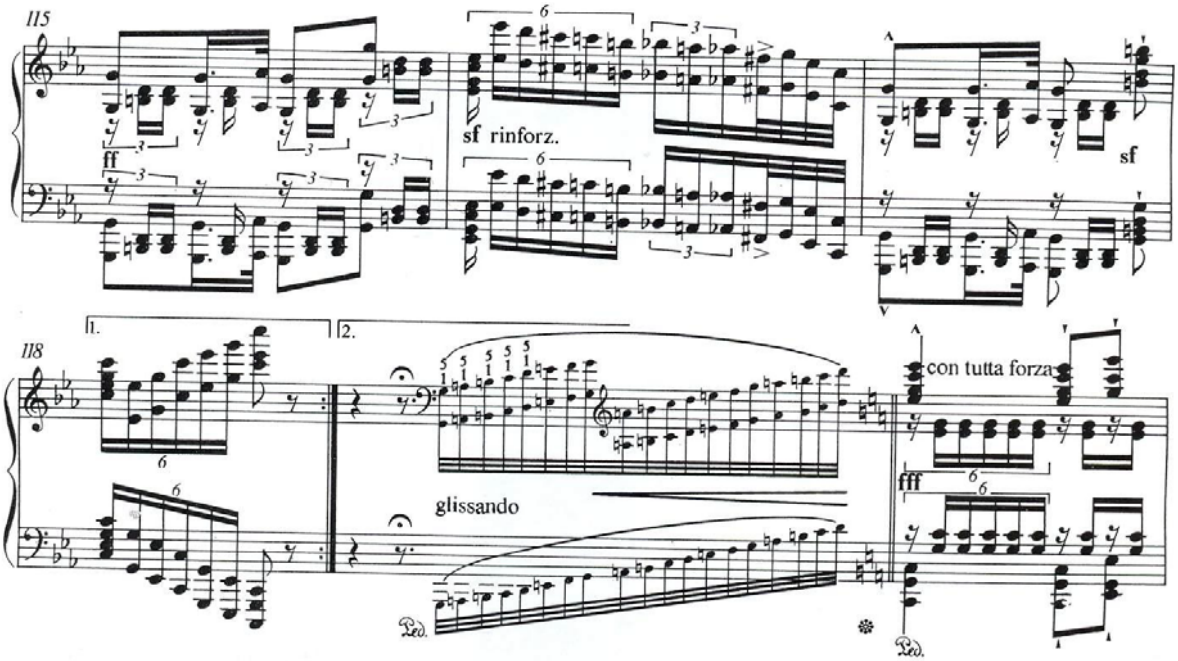


Example 3.176. H. Herz: *Rondeau caractéristique sur la barcarolle de l'Opéra 'Marie' de F. Herold*, opus 33 (1826), bars 255-258 (starting from the *Introduzione*).[551]



Example 3.177. H. Herz: *Variations sur une Cavatine de la Cenerentola: Non Più Mesta*, opus 60 (1831), *Variation V*, bars 12-13.[552]

In his 1838 *Mélodies hongroises d'après Schubert*, Liszt uses a garish triple glissando after a surprise stop on the dominant of C minor to go on "con tutta forza" to a new C major section (ex. 3.178).

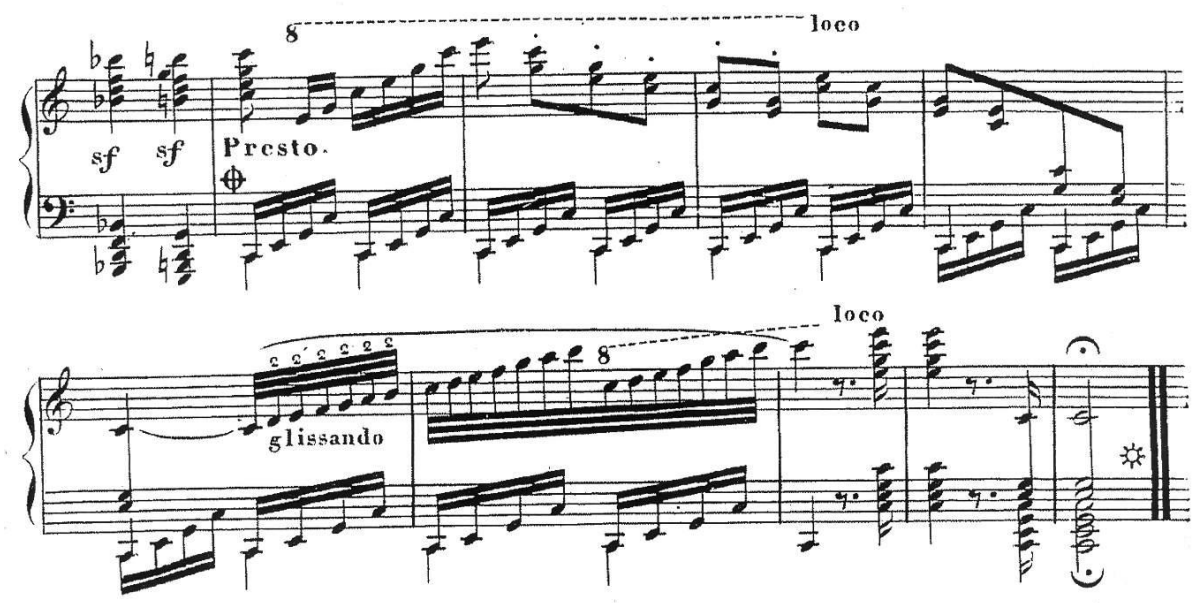


Example 3.178. Fr. Liszt: *Mélodies hongroises d'après Schubert* (1838), bars 115-120.[553]

[551] NL-Dhnmi 34 G 40 (8). Reprinted by permission.
[552] NL-Dhnmi 34 F 3 (19). Reprinted by permission.

3.3.2.2.2.2 Cancelled gestures

Examples 3.146 and 3.148 show upward glissandos as a "backward" motion in reference to the preceding melodic movement.[554] Many glissandos in this period are connected to properly fingered passages that come from or take the opposite direction. An example of a common such type is found in Herz' opus 76 (see ex. 3.145), where the upward glissando does not stop on a particular (staccato) endnote or note of a melody, as typical for the 18th century, but where it goes over into a flourish countering the direction of the glissando. Likewise examples of a glissando's movement reversing the direction of a previous or next passage can be seen in several works by Herz: in his opus 36 (ex. 3.180), in opus 20 (ex. 3.155) and opus 47 (ex. 3.181), but also in Fr. D. Weber (ex. 3.168), Alkan (e.g. ex. 3.167) and Czerny's *Eisenbahn Variationen*. (Ex. 3.179.)



Example 3.179. C. Czerny: *Eisenbahn Variationen über Johann Strauss beliebten Eisenbahn-Lust-Walzer*, opus 431 (1837), final bars.

Many of these examples show clearly how often the glissando was used to just complement large gestures in proper playing. Much compositional material did not have anything to do with melody but consisted solely of covering distance on the keyboard (e.g. extended runs and all sorts of permutations of broken chords). Within this species of "filling," the glissando could bring some esthetical variety as well as relief for the strain of relentless individual articulation.

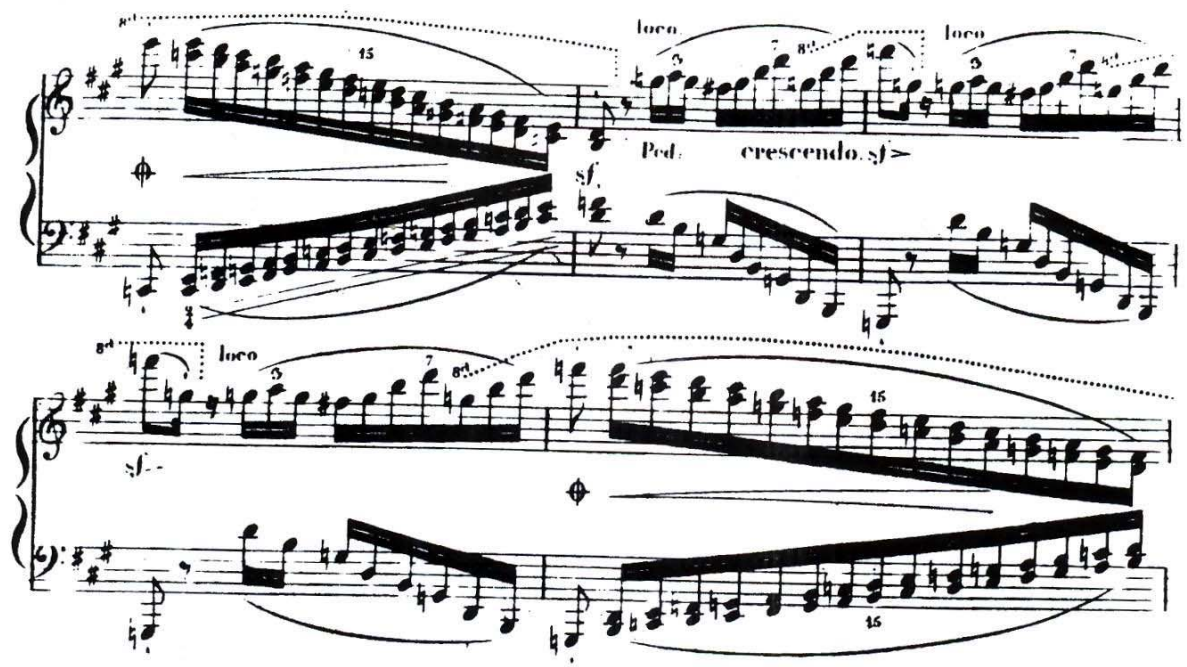
3.3.2.2.2.3 The influence of ergonomics

Most instances of two hand glissandos are parallel, even if that is not the most comfortable of bodily movements on the non-symmetrical layout of the keyboard. From the physical perspective, it is only logical that two hand contrary motion glissandos would be thought of sooner than later. This may explain why we found such an instance as early as 1827 (ex. 3.180), after only two previous cases of (parallel) two-hand glissandos in Weber (1810 – 3.2.6.1.17) and Gelinek (1821 – ex. 3.172).

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[553] New Liszt Edition, Series II, Volume 3; Editio Musica (Budapest), reproduction licensed by EMB Music Publisher Ltd.

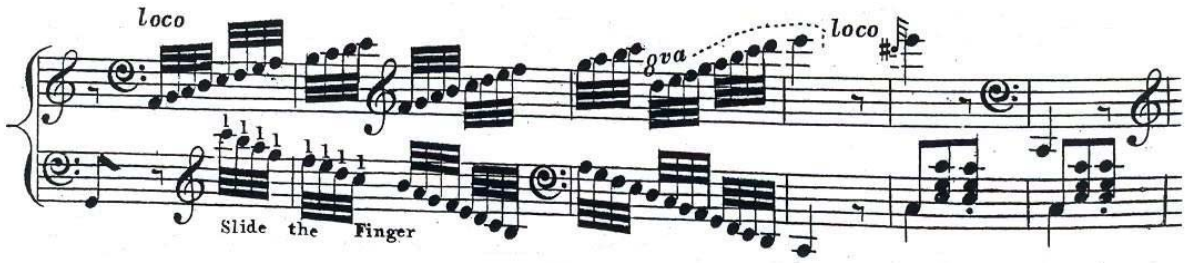
[554] The term 'backward motion' was introduced in Lin 1997, but linked mostly to 20th century glissando use.



Example 3.180. H. Herz: *Grandes Variations sur le Choeur des Grecs de l'Opéra 'Le Siège de Corinthe' de G. Rossini* opus 36 (1827), *Finale*, bars 46-50.[555]

That Herz wrote his two hand glissando in thirds is not really a surprise: he seems to have made a specialty of glissandos in thirds in his playing and composing. But these two-hand glissandos are a sign of something novel in piano writing, at least where the glissando is concerned. For the first time a two-hand glissando is used ergonomically: taking into account the symmetry of the performer's body.
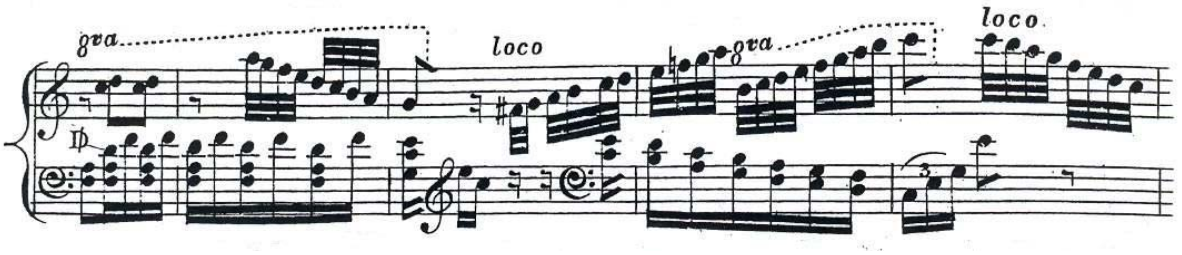
As logical and comfortable as this scenario may be (compared to parallel motion), we do not find all too many such instances in this 19th century. The next ones are by Alkan (opus 2 in 1829 – ex. 3.166), Herz (opus 76 for piano and orchestra in1833 – ex. 3.161) and Auguste Bertini, who actually writes glissandos with crossing hands in his 1833 *One Fingered Waltz, Accompanied with the left hand.* (Ex. 3.181.)



Example 3.181. A. Bertini: *One Fingered Waltz, Accompanied with the left hand* (1833), bars 188-193.

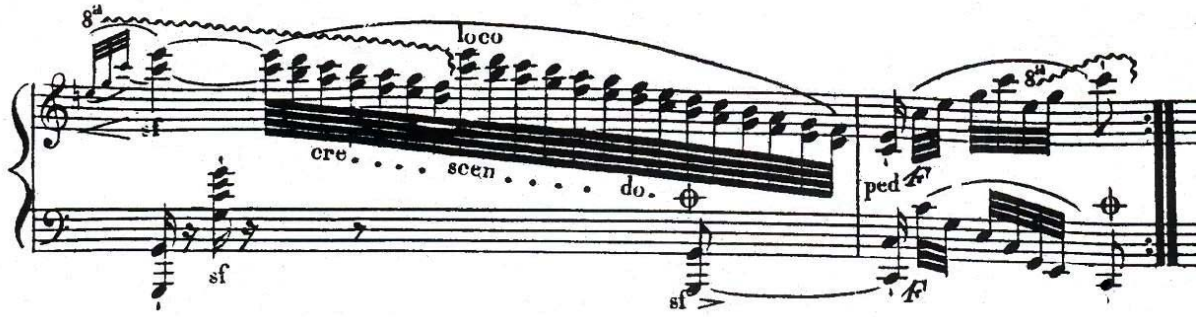
Bertini's waltz furthermore offers a rare example (next to Scarlatti – see 3.2.4.2) of a composer going against the most comfortable position for the hand and fingers in a glissando: several times in the piece he demands a diatonic glissando to commence on an F#. (Ex. 3.182.)

[555] NL-Dhnmi 34 G 40 (11). Reprinted by permission.



Example 3.182. A. Bertini: *One Fingered Waltz, Accompanied with the left hand* (1833), bars 163-167.

A last example here of the glissando's physical characteristics or comfort influencing the musical writing, is the end of Herz' opus 47. (Ex. 3.183.) The crescendo allows the natural combination of weight and momentum to come into play at the right time. The start of a double note glissando, especially when the hand has to leave a proper position on the keyboard, is a delicate one: not enough pressure will result in some notes missing, too much weight will give a sudden increase in volume and make the glissando sound unconnected to the chord where it is supposed to come out of.



Example 3.183. H. Herz: *Grande Fantaisie dur des airs de l'Opéra 'Le Comte d'Ory' de G. Rossini*, opus 47 (1830), final bars.[556]

The key to a good start here is speed management (see above – 2.5.1 – on the theory of the glissando) and Herz' example shows how a balance between speed and pressure that is beneficial to the glissando's performance practice, is validated by the logic of the musical gesture in this ending, both agogically and dynamically.

3.3.2.2.3 Towards a name I

Up to 1840, the indications in scores for playing a glissando are quite diverse. Of those scores and methods that actually contained written out names or any specific symbol or signal for the technique, we can distinguish between:

1816	Hummel	Piano Concerto opus 85	[nothing]
1816	Blewitt	*The Battle of Waterloo*	Slide Thumb
1821	Gelinek	*Hummel's celebrated waltz*	con un dito
1821	von Weber	*Concert-Stueck*	[nothing]
1823	Weber	Diabelli Variation	[nothing]
1826	Herz	opus 20 – Simrock Edition	glissando
		– Probst Edition	glissando
1826	Herz	opus 33 – Simrock	con un dito
1826	Moscheles	Concerto opus 87	*11*[straight line]
1826	Czerny	*Les Etrennes*	*424242*
1827	Herz	opus 36 – Troupenas Edition	*42*[straight line]
		– Simrock Edition	*42*

[556] NL-Dhnmi 34 G 40 (31). Reprinted by permission.

1828	Herz	opus 42 – Simrock Edition	*42*, (sempre) glissando
1828	Hummel	method	[broken line]
1828	N.N.	*The much admired Sliding Waltz*	[in title]
1828	Meineke	*Railroad*	one finger
1829	Czerny	*Fantaisie Elégante* opus 197	*424242*
1829	Alkan	opus 2 – Theme & Variation 1	*42*[straight line]
		– Variation 3	glissez
1830	Czerny	Quatuor concertant	*424242*
1830	Herz	opus 47 – Ricordi Edition	[nothing]
1830	Herz	opus 49 – Simrock Edition	*2*[straight line]
1831	Herz	opus 60 – Schott Edition	*42*[straight line]
		– Ricordi Edition	[nothing]
1833	Kalkbrenner	method	[broken line]
1833	Herz	opus 76 – Schott Edition	
		Introduzione	[nothing]
		Variation 1	*42*[straight line]
1833	Bertini	*One fingered waltz*	first finger / *1111* / slide the finger
1833/34[557]	Liszt	*Songe d'une nuit du sabbat*	glissando / *4242* / *1515*
1834	King	*Introduction*	glis [sic]
1835	Czerny	opus 365	glissando
			222 / 444 / 42 / 51 / 52
1836	Moscheles	*Due Fantasia*	sdrucciolando
1837	Czerny	*Eisenbahn-Variationen*	glissando / *222* / *333* / *4242*
1838	Herz	method	*2*[straight line]
1838	Herz	opus 97 – Schott Edition	*2*[straight line]
1838	Alkan	opus 76, #3	glissando
1838	Liszt	*Mélodies hongroises*	glissando
1839	Czerny	opus 500	glissando
1840	Liszt	*Magyar Dalok*	glissando / *414141* / *2222*
1840	Liszt	*Hussitenlied*	glissando / *3333*
1840	Strauß I	*Wiener Carnavals-Quadrille*	glissando

Many glissandos were identified by repeated fingering, either literally (e.g. *3333* for a single note glissando or *424242* for one in thirds) or by way of a straight or broke line following the initial indication of fingering. Of the glissando instances containing no sign at all, most are cases of double note glissandos which cannot be played otherwise because of the tempo (hinted at also by the small metrical value of the run – e.g. 32nd or 64th notes), mostly in combination with a slur, sometimes countered by another edition of the same work *with* a marking (e.g. Herz opus 60), and/or deducible from a noticed predilection for glissandos by the composer (e.g. Herz opus 47).

It looks as if Herz is the one who – in or around 1826 – came up with the term that would last up to the present day, coining a word from French and Italian that ended up being neither: *glissando*.[558] Confusion did not end with the famous word appearing on scores, though. As for Herz himself, after that opus 20, he only uses *glissando* once again in his 1828 opus 42, afterwards preferring straight lines after the first indication of fingering (like in his method – see 3.3.2.2.4.4). More than one composer used different kinds of indications in one and the same work, such as in Alkan's opus 2 and Herz' opus 76. From the publishers, not much consistency in choice of words can be derived either:
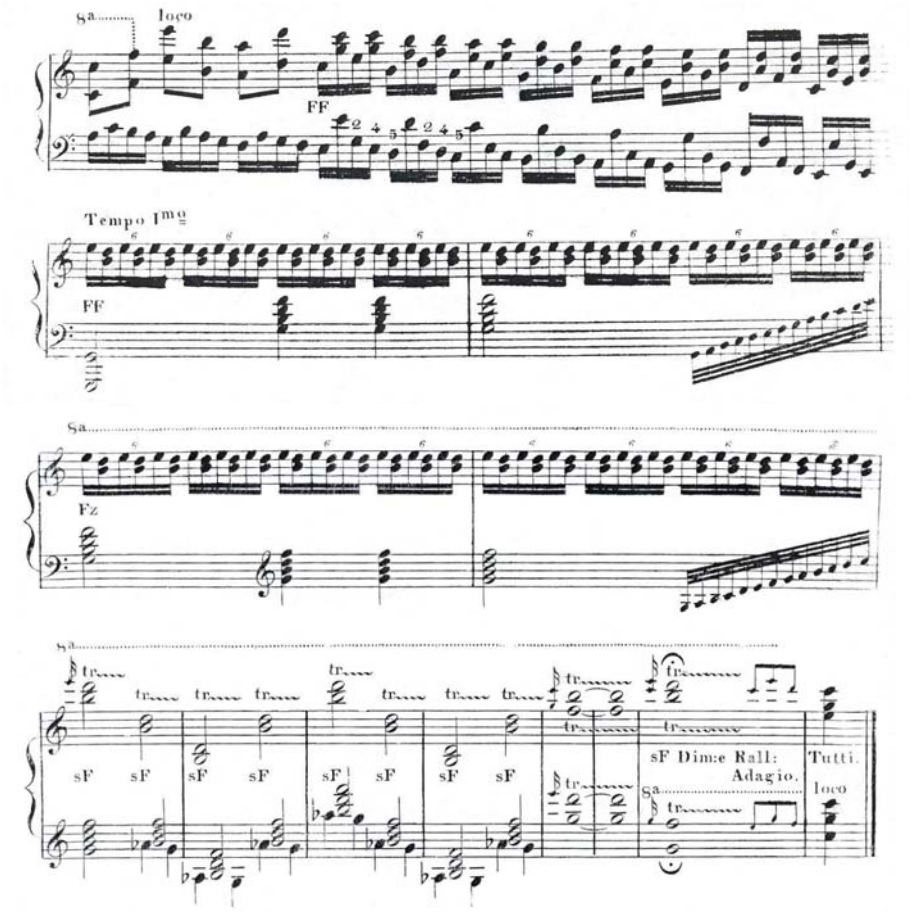
[557] We base this dating on the fact that the Parisian Brandis et C[ie] edition (which we saw at B-Gc II 7887) contains the indication 'glissando' and was printed from the plates first used for the 1834 first edition by the Parisian firm of Maurice Schlesinger (both have the plate number M.S. 1982 – the Schlesinger catalogue was sold to Brandis et C[ie] in 1846), confirming that at least Schlesinger used the word glissando in 1834. Liszt finished the transcription in September 1833, but there is no manuscript to indicate whether it was Liszt's decision to use the word 'glissando' combined with the fingering. See also Mezö 1996, p. XI-XII.

[558] We have to remark here how we found no proof that these particular Simrock and Probst editions were first editions from 1826. We could find no earlier editions, neither could we trace the manuscript of this opus 20.

in a time span of four years, Simrock has published Herz' works with all possible kinds of indications for the glissandos in it.[559]

However much the evolution of naming the glissando grew into a fixed direction in the 1820's (repeated fingerings and the apparent need for a particular word), it is still is not always possible to just determine whether or not a given run in C major is to be considered a glissando or not. Two examples will illustrate some of the factors influencing any possible doubt in one or the other way.

In 1829 Carl Czerny issued his *Systematische Anleitung zum Fantasieren auf dem Pianoforte* opus 200. Together with the opus 300 *Die Kunst des Praeludierens in 120 Beispielen*, the systematic manual to improvise on the pianoforte made out his *Fantasie Schule*. Neither of these opus numbers contains any advice on or explicit examples of glissandi, but opus 200 is interesting in one aspect, namely an example of a cadenza for the end of the first movement of Beethoven's first piano concerto opus 15 (ex. 3.184).
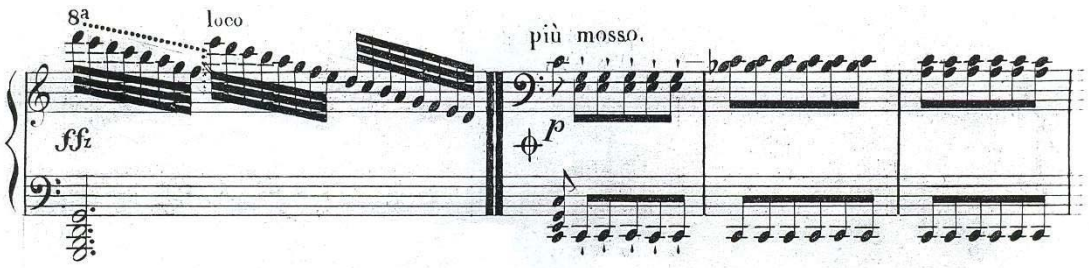


Example 3.184. Carl Czerny: *Systematische Anleitung zum Fantasieren auf dem Pianoforte* opus 200 (1829).

While the runs in the left hand require only a slightly faster speed for individual articulation than the accompanying figure in the right hand (the runs have only one more

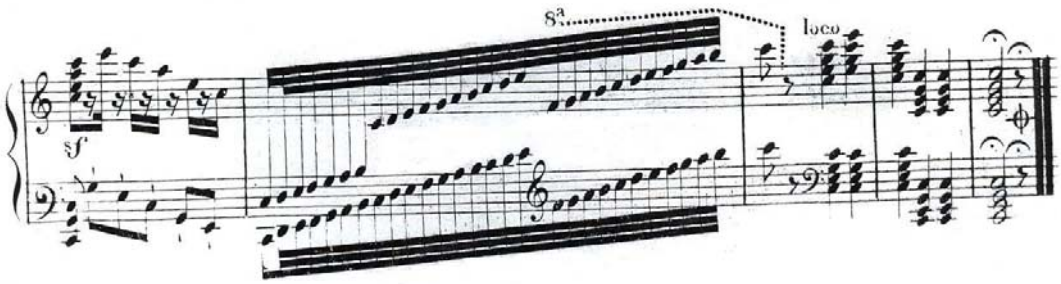
[559] Yet it seems that the name glissando first appeared in music published by German firms (Simrock and Probst). Even Liszt's Berlioz transcription was first published by the French firm of Maurice Schlesinger, brother of Berlin named Heinrich, who also published Berlioz and Liszt in Berlin. Czerny's studies opus 365 were issued first by Haslinger. It may be of no particular importance, but the question remains whether it was a composer or a publisher who thought of the Italianated word based on a French term.

note), it is tempting to see the runs as glissandi. A pianist perceiving Beethoven's octave run (at the end of the development section in opus 15's first movement) as a double note glissando would surely like that to be reflected in this cadenza. Of course, this is no proof of Czerny's intentions here: the left hand runs in this cadenza can in fact be performed with proper articulation as well.

Czerny does not seem to have used the glissando much in the pieces he himself called "serious" (to distinguish them from his studies, exercises, easy pieces for students and virtuoso show pieces).[560] Except for the double note glissandos in the 1830 *Quatuor Concertant w*e did not find any glissando in this category of his works, not even in those instances where such a technique would not be out of place, as in his *Rondeau Concertant* for piano and cello or violin opus 136. (Ex. 3.185 and 3.186.)



Example 3.185. C. Czerny: *Rondeau Concertant* for piano and cello or violin opus 136 (1826-27), bars 376-79.[561]



Example 3.186. C. Czerny: *Rondeau Concertant* for piano and cello or violin opus 136 (1826-27), final bars.[562]

If the opus numbers and dates for Czerny compositions can be trusted, the *Rondeau* would have been written after *Les Etrennes* opus 32, the latter including *424242* as glissando indications.[563] It would therefore seem that Czerny already distinguished between glissando and non-glissando playing by the time he wrote the *Rondeau* and the *Systematische Anleitung zum Fantasieren*, meaning that the runs in both the Beethoven cadenza and the opus 136 would be meant to require individual articulation of the fingers. For the downward run in the Rondeau (ex. 3.185) this looks acceptably logical: the number of notes per beat is regular, the notation divides the rhythm evenly over the meter and a fingered articulation – possibly highlighting the meter with little accents on

[560] Lindeman (with Barth) 2002, p. 825 and Wehmeyer 2001, p. 223, 224 and 226. Among the 'serious' works – Wehmeyer calls them 'private' – are many sonatas, often brilliant or programmatic. The other three categories were: studies and exercises; easy pieces for students; brilliant pieces for concerts. The latter consists of fantasies, rondos and sets of variations on popular melodies, and all kinds of entertainment pieces.
[561] B-Gc DS1803. Reproduced by permission.
[562] B-Gc DS1803. Reproduced by permission.
[563] According to the few dated opus numbers for other works by Czerny, as we could find in different work lists and biographical articles (e.g. Wehmeyer 2001, Lindeman (with Barth) 2002, Mitchell 1980), the rondo opus 136 would fit in between 1826 and 1827. The earliest known edition of *Les Etrennes – 24 Waltzes* opus 32 would be by S.A. Steiner & co, with a plate number 3970 dating from after 1812 and before 1826. (See Weinmann 1979.)

the beat – would be consistent with the rhythmic 8th-note sequence that follows. The great upward surge at the end of the piece (ex. 3.186) is another matter, though. Not only is our *Fingerspitzengefühl* tickled by the longer first note and the irregular number of notes to identify this run as an intended glissando, the sheer speed with which to execute it in the given tempo (*molto allegro*) seems far too high to accomplish the necessary élan in the metrical stability of this coda. Nevertheless, the lack of a defining term to unequivocally specify glissando technique never ceases to cast doubt.

From around 1834, the word "glissando" starts to appear in enough works by enough composers with an international statute and exposure to qualify for the claim of standard indication for this technique. We will see that this aspiration is confirmed in the next two decades.

3.3.2.2.4 Acquiring status in piano methods

In the second and third decade of the 19th century, the glissando is being introduced into the main repertoire of compositional features in piano writing. With the imitations in concerti of the glissando in Beethoven's opus 15, the upbeat glissando that signals a turning point in the structure of a composition would become an almost typical functional device. Most of the pieces that make up for the swift rise in the glissandos use in the 1820's and 1830's are more of the lighter genre, though, with mostly sets of variations and paraphrases containing them. The concerto glissando and Beethoven's purely musical use of a glissando in one of his major sonatas, which had shown how it could be more than just a way to play fast runs and more than an empty effect, were important compensations for the "light" and popular repertoire's interest in the glissando. It is the merit of the piano method genre that it now establishes the glissando as a respectable piano playing technique. Several tutors for the piano start incorporating it, advising how to best use the technique and giving examples in abstracto as well as in exercises and studies.

After the transitional keyboard methods, products of the end of the 18th century[564] and concerning the harpsichord or clavichord as well as the piano (often despite their title), the first methods aimed exclusively at playing on the pianoforte were those by Louis Adam, Daniel Steibelt and Johann Baptist Cramer, all written in the early 19th century.[565] These were all very much occupied with the proper aspects of both technique (posture, rules for fingerings in scales, legato, pedal use) and aesthetics (general musicianship, ornaments). Finger dexterity as a means to acquire virtuosity is an important part in any of these methods, with often the lengthiest parts devoted to the "art of fingering."[566] With the next three piano methods, this would change, admittedly only slightly, but with striking consequences for the development of our subject.

[564] See Kloppenburg 1951, p. 115-143, on the methods by J.K.F. Rellstab (*Anleitung für Klavierspieler*, 1790), J.P. Milchmeyer (*Die wahre Art, das Piano-forte zu spielen*, 1797), J.L. Dussek (*The Art of playing the pianoforte*, 1797), C.D. Schuster (*Clavierstunden für Kinder*, 1799) and A.E. Müller (*Forte-piano-Schule*, 1804).
[565] *Méthode de piano du Conservatoire* by Adam (+/- 1802), *Méthode pour le pianoforte ou l'art d'enseigner cet instrument* by Steibelt (1809), *Große Pianoforteschule* by Cramer (+/- 1800).
[566] See Kloppenburg 1951, p. 124-127 and 130-136. Of the twelve chapters of Louis Adam's *Méthode*, more than a third concerns dexterity.

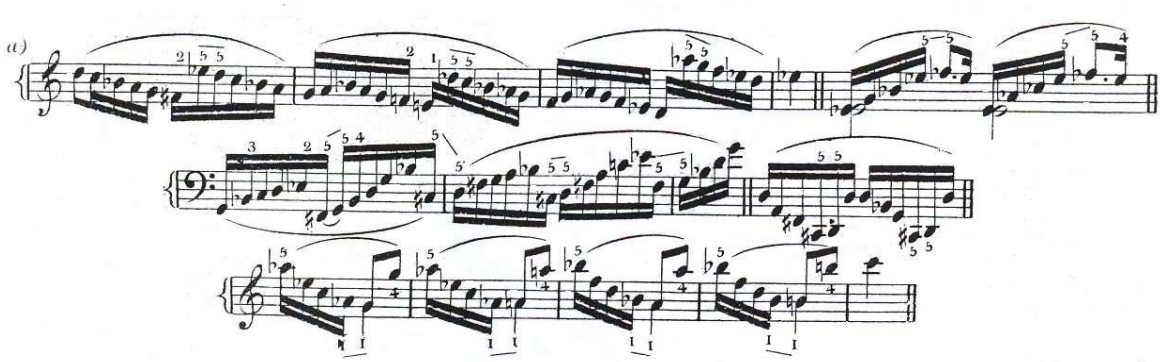
3.3.2.2.4.1 1828 Johann Nepomuk Hummel: *Ausführliche theoretisch-praktische Anweisung zum Pianofortespiel*

The first piano method to seriously describe the glissando from a pedagogical performance practice point of view, is the 1828 *Ausführliche theoretisch-praktische Anweisung zum Pianofortespiel vom ersten Elementar-Unterrichte an, bis zur vollkommensten Ausbildung* by Johann Nepomuk Hummel (1778-1837).[567] In the second part, devoted completely and exclusively to fingerings[568], the eight chapter concerns the change of one or more fingers on the same key (when repeated as well as when kept depressed) and the use of one finger on two or more consecutive keys.[569] Hummel remarks how this technique

> replaces in part the passage of the thumb, facilitates the fingering of many passages, and gives their execution more legato and roundness.[570]

He goes on to list the examples of such a usage:

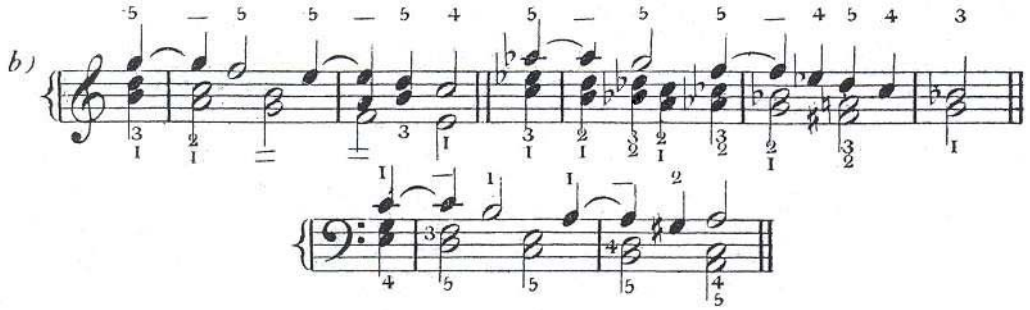
a) in legato passages, were one and the same finger glides from a black key to the nearest white key above or below (ex. 3.187);



Example 3.187. J.N. Hummel: *Ausführliche theoretisch-praktische Anweisung zum Pianofortespiel* (1828).

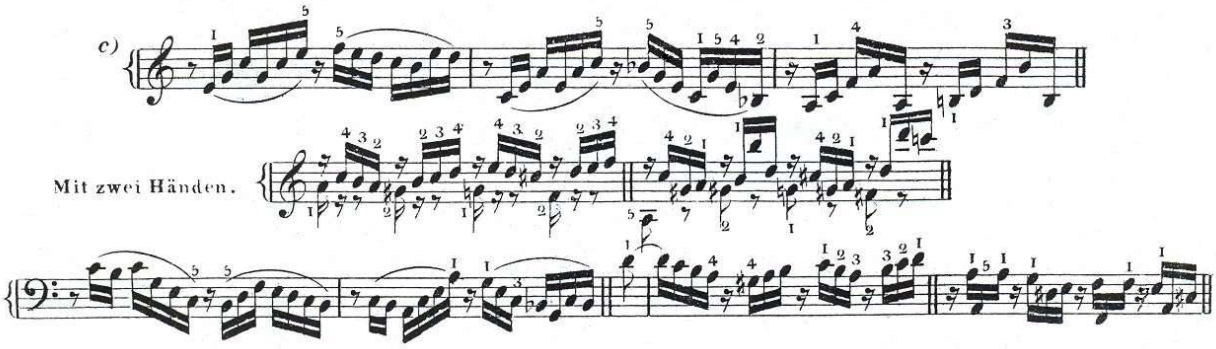
b) in places with more than one voice where there are extensions or ties and where the same finger goes from one white key to another without being lifted, i.e. by gliding (ex. 3.188);

[567] Vienna, Tobias Haslinger, 1828.
[568] The first part is all about elementary musical education; the third part concerns ornaments and musical elocution.
[569] Description of the eight chapter in the index on page 8 of the Haslinger edition: "Vom Abwechseln eines oder mehrer Finger auf derselben Taste, bei wiederholtem und nicht wiederholtem Tonanschlag; und umgekehrt – vom mehrmaligen sogleich wiederholten Gebrauch eines und desselben Fingers auf zwei oder mehren Tasten; nebst Übungen".
[570] Haslinger edition, p. 334, §5: „[…] ersetzt zum Theil das Untersetzen des Daumens und Überschlagen der Finger, erleichtert die Ausführung mancher Stellen, und gibt ihrem Vortrag grössere Bindung und Rundung." In the French edition by A. Farrenc (p. 346): « C'est encore ce moyen qui remplace en partie le passage du pouce; il facilite le doigter de plusieurs passages et donne à leur exécution plus de liason et de rondeur ».



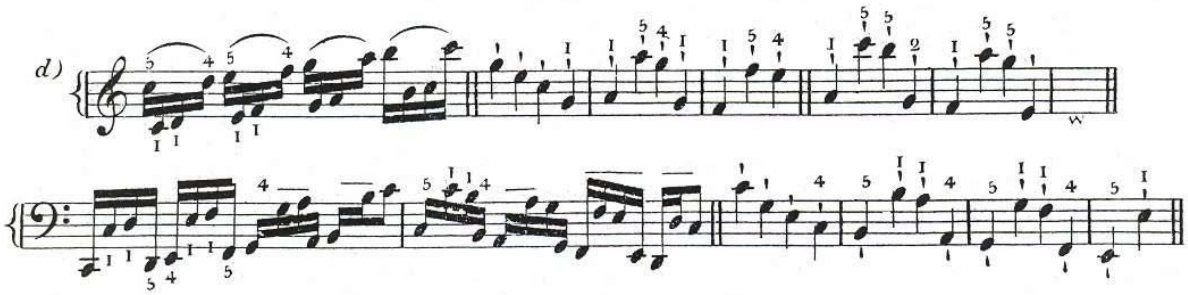
Example 3.188. J.N. Hummel: *Ausführliche theoretisch-praktische Anweisung zum Pianofortespiel* (1828).

c) on two different keys separated by a pause, where the finger is lifted only very slightly (ex. 3.189);



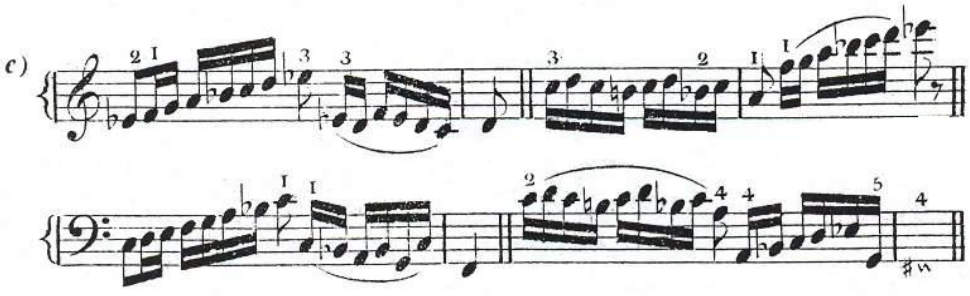
Example 3.189. J.N. Hummel: *Ausführliche theoretisch-praktische Anweisung zum Pianofortespiel* (1828).

d) for detached notes (ex. 3.190);



Example 3.190. J.N. Hummel: *Ausführliche theoretisch-praktische Anweisung zum Pianofortespiel* (1828).

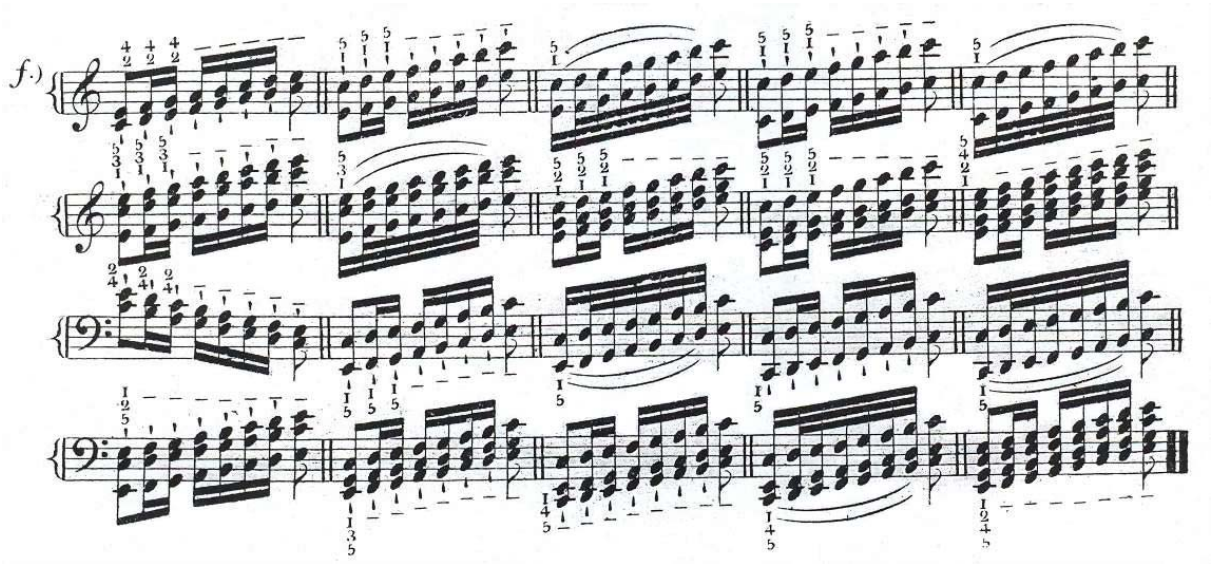
e) after a leap, even without pauses, which one can consider as a new position of the hand (ex. 3.191);



Example 3.191. J.N. Hummel: *Ausführliche theoretisch-praktische Anweisung zum Pianofortespiel* (1828).

and finally,

f) in polyphonic scales on white keys[571] when a run, according to the indication, needs to be legato or detached (ex. 3.192).



Example 3.192. J.N. Hummel: *Ausführliche theoretisch-praktische Anweisung zum Pianofortespiel* (1828).

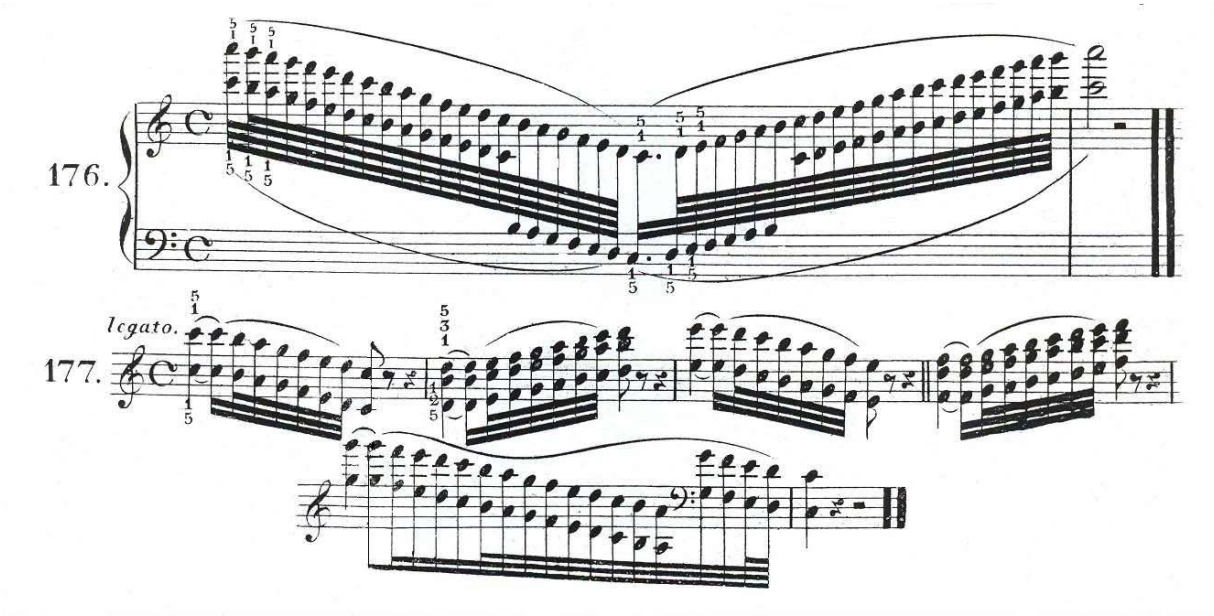
With a), Hummel shows us how performance practice allowed for finger gliding to avoid having to use the passage of the thumb. In b) we can see legato by gliding from one white key to another white key, even when a rest in between – as in c) – effectively cancels the concept of *legato*.[572] Both these examples deviate from the age-old proper technique that reserved the long 2nd, 3rd and 4th fingers for black keys and which used the passage of the thumb to change position of the hand and to provide legato. Hummel's view is based on ergonomics in that the position of the hand can be changed without the thumb's rotational function and by gliding over the keys instead of using one finger per key.

Considering his examples of gliding with one finger from key to key, it is rather odd that no single-note glissando appears in Hummel's tutor.

In f) we also see the typical prolonged first note in runs that require the performer to lock his wrist in a fixed position. All the examples start with a note double the length of the next notes, something we see in most of the glissandi in the entire keyboard repertoire. Hummel furthermore stresses the legato playing by indicating double slurs in some of the double note and chord run examples.

All things considered, f) shows gliding without conclusive evidence of glissandi the way we commonly think about it. Curiously, Hummel does not include glissandos in 3rds. A few bars have double slurs that may mean legato or even glissando. After exercises on the techniques shown in a) to e), we come across studies nrs. 176 and 177, which definitely contain glissandi. (Ex. 3.193.)
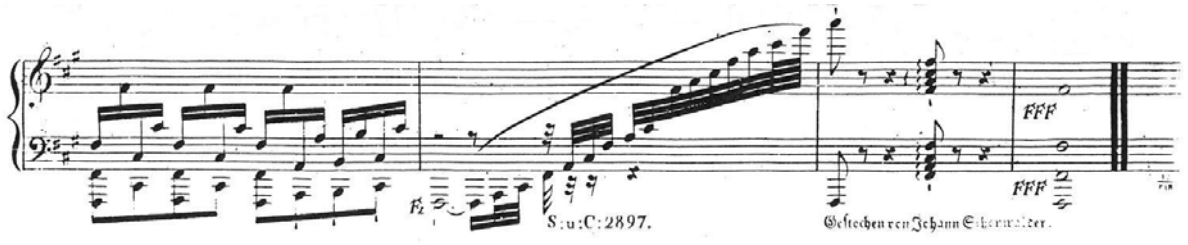
[571] In the French edition it says 'sur les touches noires' - this must surely be a printing mistake.
[572] The slur in the first bar of example d) seems to contradict the 'kurz abgestossene' notes to which the title refers. It is not clear whether this slur indicates legato or phrasing and articulation. If it were to indicate legato, it would mean Hummel envisioned legato by gliding for faster movements as well as the slower examples in b).



Example 3.193. J.N. Hummel: *Ausführliche theoretisch-praktische Anweisung zum Pianofortespiel* (1828).
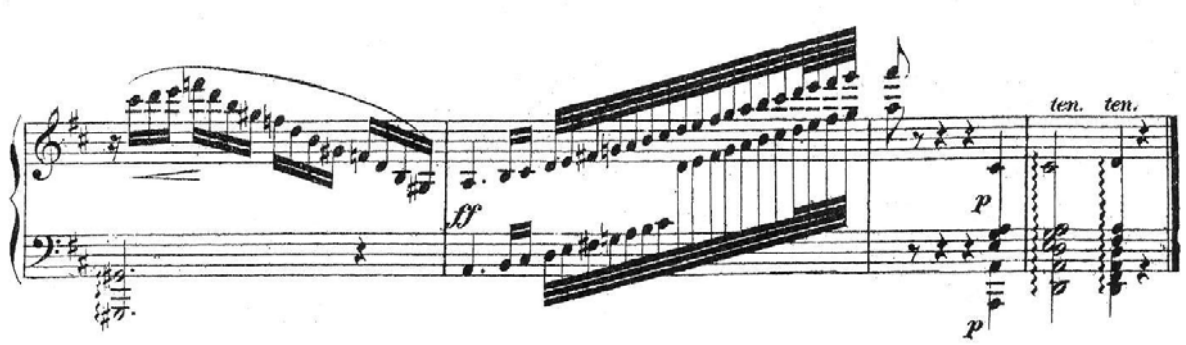
Identifying a glissando by its fingering as in exercise 176 (and as in Beethoven's sonata opus 53) coincides with the suggestion of tempo (64th-notes; two three-octave glissandi in only one 4/4 bar in 176; one-octave range glissandos in one beat of a bar in 177) and with the time provided by the (often many times) prolonged first note to practice preparing the position of the hand. These identifying characteristics exclude the need for the word "*legato"* in 176. Perhaps Hummel added "*legato"* to 177 because the 32nds and the fewer fingering indications might otherwise have looked confusing with regards to the performance technique.

Interesting to note is the last part of the second exercise, the only example to show a subtle, rhythmically written out acceleration. The association of accelerando and glissando is inherent to the ergonomical essence of the glissando technique. Not only is the speed related to the pressure of the hand and arm to ensure continuous regularity of touch, it also can be needed to 'aim' for timely arrival at the endnote. This particular way of writing out movement should not be associated solely with the glissando, however. Such notation was not uncommon for extended runs and broken chords in 18th century scores for keyboard as well as for other instruments[573], and we could find it often in the piano works of Hummel. (Ex. 3.194 and 3.195.)



Example 3.194. J.N. Hummel: Sonata opus 81 (1819), 3rd movement *Finale – vivace* (= 152).

[573] E.g. some of the Scarlatti and Dussek keyboard sonatas or in the string parts of orchestral overtures by Telemann.



Example 3.195. J.N. Hummel: *Preludes dans tous les 24 Tons Majeurs et Mineurs* opus 67 (1814-15), prelude in D.

At times this type of notation makes sense, e.g. in slow movements and in cadenzas where agogical flexibility in virtuoso flourishes is not only musically necessary but also hinted at by the composer[574], but in other instances an actual accelerando was theoretical (to make the number of notes fit the meter) rather than practical, since the speed was often too high to make the difference. Therefore it is not always clear how much of this type of notation was in general a mere question of psychology. We have not seen much of it after the 1820's. In the case of the octave glissando in Hummel's concerto, he must have felt that a slow start was somehow logical for either the effect or the technique – or both.

We should point out that the exercises nr. 176 and 177 (ex. 3.193) are meant for the left hand as well as the right hand, as shown by the dual fingerings in both exercises. The second instance in nr. 177 shows how Hummel's ideas indeed tended to linger in the theoretical sphere: a superimposed sixth and third for the left hand (as in exercise 177, bar 2) leaves the performer with a second finger that is supposed to glide over the keys while in fact it is impossible to put it the right position for this action. The build of the human hand is such that a *521* fingering for this left hand chord means that the 2nd finger stands perpendicular to the key it is supposed to glide over. Even a light Viennese action with shallow key dip and light key weight does not allow the player to perform such a glissando with this kind of fingering in any realistic comfort. This may be part of what Schumann meant when he commented on Hummel's method:

> Already his piano method […] made me suspicious of whether Hummel, who was an excellent virtuoso in his time, also was a pedagogue for the future. There was in it, next to much that is useful, so much that is pointless and aimlessly accumulated, next to good tips so much that curbs the development, that I was nothing less than astounded by the Haslinger as well as my edition.[575]

As it happened, Hummel's method – an extensive work with some 1900 exercises - is said to have sold thousands of copies within days of its publication.[576] Hummel himself was considered one of Europe's most famous pianists and for many years he was one of

[574] E.g. in the slow part of Hummel's fourth piano sonata opus 38, in the cadenza he wrote for Mozart's concerto K.V. 503, or at the end of his own concerto opus 89.
[575] Schumann 1834, p. 8: „Schon bei der Clavierschule Hummel's (Ihr wißt, Davidsbündler, daß ich allemal eine ungeheure Maschinerie anbrahte, weil das Notenpult nicht halten wollte) schöpfte ich einen leisen Verdacht, ob Hummel, wie er ein ausgezeichneter Virtuose seiner Zeit war, auch ein Pädagog für die künftige wäre. Es fand sich in ihr neben vielem Nützlichen so viel Zweckloses und bloß Aufgehäuftes, neben guten Winken so viel Bildunghemmendes, daß ich ordentlich erschrak über die Ausgabe, die Haslinger'sche sowohl, wie meine." Hummel's method is extensive (more than 450 pages) and Kloppenburg 1951, p. 158 considers it unsystematic, concluding that the exercises are without the practical insight of someone like Czerny. "A certain figure is considered from al sides without taking into account the question whether or not the student is advanced enough to be able to play these exercises".
[576] Sachs 1990, p. 784.

the most important teachers in Germany. The 1820's were his most productive years, for touring as well as for writing his method. One would assume then, that the method has had an impact on teaching as well as reflecting at least some period performance practices. And yet we have not found any repertoire from this period that shows out-of-the-question chord-glissandi as in some of the theoretical examples of Hummel's method.[577] (Ex. 3.192.) Maybe Schumann summarized this contradiction best by stating on the one hand that the examples in Hummel's method consisted merely of "Hummelianis" (which Schumann excused, "for everybody knows his own things best and can thus choose faster and more to the point"[578]) while claiming on the other hand that "maybe Hummel did not keep up with the fast-paced world."[579] It is not clear were precisely Hummel got his ideas about the glissando. We see no point in his advocating and teaching a technique for which there is no use in contemporary repertoire. Judging the content of the method in general, it is clear that he did set out to discuss piano playing from a practical point of view and not just compiling all kinds of possible but non-existing keyboard phenomena. But at this time there still was no consensus yet as to a name for the glissando (cf. 3.3.2.2.3) and its detection in scores of that age is often problematic. As much as we have seen how the glissando's appearances start to rise in the '20s, we still only detected some 45 glissandos between 1816 and 1829, with some of them notated in American musical scores. Hummel himself didn't really develop the glissando much in his own works and there is even some doubt as to whether the two instances we found – the downward octave glissando in his piano concerto (published in 1821 – see 3.3.2.2.1.1.) and the two single finger glissandi in his first opus *The Plough Boy* (published 1790 – see 3.2.6.1.3.) – can be considered conclusive evidence. But he had certainly known of the glissando outside of his own works. A prodigy, he had studied with Mozart and at age 11, he is documented to have played the variations on *Lison dormait*, K.V. 264.[580] (See 3.2.5.1.) In the 1790's, when Hummel settled in Vienna, he began a long-time friendship with Beethoven that may well have made him acquainted with the opus 53 sonata. At any rate, it is clear that Hummel knew of the double note glissando from personal pianistic experience and before he wrote about it in his method. Oddly, though, the kind of glissandos Beethoven used in his sonata and the one we could find in *Lison Dormait* only receive as much attention in Hummel's examples as all the other possible permutations of the glissando idea. Of the 20 bars in f) (ex. 3.192), only two are connected to real pieces that Hummel may have known. And the exercises only elaborate on the octave and third+sixth glissando.

From all this we have to conclude that the Hummel examples of different kinds of glissandi are to some degree either theoretical extrapolations of the few glissandi that we have encountered ourselves, or else that they are remnants of the pianist's repertoire and concert practice which included them more than the surviving scores may lead us to believe. This would mean that more pieces with glissandi were played than we know of, and/or that performance practice allowed for glissandi even when they were not indicated in the score.[581]

Hummel's method may be taken as indirect proof that he meant the octave run in his concerto to be a glissando. Hence we could deduce that the similarity between this instance and the octave run in Beethoven's opus 15 might equally well mean that

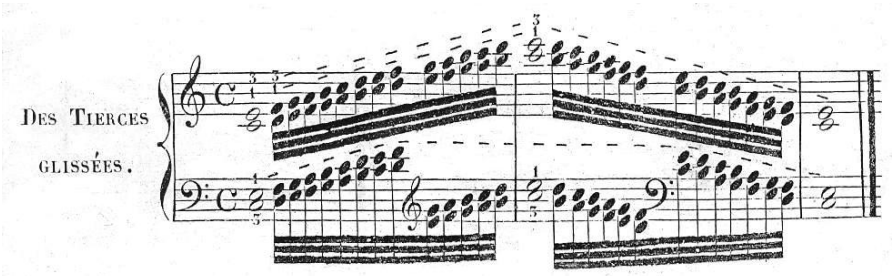
[577] The Vogler and Nägeli instances of double and triple note glissandos both date from before Hummel's method.
[578] Schumann 1834, p. 8: "[…] weil jeder seine Sachen am besten kennt und so schneller und treffender wählen kann."
[579] Schumann 1834, p. 8: "[…] daß Hummel mit der einstweilen raschgehenden Zeit vielleicht nicht Schritt gehalten, […]".
[580] Sachs 1990, p. 781.
[581] Schumann's remark about Hummel being out of touch does not necessarily contradict this train of thought: first of all, he may not have had the specific issue of the glissando in mind, and, secondly, Hummel's glissando examples may just as well reflect a world that Hummel perceived in the late 1820's rather than the world Schumann perceived in 1834.

Beethoven's passage was considered an octave glissando in the perception of pianists from Hummel's generation. The space Hummel allots the gliding of fingers in his method would thus serve as an indicator of how the glissando was known and advocated in these late-Classicist times as a performance practical technique for playing contemporary as well as earlier compositions.

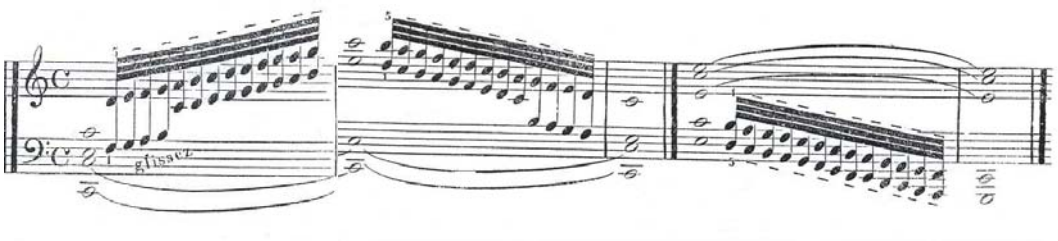
Apart from historical performance issues, Hummel's method is striking in one more aspect of the glissando. By incorporating the technique in a more general approach of gliding techniques, he gives the glissando a more generic *raison d'être* than simple putting it in an isolated position somewhere in a chapter on fingerings and scales. He thus also broadens the view on the glissando's genes: glissando can be more than just playing runs by gliding over extended stretches on the keyboard. Going from one black to one white key, or "gliding" between two white keys (by hardly lifting the finger) constitutes glissando playing as well. Finally, his examples indicate that gliding over the keys is not necessarily used for fast speed runs only, but can be used in tempi where the momentum of the gliding movement is imperceptible (ex. 3.188).

3.3.2.2.4.2 ca1833[582] Frédéric Kalkbrenner: *Méthode pour Apprendre le Piano Forte à l'aide du Guide-Mains* opus 108

The method written by Frédéric Kalkbrenner (1785-1849) starts out with elements of solfege – as did many of his precursors – followed by the general treatment of equally traditional items such as pedal use and the choice of instrument, expressive nuances, fingering, "pianistic qualities" and methods of studying, ending the more textual part with a drawing of the *Guide-mains* contraption.[583] Then a number of exercises follow – grouped in five "degrées." The fifth – "the most important part" - handles the passage of the thumb. After the obligatory scales in unison and contrary motion, the different "gammes glissées" are put after each subsection on double note scales. (Ex. 3.196-3.198.) After the double note scales the chromatic scales (and their double note counterparts) are discussed before a half page on tenths closes the first part.

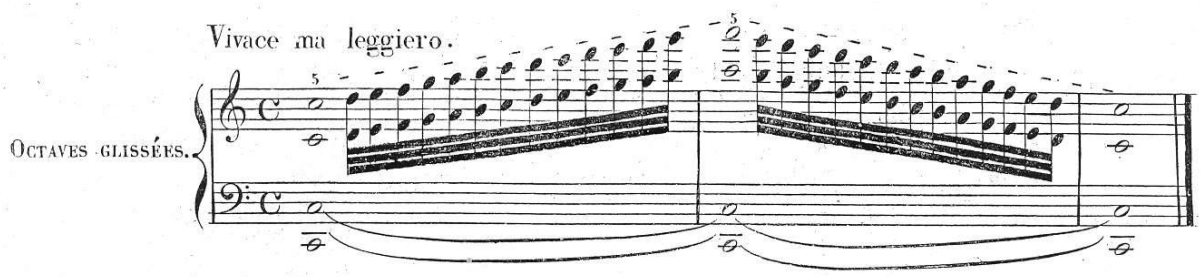


Example 3.196. Fr. Kalkbrenner: *Méthode pour Apprendre le Piano Forte à l'aide du Guide-Mains* opus 108.



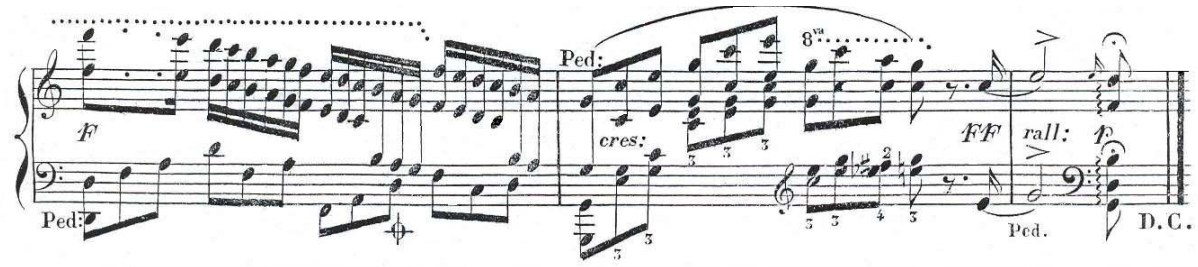
[582] Date according to Dutch Music Institute for the first edition. Kloppenburg 1951, p. 159 gives 1830.
[583] This mechanical device to keep the hand at a steady height and position in relation to the keyboard – patented by Kalkbrenner – is closely related to Herz' contraption called Dactylion, an exercise aid aimed at strengthening the fingers.

Example 3.197. Fr. Kalkbrenner: *Méthode pour Apprendre le Piano Forte à l'aide du Guide-Mains* opus 108.



Example 3.198. Fr. Kalkbrenner: *Méthode pour Apprendre le Piano Forte à l'aide du Guide-Mains* opus 108.

As in Hummel's tutor, Kalkbrenner does not discuss single note glissandi. The second part of this method contains "études" based on the previously discussed techniques. The last etude is an allegro furioso octave study. (Ex. 3.199.)



Example 3.199. Fr. Kalkbrenner: *Méthode pour Apprendre le Piano Forte à l'aide du Guide-Mains* opus 108, Study # 12, *Allegro furisoso*, final bars.

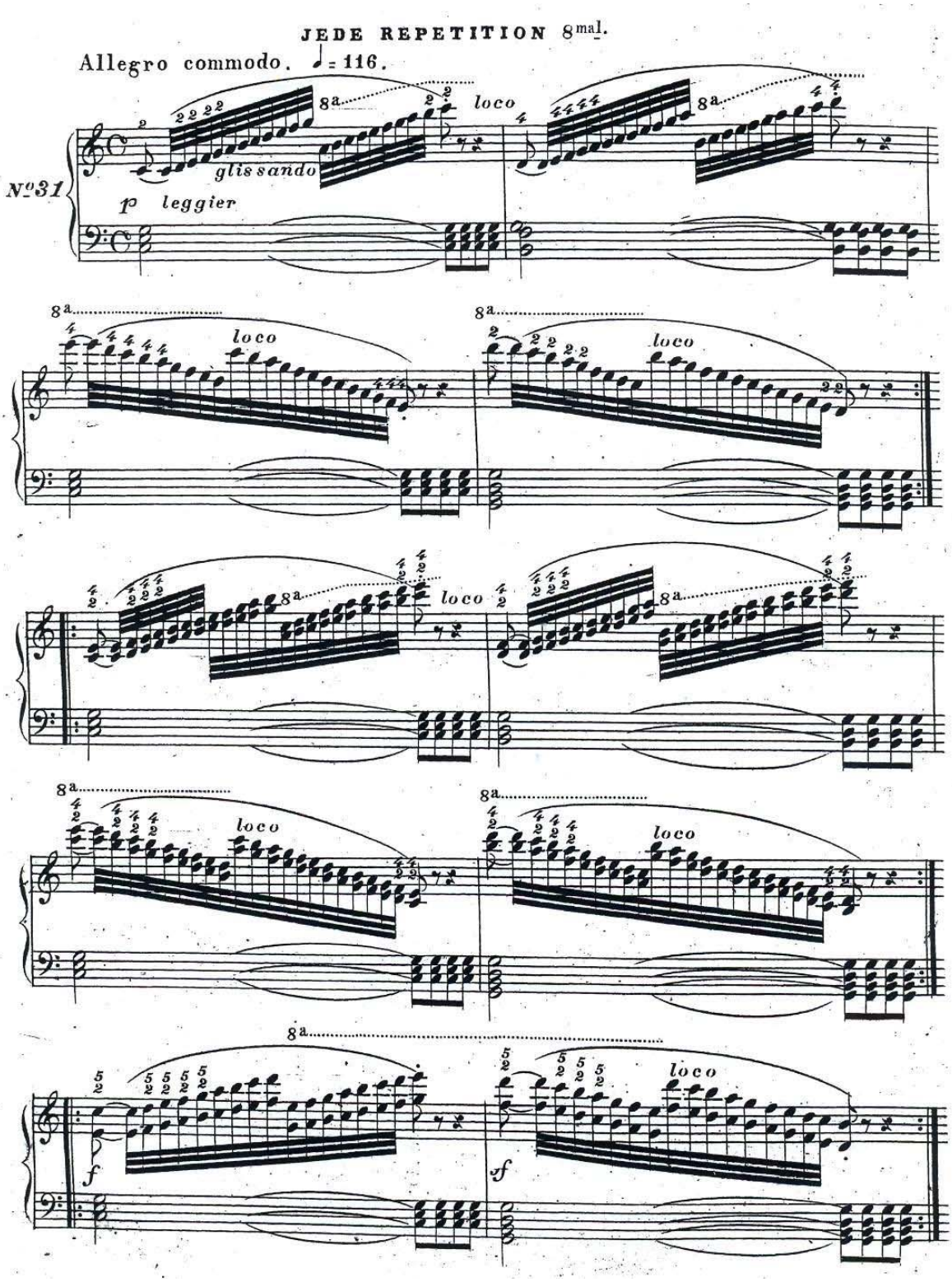
In one of the bars previous to the one with the octave run shown here, there is a passage with 16th-note octaves and spiccato signs above it. Clearly, those octaves are to be individually articulated and therefore narrow down the *Allegro furioso* tempo of the study (no rubato indication is in sight) and therefore the descending octave run in the third last bar is not necessarily a glissando, even if it is an attractive possibility. That there is no broken line showing the use of one fingering for all the octaves, like in his method's examples of 'gammes glissées', confirms this run to be individually fingered.

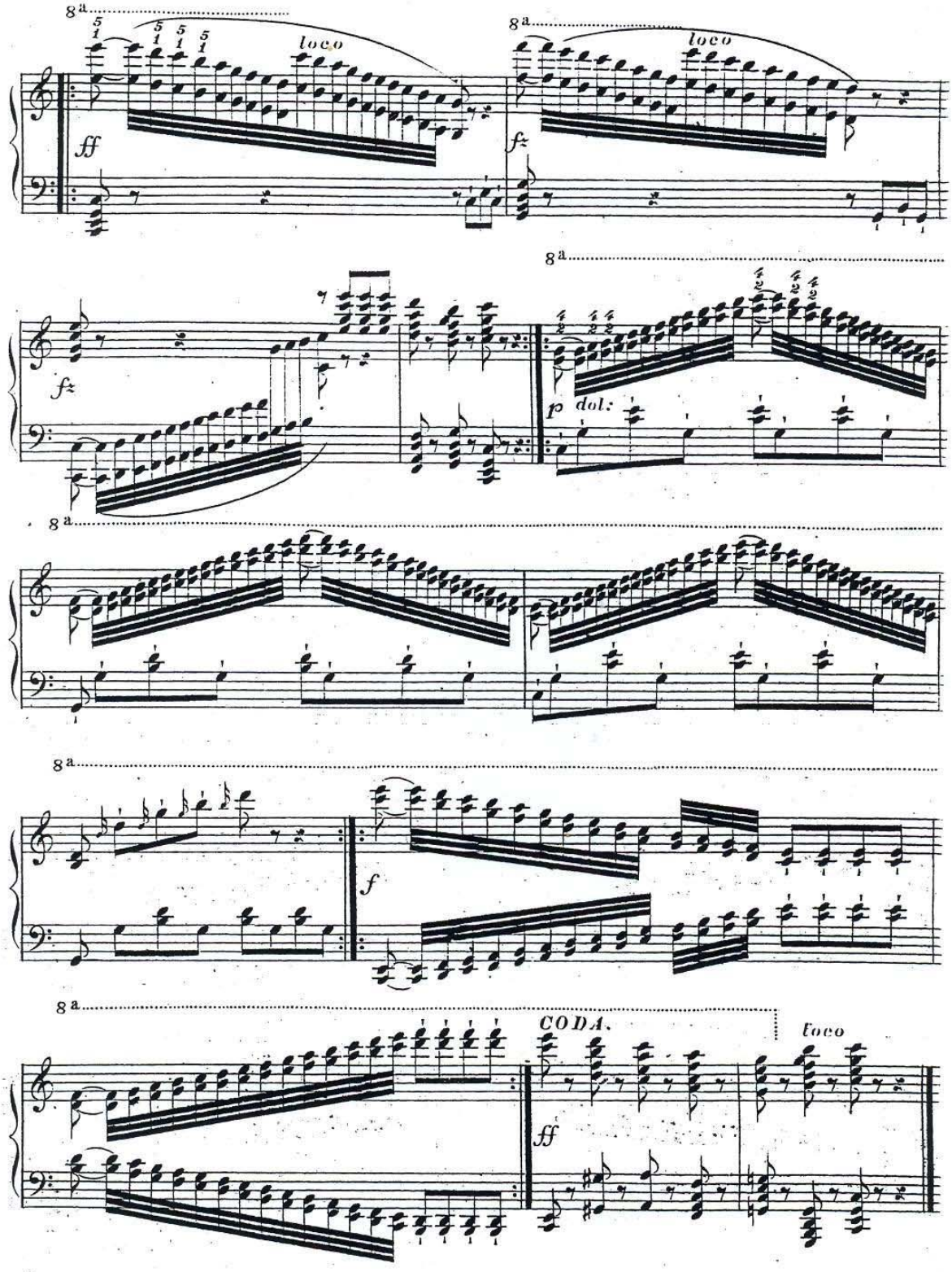
The place and importance allotted to the glissando in this method seems much in keeping with the general impression we have of the place of the glissando in the repertoire of those 1830's. It is definitely there, sometimes ill defined, never in abundance but not to be ignored either. The treatment of the glissando in Kalkbrenner's method reflects the use of the technique in his own works, it compares to the other pianistic techniques in his method as it does in the repertoire, and it is presented more realistically in its variety than it was in Herz' method as well as being more practical than in Hummel's study.

3.3.2.2.4.3 ca1835[584] Carl Czerny: *Schule des Virtuosen* opus 365

The 23 glissandos in the 31st study of Czerny's four-part method summarize all the know-how he considered necessary for the young virtuoso-in-training. (Ex. 3.200.)

[584] There is no complete and definitive work list indicating both the opus numbers and years of writing (and/)or of publishing for the works of Carl Czerny. From bits of information gathered in different encyclopedic entries (e.g. Wehmeyer 2001, Lindeman (with Barth) 2002, Mitchell 1980), we trust that opus 299 and 333 would in fact date from 1834 and that opus 374 would indeed have been written in 1836, hence the deduction that opus 365 would be from around 1835.


JEDE REPETITION 8mal.
Allegro commodo. ♩= 116.
No 31
glissando
p leggier
loco
8a
f
sf



Example 3.200. C. Czerny: *Schule des Virtuosen* opus 365 (+/- 1835), study 31.[585]

The study features single-note as well as third, sixth and octave glissandi. Each covers 3 octaves and all types are presented for the right hand and in ascending and descending

[585] GB-Lbl h.490.j. Reproduced by permission.

mode. Only the octave glissando is written for the left hand also, while there are two two-hand glissandos with thirds in each hand in contrary motion.

Czerny prescribes them with dynamics that range from piano dolce to fortissimo, without crescendo or diminuendo. As for fingerings, they are aimed at using as much the fingernail as possible, even if it means playing sixth glissando with 5 and 2. There are no thumbs prescribed for the thirds or the sixths. This is by far the most extensive use of glissando to date. All glissandi have a prolonged (and sometimes stressed by a sforzate) first note. The endnotes vary from staccato and spiccato to a starter note for the following glissando. Typical for Czerny's pedagogical approach, it is through mere repetition - "Jede Repetition 8 mal" – that the ability to play glissandi is built. Even if this is not surprising in a Czerny study, where methodical investigation and presentation of an isolated technical feature is the basis for hundreds of his studies, it is remarkably diverse for its time. We had already encountered single-note, one sixth and a few octave glissandi, but no thirds and no two-hand motion yet.

Czerny mainly used subjects for his studies that were already present in the repertoire: most of the innumerable permutations of scales and broken chords that make up the myriad of passage work training in his methods can be traced back to existing works by other composers[586]. Just as with Hummel's method, we are once again tempted to deduce that more glissandi were being used in concert practice and in scores than hitherto discovered.

3.3.2.2.4.4 1838[587] Henri Herz: *Méthode Complète de Piano* opus 100

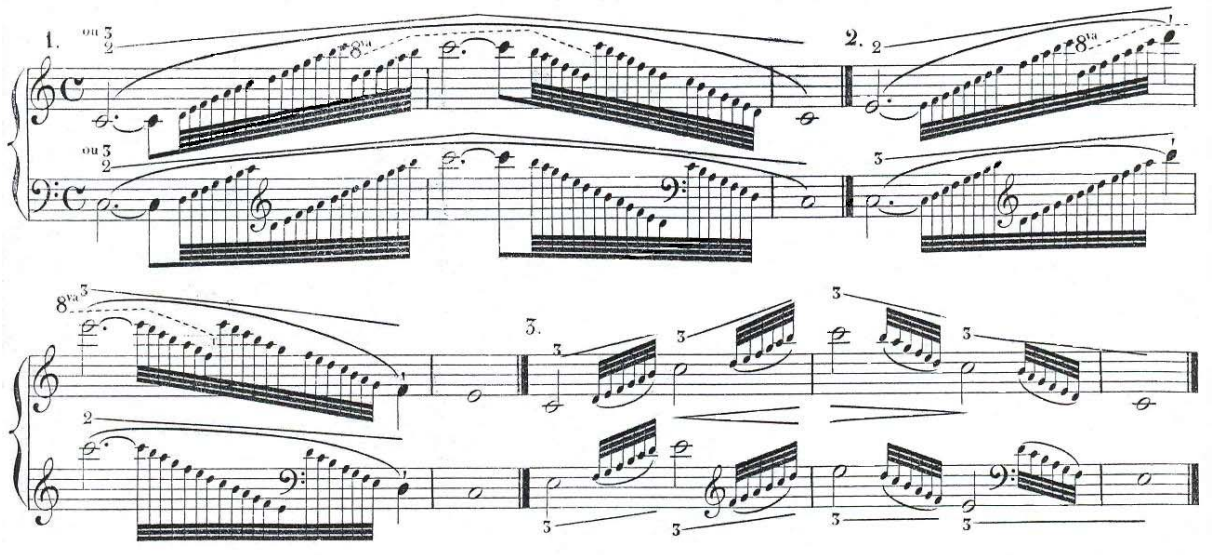
Henri Herz (1803-1888) was an Austrian pianist, composer and teacher, active in France. With his brother Jacques Simon Herz he founded the École Spéciale de Piano de Paris, he became one of the most famous virtuosos and popular composers in Paris in the 1830s and 1840s and toured Europe and the American continents heavily. His compositions are exclusively for or with piano and consist largely of variations and fantasies on themes by other composers, but they also include eight piano concertos, dances, salon pieces and exercises, amounting to some 225 works with opus numbers, and the same number again without. Herz was also involved in piano manufacture, establishing his own factory in 1851. Although he was later accused of pirating another's invention, he also invented and marketed the *dactylion*, designed to strengthen pianist's fingers.[588]

It is no wonder that this versatile and productive musician wrote his own piano method. The opus 100 includes 140 pages and is divided into five main parts: "musical elements" (on notation, rhythm, expression, ornaments, etc.), "on the piano" (on what age to start studying, the choice of instrument, description of the piano, on tremolo, broken chords, fingering, pedals, signs of expression, etc.), "practical part" (finger exercises, scales, chords, ornaments, jumps, twelve *airs favoris*, etc.), "six recreations" (compositions by Herz) and "eighteen special studies" (on topics ranging from velocity, arpeggios, the left hand, and double notes to expression, repeated notes, changing fingers etc.), closing with a "synoptic table" (abbreviations used in scores) and a thesaurus of Italian words with their French translations.

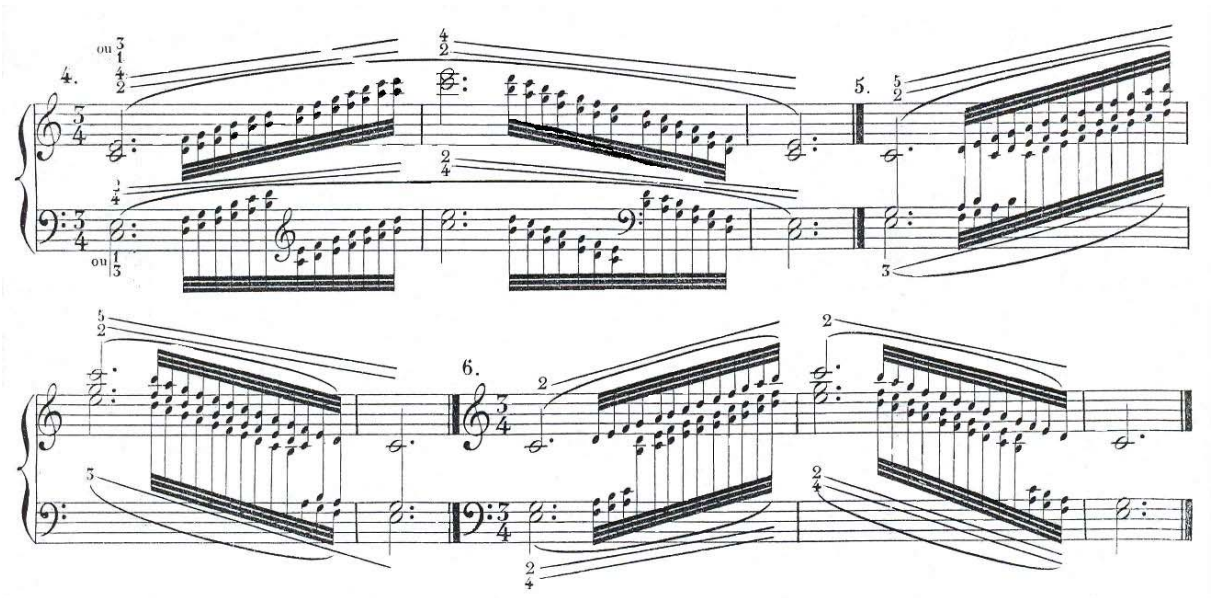
It is in the *Partie Pratique* that we find Herz' writings "on glided scales."[589] (Ex. 3.201-3.203.) They are fitted logically and almost organically after sections devoted to making the fingers operate independently (some 150 exercises), to teaching scales and their

[586] Compare for instance study number 17 from this *Schule des Virtuosen*, which is built on the opening passagework in Beethoven's sonata opus 22 (1799-1800).
[587] Date according to Dutch Music Institute for a Meissonnier edition with plate number J.M. 1089.
[588] All biographical information in this paragraph is taken from Lindeman 2002, p. 452-453.
[589] Herz 1838, p. 55: 'Des gammes glissées'.

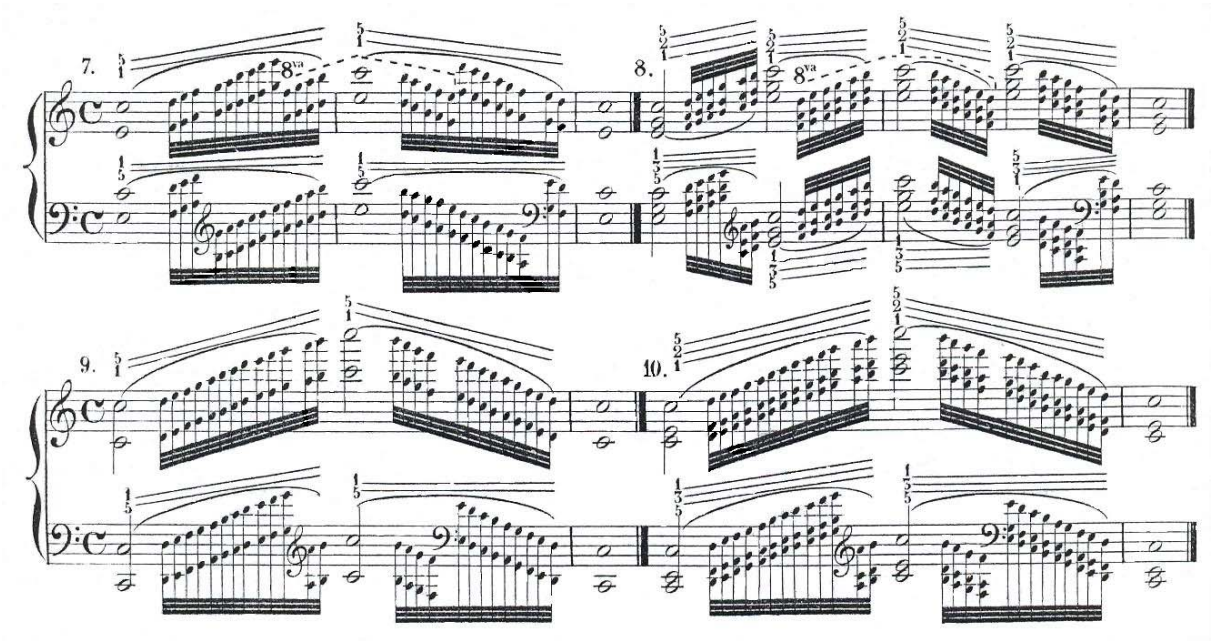
fingerings (over 80 exercises) and to discussing repeated notes (with finger change). After the glissando, clearly seen as part of the general subject of scales and fingerings, Herz continues with chromatic and double note scales and figures.



Example 3.201. H. Herz: *Méthode Complète de Piano* opus 100 (1838).



Example 3.202. H. Herz: *Méthode Complète de Piano* opus 100 (1838).



Example 3.203. H. Herz: *Méthode Complète de Piano* opus 100 (1838).

Herz' pedagogical approach has evolved substantially compared to the efforts Czerny and Hummel had put to paper before him. In contrast to Czerny's uncontextualized approach (writing a glissando study without any further pedagogical or technical elaboration), and contrary to Hummel's linking the glissando to other gliding techniques from key to key, the Parisian pianist identifies the glissando as part of scale fingering technique. In his general chapter "on the piano," preceding the practical chapter, Herz elaborates "on fingering in general":

> Modern music offers, at each step, new and unexpected figures of which the fingering cannot be determined by fixed rules. Who could, in effect, assign limits to the function of fingers and to the innumerable combinations to which it is susceptible? But, if it is generally fitting to rely largely on the performer's intelligence and taste for choosing and determining the fingering, one cannot but admit – in theory – certain fundamental rules which we will expose, and which, all of them, aim at simplifying and facilitating performance.[590]

Herz goes on to abolish the tradition whereby the thumb should as a rule not be used on a black key and by looking ahead to the practical part of the method. He ends his general views on fingerings by confirming that these general ideas are directly linked to the rules of fingering as they are developed in the practical part, which include the "glided scales."

Compared to the examples Hummel and Czerny have given in their respective treatises, the range in Herz' examples is more extended but also more varied (between 1 and 3 octaves); the intervals are even more numerous than Hummel already thought of, and they are worked out more practically than theoretically, with thirds, fourths, sixths, octaves and filled up octaves and sixths. If Hummel still saw the combination of a sixth with a third on top fit to be played – or at least practiced – by the left hand in upward

[590] Herz 1838, p. 14: « La musique moderne offer, à chaque pas, des traits nouveaux et imprévus don't le doigté ne saurait être déterminé par des règles fixes. Qui pourrait, en effet, assigner des limites à la fonction des doigts et aux combinaisons innombrables dont elle est susceptible? Mais, s'il convient en général de faire une large part à l'intelligence et au goût de l'exécutant dans le choix et la fixation du doigté, on ne peut se refuser néanmoins à admettre, en théorie, certaines règles fondamentales que nous allons exposer, et qui, toutes, ont pour but de simplifier et de faciliter l'exécution. »

motion (see ex. 3.193), Herz reserved the much more ergonomically suited compound of a third with a sixth on top for that hand, the inverse of what he writes in the right hand. (Ex. 3.203 – nr. 10) He also gives attention to the different possible fingerings for some of the types. For the single note glissandos, he plays with different combinations of *2* and *3* for the two hand glissandos (ex. 3.201) and for the first time the more comfortable *31* fingering for glissandos in thirds is shown as an alternative to *42*, even if he does not seem to keep it in mind for the glissando in fourths. (Ex. 3.202.) For the scales in sixths and octaves (ex. 3.203), Herz specifies the use of the nail resp. the flesh of the thumb when gliding downwards with the right hand and upwards with the left hand, resp. downwards with the left hand and upwards with right hand.

Apart from the glissandi in chords and in fourths – the former we still have not encountered since Nägeli and Vogler, the latter we will see only appear in the next century – Herz obviously wrote his examples based on personal experiences as a performer. He is the first pedagogue to go deeper into the performance technical aspect of the glissando than only write about the nail of the fingers. Herz talks about placing the fingers on the keys "with aplomb" and – in order to operate the movement with the utmost grace and ease - to keep the right arm close to the body and to keep the hand lightly away from the body for the upward glissandi and to extend the arm away from the body and keep the hand toward the inside for the downward glissandi. For the left hand glissandi, the positions are inverted. The inactive fingers have to be kept lifted above the keys without tensing or retracting towards the inside of the hand.

"In general," Herz ends, "glissando scales can only be performed well on keyboards with keys that do not go deep when depressed and which have rounded corners. Until a few years ago, the Viennese pianos were the only suitable ones; but, since then, the French pianos, being perfected, have acquired all the kinds of merit. The less smooth mechanism of the English piano allows little for the execution of these scales."[591] Throughout his method, Herz hints at French pianos being either best at something or at least having caught up with the competition. This chauvinism was no doubt inspired by his efforts in the piano manufacture industry, which, it must be said, rose to critical acclaim. More interesting to remark is how Herz involves the different kinds of pianos then available to a performer in his advice. His comments are not only practical for the pianist of his day, but they also contain a historical clue as to where and when (and why) glissandi seem to pop up. After Scarlatti and Soler, most glissandi have been located in Vienna and Paris. A comparison along the lines Adolph Kullak set out in his *Die Ästhetik des Klavierspiels*[592], where he distinguishes two directions of virtuosity (before Chopin, Liszt and Thalberg), a Viennese and an English one, reveals how closely this division is related to our finding of glissandi. Kullak's Viennese direction consists of Mozart, Hummel, Moscheles, Wölffl, Steibelt, Kalkbrenner, Herz, Hünten and Czerny, and for the English direction he names Clementi, Cramer, Field, Dussek, Berger and Klengel. Except for the Clementi waltzes (3.2.6.1.11), we have not found any English compositions with definite glissandi, whereas virtually all of the composers in his Viennese group have written glissandi.[593] More than it is just a question of cultural capitals of the day, finding evidence of glissandi has to do with the kind of piano available to the composer-pianist, with practical convenience and the ensuing performer's discretion having priority over compositional creativity. The glissando as a performer's technique rather than a compositional feature allows for a momentary choice of technique dependent on the

[591] Herz 1838, p. 56: « Les gammes glissées, en général, ne peuvent être bien rendues que sur les claviers dont les touches enfoncent peu et offrent des angles arrondis. Les pianos de Vienne étaient, il y a peu d'années, les seuls qui se prêtassent à cette exécution: mais, depuis, les pianos français, en se perfectionnant, ont acquis tous les genres de mérite. Le mécanisme moins souple des pianos anglais est peu favorable à l'exécution de ces gammes. »
[592] Kullak 1861.
[593] We have not been able to track down sufficient scores by Wölffl and Hünten to determine whether they have written glissandi.

piano, like the exact use of the pedal and touch depends on the acoustics of the concert hall at hand.

Herz starts his exposé on the glissando by stating that

> This easy means of obtaining the highest degree of speed and regularity in execution, without having to pay for it with the fingering, is – exactly because of that – somewhat linked to charlatanism; that's why the great masters rarely use it.[594]

Ironically, as a glissando writer Herz ended up having used the glissando in his compositions more than anyone else ever did, except for Franz Liszt. Either he knew his place amongst his colleagues and was unconsciously innocent and frank about it, or he used the term "great" to indicate those composers from the past that had become part of the canon. Going on how much he prides himself in being part of the efforts to enhance the quality of the French piano and how much he values the inclusion of pianistic features of the "modern school" in his treatise, we would tend to believe that Herz is apologizing for the apparent little interest of past masters in the glissando by considering them to have found it possibly a fraudulent performance technique.

That he nevertheless includes it in his method and uses it himself must be seen as interconnected: by teaching how to do it properly (through his method) and how to use it with musical sense (through his compositions) he hopes the glissando will be freed of the link with charlatanism, just as he advocates the repeated notes in the section before the one on glissandi:

> This kind of passage [i.e. repeated notes] is part of the modern school. *Moscheles* and I have propagated it first, and, since the time the audience have welcomed it with so much benevolence, it has been fortunate in my variations on the motif *ma Fanchette est charmante* even beyond my intentions; for the spirit of routine and the way some artists go for the effect, even at the expense of taste, has squandered it in a myriad of compositions were it hasn't even received a happy application. Such is too often, in music, the fate of things that were most sensational at first: the favor which accompanies it, is the source of their popularity, which then brings it into oblivion by the abuse one makes of it.[595]

Herz then explains that the "proper merit of this mode of execution" (i.e. repeated notes) is:

> to delude the nature of the instrument by concealing the effect of the hammers, when, by the speed of their succession, the sounds seem to imitate a prolonged voice.[596]

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[594] Herz 1838, p. 55: Ce moyen facile d'obtenir le plus haut degree de vitesse et d'égalité dans l'exécution, sans faire les frais du doigté, tien, par cela même, un peu de charlatanisme ; c'est pourquoi les grands maîtres en font rarement usage. »

[595] Herz 1838, p. 53 : « Ce genre de trâits appartient à l'école moderne. *Moscheles* et moi l'avons propagé les premiers, et, depuis l'époque où le public l'a accueilli avec de bienveillance, dans mes variations sur le motif *ma Fanchette est charmante,* il a fait fortune au delà même de mon intention ; car l'esprit de routine et la manie propre à quelques artistes de viser à l'effet, même aux dépens du goût, l'a fait prodiguer inconsidérément dans une foule de compositions oú il ne reçut pas même une application heureuse. Tel est trop souvent, en musique, le sort des choses qui ont fait d'abord le plus de sensation : la faveur qui les acceuille, est la source de leur popularité, qui les ramène à l'oubli par l'abus qu'on en fait. »

[596] Herz 1838, p. 53 : « Le propre mérite de ce mode d'exécution est de faire illusion sur la nature de l'instrument en dissimulant l'effet des marteaux, lorsque, par la rapidité de leur succession, les sons semblent imiter une voix prolonguée".

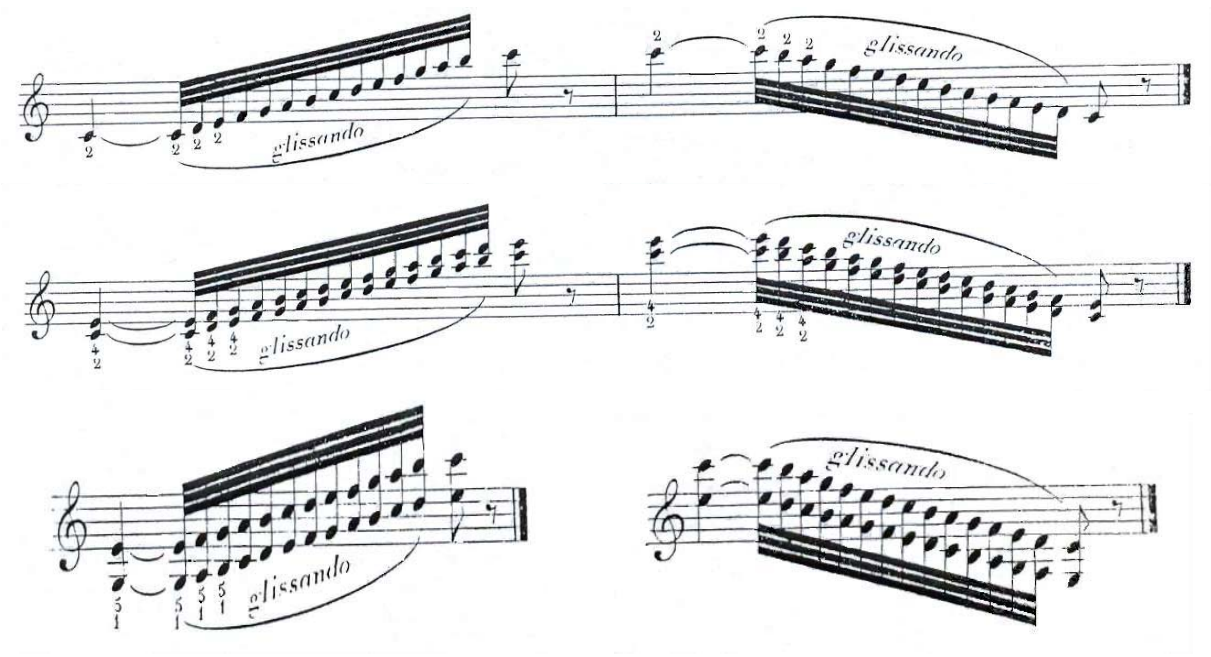
This idea of a proper merit of a performer's technique, which defies the natural limitations of the instrument, is easily applicable to the glissando. Herz continues in his introduction to the section on the glissando saying "it is good to know it, to be able to use it when necessary, without abusing it."

From this extrapolation to the issue of repeated notes and from the earlier discussion of Herz' views on piano fingering rules, it is clear that the glissando was – at least at the time of Herz writing his method – considered a performing practice tool to be at the disposal and discretion of the piano player.

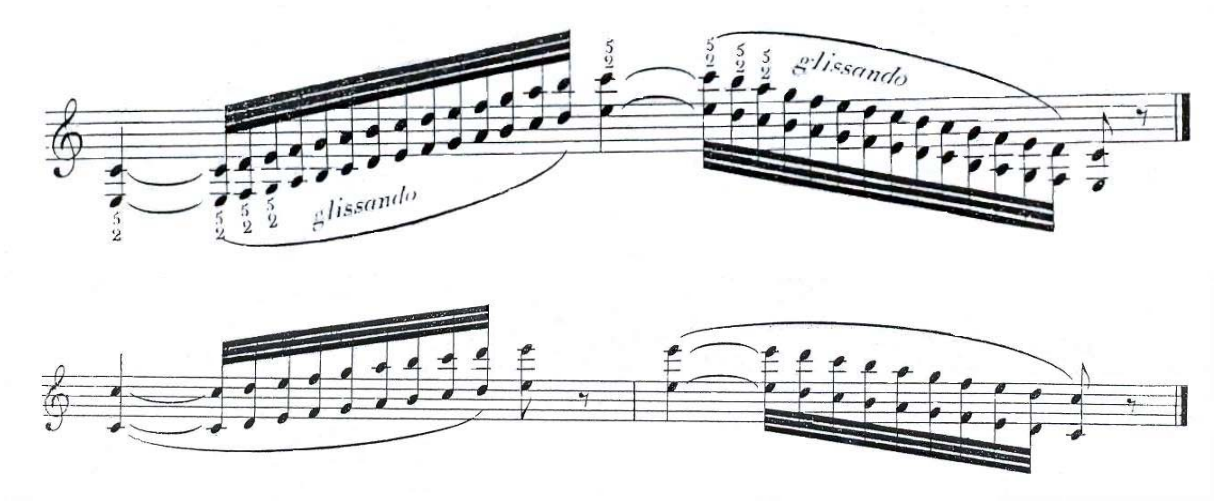
He further defines the "gammes glissées" as only possible on the white keys. A black keys glissando was inconceivable at the time - pianists would have to wait until 1843 before Tausig proved Herz wrong.

3.3.2.2.4.5 1839 Carl Czerny: *Pianoforte-Schule* opus 500

The second of Czerny's pedagogical works that treat the glissando is what he considered to be his most complete theoretical-practical method.[597] (Ex. 3.204.)



[597] The complete title is: *Vollständige theoretisch-praktische Pianoforte-Schule von dem ersten Anfange bis zur höchsten Ausbildung fortschreitend, und mit allen nöthigen, zu diesem Zwecke eigends componirten zahlreichen Beispielen.*



Example 3.204. C. Czerny: *Pianoforte-Schule* opus 500 (1839), p. 22-23.[598]

Other than in the isolated piece in his *Schule des Virtuosen* opus 365, the glissandos here are mentioned and elaborated upon in the opus 500's exhaustive second part that is completely devoted to fingering. The section "on gliding"[599] is given a rather prominent place in this exhaustive pedagogical work: as part of the first chapter (of 16), which elaborately discusses fingerings for scales in all keys as well as related permutational passagework, the glissando is treated before the chromatic scale, passagework with fourths, sixths, octaves and chords, repeated notes, trills, jumps and multi-part writing. The illustrations were made by Czerny for the purpose of the book[600]and are conceived to be practical, as the prolonged first notes show. These have now become longer than the glissandi themselves, which is testimony to the need for time to consciously and meticulously prepare the execution of the glissando and its accompanying change of position for the hand. All examples are in C major and have comments on aspects of performance technique. They are all two-octaves long and all (except the last two) carry the word "glissando" in italics with them. Priority is not given to thumbless fingerings anymore. The first example of the glissandos in 6^{ths} has a *51* fingering for both ascending and descending scales: "One glides the sixths with the fleshy part of the thumb and the nail of the little finger"[601] and "For a large and strong hand the 2nd and 5th fingers are preferable, the right hand must be held very high in order for only the surface of the nails to hit the keys."[602] Czerny explains how, for the glissandi in thirds, "It is necessary that only the nails hit the keys; one will keep them very close to one another, the elbow will be pressed against the body in the ascending run and will be held a little elevated while descending."[603] Different than with the sixths, for the octaves Czerny prescribes that "The hand will be tense, but the wrist and the arm will be flexible."[604]

The remark with which Czerny closes his section on the glissando technique is significant in that it differs from Hummel's treatment of the glissando subject: "All these passages

[598] NL-Dhnmi mf VIII/223.
[599] In the French edition the chapter is called "Du glissé", in the German edition: "Über das Glissando".
[600] As made clear in the full title of opus 500: "*Vollständige theoretisch-praktische Piano-Schule von dem ersten Anfange bis zur höchsten Ausbildung fortschreitend, und mit allen nöthigen, zu diesem Zwecke eigends componirten zahlreichen Beispielen*".
[601] Czerny 1839, 2nd part, p. 22 : « On glisse les sixtes avec la partie charnue du pouce et l'ongle du petit doigt. »
[602] Czerny 1839, 2nd part, p. 22 : « Pour une main grande et forte le 2e et le 5e doigts sont préférables, la main doit être très élevée pour que la surface des ongles atteigne seule les touches. »
[603] Czerny 1839, 2nd part, p. 22 : « Il faut que les ongles seuls atteignent les touches ; on les tiendra fort peu éloignés l'un de l'autre, le coude sera pressé contre le corps dans le trait ascendant et se tiendra un peu élevé en descendant. »
[604] Czerny 1839, 2nd part, p. 23 : « La main sera tendue, mais le poignet et le bras seront flexible. »

are played Presto, in a slow movement they produce no effect."[605] He specifically says "these passages," referring only to those he showed in print and therefore not excluding other kinds of gliding passages in which the tempo need not be presto. Nevertheless, we still have the impression that Czerny brings us closer to the nature of early 19th century glissandos than Hummel did with his chordal glissandi. Judging how Czerny devised his studies and his theoretical works around passage work that was used by other composers in their works (see also footnote 586), we can be confident that the glissando – as Czerny explored it – was incorporated in his grand piano method for the same reason: it was part of the piano repertoire and of its performance practice.

Further comparing Czerny's opus 500 with Hummel's method, we don't need to look far for real life examples on which Czerny may have based his elaborations regarding the glissando technique. Aside from his social and artistic position and the perspective that offered him to see what the pianists and composers of his day were interested in, there are several direct links from Czerny to specific historic glissando passages. Early on in his life he had been taught by Beethoven and had performed the master's first piano concerto at age 15. From 1806 onwards he gave weekly programmes at his home devoted exclusively to Beethoven's piano music, and apparently he could perform all of Beethoven's piano music from memory[606] - of course Czerny knew the Beethoven glissando passages intimately. In the year of publishing his opus 500, Czerny had also finished editing the *Sämtliche Werke für das Pianoforte von D. Scarlatti,* amongst which two sonatas with the *con dedo solo* issue (cf. below, ex. 3.208 and 3.209).

The sheer number of Czerny's studies in his total output is enough to consider it proof of his pedagogical renown. Perhaps more so than Hummel's method, Czerny's opera 365 and 500 can be held co-accountable for the glorious rise of the glissando's popularity in the 1840's and 1850's, to which we shall now turn.

3.3.2.2.5 Editing the glissando I

With Simrock's 1803 edition of Mozart's Variations K.V. 264, we have already seen how posthumous editions of existing published pieces may differ from early ones that had been published in the composer's lifetime, and how that can affect the notation and even identification of glissando technique. (Cf. 3.2.6.1.12.)

Some later editions contain other slight changes compared to the original, as for instance the 1810 Paris edition by Sieber, which has the slur starting a few notes later, or two London editions that have narrowed down the rhythmic value from the original 128^{ths} (see 3.2.5.2.) to 64^{ths} (1804[607]) and even 32^{nds} (1807 - ex. 3.205).

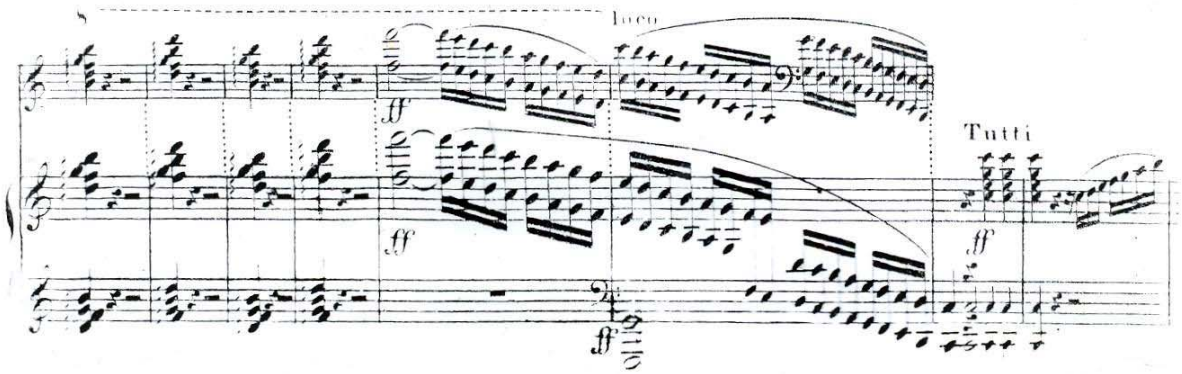
[605] Czerny 1839, 2nd part, p. 23 : « Tous ces passages se jouent Presto, dans un mouvement lent ils ne produiraient aucun effet."
[606] All the information in this paragraph is taken from Lindeman (with Barth) 2002.
[607] *Air: with variations: for the piano forte: No. 1.* London: Printed by R. Birchall (RISM M 6938). Copy at Dutch Music Institute: NMI mf IV/777.



Example 3.205. W.A. Mozart: *Lison dormoit* [sic], number 3 from *Mozart's variations: to* [sic] *favorite airs: for the piano forte.* 1807 edition by Preston.[608]

None of these editions specify a glissando technique, however: neither by adding a fingering or any other indication.
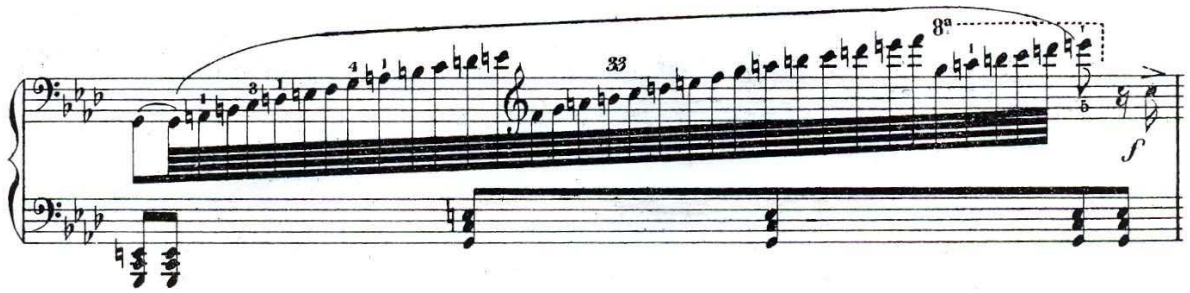
The 1837 Halsinger edition of Beethoven's concerto opus 15[609] is different in approach from all the earlier cases: it does not explicitly indicate the octave run to be a glissando, but indirectly takes away any doubt by adding an ossia with the glissando starting one octave higher (ex. 3.206). Without an explanation offered, the intervention is presumably meant to both justify and assure the glissando technique by providing it with more momentum. (Cf. 3.2.6.1.7 for this particular issue.) That other ossia passages in this edition also provide alternatives an octave higher than the original music shows the eagerness to update older music to the possibilities offered by the larger range of the latest keyboard.



Example 3.206. L. Van Beethoven: Concerto opus 15, bars 340-347, 1837 Haslinger edition.
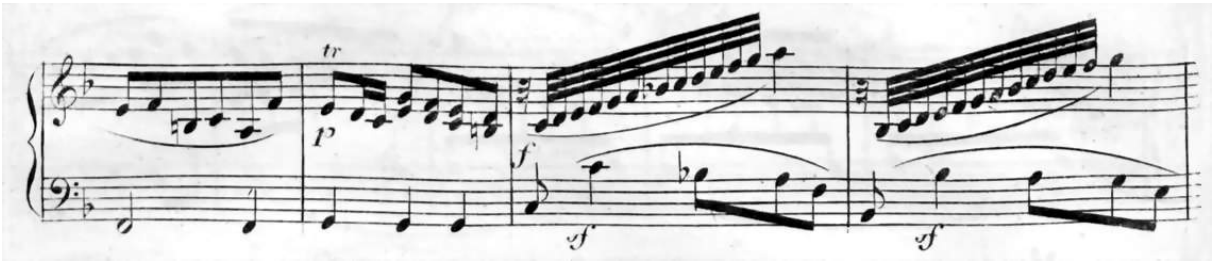
In a more direct way, the "nouvelle edition soigneusement doigtée" by Jean André of Von Weber's *Concert-Stueck* takes away any doubt as to the technique with which to play the fast runs we have discussed before (3.3.2.2.1.1.). The long run in the slow movement has been given an individually articulated fingering (ex. 3.207) whilst the octave runs are now each and all designated "glissando." (Cf. 3.3.2.2.1.1.)

[608] Copy at Dutch Music Institute: NMI mf IV/775.
[609] *Erstes / CONCERT / in C-dur. / für das PIANO-FORTE allein / von / L. VAN BEETHOVEN. / 15=tes Werk. / Eigenthum des Verlegers / Eingetragen in das Archiv der vereinigten Musikalienhändler. – [Klavierauszug]. – WIEN, : BEI TOBIAS HASLINGER, k.k. Hof- u. priv. Kunst- u. Musikalienhändler.* Copy used: G-BNba C 242/7. Dating according to G-BNba. Reprinted by permission.



Example 3.207. C.M. von Weber: *Morceau de concert*, bar 52, post-1830 edition by Jean André, Offenbach s/M.[610]
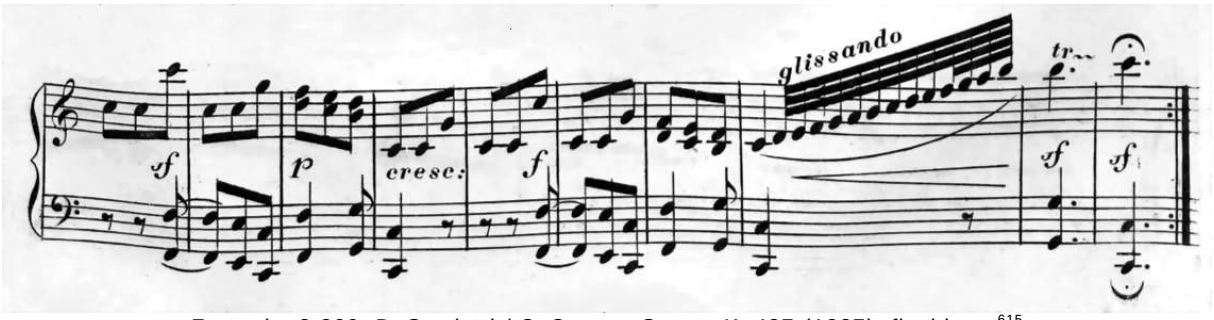
Publishers clearly had their own ideas on how to adequately inform the player of the intentions of the composer. Unfortunately, these particular editions did not advertise who exactly was responsible for the posthumous changes brought to the original scores. From around this time, however, some publishers started to ask famous pianists to put their art and know-how to work as editors in publications of the great works of their predecessors. Czerny is said to have edited the 'complete works' of Scarlatti for the piano in 1839[611], an edition containing some 200 of Domenico's sonatas, including K. 468[612] and K. 487[613]. Here we find the editor to be practical in more than one way: the instance in the F major K. 468, originally with 'con dedo solo', is now printed with an extra flat added to the B in the run, and with any textual indication left out (ex. 3.208).



Example 3.208. D. Scarlatti / C. Czerny: Sonata K. 468 (1837), bars 82-85.[614]

The instance in K. 487, which did not contain any indication in the manuscripts, is now printed in a reorganized rhythmical division (ex. 3.209) and with the very "glissando" denomination that we have seen Czerny use in his own works from around these years. (Cf. 3.3.2.2.3.)

[610] The available histories of the firm of André do not cover the period at hand sufficiently to precisely date this particular edition. Its plate number 7341 fits somewhere in between 5177 and 5185 on the one hand (both ca 1830) and 10216 on the other hand (1860). See also Warrack 2006, p. 130.
[611] *Sämmtliche Werke für das Piano-Forte*. 2 volumes, Vienna: Tobias Haslinger. We examined the copy at the Bayerische Staatsbibliothek in München (D-Mbs: 2 Mus. Pr. 1440), wherein no mentioning of Czerny is found, except added in pencil on the title page.
[612] Number 41 in the Haslinger edition, on p. 117-120.
[613] Number 55 in the Haslinger edition, on p. 161-163.
[614] D-Mbs: 2 Mus. Pr. 1440. Reprinted by permission.



Example. 3.209. D. Scarlatti / C. Czerny: Sonata K. 487 (1837), final bars.[615]

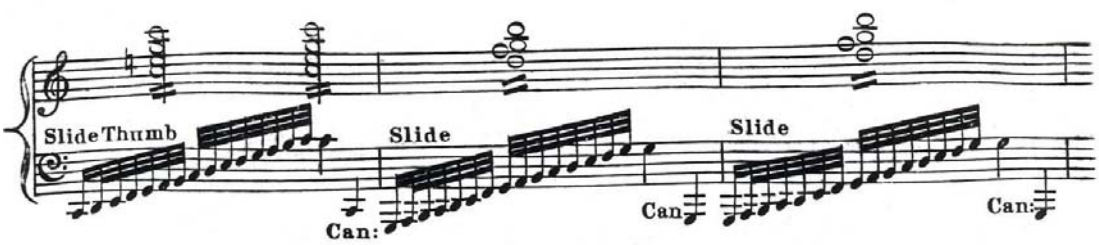
Not all famous pianist-editors felt the need to "clarify" the original notation for the editions that were issued under the wings of their authority. For instance, Moscheles did not add any indication to the double octave-glissando in his ca 1840 edition of Von Weber's first concerto.[616]

3.3.2.2.6 Miscellaneous aspects

3.3.2.2.6.1 Fingerings I

In this 19th century period, glissando fingerings pop up more and more, showing how pianist-composers were becoming conscious of differentiation through fingerings, and what their preferences were.

In 1816, we see what is probably the first indication of a specific fingering for a single-note glissando. (Ex. 3.210.)



Example 3.210. J. Blewitt: *The Battle of Waterloo*, 1816.[617]

Until about the 1820's, glissandos usually did not carry any specific indication as to which "detto" was to be used according to the composer. In the 1820's and 1830's, more and more detailed fingerings gradually appear in scores:

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[615] D-Mbs: 2 Mus. Pr. 1440. Reprinted by permission.

[616] *Grand Concerto, / IN C. / for the / Piano Forte, / With Orchestral or Quartett Accompaniments, / Composed by / C. M. VON WEBER. / [l.:] Ent. Sta. Hall. [M.:] OP. 11.* as part of the series *C. M. VON WEBER'S PIANO FORTE WORKS, / Edited by / J. MOSCHELES*, published in London by Chappell. We saw a copy of this edition at G-Bnba.

[617] Reproduced by permission of the Music Division of The New York Public Library for the Performing Arts, Astor, Tilden, and Lenox Foundations.

O= outward
I= inward
R= right
L= left

Date	fingering	gliss.-type	composer
1816	*1*	IL	Blewitt
1821	--	ORL, IR	Gelinek
1826	*2*	OR	Herz opus 20
1826	--	IR	Herz opus 33
1826	*1*	IR	Moscheles concerto
1835	*2/3*	OR, IR	Czerny opus 365 study
1828	--	OR, IR	NN *Sliding Waltz*
1828	--	OR	Meineke *Railroad*
1829	--	ORL, IRL	Alkan opus 2
1830	*2*OR, *3*IR	OR, IR	Herz opus 49
1833	--	OR, IL	Herz opus 76
1833	2	OL	Bertini *One Fingered Waltz*
1834	--	OR	King *Hail Colombia*
1836	*1*	IR	Moscheles *Due Fantasie*
1837	*2/3*	OR, IR	Czerny *Eisenbahn*
1838	*2*	OR	Herz opus 97
1838	*3*	OR, IL	Alkan opus 76
1838	--	IL	Liszt *Mélodies Hongroises*
1838	*2/3*	ORL, IRL	Herz method
1838	*3*	OR, IL	Alkan opus 76
1839	*2*	OR, IR	Czerny opus 500
1839-40	*2*	OR	Liszt *Magyar Dalok*

In general, we find *2* for single note glissandos whether up or down, left or right. *3* is sometimes used for a louder volume (Herz opus 49), for a right hand inward glissando after the outward glissandi had *2* (Czerny's *Eisenbahn –Variationen*), or just as an alternative appearing above glissandos further in the score, both inward and outward (Czerny opus 365). Some inward glissandos are for the thumb, the easiest and most morphologically efficient fingering for that direction since the hand does not have to move away from its proper position. A special case is the *One fingered waltz, accompanied with the left hand* by Auguste Bertini: before the right hand begins, it is indicated "First Finger"; the one glissando in the left hand carries *1111* and "slide the finger" underneath it. Since other works by Bertini, written in that same year or later, consistently seem to have "x" for the thumb, it is safe to assume that the "first" finger in the waltz is in fact the 2nd.

Glissandi in 6ths and octaves had already been given fingerings in the first decade of the 19th century, for those in 3rds it seems Herz started indicating specific fingerings:
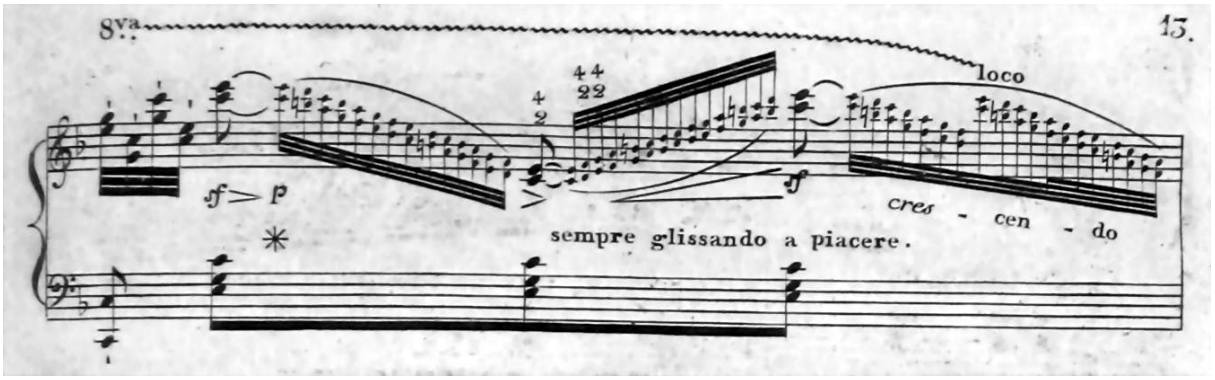
	3rds	6ths		8ths
1803		*51* OR		Mozart K.264/Simrock ed.
1804			*51* IRL	Beethoven opus 53
1816			-- IR	Hummel concerto
1821			-- OR	Weber *Concert-Stueck*
1823		-- OR		Weber Diabelli variation
1826	*42* OR			Czerny *Les Etrennes*
1827	*42* IR			Herz opus 36
1828	*42* ORL	*51* OR, IR	*51* OR, IR	Hummel method

1828	*42* OR, IR			Herz opus 42
1828-29	*42* OR			Czerny *Fantaisie opus 197*
1829	*42* IR			Alkan opus 2
1830	*42* OR			Czerny *Quatuor*
1830	-- IR			Herz opus 47
1831	*42* IR			Herz opus 60 (Schott ed.)
	-- IR			[618] (Italian ed.)
1832-33	*31* ORL, IRL	*51* ORL, IR	*51* OIR	Kalkbrenner method
1833	*42* OR			Herz opus 76
1833	*42* OR, IR	*51* OR		Berlioz/Liszt
ca1835	*31* OR, IR			Herz *Othello*
1835	*42* OR, IR	*52*/(51) OR, IR		Czerny opus 365 study
1837	*42* ORL			Czerny *Eisenbahn*
1838	*42* ORL, IRL	*51* ORL,IRL		Herz method
	31 ORL, IRL	*51* ORL, IRL		
1838			*51* OR	Liszt *Mélodies Hongroises*
1839	*42*	*51/52* OR, IR		Czerny opus 500 method
1839-40	-- OR	*41* OR		Liszt *Magyar dalok*

For the glissandi in 3rds, the *42* fingering enjoys an overwhelming majority: only in the tutors by Kalkbrenner and Herz do we find the alternative *31* (for both hands in both directions). For the glissando in 6ths, this is hardly different: we find mostly *51* in compositions but both *51* and *52* in Czerny's study (*51* in between brackets) and his method opus 500 (*52* for larger hands). Per exception, Liszt indicates a *41* fingering for a glissando in 6ths. Herz' method further valued *52* for glissandi in 4ths and both Herz and Hummel gave fingerings for chords (*521* OIR an *531* OIL in Herz / *521*, *531*, *54*(*2*)*1* OR and IL in Hummel), but all these fingerings seem to have been as rare as the chance that we come across such glissandi in 19th century scores.

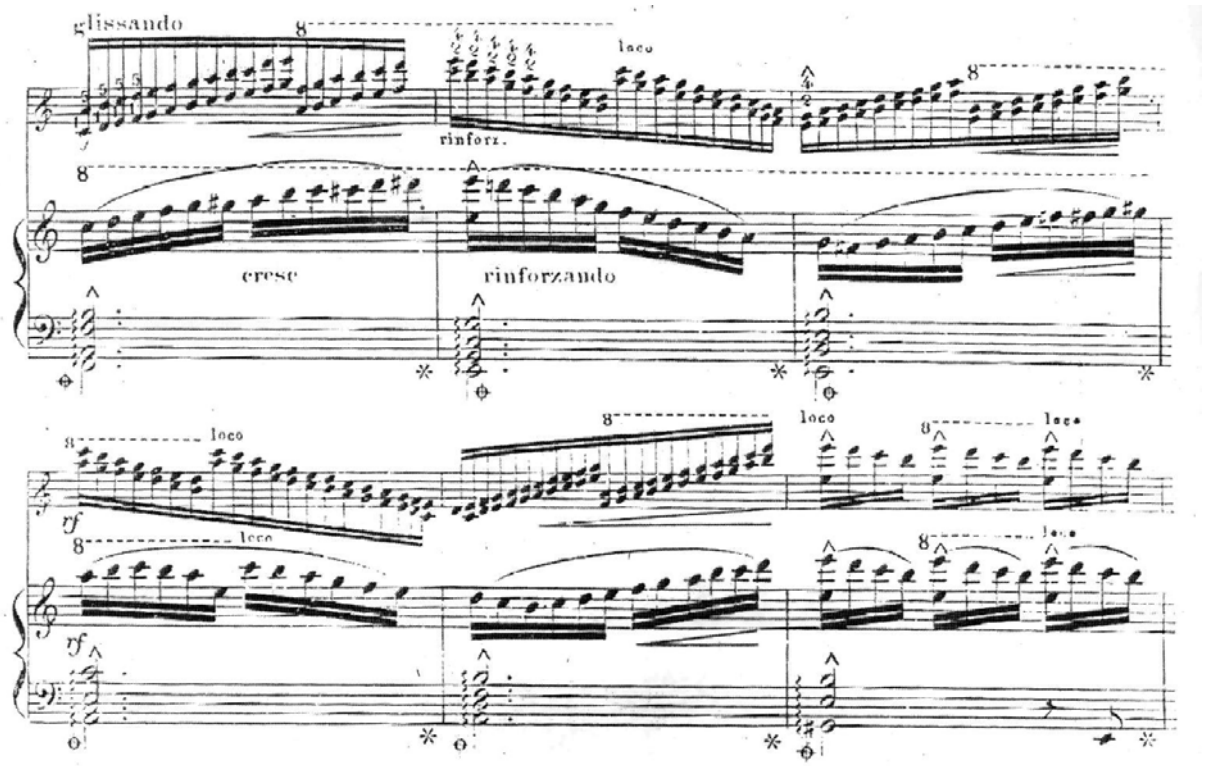
The prominence of the *42* fingering for glissandi in thirds – back and forth – is explained by its being the only comfortable fingering by which only the nails of the fingers are used to play both directions of a glissando one after the other. It is easier to go up with *42* and to come down with *31* because that way the hand does not have to change position at the top, but then the flesh of the third finger is needed to glide over the keys. Crucially important to the *42* fingering for two-way glissandi is that the hand needs to turn around at the moment when the direction changes, which complicates the transition and takes time. That is most likely the reason why we find few examples of consecutive glissandi changing direction without resting on the pivotal double note. The methods by Hummel, Herz and Kalkbrenner as well as the study by Czerny either make the glissandos end on long notes or place a rest in between two glissandos that have different directions. (See 3.3.2.2.4.) Only one composition – Herz opus 42 – provides the hand with the necessary time on the pivotal third. (See the right hand on the second, third and fourth beat in ex. 3.211.)

[618] There was no title page to the edition we came across. Presumably it was Ricordi.



Example 3.211. H. Herz: *Variations brillantes sur la marche favorite de 'Moïse' de Rossini* opus 42 (1828), bar 48.[619]

The other example we found of consecutive glissandos in thirds in both directions – from Liszt's Berlioz transcription – does not give the pianist the opportunity to take time and switch position, resulting in the necessity to make an interpretative choice: either end on the first third of the new glissando without lifting the hand off the keyboard and then take the required time to turn the hand around, or switch position while in mid-air right before arriving on the new glissando. (See bars 429-430, 430-431, 431-432 in ex. 3.212.)
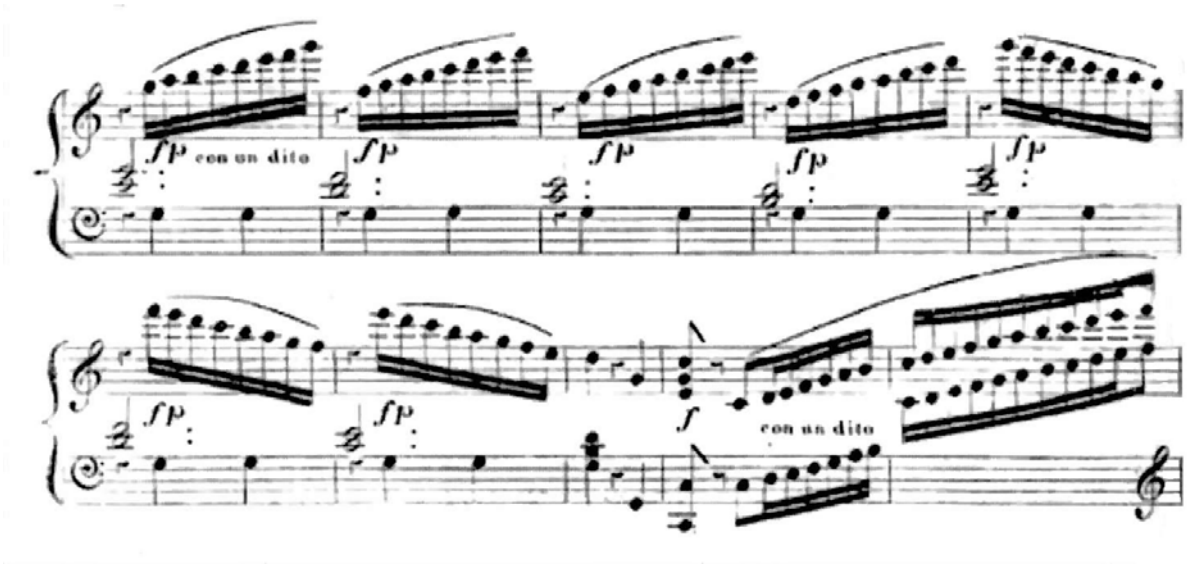


Example 3.212. Fr. Liszt: *Episode de la Vie d'un Artiste. Grande Symphonie Fantastique par Hector Berlioz* (1933), 5th movement *Songe d'une nuit du sabbat*, bars 429-434.

[619] NL-Dhnmi 34 G 39 (26). Reproduced by permission.
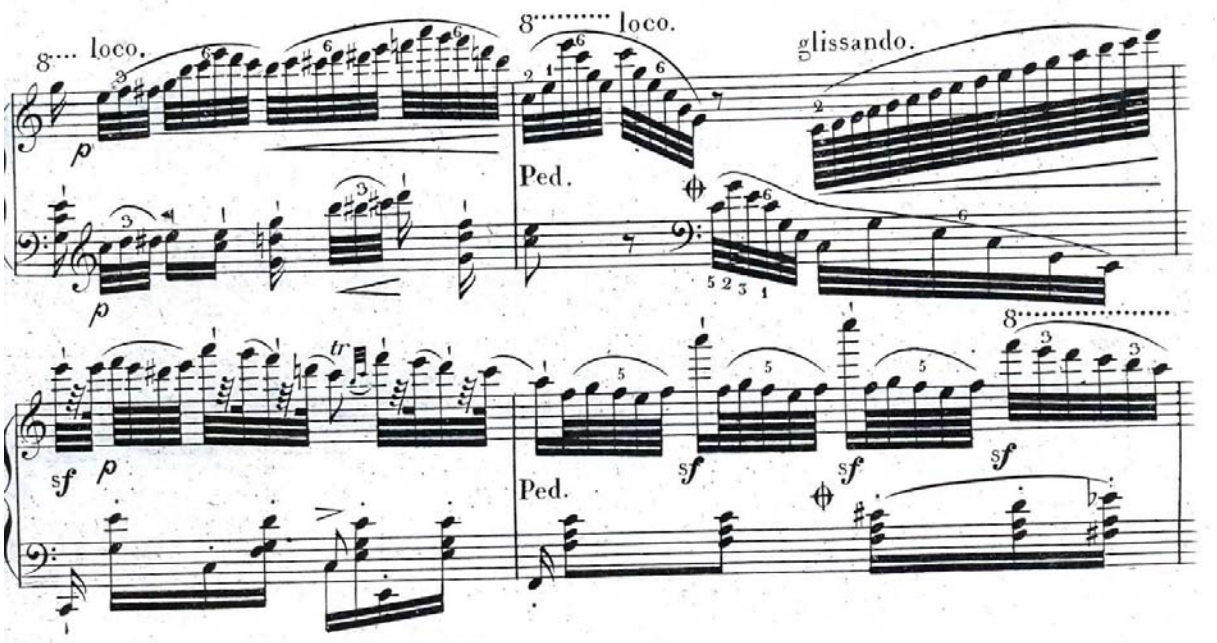
3.3.2.2.6.2 Dynamic range I

Apart from Clementi's *Valze Comique* opus 39 n° 9 (3.2.6.1.11), Beethoven's opus 53 and Zapf's glissandos ending in a surprise fall of the dynamic level (see ex. 3.94), all past glissandos we have seen were loud and placed in a loud context (if and when any dynamic level was indicated) and, without exception, their notation did not show any change of dynamic in the course of their movement. From the 1820's onwards the dynamic abilities of the glissando are explored a little more. Gelinek had already use *fp* at the beginnings of some of his glissandos (ex. 3.213), but the position of the indication (more or less underneath the second note of each glissando) looks more like a *rinsforzando* and there is no hint at how it should be executed.



Example 3.213. J. Gelinek *Hummel's celebrated waltz* (1821), bars 17-26.

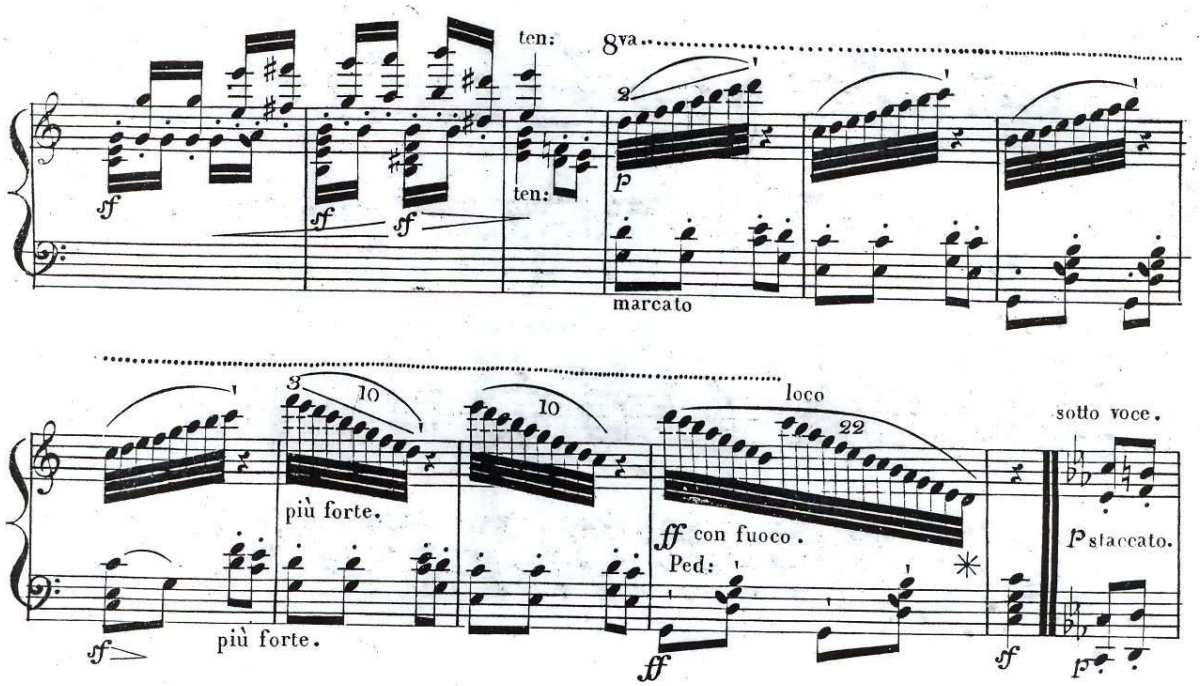
Besides Gelinek, there was only one other composer who did not write loud glissandos during the 1820's and 1830's. It was with Henri Herz that the glissando really benefited from the diversification of dynamics. In 1826, he wrote a *pp leggierissimo* glissando in thirds (opus 33), but he seems to have written the first *crescendo* glissando even before that, in his opus 20 of the same year (example 3.214).



Example 3.214. H. Herz: *Variations de Bravoure sur la romance de l'Opéra 'Joseph' de F. Méhul*, opus 20 (1826), variation 2, bars 3-6.[620]

Herz liked the softer dynamic level: the glissandi in opus 20 and 42 are *piano*; in opus 33, 36 and 60 they are *pianissimo*. Later on, in the 1840's, Herz writes two more *pianissimo* glissandos, one *leggierissimo* (opus 158) and one *dolcissimo* (opus 159). When *crescendo,* the level mostly goes up to *sf* in what remains on or around a soft context (opus 20, 36, 42 – all in the 1820's). Only in the 1830's did he write *piano* glissandi with a *crescendo* up to *f* (opus 76 and 97) and a *crescendo* during a glissando in a *forte* context (opus 47). In opus 49 (1830), Herz structures the levels: 4 glissandi in *piano*, 2 in *più forte* and one in *ff con fuoco*. (Ex. 3.215.) Together with the latter, the *f con forza* two-hand glissando in the introduction to opus 76 and the possible *fortissimo* two-hand glissando at the end of the opus 20 (for piano and orchestra) are part of a minority in Herz' glissando writing.

[620] NL-Dhnmi 34 G 39 (20). Reproduced by permission.



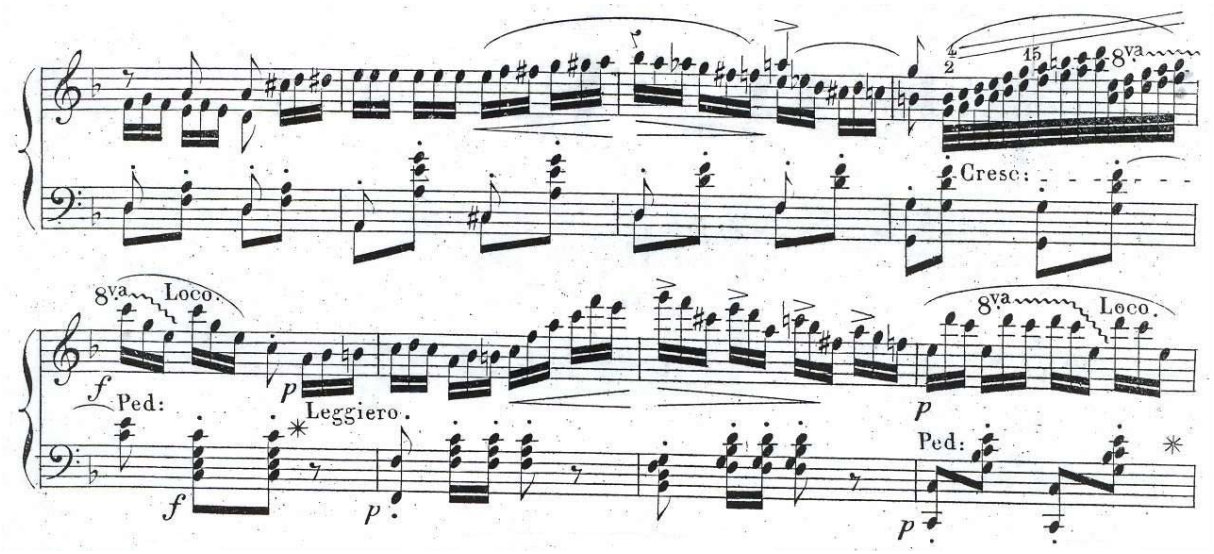
Example 3.215. H. Herz: *Les Elégantes: Contredanses brillantes et variées* opus 49 (1830), finale, bars 6-16.[621]

3.3.2.2.6.3 Morphology: beginnings and endings I

Until the 1840's the glissando has in general a specifically marked beginning and/or ending. The first note is often prolonged and/or with some kind of an accent, while the last note is almost invariably on the beat, separated metrically and very often with an accent or staccato dot. That ending is also mostly the last note of the run. Exceptions on this latter aspect have been few: only three glissandos in pieces by Moyreau (see ex. 3.33), Soler (ex. 3.46) and Vogler (ex. 3.70) do not have an accentuated last note and instead end on some note an octave or more away in the opposite direction. Exceptions to the stressed beginning are more common: quite a few glissandos are off to a flying start, i.e. with a rest or with the first note unmarked (e.g. Moyreau (ex. 3.33), some of the Scarlatti examples, or all of those in Haydn pieces). The Moyreau example contains the only glissando without a marked start and ending.

In the 1820's and 1830's this trend is continued: in many cases, as in Herz (opus 20, 33, 36, 49, 76, 159), Meineke, Alkan opus 76 or Fr. D. Weber, there is no specially marked beginning. Gelinek's variations on the other hand have glissandos with an open ending (ex. 3.213). New for this period is the way the glissando does not stop on a note or a rest, but instead either continues to glide in another direction (ex. 3.212) or goes over into passage work requiring proper playing technique (ex. 3.216).

[621] NL-Dhnmi 26 E 28 (2). Reproduced by permission.



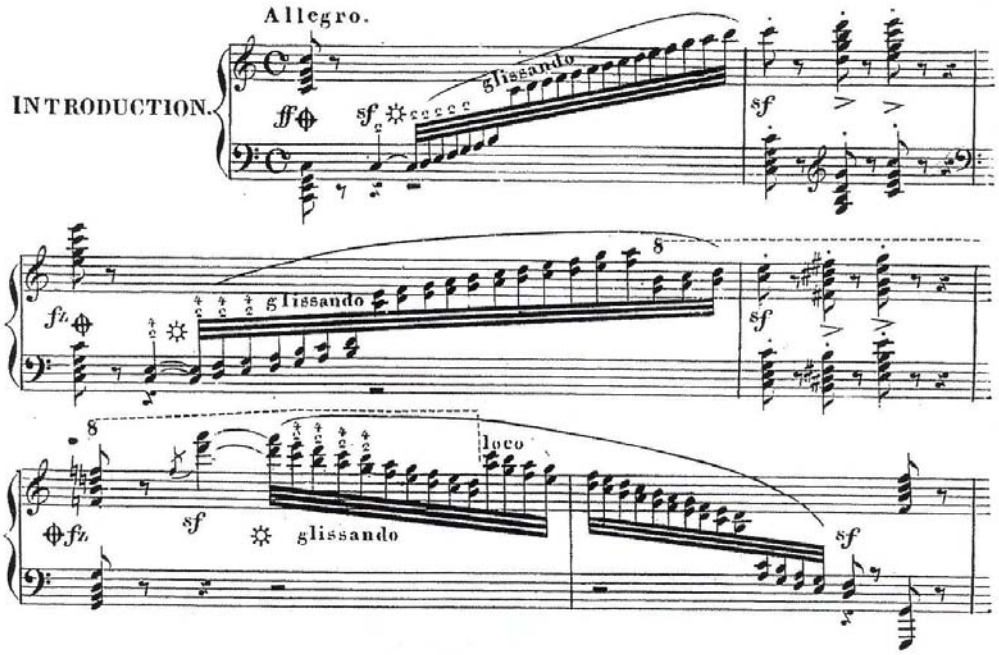
Example 3.216. H. Herz: *Variations brillantes di bravura sur le Trio favori du 'Préaux Clarcs'* opus 76 (1833), variation 1, bars 12-19.[622]

Just like with the change of direction while gliding (see 3.3.2.2.6.1.), changing from glissando to individually articulated performance technique can present a problem of interpretation when the moment to switch influences the sound of the glissando's ending. Either the first note of the new technique serves to change position of the hand (requiring time), or the new technique's hand position has to be prepared at the end of the previous action. In some cases there is a third way, as in ex. 3.216, where an articulated 5th finger can play the high C in bar 16 without compromising the glissando. In another example (ex. 3.212) the composer provided similar opportunities: for the transition from bar 432 to 433 the single D – played with the third finger – provides the pivotal chance, and between bars 433 and 434 the *42* third can connect to the *51* octave effortlessly.

3.3.2.2.6.4 Speed I

As we have seen, the eighteenth century single note glissando was more a gimmick than a technical – let alone musical – necessity. The works in which we found them often contained the same kind of run transposed to a key requiring regular fingering. Clearly, the speed was not always the reason for choosing glissando technique over individual articulation. It was so for double note types, however: regular fingering could not cope with the speed of any such glissando we have found. Nevertheless, the relation between the glissando's speed on the one hand, and its metric place in the music and the tempo of its environment on the other hand, is often an issue. With Beethoven's opus 15 instance, the issue of the needed momentum for gliding over the keys is at the heart of the discussion on the necessity and possibility of the technique. In the early 19th century, we can sometimes discern how this relationship was still not fully reckoned with, as shown in the opening of Czerny's *Eisenbahn-Variationen über Johann Strauss beliebten Eisenbahn-Lust-Walzer*, opus 431 (1837)[623]. (Ex. 3.217.)

[622] NL-Dhnmi 23 G 38 (2). Reproduced by permission.
[623] Dating is tentative: Johann Strauss the elder (1804-1849) wrote his *Railroad Delight Waltz* in advance of the opening of the first Austrian steam railway on 14 November 1837 between the Viennese suburbs of Florisdorf and Deutsch Wagram, and the closest dated opus number of Czerny's (433) is reported to be issued in 1837 (Wehmeyer 2001, p. 225).



Example 3.217. C. Czerny: *Eisenbahn-Variationen über Johann Strauss beliebten Eisenbahn-Lust-Walzer* opus 431 (1837), opening bars.

The first two glissandos are the same length and take up half a bar in 4/4. The third is 7 notes longer, a bit more difficult ergonomically, and is given four beats time to complete. The relation between tempo and length is not the same for the third glissando as for the first two, meaning that the performer will have to be creative with the way speed and momentum are gained the third time, or he will arrive too soon. Experience with the glissando is not yet matured to the point that such performance practical matters were taken into consideration when notating these glissandos. But with the steady growth of the glissandos into longer and faster specimen, the problem of matching that length with the available time to cover the distance would soon raise its head, as we will see especially in the works by Czerny's pupil Franz Liszt.

3.3.2.3 1840's-1860's The glissando's high point

Around the middle of the 19th century lies the pinnacle of the glissando's position in the piano repertoire. In these three decades, about 70% of all the glissandos written in between 1815 and 1900 are found in about half of the works listed. The diversity and creativity in applying the technique is greater then ever before, its performance practice is taken to new levels, and its identity is now well accepted.
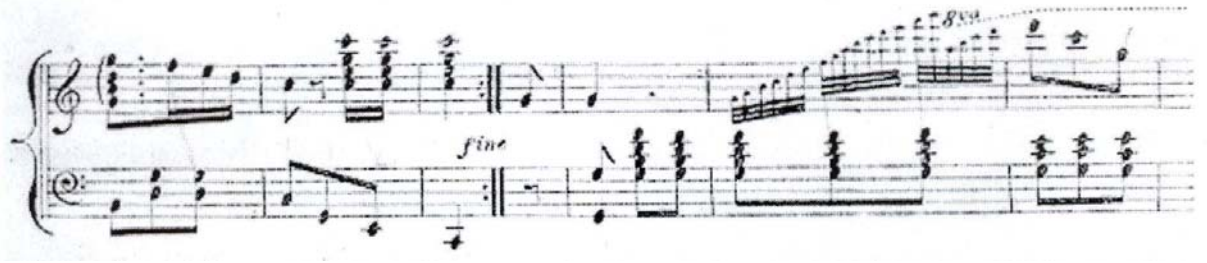
3.3.2.3.1 Towards a name II

The previous twenty years of the 19th century had shown a lack of consensus in choosing a name with which to indicate in scores that the gliding technique was called for. Between 1840 and 1860, composers finally settled upon such an indication when it became clear that the pseudo-Italian *glissando* was preferred over any other term or manner.

1840	Liszt	Ungarische Nationalmelodien	gliss.
1840	Liszt	*Hussitenlied*	glissando
1840	Strauß	*Wiener Carnavals-Quadrille*	glissando
1840	Liszt	*Réminiscences de Lucrezia Borgia* I	*424242*[624]
1843	Liszt	*Gaudeamus Igitur* I	glissando
1844	Wallace	*Midnight Waltz* (octave glissandi)	glissando
1845	Liszt	*Konzertfantasie über Spanische Weisen*	gliss.
1845	Kalkbrenner	*Grande Sonate Brillante* opus 177	glissez
1846	Herz	*Henrietta's Waltz*	
		– NY Riley Edition	[nothing]
		– Boston Prentiss Edition	*1* on first note
1847	Liszt	*Schwanengesang und Marsch*	
		– New Liszt Edition	gliss.
		– manuscript	glissando
1847	Liszt	*Magyar Rapszódiak* 13	gliss. / glissando
1847	Liszt	*Rákóczi-Marsch erleichtert*	gliss. / glissando
1847?	Herz	opus 158	[straight line]
1847	Herz	*Last Rose of Summer* opus 159	
		– Libau (Brussels)	glissando + [straight line]
		– André (New York)	glissando + [straight line]
1847	Liszt	*Zigeuner-Epos* 8	[nothing]
1847	Liszt	*Zigeuner-Epos* 11	glissando
1848	Liszt	*Réminiscences de Lucrezia Borgia* II	*4444*[625]
1848	Raff	*Divertimento* opus 43	[nothing]
1848	Grobe	*Salut to NY*	glissando
1849	Schulhoff	*Carnaval de Venise*	glissando
1849	Liszt	*Totentanz* (De Profundis Version)	glissando
1849	Liszt	*Illustration du Prophète*	glissando
1851	Quidant	*Etoiles filantes*	*4* or *1* on first note
1851	Raff	Opus 60, Nr. 4	glissato
1851	Rubinstein	Concerto 2	glissando
1851	Liszt	*Paganini Etude* 5	glissando
1852	Jaell	*Carnaval of Venice*	glissando
1852	Liszt	*Fantasie über Ungarische Volksmelodien*	glissando
1853	Liszt	*Rhapsodies Hongroises*	glissando
1853	Liszt	*Andante, Finale und Marsch*	glissando
1853	Van der Weyde	*Carnaval de Venise*	glissando
1853	Croze	*Polka*	glissé
1853	Liszt	*Gaudeamus Igitur* II	glissando
1855 ?	Weber/Tausig	*Aufforderung zum Tanz*	glissando
1855?	Tausig	*Man lebt nur einmal*	glissando
1858	Smetana	*Ballade*	glissando
1850's	Berwald	*Marche Triomphale*	[nothing]
1850's	Liszt	*Totentanz* (solo version)	glissando

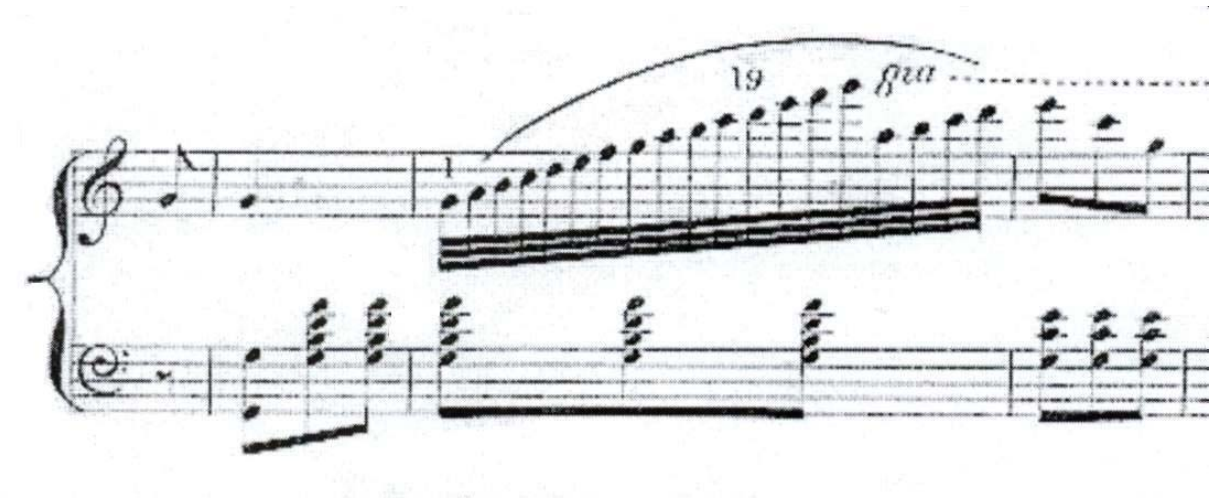
[624] The New Liszt Edition has added "glissando" to the 42 fingering, but since the first edition (Vienna: P. Mechetti, 1948-49) of the second version of this composition (from 1848) does not include this indication, we are not sure that the original first version from 1840 did.
[625] See previous footnote.

Contrary to the previous period, now only 3 out of 37 pieces do not have a defining indication for the glissando. Each of these three cases may – at first – still make us wonder whether or not we are in fact dealing with glissandos. The first edition we came across of Herz' *Empress Henrietta's Waltz* gives no clue as to whether or not there is a glissando in the piece. (Ex. 3.218.)



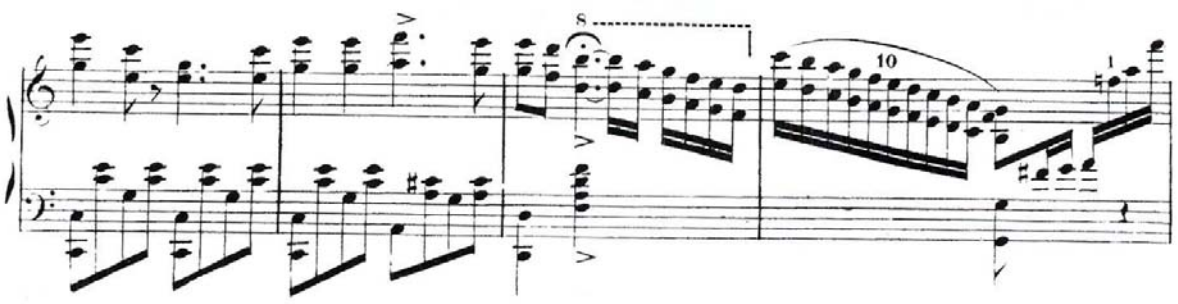
Example 3.218. H. Herz: *Empress Henrietta's Waltz*, bars 14-19 (Boston: Henry Prentiss, 1839-46).

As the tempo for this little dance is not given, this run could easily been intended for proper finger articulation, even if the second beat contains one more note than the other two beats in that bar. A later edition specifically indicates this irregularity and gives a fingering for the first note. (Ex. 3.219.) There is not much sense in specifying the thumb here if the run is to be played with regular fingering. More likely, the "1" here means to be the finger with which to glide over all 19 keys.



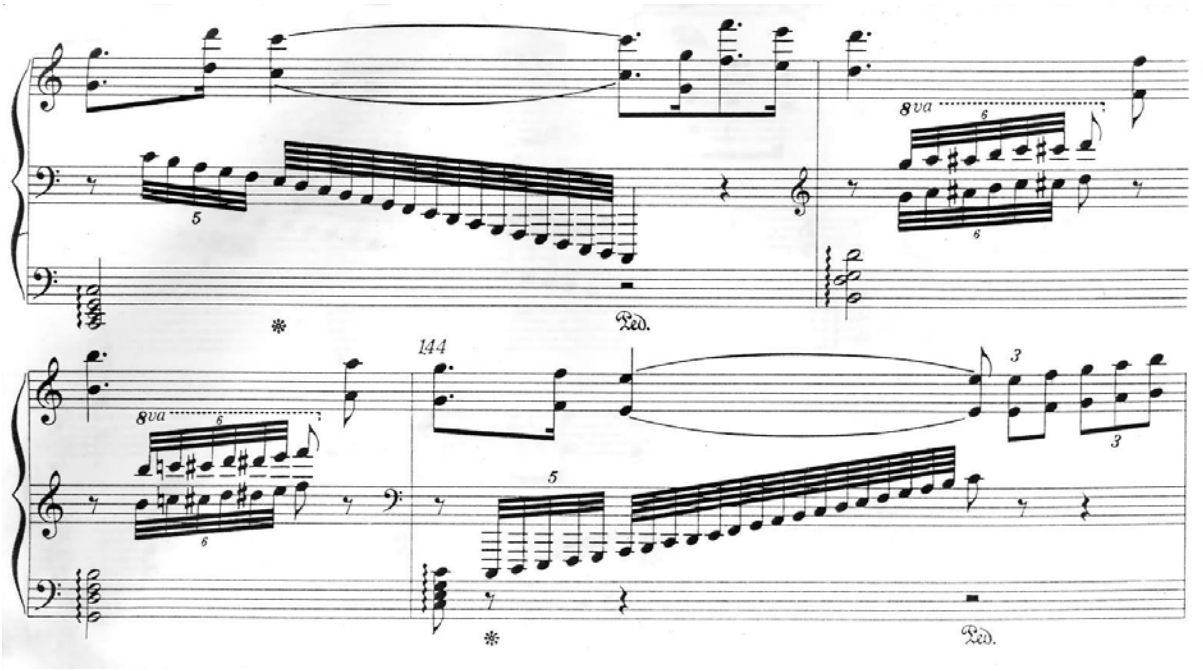
Example 3.219. H. Herz: *Empress Henrietta's Waltz*, bars 17-19 (New York: F. Riley & Co, 1845-47).

In Raff's *Divertimento* it is the tempo of the main material that points towards the run in sixths to be a glissando. (Ex. 3.220.) The 4/4 metrum is clearly condensed to 2 beats per bar and in order to keep the flow of the Allegro going – the fermata that really closes this section is found in bar 115 (not shown here) – only a glissando can assure the necessary speed.



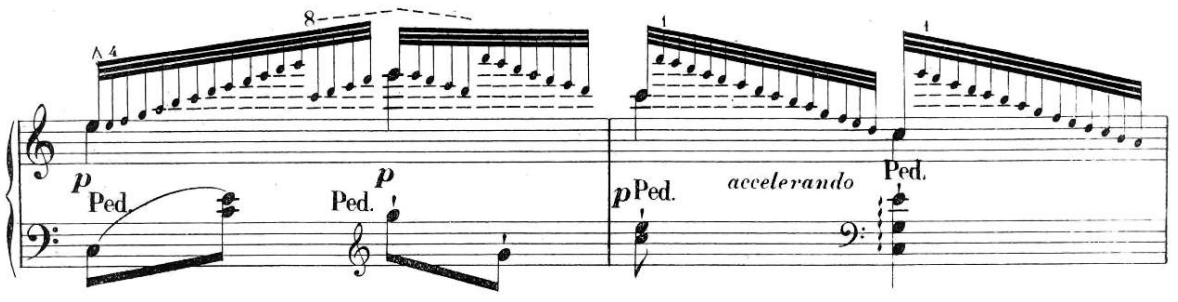
Example 3.220. J. Raff: *Divertimento über Motive aus 'Die Jüdin' von J. Halevy* opus 43 (1851), bars 110-113.

Even more so than in Raff, speed dictates the technique with which to execute the long left hand runs in Berwald's *March triomphale.* (Ex. 3.221.)



Example 3.221. Fr. Berwald: *Marche triomphale* in C (1850's), bars 142-144.

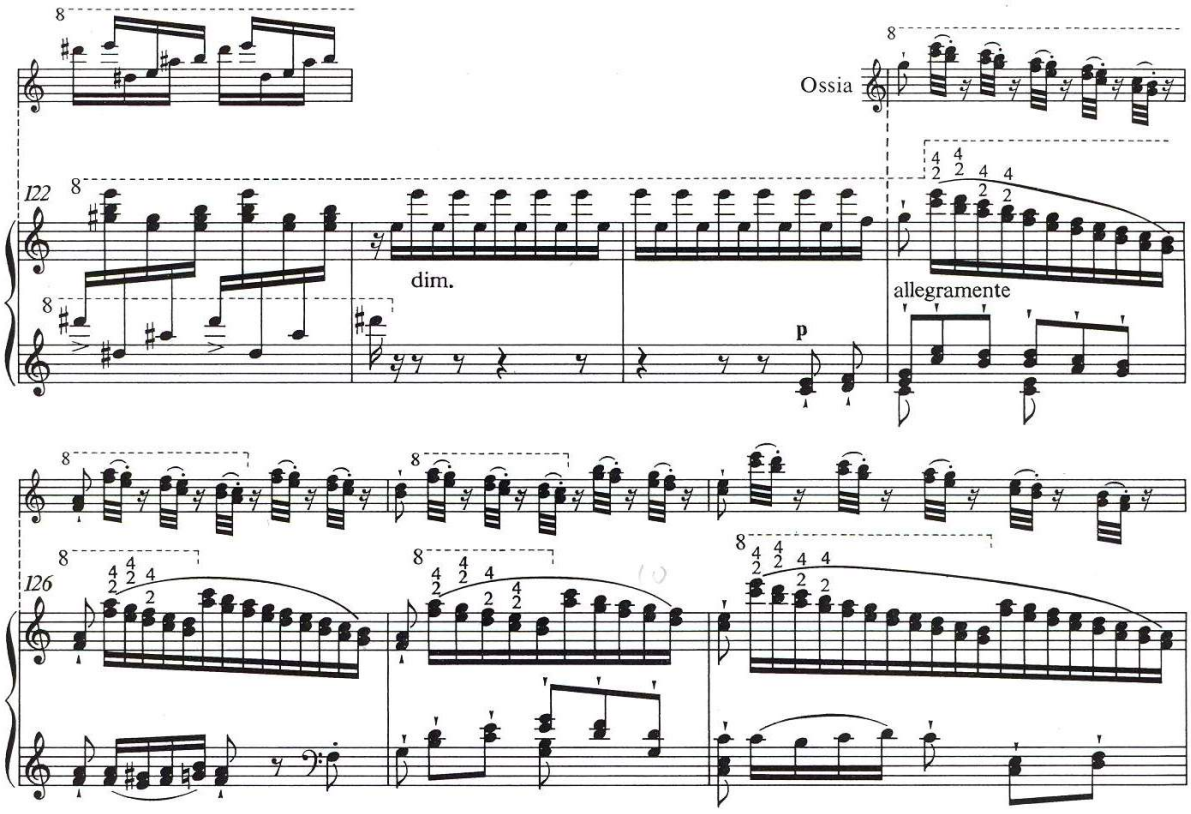
Some composers decide on their own way of indicating glissando technique. In Alfred Quidant's description of falling stars, his fingering affirms the obvious suspicion of glissando playing: there would be no other reason for starting a long outward run with the 4th finger or an inward one with the thumb. (Ex. 3.222.)



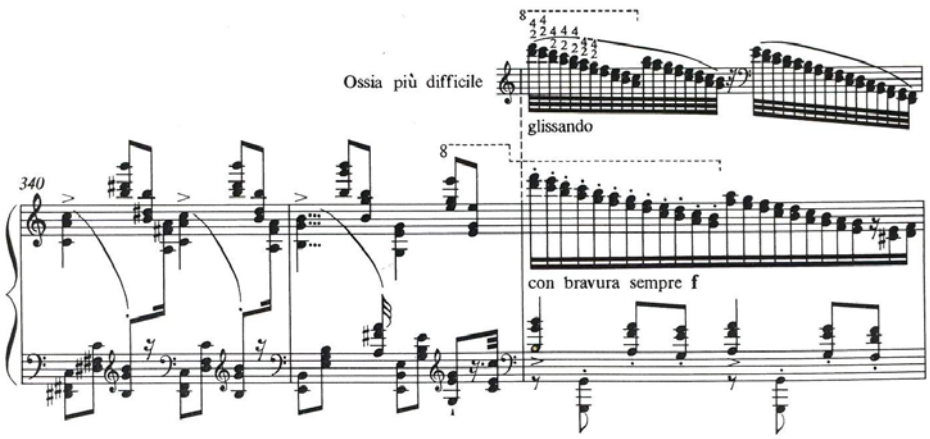
Example 3.222. A. Quidant: *Les Mystères du coeur* opus 32 (1851), Nr. 4: *Les Etoiles Filantes*, bars 115-116.

Quidant's score shows how the existing system of notating fingerings by little numbers can be sufficient and efficient to affirm that a run is a glissando as well as to indicate the particular way to execute the glissando. This is very probably the reason why the word glissando is still often used only at the beginning of a multiple glissando passage (and not at every glissando) in this period, while finger indications can still be more elaborate.

In one case – the 1840 version of Liszt's fantasy on *Lucrezia Borgia* – only fingerings are used to specify glissandi in thirds (ex. 3.223). (The word "glissando" at the beginning of an ossia passage further in the piece – ex. 3.224 – is not original.)



Example 3.223. Fr. Liszt: *Fantaisie sur des motifs favoris de l'opéra Lucrezia Borgia de G. Donizetti*, 1st version (1840), bars 122-128.[626]



Example 3.224. Fr. Liszt: *Fantaisie sur des motifs favoris de l'opéra Lucrezia Borgia de G. Donizetti*, 1st version (1840), bars 340-342.[627]

[626] New Liszt Edition, Series II, Volume V; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.

Putting aside this *Lucrezia Borgia* case – in all other pieces Liszt uses the "glissando" word – composers generally liked to stick with their choice for a while (e.g. Herz who continued to use straight lines to symbolize repeated fingerings) or to go with the flow when consensus was reached (e.g. Raff, who switched to *glissato* in 1851 and then to *glissando* in 1862). As far as our investigation has reached, Berwald's *Marche triomphale* from the 1850's was the last score that contained a glissando without saying exactly so.

[627] New Liszt Edition, Series II, Volume V; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.

3.3.2.3.2 Franz Liszt

Throughout the 18th century, composers used the glissando sparingly. If they wrote more than one, they stuck to the same type. Scarlatti only wrote single note upwards right hand melodic glissandos, Haydn used only short downwards right hand octave glissandos at the end of a piece, and Beethoven's gave us only inwards octave glissandos. In the 19th century, we see a few composers paying more diverse attention to this technique in their works. Herz experimented with different types, settings and functions to the point that we can expect him to have tied the glissando to his reputation as a concert pianist, making the technique a part of his personal virtuoso toolbox as Daniel Steibelt tried to make a reputation as the developer (if not the inventor) of the pedal markings and techniques.

Apart from Herz, and much more so, Franz Liszt has made the glissando a trademark of his performance technique. A highpoint in any sense, for any aspect of 19th century piano repertoire and its development, Franz Liszt is a key figure for the development of the keyboard glissando. In between 1838 and 1881 he wrote more of them than any other composer before and after him, he used more of them in one composition than anyone else (57 in the 1849 *Illustration du Prophète* alone), wrote more pieces containing them, found more ways in which to apply them, tried out more possible combinations and went furthest in arranging other composer's glissando passages.

3.3.2.3.2 Transcendental technique and the glissando

From his childhood, Liszt had come in contact with the glissando. In 1822 – eleven years old and studying with Czerny – he was one of the 51 composers honored with Diabelli's request for a variation on a now very famous theme. One of his colleagues was Fr. D. Weber, who ended his contribution with a glissando in sixths. Liszt must surely have seen this 45th variation when the set was published. A year later, the Hungarian boy performed Hummel's piano concerto in A minor opus 85 and was reported to have played Beethoven's opus 15[770]. Czerny would surely have taught him to play an octave glissando in at least opus 15 and almost certainly in Hummel's coincidental instance. In the 1830's, the decade of the Parisian melting pot of international virtuoso pianism, Liszt was befriended with Herz and Alkan, undoubtedly hearing, seeing and playing (*a prima vista* if not on a stage) their music.[771] In 1837, he played Weber's *Concert-Stueck* during one of the installments of his public duel with rival Thalberg, by which time Liszt had produced his own first score containing glissandos similar to existing examples in thirds and sixths, but by combining them to take his colleagues' ideas one step further. (Ex. 3.212.)

During the 1830's Paris was a hotbed for virtuoso pianists. Dozens of them played there regularly, many lived in the city, and the conservatoire became the ultimate school for training them. To survive in a biotope that requires profile to survive, pianists marketed those technical abilities in which they excelled. Like Steibelt had made efforts to earn a reputation by way of the pedal, Dreyschock was famed for his showstoppingly fast octaves, Kalkbrenner for his clean and pearly passagework and Thalberg for his "three-hand" textures. To continue on this line of thinking, Herz' interest in the glissando in thirds may well have been a feature in his career as much as in his repertoire.

[770] See Walker 2004, p. 83-85.
[771] Liszt and Herz corresponded at some time (see Walker 2004, p. 22, fn.45), even played together in public (Idem, p. 165).

It is in this highly competitive environment that Liszt went on stage with an unseen characteristic: whereas his colleagues cultivated specific branches of piano technique to protect the valuable and necessary perception of their playing's individuality, Liszt went for the "all-in" approach: "there was nothing they could do as a group that he could not do himself."[772] He was not the first to think of a level on its own, outside of competition. Paganini had been the example when he played in Paris in April of 1832, with Liszt in the audience. It was Paganini's playing which inspired Liszt to a first creative burst of revolutionary advance in piano performance technique. The juvenile sense of adventure and confidence in his *Etude en douze exercices* opus 6 – begun at age thirteen and published in 1826 – still feeds on the authority of Czerny's *Fingerfertigkeit*. After hearing Paganini, he set himself precise and daunting goals to do for the piano what his great new idol had done for the violin. It took him five years to develop his intentions and show the world a new level of pianistic technique in the 1837 *Douze Grandes Études* (the second version of his opus 6) and the six 1838 *Études d'exécution transcendante d'après Paganini*. The twelve great studies were dedicated to his teacher Carl Czerny – as were the early "exercices" – but this time their technical aspects had gone far beyond the principles of his old master. Liszt escaped the constraints of classical thought on further developing technique by introducing ergonomically practical ways of approaching keyboard problems, turning a mental knob to solve a physical problem. Instead of seeing a hand for the melody in the treble and one for an accompaniment in the bass, with each five fingers to more or less encompass an octave before changing position, he saw ten fingers and no taboos. Besides expanding and extending existing characteristics of piano playing technique – such as the traditional predominance of the middle register, the use of the pedals as a mere special effect, the timid dynamic range and minimal expression markings, some basic stages of existing techniques like trills, tremolos, repeated notes, alternating and crossing hands, and even other pianist's trademark feats (like Thalberg's "three hand technique")[773] – he also introduced new ways of looking at the very concept of keyboard technique. Attention has already been drawn on the way the Paganini studies show how Liszt not only transferred the notes – difficult as they are – from the violin score to the keyboard, but also the pedagogical aspects of the original caprice itself, reformulating the problem in pianistic terms.[774] But the link between Liszt's new music and violin virtuosity goes directly, purposefully and concretely to the essence of piano playing itself. The way Paganini could fool the audience into believing that he could execute what was not possible (by sometimes simple tricks like scordatura)[775] is exemplary to some of Liszt's ideas, such as his technique of interlocked hands to simulate fast octave runs. Inspired by the violin technique, Liszt's fresh look upon the keyboard enabled him to use a topographical feel of it, distinguishing between passage work on black keys versus on white keys on the basis of what works better, instead of letting the tonality determine the difficulty. The violinistic principle that all four fingers are to be used interchangeably is mirrored on some of Liszt's fingerings which demand the ten fingers to operate independently and deployable on any key in any position, e.g. a melody with the fifth finger on top of a sustained chord in the same hand (Liszt's transcription of Schubert's *Erlkönig* from 1837) or, later in 1863, with the *123451234512345* fingering for a run in C# major ((*Rhapodie Espagnole*), showing a high level of flexibility in scale playing. The first verse of the original 1838 version of the *Sonetto 104* is for the left hand alone, in several aspects comparable to the idea of a piece on the G-string of the violin.

As ergonomical as Liszt started to think from 1832 onwards, and as all-encompassing his approach seems to have been, he did not do much with the glissando, even if that technique was the most intrinsically violinistic of all, old and new. It may have been the fact that Paganini did not do much with it either, as if proper fingering on the violin was as important for him as it had been for generations of piano masters. Be what it may,

[772] Walker 2004, p. 167.
[773] See Walker 2004, p. 285-318.
[774] See Walker 2004, p. 308.
[775] See the anecdote as in Walker 2004, p. 173.

Liszt only wrote one instance of glissando before he compiled his technical maturity into the two-fold compendium of studies: a set of to-and-fro double note glissandos in his 1833 Berlioz transcription, looking like the ones in Herz' opus 42 from 1828. The studies contain no sign or hint of a glissando either.[776] But this anti-climactic surprise is short lived and his fascination with this technique was roused almost immediately after this compendium of personal technical expertise had been put together. Two periods can then be distinguished in Liszt's glissando writing: a first and almost reckless involvement with the technique's potential during his most public faze of life as a pianist, followed by a more mature handling of the glissando at its most efficient.

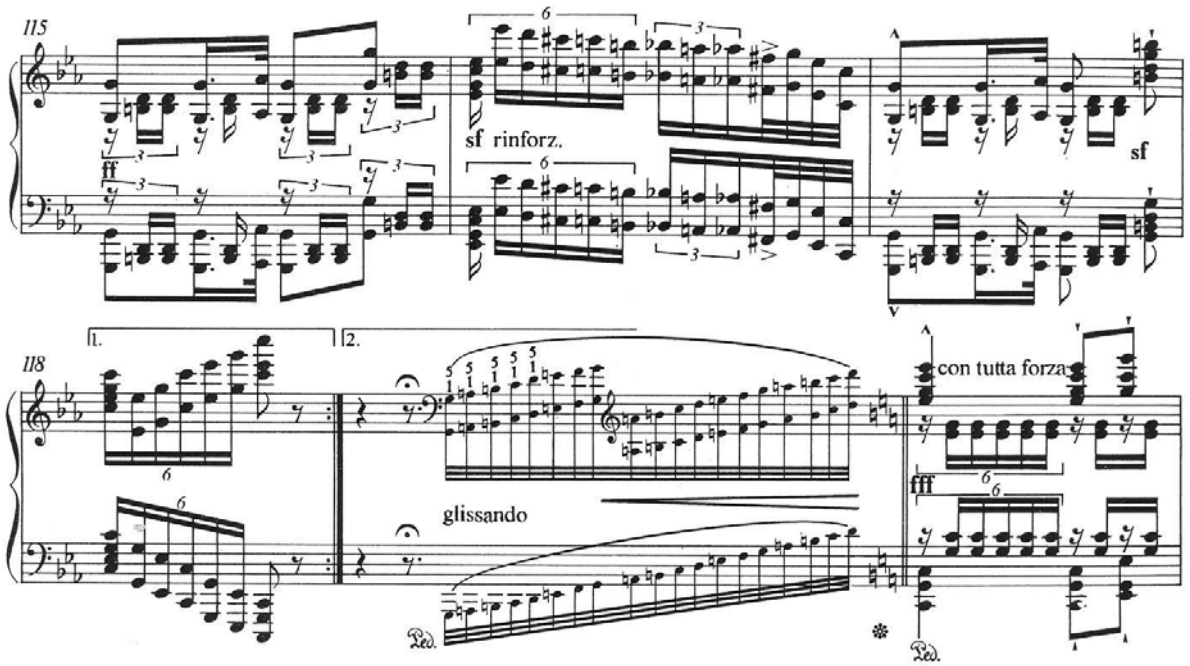
3.3.2.3.2.2 Bigger is better

Liszt's years between 1839 and 1847 have been called those of "transcendental execution,"[777] referring both to the way he transformed piano playing technique and to the intense travel period Liszt now embarked upon. These years as a traveling virtuoso – his "Glanzzeit" – coincided with Liszt's most intense interest in the glissando.
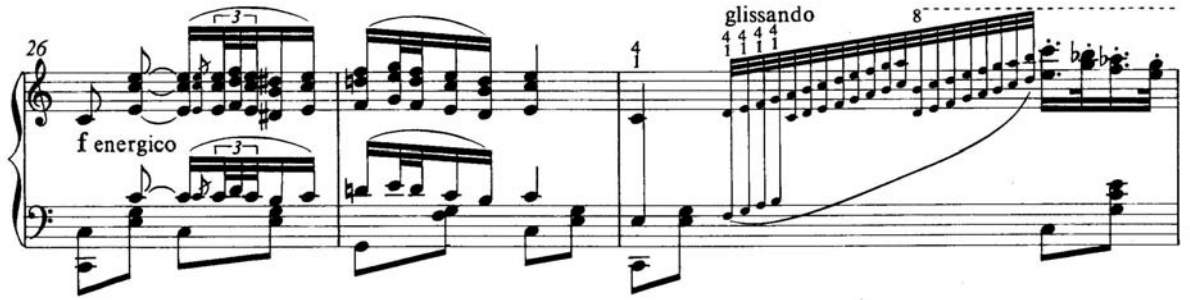
Liszt's glissandos in his arrangement of Berlioz's *Symphonie Fantastique* (ex. 3.212) - the first ones we have found in his output – are not used overly confidently yet (they appear in the ossia only) but they show the remarkable potential Liszt had in stall: not only are these glissandos programmatical (depicting the whirlwind climax of the witches' Sabbath), they are also emulating orchestral colors, they may be the first accompanying glissandos, and at this stage they are a rather uncommon example of different types of glissandos linked together.

The next Liszt pieces including glissandos are the *Mélodies hongroises d'après Schubert* (ex. 3.225) and two of his *Magyar dalok* (ex. 3.226, 3.227 and 3.228), all written during his 1838-1839 stay in Hungary, where and when Liszt rediscovered his cultural heritage after fifteen years of life in Paris.

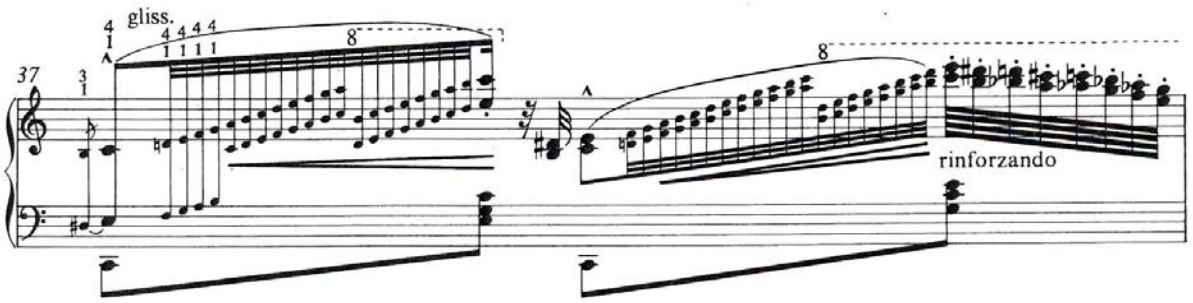
[776] The glissandos in the 5th Paganini study in E major, as we know them from the 1851 Grandes Études de Paganini, were not yet part of the 1838 *Études d'exécution transcendante d'après Paganini*.
[777] Walker 2004, p. 283 used the expression for the title of Book Four of his biography.



Example 3.225. Fr. Liszt: *Mélodies hongroises d'après Schubert* (1838-39), nr. 2 *Marcia*, bars 115-120.[778]

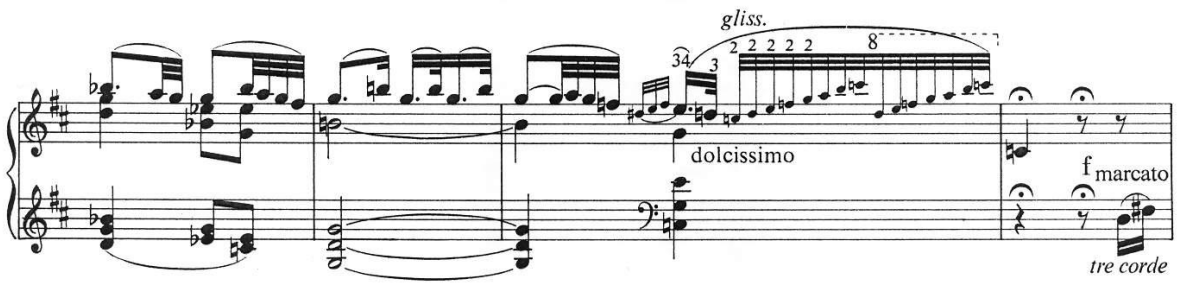


Example 3.226. Fr. Liszt: *Magyar dalok - Ungarische National-Melodie 9* (1838-39), bars 26-28.[779]



Example 3.227. Fr. Liszt: *Magyar dalok - Ungarische National-Melodie 9* (1838-39), bar 37.[780]

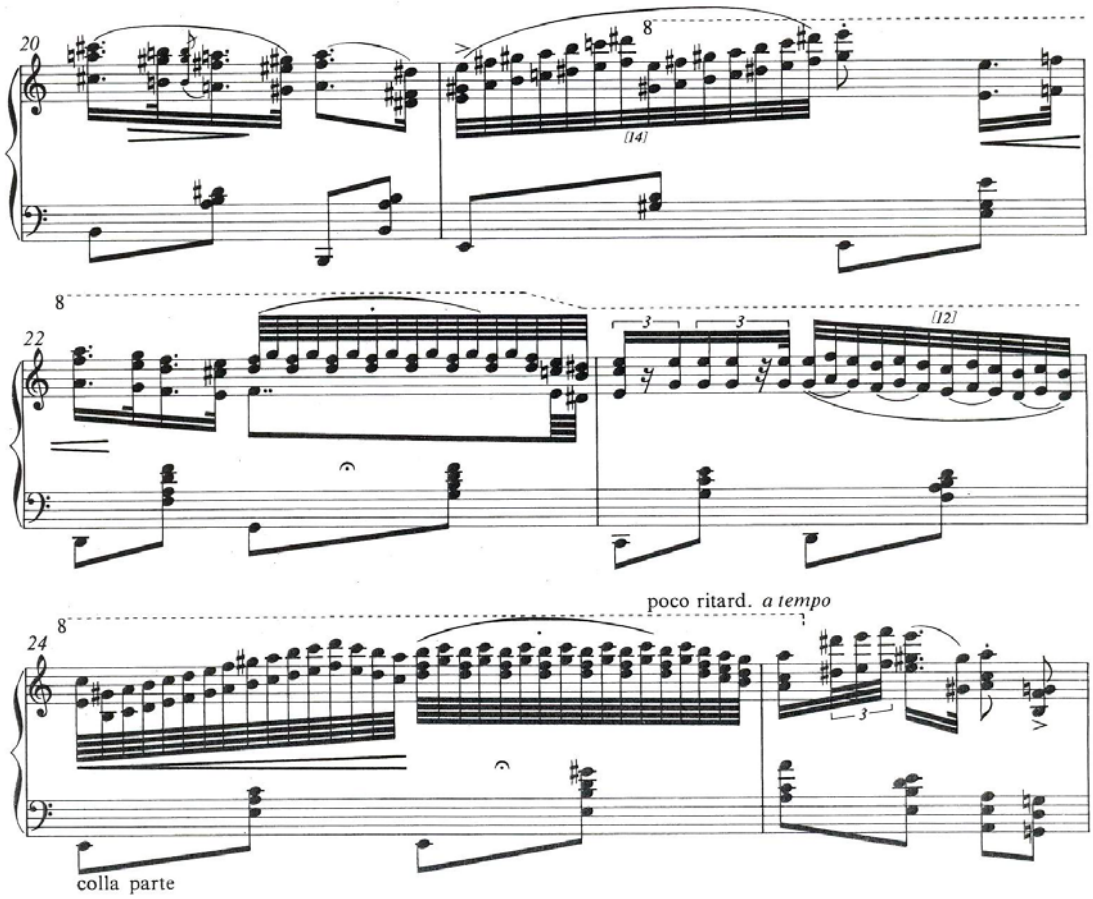
[778] New Liszt Edition, Series II, Volume 3; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[779] New Liszt Edition, Series I, Volume 18 (Supplement); Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[780] New Liszt Edition, Series I, Volume 18 (Supplement); Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.



Example 3.228. Fr. Liszt: *Magyar dalok - Ungarische National-Melodie 10* (1838-39), bars 9-12.[781]

The Schubert two-hand glissando reminds us of the ones in Weber's second concerto and *Concert-Stueck*, especially in its structural position as an upbeat to a repeat of thematic material at the highpoint of a steadily prepared build-up.
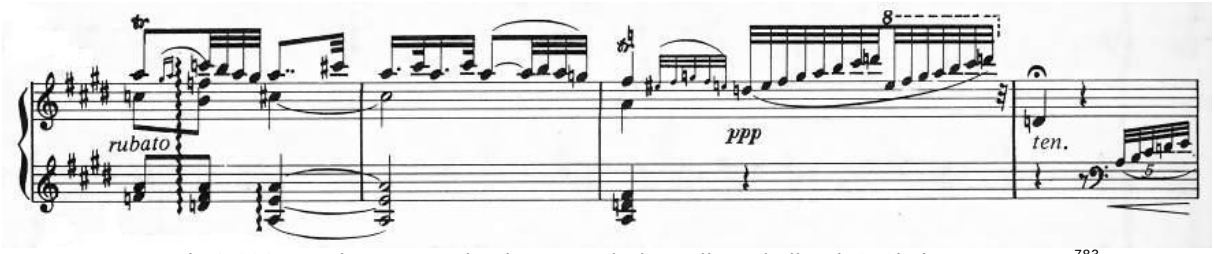
Unlike the advantage of the fermata in the Schubert arrangement, enabling the performer to take as much time as he needs to cover the 2.5 octaves, the glissandos in the 9th *Magyar dalok* are notated completely out of time. The difficulty of gliding over such a stretch at a speed that cannot afford the performer to lose too much of the appropriate tempo (even if this instance is from the *lento* and rhapsodic "frissu" part of the piece), is anticipated in some of the passagework (ex. 3.229). It is also this double note version of the melodic material that dictates the use of glissandos in sixths that follow it (see ex. 3.226 and 3.227).



Example 3.229. Fr. Liszt: *Magyar dalok - Ungarische National-Melodie 9* (1838-39), bars 20-25.[782]

[781] New Liszt Edition, Series I, Volume 18 (Supplement); Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.

The single note glissando in the 10th *Magyar dalok* (ex.3.228) is a simple one leading to a bog jump, and in the score of the later version of this piece for piano and orchestra (*Fantasie über Ungarische Volksmelodien*), where this section is transposed to D major so the upwards run is individually articulated, we can see how Liszt played the transition from the upward run to the fermata three octaves lower. (Ex. 3.230.)
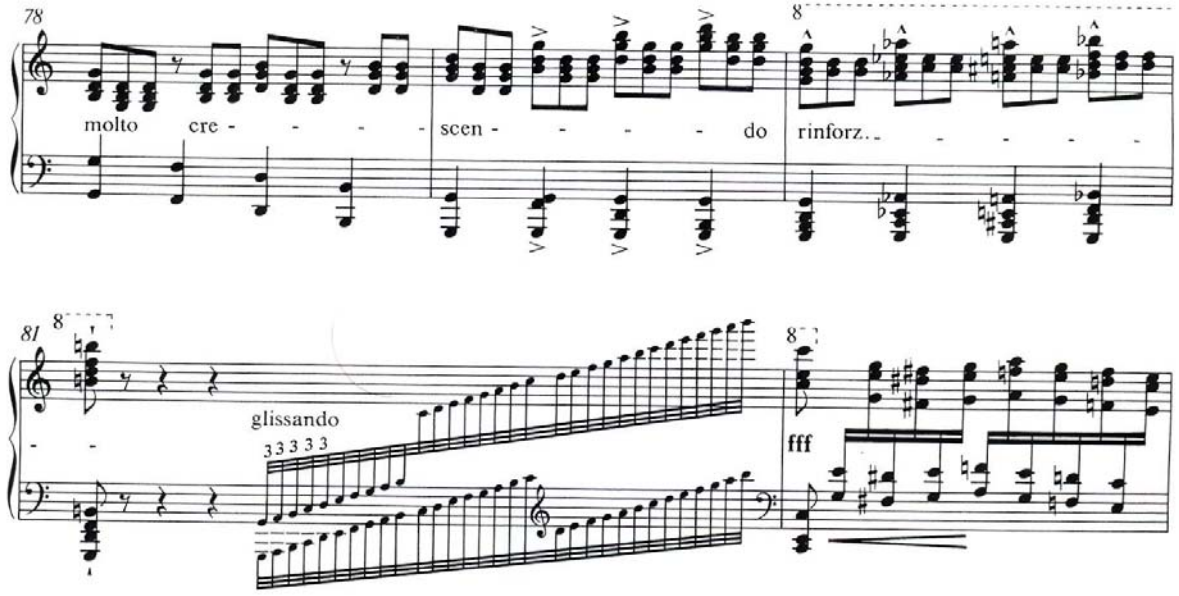


Example 3.230. Fr. Liszt: *Fantasie über Ungarische Volksmelodien* (1852), bars 114-117.[783]

There is no proof that this suddenly renewed interest of Liszt in the glissando has a direct link to the music of the gypsy bands. The typical sounds of the cimbalom and the specific techniques to perform them found their ways into the *Magyar dalok* immediately, especially in the slow frissu parts with tremolos often written out for interlocked hands. But even if such idiomatic writing – e.g. playing trills with alternating hands as on the cimbalom – may have driven Liszt to think about percussive ergonomics in performance and bring him to associate it with the glissando, the reasons for deploying this technique right here in these arrangements of "Hungarian" melodies may be more down to earth. The glissando in the Liszt/Schubert instance occurs in the middle of a section where all melodic material is written in octaves. Needing an impressive upbeat, especially with the historical examples Liszt knew so well, the octave glissando with gliding accompaniment was not a far-fetched idea. Similarly, the glissandos in the Magyar song appear in the section that repeats (and develops) in double notes what preceded as a single declamatory line. As in the Mozart example from the previous century, double note glissandos here are organically necessary to keep the melodic timbre and intensity consistent with what comes before and afterwards.

The next piece is an arrangement of a so-called 15th century Hussite song (ex. 3.231), composed quickly in August 1840. Like in the Schubert and Magyar pieces, the glissandos are still conventional in that they use existing types and functions, if expanded a little from what his colleagues and predecessors had done. While the *Magyar dalok* glissandos were classical melodic downbeat types (though the juxtaposition of two different types was still rare), the ones in the Hussite song make for a structural upbeat much like in the Schubert adaptation. What is poignantly different however is that in the *Mélodies hongroises* a fermata stops the meter of the bar and allows the pianist to take all the time he needs for the triple glissando (ex. 3. 225) – in the *Hussitenlied* there is only one beat (tempo *Allegro con strepito*) to cover more than four octaves. In both cases the glissando upbeat turns out as an extra metrical stress on the last beat of the bar: the number of notes to be played stretches the beat they are in, making that beat heavier even than the first beat of the next bar.

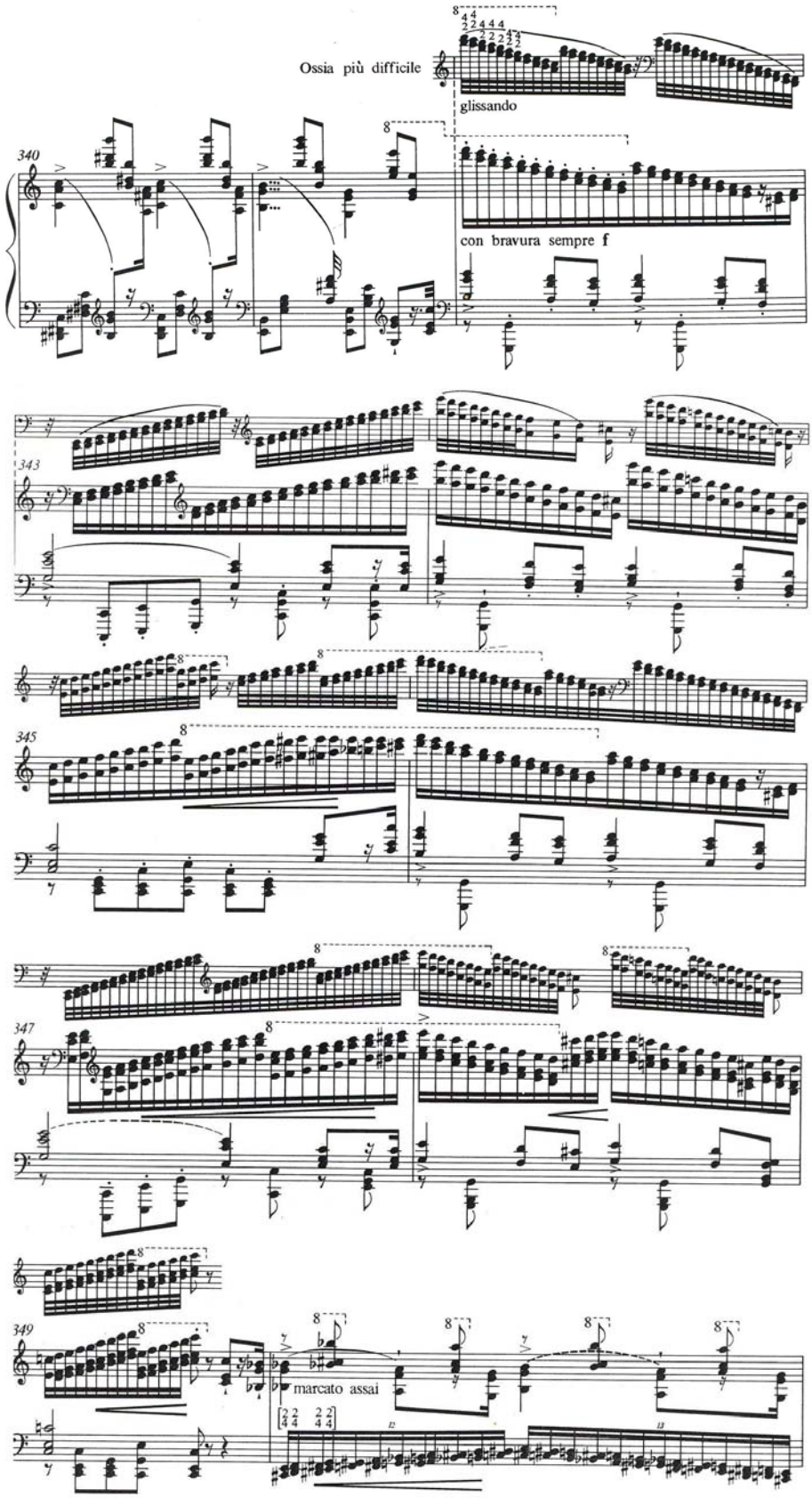
[782] New Liszt Edition, Series I, Volume 18 (Supplement); Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[783] From the Eulenburg edition, nr. 1298, plate number EE 6685. Reproduced by permission of Schott Music GmbH & Co. KG.



Example 3.231. Fr. Liszt: *Hussitenlied aus dem 15. Jahrhundert* (1840), bars 78-82.[784]

If these three pieces show only little of Liszt's capacity to expand all existing techniques onto an unheard-of level, that very stage was reached only a couple of months later. Somewhere in October/November of 1840, during his performances in Hamburg, he wrote the first version of his paraphrase on the poison drinking scenes in Gaetano Donizetti's melodrama *Lucrezia Borgia* from 1833 (but which was not produced until 1840). Liszt has been noted to describe this opera as requiring "a stronger application of colors" due to the "more drastic subject."[785] Whether or not the need for colors had anything to do with it, he seems to have acquiesced to a sudden inflammation with the glissando in his fantasy *Chanson à boire (orgie)*[786], based on the dramatic climax that leads to the opera's finale. There are no less than 25 double note right hand glissandos in it, from 10 to 36 notes in length, sometimes even crossing the left hand. The first appearances are in the main text, with a simpler *ossia* to provide an alternative (ex. 3.223), the second time he uses glissandos to adorn the melody, then self-consciously notated as the *ossia più difficile* (ex. 3.232). From the performance practical point of view, it is striking how the length of the glissandos in thirds in the first passage (ex. 3.223) varies from 11 to 19 notes, to be played in five 8th notes' time. In contrast to the almost impractically high speed for the upbeat glissandos in the *Hussitenlied* and the *Mélodies hongroises*, the *Lucrezia Borgia* glissandos in thirds are sometimes hardly fast enough to gain much comfortable momentum. On the other hand, it is fascinating to see how Liszt notated a written-out ritenuto (in the first downwards glissando in sixths) to make sure the performer takes his time when approaching the black key. (See bar 344.)

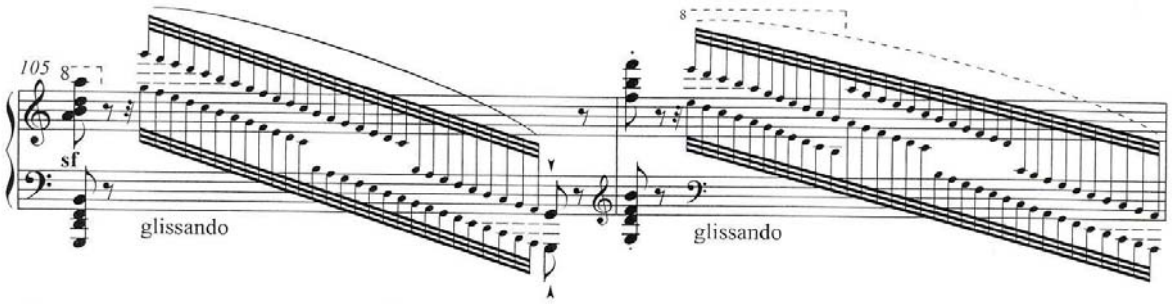
[784] New Liszt Edition, Series II, Volume V; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[785] As quoted in Mezö 1999, p. XIII.
[786] Published in 1841 with that title in Paris and as *Fantaisie pour le piano sur des motifs favoris de l'opéra Lucrezia Borgia de G. Donizetti* in Vienna.



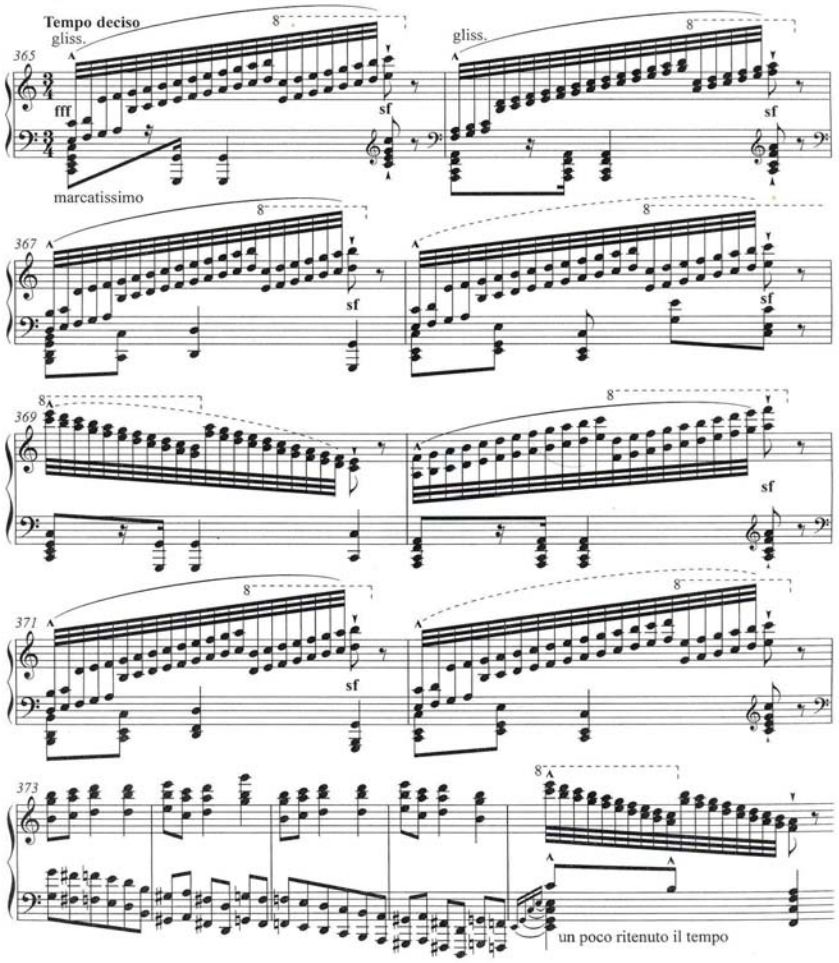
Example 3.232. Fr. Liszt: *Fantaisie sur des motifs favoris de l'opéra Lucrezia Borgia de G. Donizetti*, 1st version (1840), bars 340-350.[787]

[787] New Liszt Edition, Series II, Volume V; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.

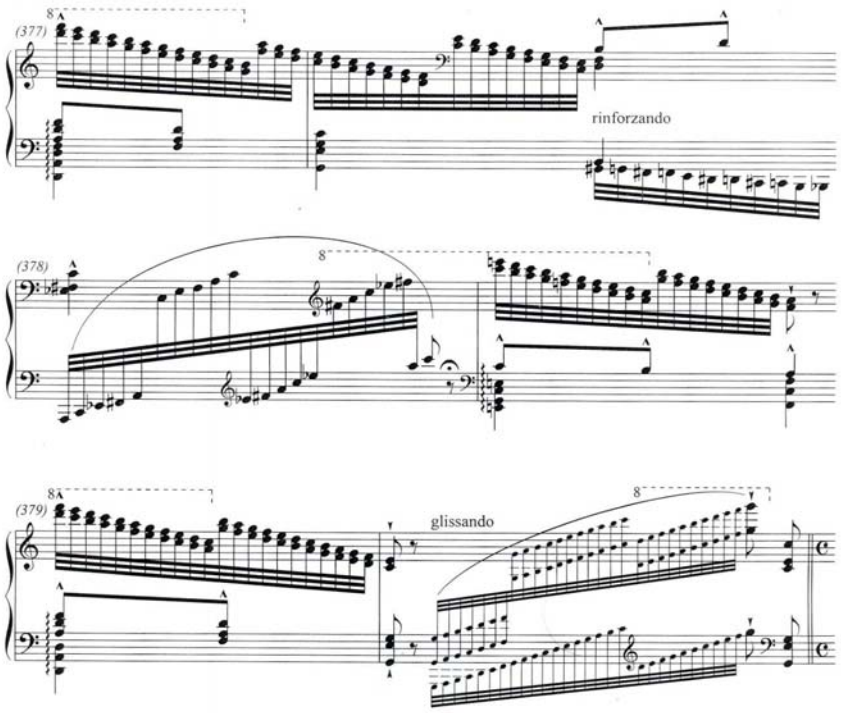
It is with the *Lucrezia Borgia* paraphrase that we see the glissando attract Liszt's general interest in bringing any technique to its practical limits. The ornamental variation technique has now become necessary as a format to try out all that is possible with the glissando. He wasn't finished doing so with this one paraphrase, though, and we will see Liszt use this coupling of glissando and variation format time and again. In 1843, he wrote another such glissando vehicle: *Gaudeamus Igitur*. This time there are single glissandos, third-, sixth- and octave glissandos, and all are in the main text. (Ex. 3.233 and 3.234.)



Example 3.233. Fr. Liszt: *Gaudeamus Igitur*, 1st version (1843), bars 105-106.[788]



[788] New Liszt Edition, Series II, Volume VI; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.



Example 3.234. Fr. Liszt: *Gaudeamus Igitur*, 1st version (1843), bars 365-380.[789]

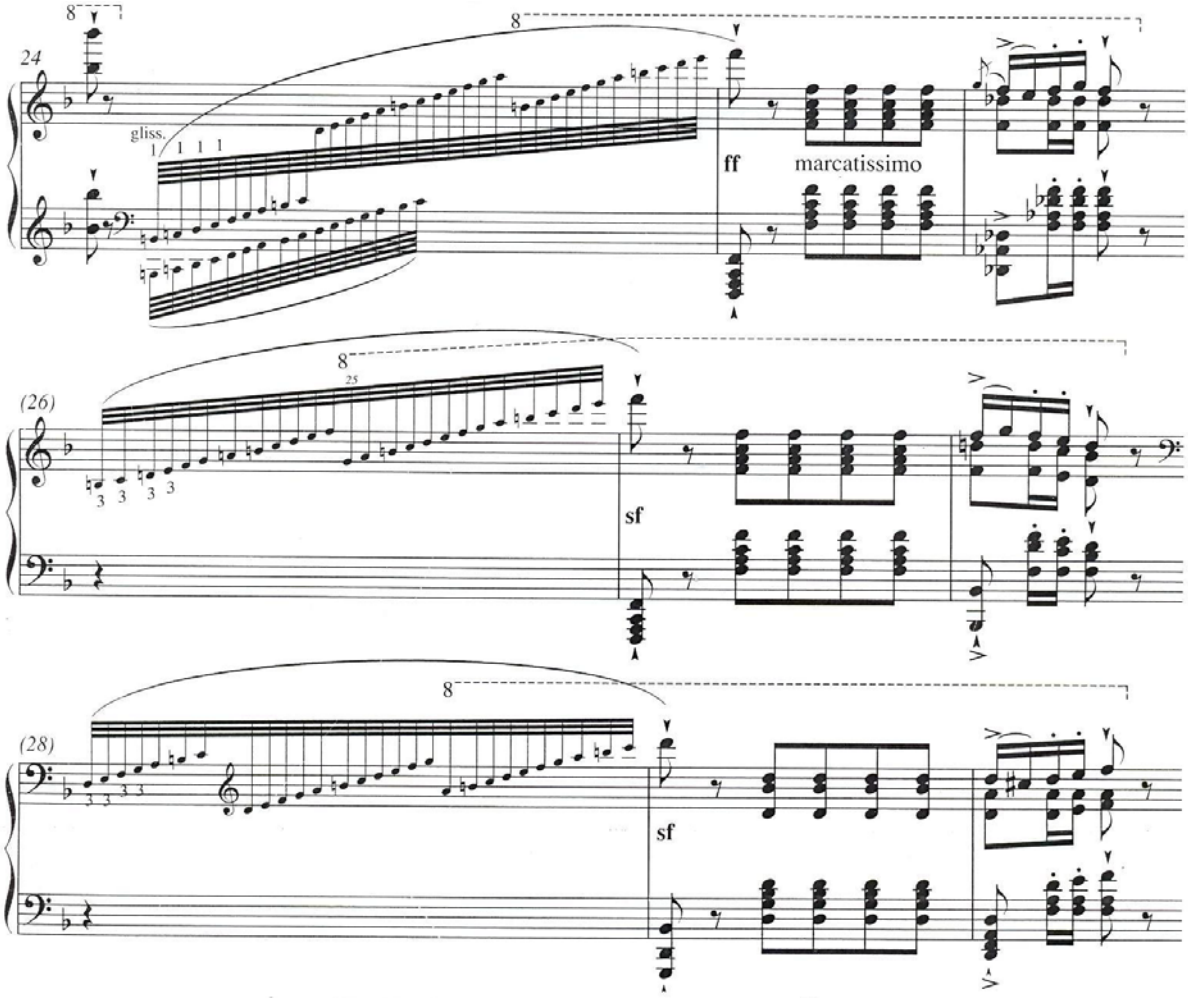
There is now differentiation on different levels: types, functions and even notation. The single downward glissandos are used incidentally to mark the build-up of a cadence (ex. 3.233); the combination of double- and single-note glissandos is closing off the section (ex. 3.234, bar 380). These occasional structural glissandos are put in small print, whereas the double-note glissandos ornamenting the theme in the rest of this section (ex. 3.234, bars 365-379) are printed with bold type. The latter are in fact not just an accompaniment, their first notes are generally the same as the left hand's, reinforcing the melody as well as metric pulse of the theme on the first and third beats. The way the glissando partakes in – and at times overtakes – the theme is further illustrated in bars 367 and 371, where the original theme's third beat note (normally a B) only occurs in the right hand. The hemiolas in bars 377-378 and 379-380 are also stressed by the structure of the glissando writing. Because of that hemiola structure, the four octave long two-hand glissando in bar 380 starts on a stressed "meta-beat" (the upbeat in the hemiola meter), profiting from such a rubato-opportunity to take the time necessary for this difficult feat. (Compare with the *Hussitenlied* above, ex. 3.231.)

In one early edition of the first version of *Gaudeaumus Igitur*, an asterisk at the beginning of the double-note glissando section points to a footnote allowing the performer to skip all 43 bars of this variation.[790] Liszt may have realized that he was pushing the limits of the technique perhaps too much, especially since the pianos' key weight and –dip would increase and make such dense glissando writing difficult and even painful to perform.

Two years later – in 1845, during his Iberian tour – Liszt wrote another such glissando showpiece, the *Grosse Konzertfantasie über spanische Weisen*, and he now seems to have relaxed a little. There are no double note glissandos and, even though the keyboard

[789] New Liszt Edition, Series II, Volume VI; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[790] *Gaudeamus Igitur. Paraphrase von F. Liszt* published by Julius Hainauer, Breslau. As found in US-Nyj: 2 L699 AA Dana v.13 p.13-29. The information of this US collection (The Ruth Dana Collection) specifies that this is a first edition (1843) and the score shows plate number J.H. 953. Oddly enough, the editor's notes in the Editio Musica Budapest publication claim that the first edition (by Hainauer) has no plate number. (Sulyok 2001, p. XVI.)

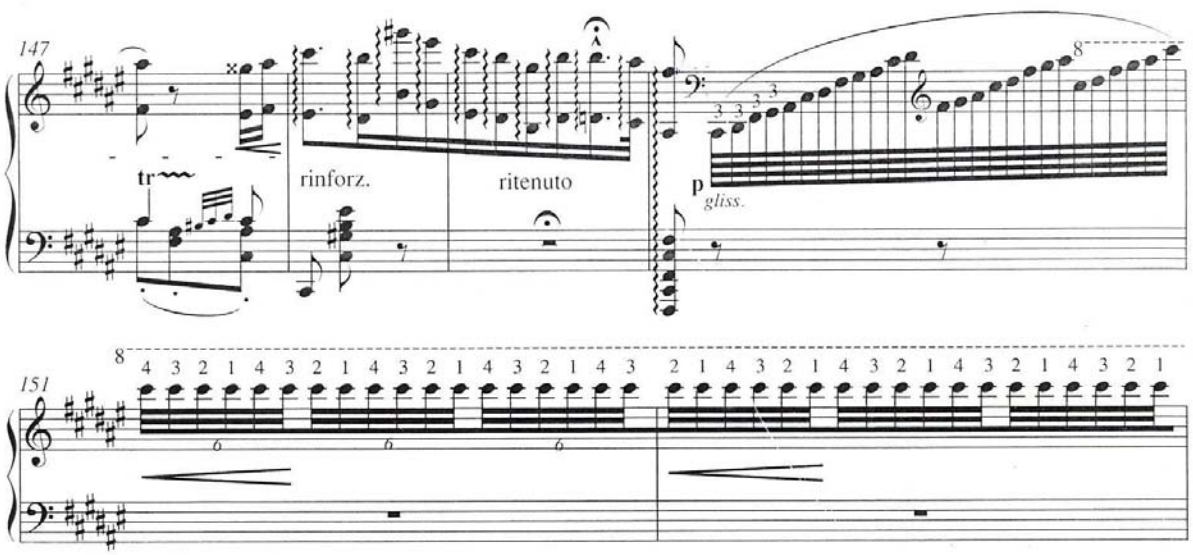
distance covered in one beat can be unrealistically high, there is now a degree of compassion towards the ease of performance: one of the left hand glissandos is broken off in order to make time and place for the hand to move towards the next chord in the bass (ex. 3.235).



Example 3.235. Fr. Liszt: *Grosse Konzertfantasie über spanische Weisen* (1845), bars 24-30.[791]
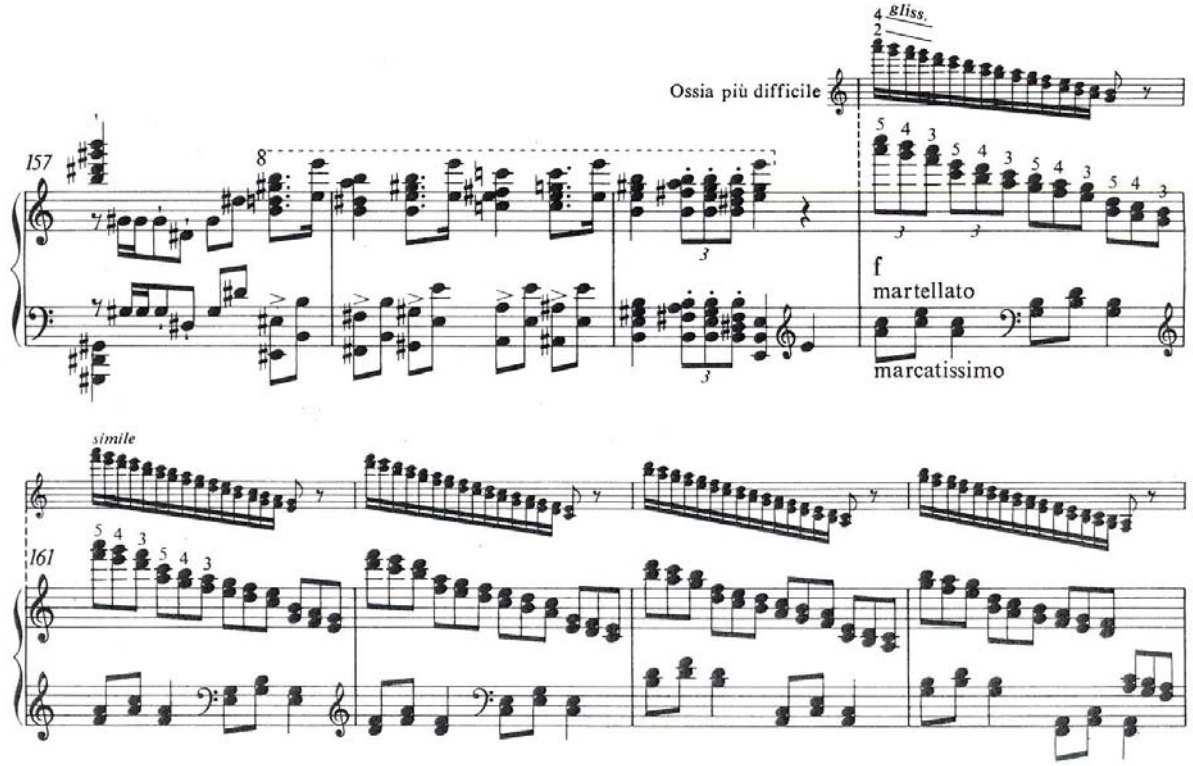
Liszt's apparent mitigation in glissando virtuosity should not be mistaken for a lack of interest in matters of glissando writing. His concern for performance practical efficiency and comfort was perhaps the very reason for him to introduce in this composition a new step in the development of the technique: when the modulation arrives at F# major, he writes a glissando on black keys. (Ex. 3.236.)

[791] New Liszt Edition, Series II, Volume VI; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.



Example 3.236. Fr. Liszt: *Grosse Konzertfantasie über spanische Weisen* (1845), bars 147-152.[792]

After the Iberian tour, Liszt paid another extended visit to his native land. Continuing to explore his interests in the music of the gypsy's bands, he wrote another set of Magyar pieces in 1846-1847. Following the first eleven *Magyar dalok - Ungarische National-Melodien*, he now produced eleven *Magyar rapszódiák – Ungarische Rhapsodien*. One of these – the number 13 – carries the subtitle *Rackóczi-Marsch*. Liszt had known this melody for a long while now, having improvised on it as early as 1823, and composed a first version in 1839. While this first version contains no glissandos, the one from his second trip to Hungary does. (Ex. 3.237.)



Example 3.237. Fr. Liszt: *Ungarische Rhapsodie – Magyar rapszódiák 13 (Rákóczi-Marsch)* (1846-47), bars 157-164.[793]

[792] New Liszt Edition, Series II, Volume VI; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
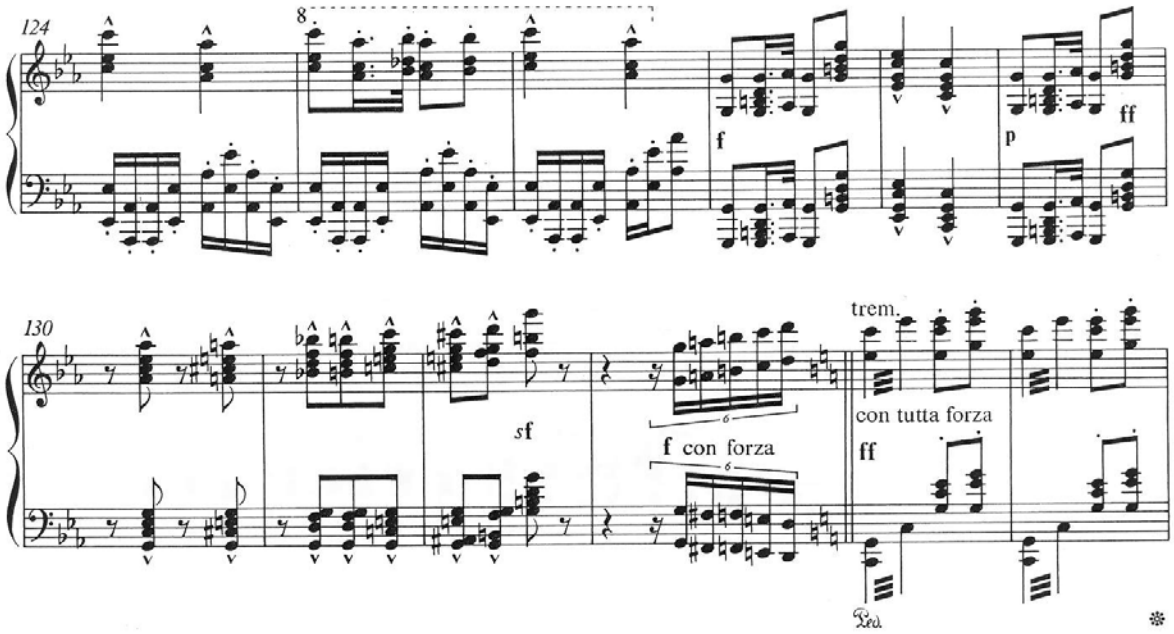
The glissandos in this second rendering of the March theme do not stand in any particular relation to the first version. In fact, both pieces (and the subsequent ones, as we shall see) show a remarkable creativity in thinking up different kinds of passagework for the same musical idea: hardly anything from the first paraphrase was carried over into the second, even though all the melodic material including the structure remains the same. It is furthermore striking how Liszt seems to have considered these glissandos to be more difficult than the properly fingered thirds in the main text.

3.3.2.3.2.3 Less is more

During the time the glissandos in these examples were first put onto paper, Liszt did write other music as well, so it is not as if the glissando took up al his time and effort. But in these "transcendental" years from 1838 to 1847 it is clear that, if and when he set his mind on the glissando, he treated it mostly with the same "devil-may-care"[794] exuberance which he had imposed on his transcendental and Paganini studies, pushing the boundaries of technique to an almost absurd level to open up new horizons in performance practical accomplishment. After this decade of adolescent blind confidence in the added value of conquering difficulties, Liszt's glissando writing matured. Instead of the 'bigger and more is better' approach, seen in much of his works from the transcendental years, a more economic view is discernable throughout his compositional style in what we can consider to be a second period in his approach towards the glissando. When Liszt gave up the life of a professional virtuoso in 1847, he devoted time to reworking some of his earlier music. Much of this recasting was a question of simplifying textures and difficulties to allow for the music to shine through instead of being buried under notes and demands.

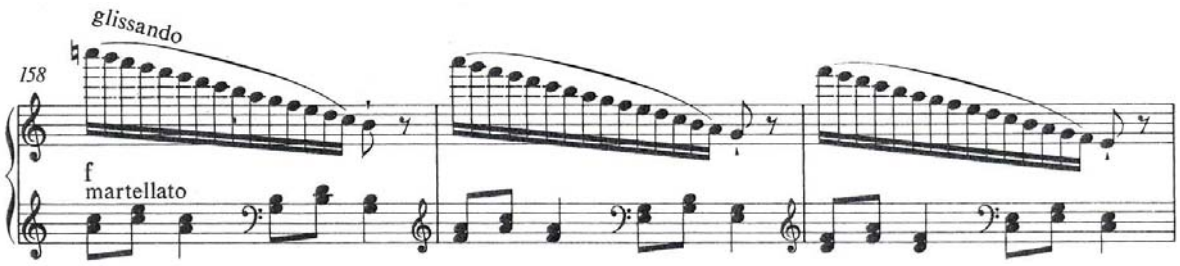
The first example of this new practice concerns one of the earliest pieces by Liszt that contained any glissandos. In the 2nd version of his arrangements of Schubert's *Divertissement à l'hongroise* – called *Schuberts Ungarische Melodien auf eine leichtere Art gesetzt* – he does away with them altogether, leaving only a two hand octave run to remind us of the octave glissandos. (Compare ex. 3.238 with 3.225.)

[793] New Liszt Edition, Series I, Volume 18 (Supplement); Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[794] Howard 1995, p.2.



Example 3.238. Fr. Liszt: *Schuberts Ungarische Melodien auf eine leichtere Art gesetzt* (1846), nr. 2 *Marcia*, bars 124-135.[795]

The very same set of *Magyar rapszódiák* out of which we already cited number 13 (see 3.237) also contained a simplified version of that composition[796] – called *Ungarische National-Melodie,* in contrast to the rest of the pieces – in which the section in thirds as well as the ossia is replaced by single note glissandos. (Ex. 3.239.)

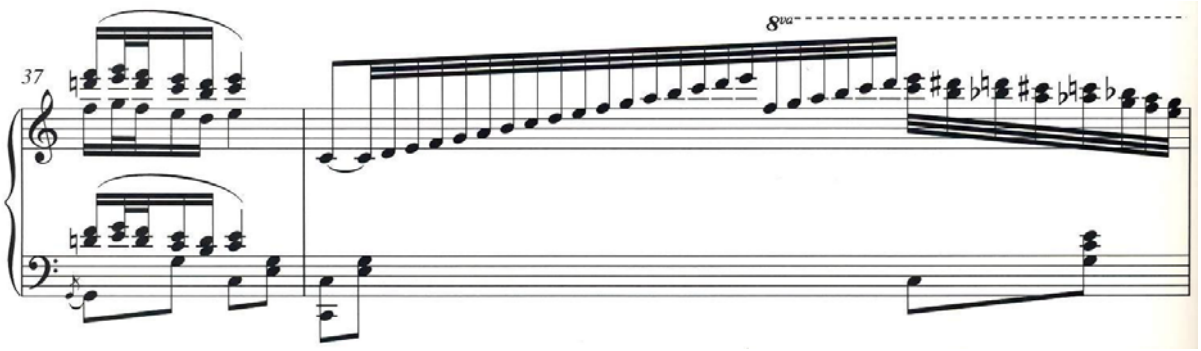


Example 3.239. Fr. Liszt: *Ungarische Nationalmelodie (Rákóczi-Marsch), erleichtert* (1846-47), bars 158-160.[797]

This simplified version of the *Rákóczi-Marsch* was also indicated by Liszt to be part of the *Zigeuner-Epos*, a new project of works derived from the *Magyar dalok* and *rapszódiák*. This collection, of moderate difficulty, was likely put together as an intermediate set, between the completion of the first series of Hungarian songs and rhapsodies in 1847 and the start of the second series – the *Rhapsodies Hongroises* – in 1851. The "epic" exists only as an incomplete manuscript[798], with shorthand used to indicate where and how pieces from the earlier set are to be inserted. The empty space after number 6 of this set is left for *Rákóczi Nr 7*, probably meaning the lighter version of Rákóczi marches from the *Magyar rapszódiák*. (Ex. 3.239.) As far as glissandi go, the eighth piece of the *Zigeuner-Epos* corresponds to the tenth of the *Magyar dalok*, but the eleventh piece from

[795] New Liszt Edition, Series II, Volume III; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[796] Sulyok & Mező 1985, p. XVII.
[797] New Liszt Edition, Series I, Volume 18 (Supplement); Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[798] Sketchbook N7 at the Stiftung Weimarer Klassik, Goethe-Schiller-Archiv (D-WRgs).

the *Epos* reduces the original glissandos in sixths of the ninth *Magyar dalok* (ex. 3.226-3.227) to single-note glissandos of the same length, leaving out the third double-note glissando. (Compare ex. 3.240 and 3.227.)



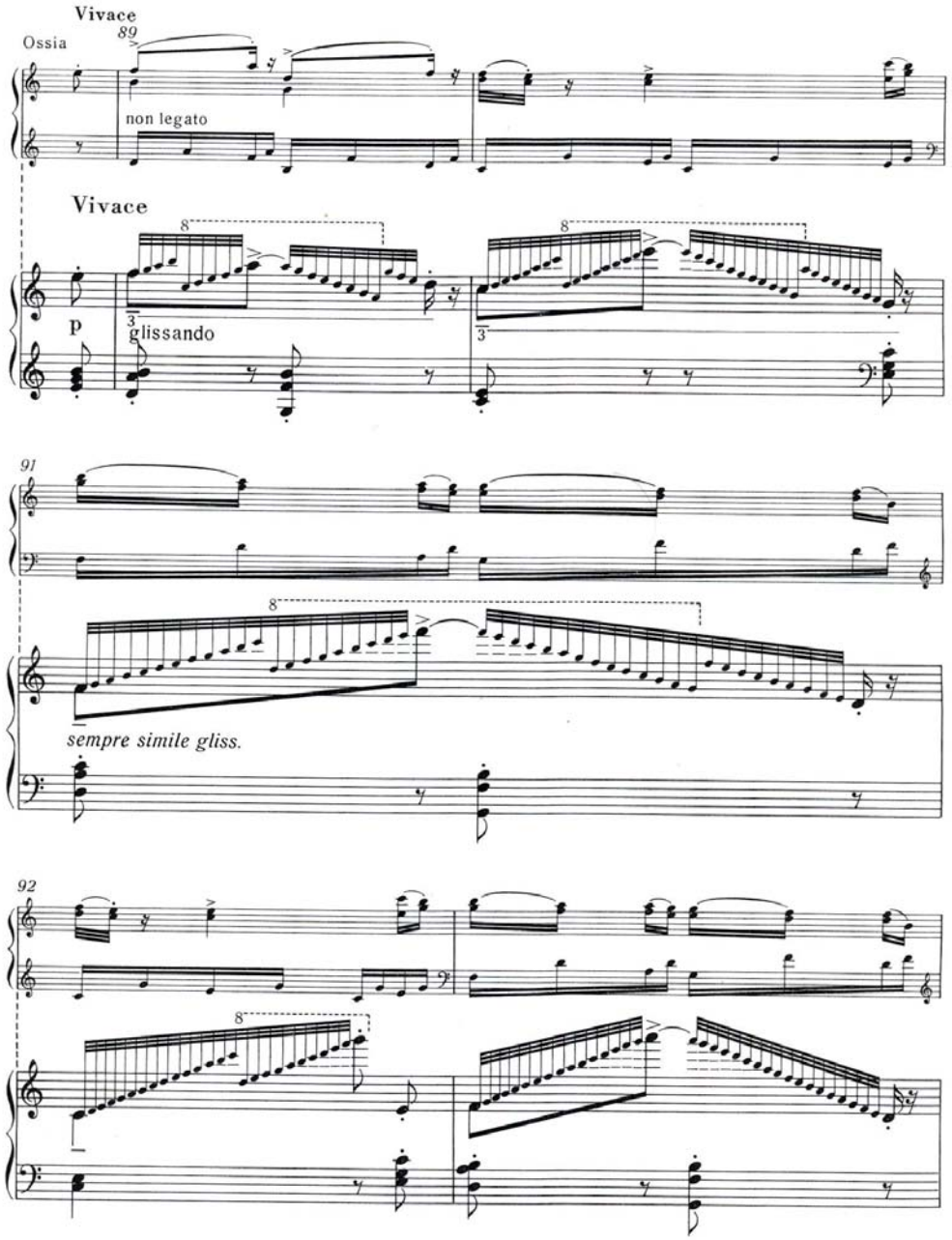
Example 3.240. Fr. Liszt: *Zigeuner-Epos* (1848), nr. 11, bars 37-38.[799]

Liszt's fifteen *Rhapsodies hongroises*[800] are in part based on the earlier series, probably written no sooner than 1847/48[801] and published in 1853. Three of these new pieces contain glissandos. The tenth rhapsody (nr. X) is even more audacious than the *Lucrezia Borgia* or *Gaudeamus Igitur* transcriptions, but only if the *number* of glissandos (no less than 30) is the criterion. (Ex. 3.241.)

[799] *Sarastro Liszt Series. Vol. 1. Ferenc Liszt. Zigeuner-Epos (Epic Story of the Gypsies). 11 pieces for piano. Urtext. Edited by Leslie Howard.* London: Sarastro Music. Reproduced by permission.

[800] To avoid confusion, we will refer to the earlier sets (from 1838/39 and 1846/47) as the first set or by their Hungarian titles and to the later series as the second set of *Rhapsodies hongroises*. Following most of the literature on this subject (as well as Liszt himself), we will use Arabic numbering for the first set and Roman numerals for the second set. As for the Hungarian titles, we decided to stick to the originals ('dalok' and 'rapszódiák') instead of the common transliteration 'Dallok' and 'Rhapsodiák'. For more information on how Liszt confused what was Hungarian with what was Gypsy, see Walker 2004, p. 334-342.

[801] Howard 1999. Three decades later, Liszt would add the numbers XVI-XIX. See also Gárdony 1995.

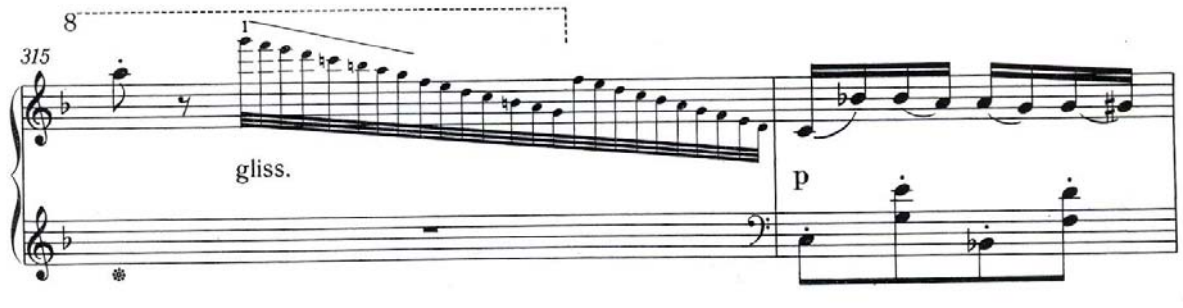


Example 3.241. Fr. Liszt: *Rhapsodies Hongroise X* (1853), bars 89-93.[802]

The *ossia* version is here not meant as a simplified version, but is the actual inspiration of the composition: "Fogadj Isten" ("God be with you") by Béni Egressy, the Rhapsody's dedicatee. As in the previous glissando-congested paraphrases, the variation format is used to allow for all the melodic gliding here required, but like the Spanish fantasy, the difficult double note glissandos from the transcendental period are nowhere to be seen.
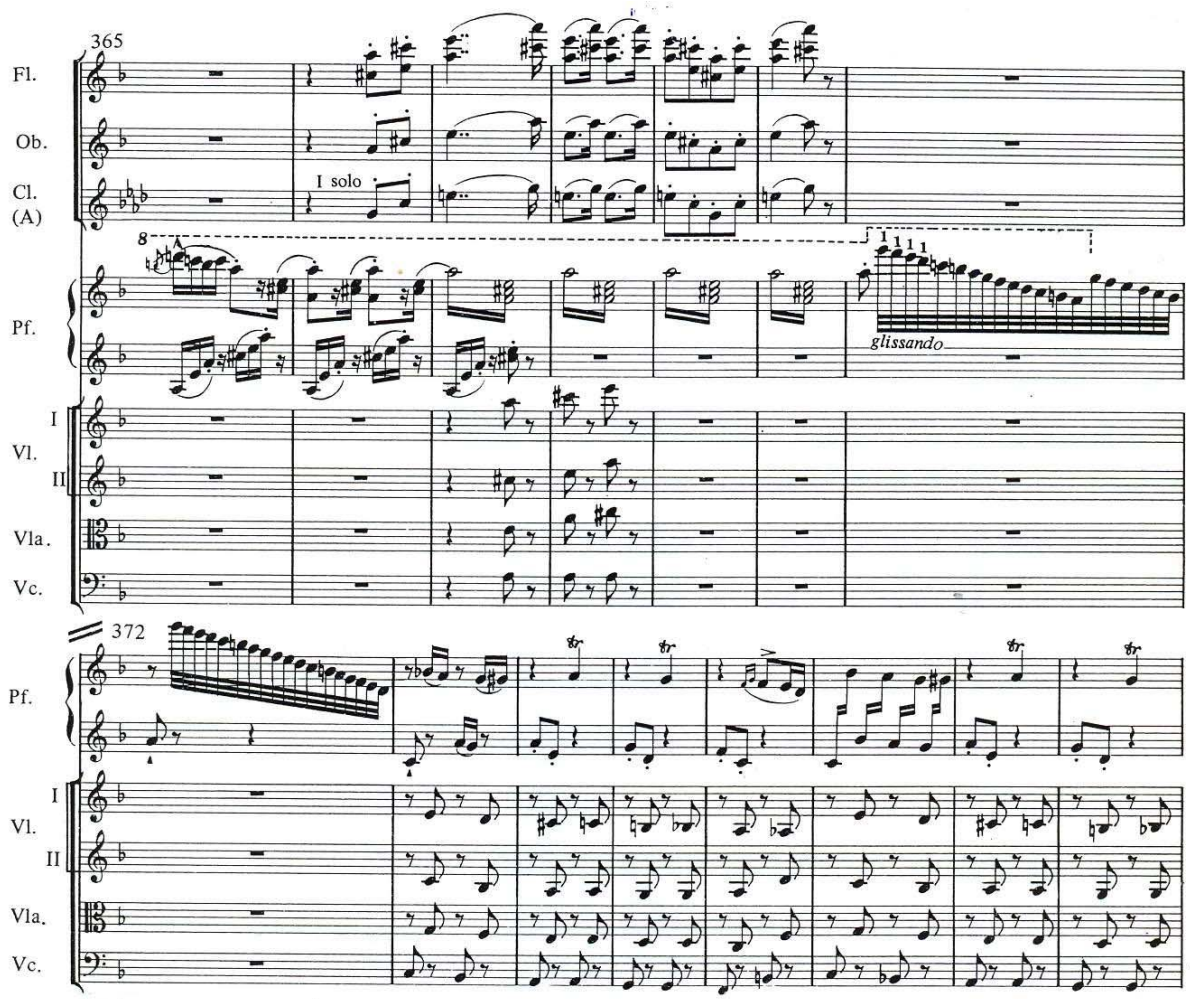
The other two rhapsodies Hongroises relevant to our overview are somewhat less demanding in terms of glissando stamina, at least compared to what we have seen until now. Nr. XIV – based in part on *Magyar dalok* #10 (which is in turn the basis for number 8 from the *Zigeuner-Epos*) – contains none of the glissandos in those earlier pieces, but three new single note glissandos: two downwards (like in ex. 3.242) and one upwards.

[802] New Liszt Edition, Series I, Volume IV; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.



Example 3.242. Fr. Liszt: *Rhapsodie Hongroise XIV* (1853), bars 315-316.[803]

The version for piano and orchestra of this rhapsody - *Fantasie über ungarische Volksmelodien* – varies the passage slightly by repeating the glissando. (Ex. 3.243.)

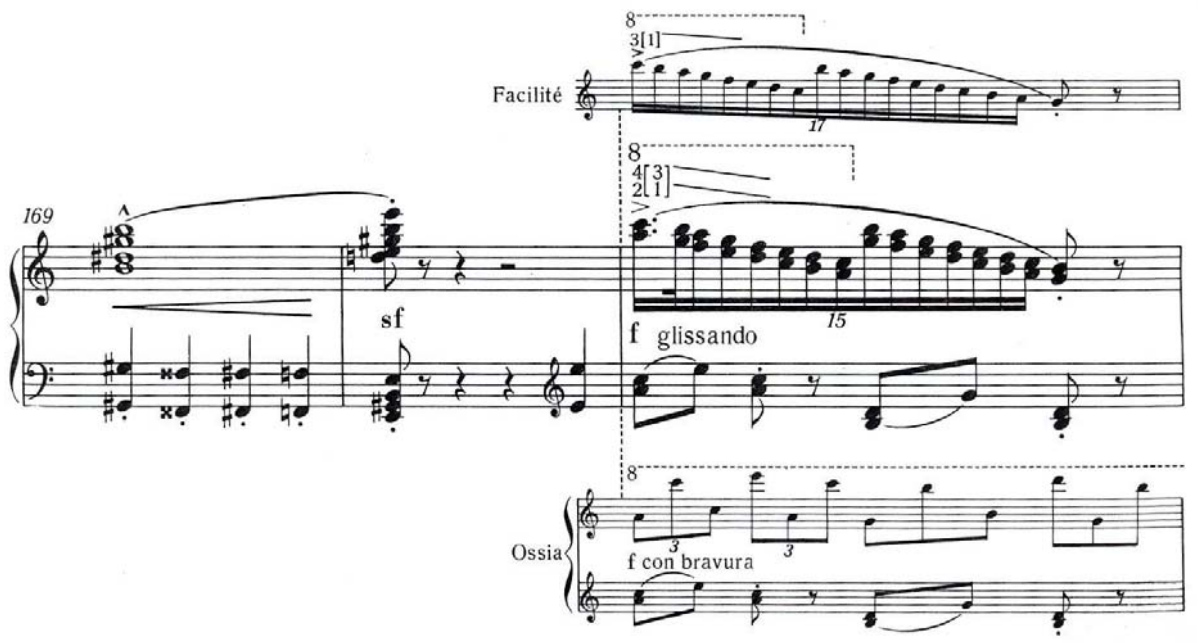


Example 3.243. Fr. Liszt: *Fantasie über ungarische Volksmelodien* (1852), bars 365-379.[804]

The *XV. Rhapsody* – another *Rákóczi-Marsch* – keeps the glissandos in thirds that were used in the 1846/47 version, although practical arrangements have been made to lighten the load. (Ex. 3.244.) The glissandos are shorter and start with a rhythmically notated

[803] New Liszt Edition, Series I, Volume IV; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[804] From the Eulenburg edition, nr. 1298, plate number EE 6685. Reproduced by permission of Schott Music GmbH & Co. KG.
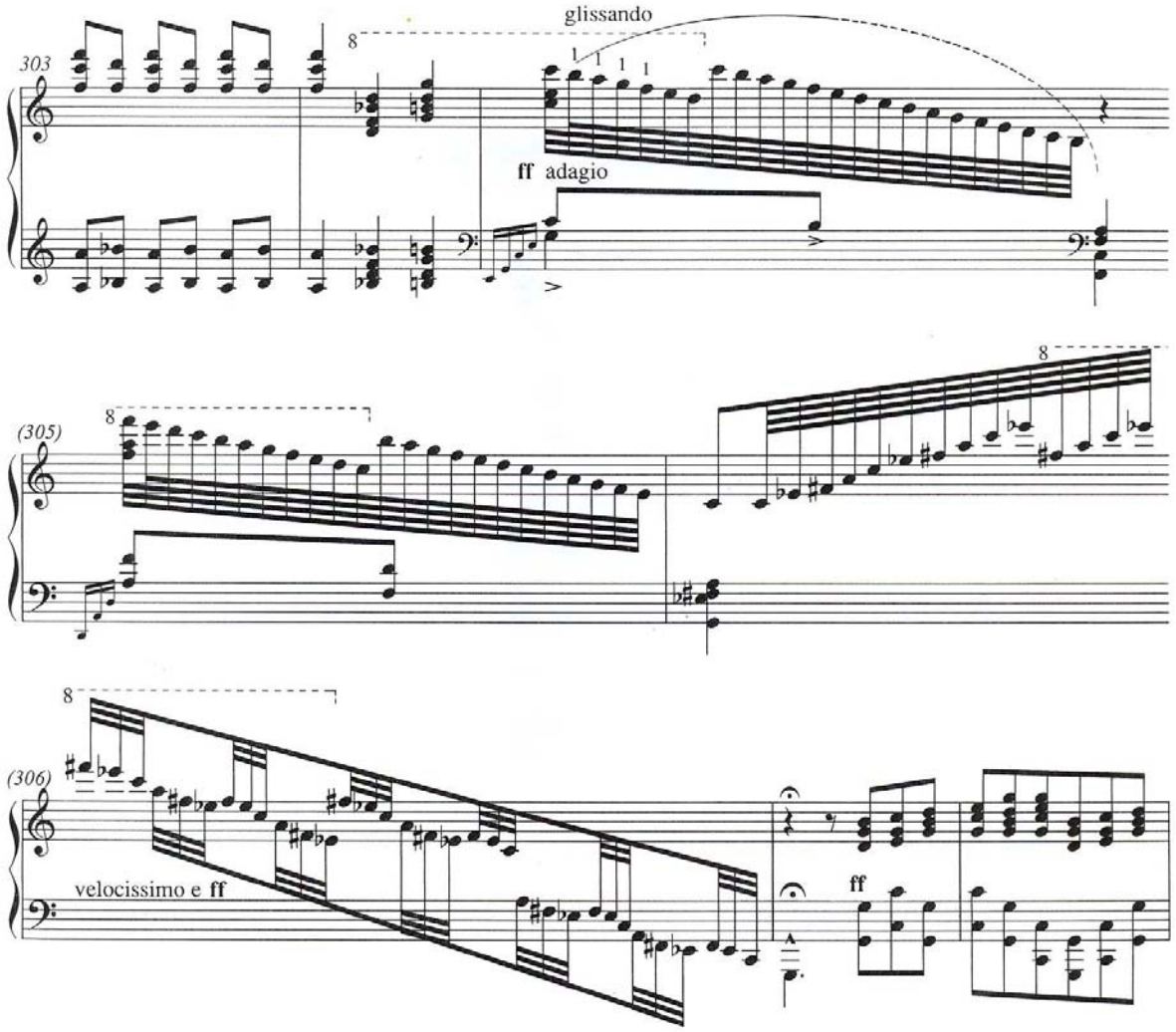
pivot moment, the single note glissandos are still the main alternative but there is even a second escape route with no glissandos at all.



Example 3.244. Fr. Liszt: *Rhapsodie Hongroise XV* (1853), bars 169-171.[805]

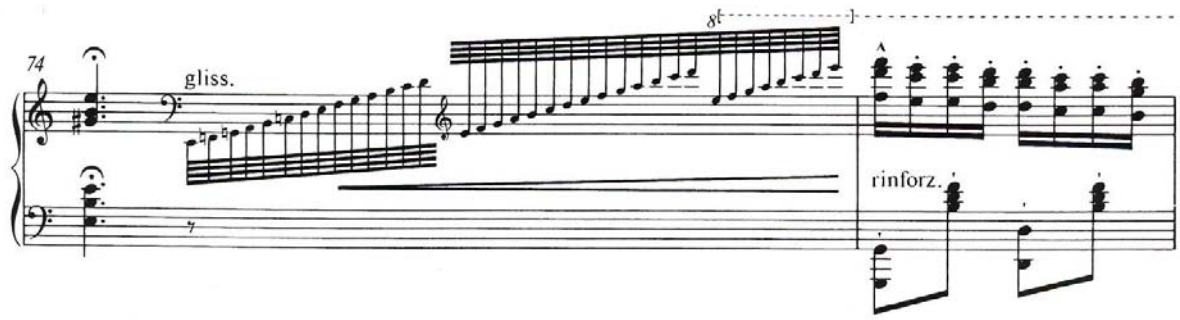
While all the different Magyar pieces were put through their diverse stages of completion in between 1839 and 1853, Liszt also wrote other pieces containing glissandos, and in most of them we see the same urge to simplify and "essentialize" the application of the glissando. Sometimes even crucial glissando passages just disappear, as in the second version of *Gaudeamus Igitur* (1853). The glissando variation of the main theme had already been marked for optional deletion in the first edition (see footnote 648), now it had gone almost completely. Only half of the first of the hemiola remains, accompanied by now single-note glissandos. (Compare ex. 3.245 with ex. 3.234, bars 377-378.)

[805] New Liszt Edition, Series I, Volume IV; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.



Example 3.245. Fr. Liszt: *Gaudeamus Igitur*, 2nd version (1853), bars 303-308.[806]

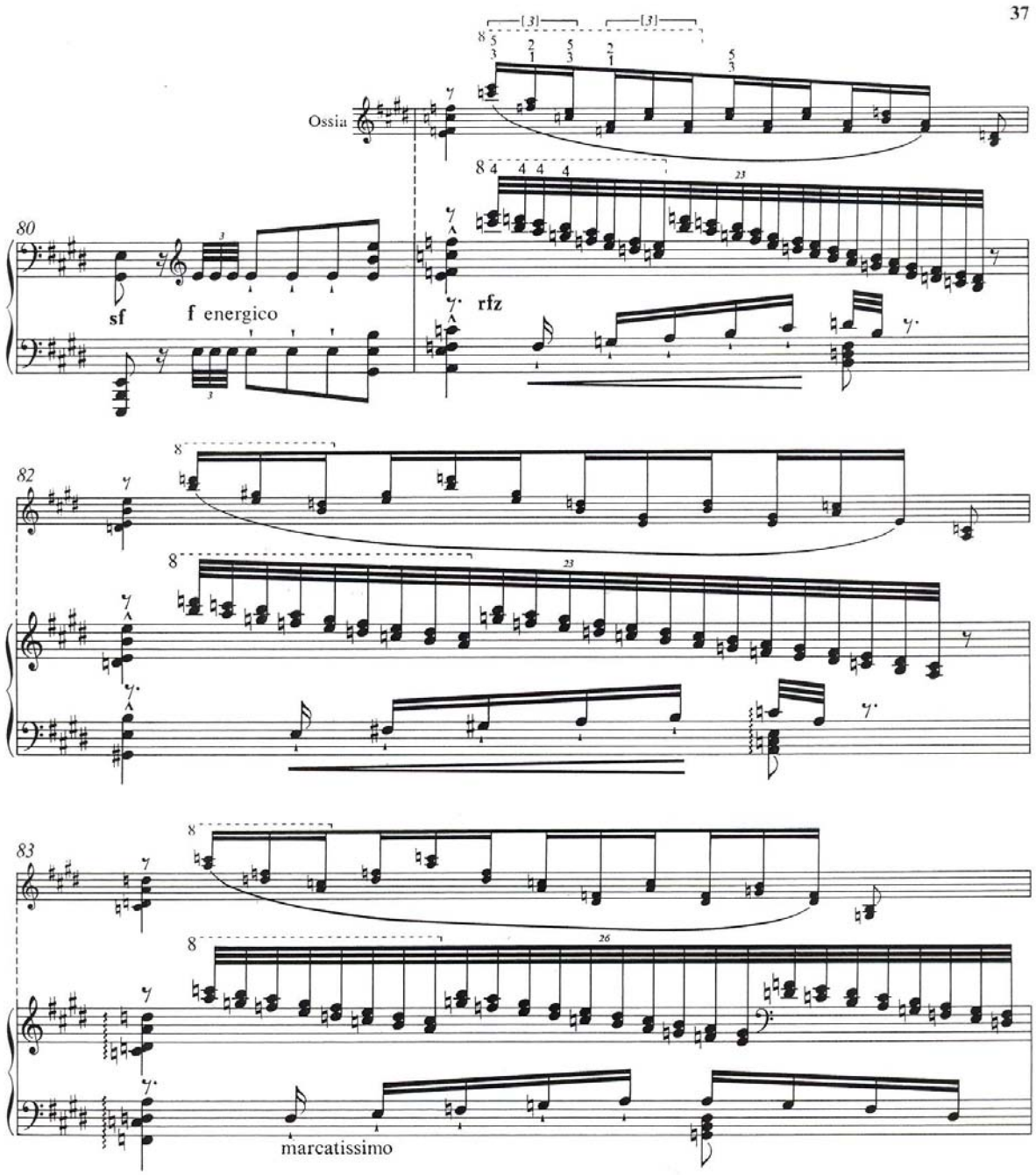
Some of Liszt's reflexes towards the glissando seem difficult to change, however: in the 1847 *Schwanengesang und Marsch aus Erkels Hundyadi* the long structural glissando is definitely too large for the 8th note rest it is allotted. (Ex. 3.246.) Only by lengthening the bar, thanks to the fermata on the first beat, can the flow of the meter be stopped and can the last 8th note be given the function of an upbeat large enough to accommodate the glissando.



Example 3.246. Fr. Liszt: *Schwanengesang und Marsch aus Erkels Hundyadi* (1847), bars 74-75.[807]

[806] New Liszt Edition, Series II, Volume VI; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
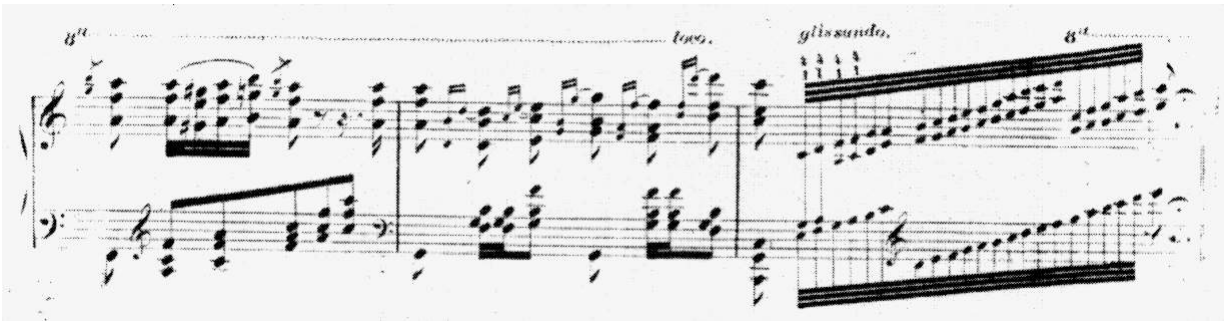
Equally untypical of this period in which Liszt mainly downsizes the glissando, is the second version of Liszt's paraphrase on *'Lucrezia Borgia'*, where he adds a movement *Trio du second Acte* (about the tragic poisoning of Borgia's secretly illegitimate son) to the previously composed *Chanson à boire.* The whole is now *Réminiscences de Lucrezia Borgia, Grande fantaisie sur des motifs de l'opéra de Gaetano Donizetto* and in keeping with the glissandos in the early version (see ex. 3.223, 3.232), Liszt added some more gliding double notes. Three such glissandos in thirds appear in the new movement and are already compensated for by a lighter *ossia*. (Ex. 3.247.)



Example 3.247. Fr. Liszt: *Réminiscences de Lucrezia Borgia – Grande fantaisie sur des motifs de l'opéra de G. Donizetti*, 2nd version (1848), *1re Partie*: *Trio du second Acte*, bars 80-83. [808]

[807] New Liszt Edition, Series II, Volume VIII; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[808] New Liszt Edition, Series II, Volume V; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.

Another new instance in the 2nd version of this paraphrase is the only glissando in fourths that we encounter in all of Liszt's works, rare even in the whole 19th century. (Ex. 3.348.)



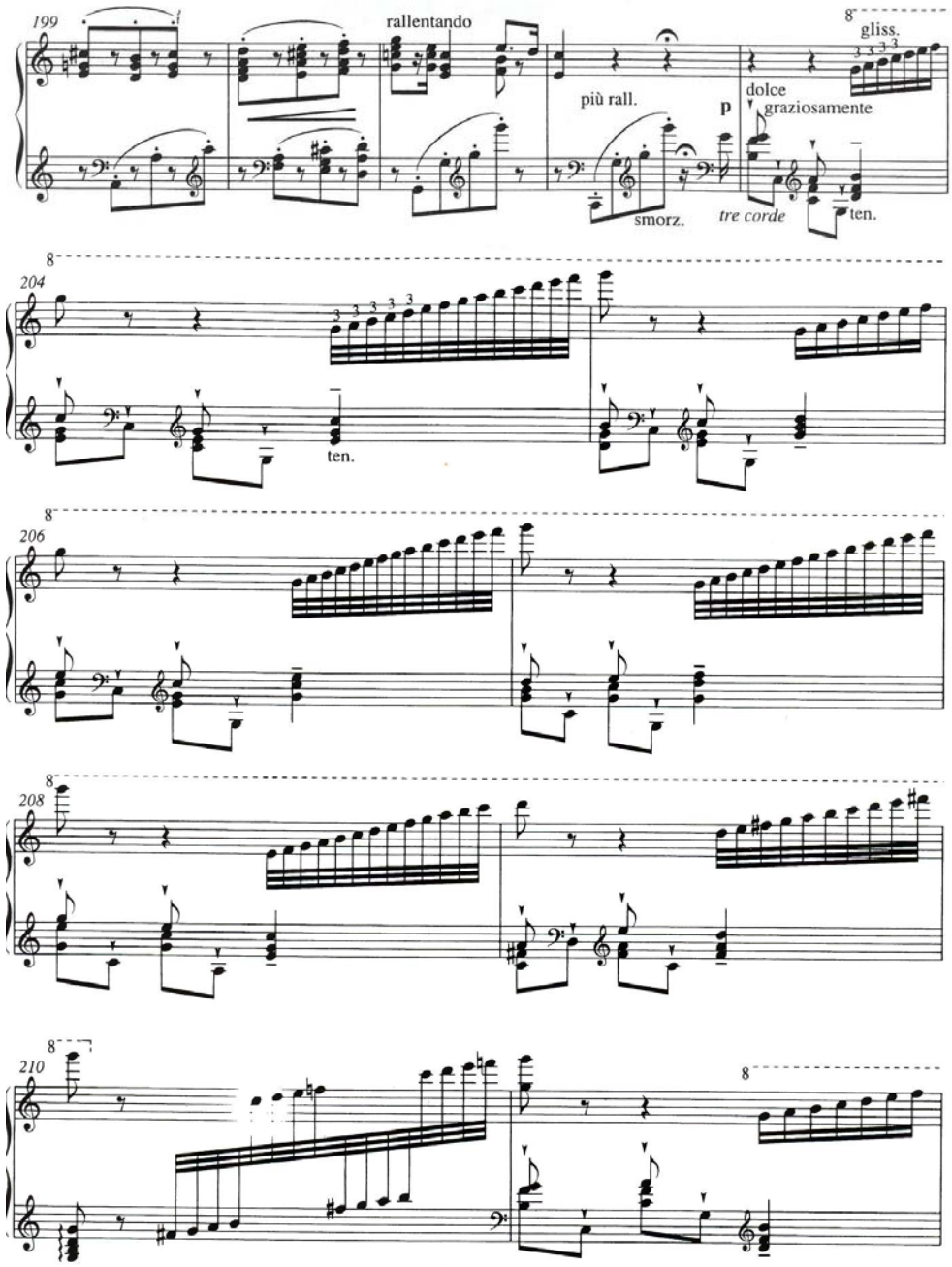
Example 3.248. Fr. Liszt: *Réminiscences de Lucrezia Borgia – Grande fantaisie sur des motifs de l'opéra de G. Donizetti*, 2nd version (1848), *2de Partie: Chanson à boire (Orgie) – Duo-Finale*, bars 63-65. [809]

That Liszt seems to have written more double-note glissandos at a time that he was mostly occupied with simplifying his glissando writing shows that the content of the *Lucrezia Borgia* additions was probably decided upon *before* 1848 (when this second version of the paraphrases was published). This would find confirmation in the suspicion that Liszt had already played a reworked version of the first *Lucrezia* fantasy in his concerts in 1846, when he was still very much interested in the highest levels of the glissando's virtuosity.[810]

At the end of the 19th century's fifth decade, Liszt wrote some more pieces that once again show how his attitude towards the glissando nevertheless matured. One of them is the three-part transcription of parts from Giacomo Meyerbeer's 1849 opera *Le Prophète.* Of these *Illustrations* (1849-1850[811]), the second is a scherzo called *Les Patineurs* (the "ice skaters"), based on themes from the first scene of the opera's third act, with sleighs and skaters crossing a frozen pond to bring refreshments and dance to battle-weary soldiers. Several themes are presented with variations ornamenting them; the sliding theme appears 6 times in its original entirety, of which 3 variations with glissandos, and once in flashes in the final mixture of motives from all treated themes, characterized for the last time through glissandos.

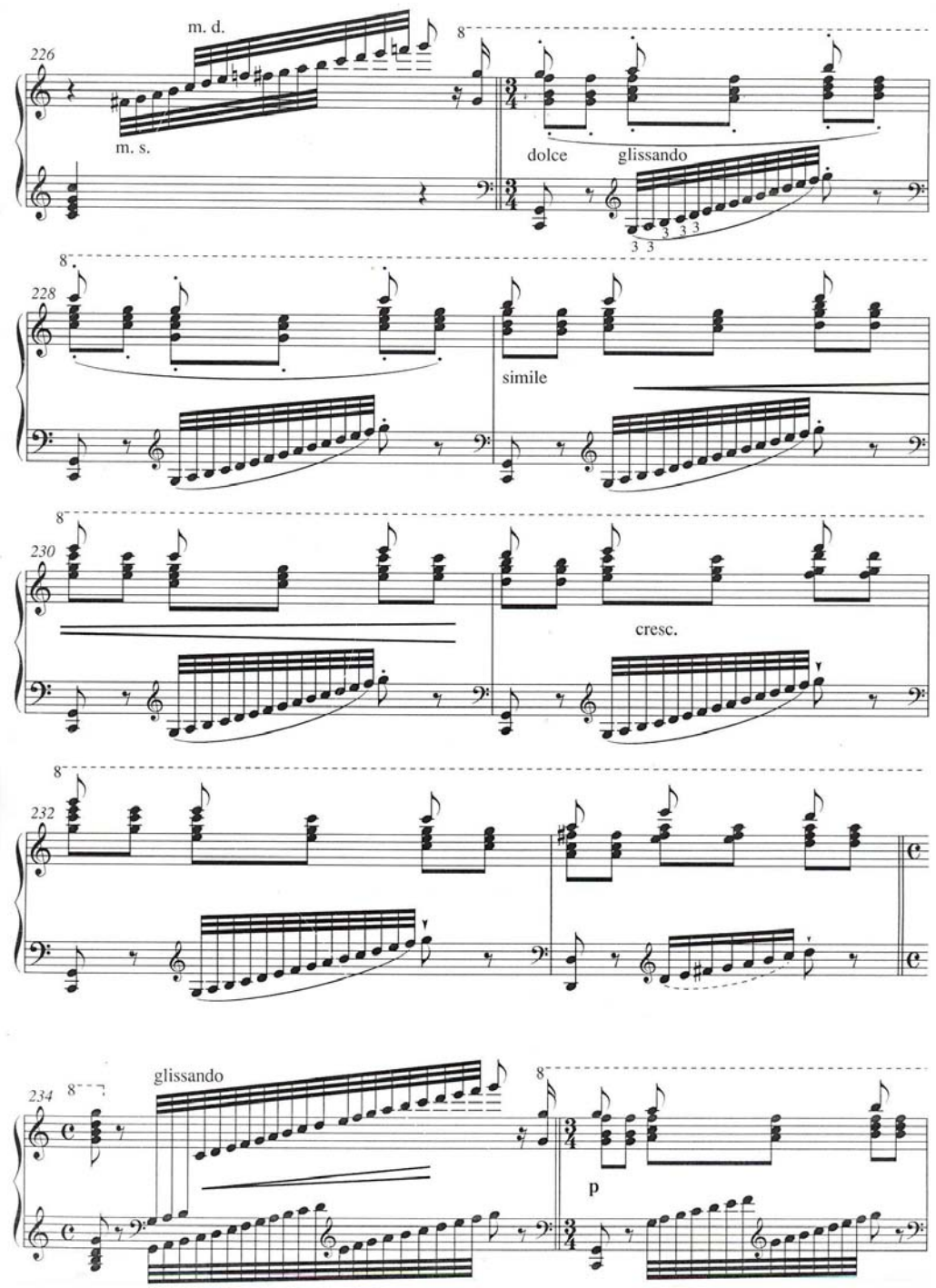
True to its subject matter, these variations are littered with glissandos. There are 57 of them but not a single one is of the double note type, and none are surpassing any realistic level of performance technique. The first proper presentation of the theme is in keeping with the atmosphere of the frozen pond in the mist, to be played *ondeggiando*. Immediately two variations follow, one with right hand upward glissandos (ex. 3.249) and one with the left hand gliding over the tenor tessitura. (Ex. 3.250.)

[809] New Liszt Edition, Series II, Volume V; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[810] See Kaczmarczyk & Mező 1999, p. XIII-XIV.
[811] Dating according to Sulyok 2001, p. XVIII. The set was first published in Leipzig in 1850. In that same year, Liszt wrote a fourth item for this series of pieces on Meyerbeer's opera: the organ work *Ad nos, ad salutarem undam*.



Example 3.249. Fr. Liszt: *Illustrations du Prophète de G. Meyerbeer*, nr. 2: *Les Patineurs* (1849), bars 199-211.[812]

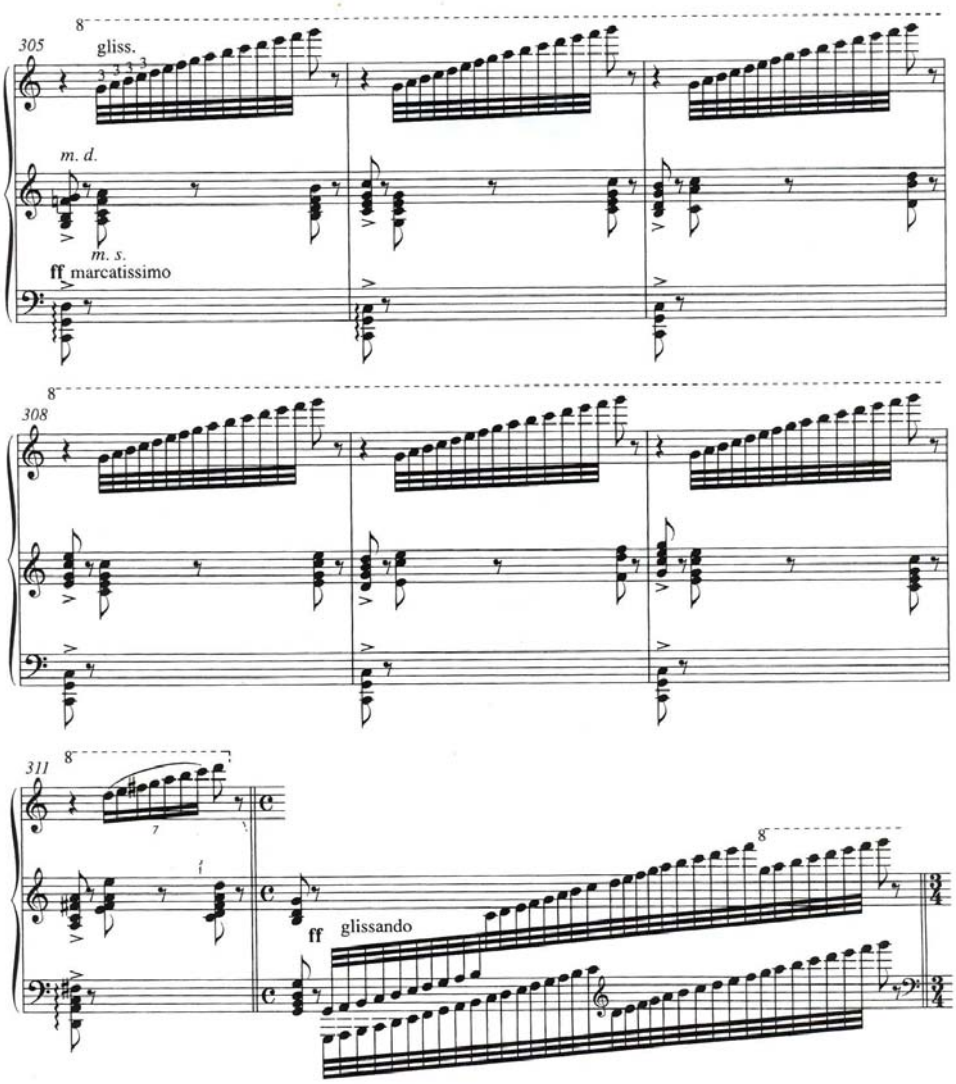
[812] New Liszt Edition, Series II, Volume IX; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.



Example 3.250. Fr. Liszt: *Illustrations du Prophète de G. Meyerbeer*, nr. 2: *Les Patineurs* (1849), bars 226-235.[813]

For this second variation, Liszt switches the metric stress from the third to the first beat (compare the *tenuto* markings in ex. 3.249 with ex. 3.250), repositioning the left hand glissandos on the second beat so that the bass fifth can be played. After an interlude based on another theme from the opera, the gliding variations continue climactic with a *ff marcatissimo* version in stead of the *dolce graziosamente* installments from earlier on. The first beat cadence again forces the glissandos to be on the second beat. (Ex. 3.251.)

[813] New Liszt Edition, Series II, Volume IX; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.



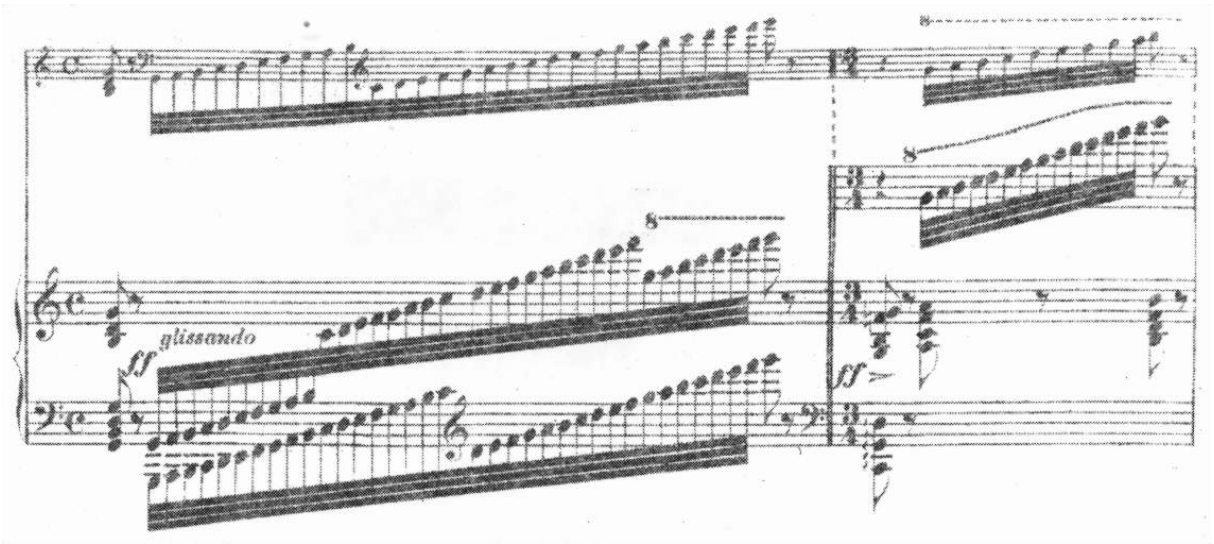
Example 3.251. Fr. Liszt: *Illustrations du Prophète de G. Meyerbeer*, nr. 2: *Les Patineurs* (1849), bars 305-312.[814]

As far as the number of glissandos, the (programmatical) reason for having them in a composition, and the performance practical feasibility and effectiveness, this composition represents the highpoint of glissando use in solo repertoire so far. There is even the integration of the glissando in individually articulated passage work: the moments in between the two parts of the theme, and closing it off, are built up from properly articulated, chromatically colored runs in alternated hands over ever-longer glissandos to the longest glissandos in the piece. (Compare for instance bars 210 and 226 in examples 3.249-3.250, bar 234 in ex. 3.250 and bar 312 in ex. 3.251.)

The first edition of the *Patineurs* contained *ossias* for a piano with a 6 octaves keyboard.[815] In some instances the *ossia* glissandos are just shorter to accommodate a

[814] New Liszt Edition, Series II, Volume IX; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[815] Breitkopf & Härtel in Leipzig published the first edition of *Illustrations du Prophète* in 1850 (plate numbers 8088, 8089 and 8090 for the three parts – see Sulyok 2001, p. XVII). It is strange that the Editio Musica Budapest is silent about this major alternative, even though it acknowledges the first edition and claims to have based the publication of the *Illustrations* on "all the mentioned manuscripts and editions (Sulyok 2001, p. XVIII). Similarly, the cut that is indicated in the first edition of the first *Gaudeamus Igitur* version (see above),

narrower keyboard range (ex. 3.252), but it is interesting to see that Liszt[816] also took advantage of the limitation to recompose the build-up of the glissandos: each endnote of the opening glissando variation follows the melody in the left hand. (Ex. 3.251.) Most striking is how the whole first series of ossia glissandos is shifted to the second beat (as in the main text of the later glissando variations – compare ex. 3.253 with ex. 3.249) without changing the metric third beat stress in the left hand.

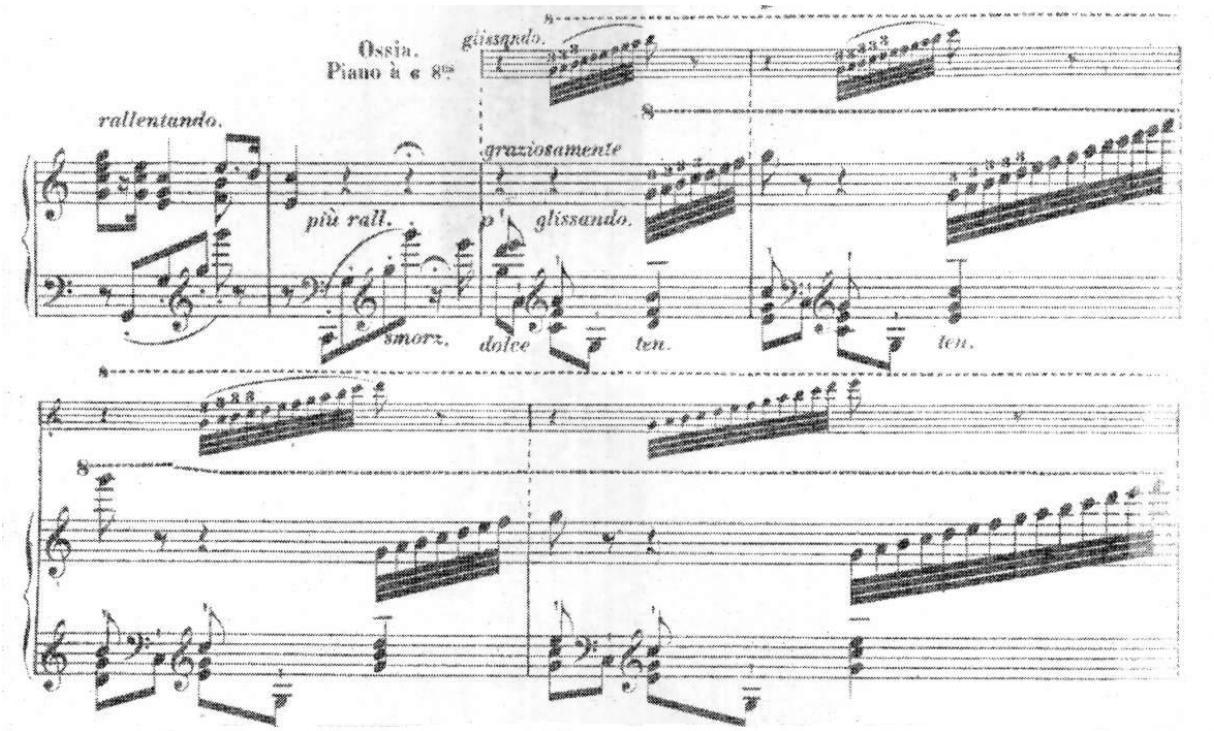


Example 3.252. Fr. Liszt: *Illustrations du Prophète de G. Meyerbeer*, nr. 2: *Les Patineurs* (1850 – first edition by Breitkopf & Härtel[817]), bars 312-313.

allowing the entire glissando section to be left out at will, is not mentioned anywhere in the Editio Musica Budapest.
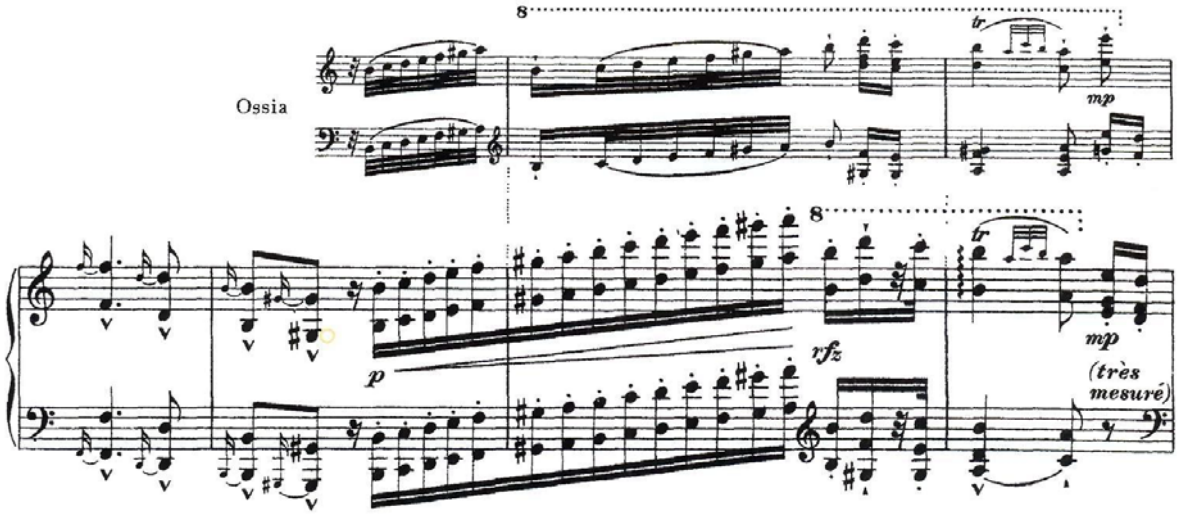
[816] We doubt that such an extensive ossia (26 glissandos) would have been included by the publisher for the first edition without the active participation of Liszt.

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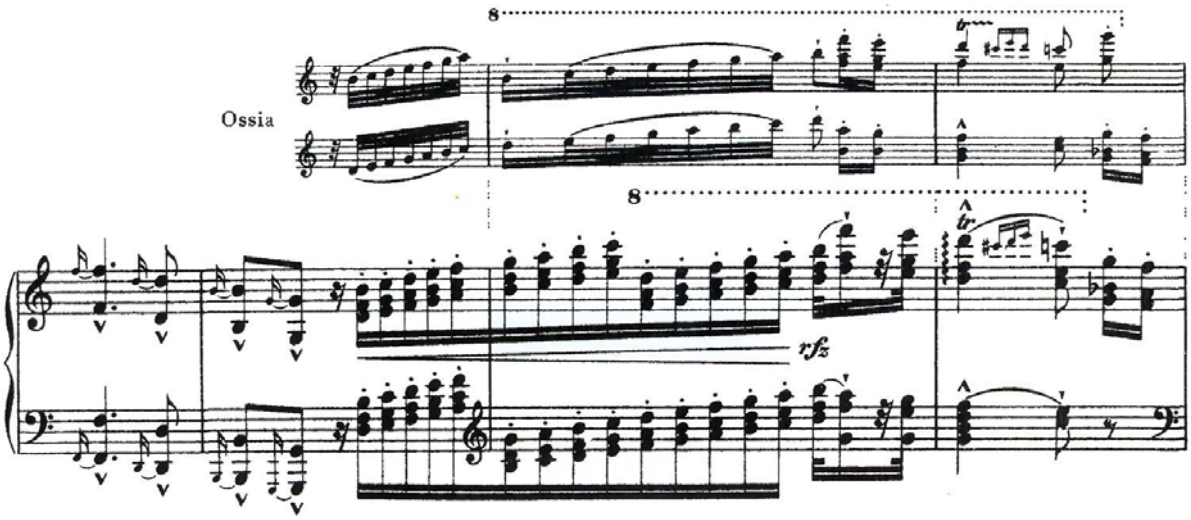
Example 3.253. Fr. Liszt: *Illustrations du Prophète de G. Meyerbeer*, nr. 2: *Les Patineurs* (1850 – first edition by Breitkopf & Härtel), bars 201-206.

A second piece shows another way Liszt moved on from the most difficult passages to a more efficient, effective and personal writing. In the first version of his E major *Paganini Etude* (1838) Liszt had put the individually articulated runs from the original violin piece (which Schumann had taken over literally in his own 1832 transcription) in the ossia while using staccato octaves and chords in the main text (ex. 3.254 and 3.255). In the 1851 incarnation of the study – already much less difficult than the others of the set – all these are now replaced by simple glissandos in sixths played by two hands. (Ex. 3.256.)

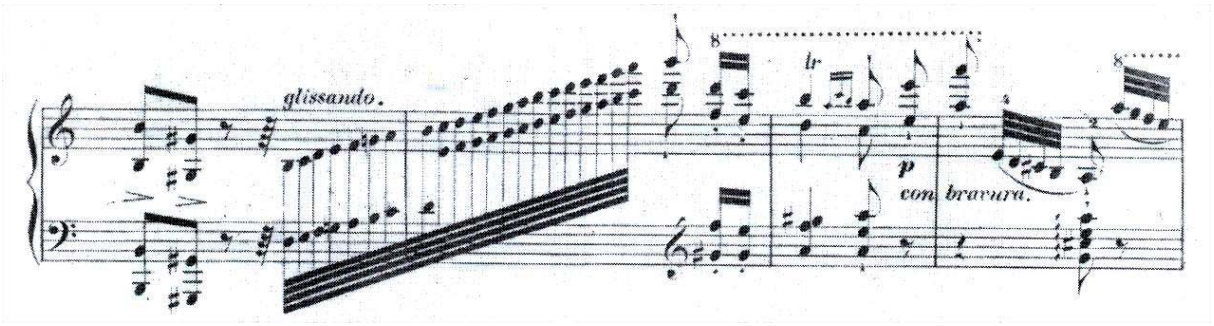


Example 3.254. Fr. Liszt: *Études d'exécution transcendante d'après Paganini* (1838), nr. 5, bars 65-68.[818]

[818] *Franz Liszt - Musikalische Werke, Series II (Pianofortewerke), Vol.II, Etüden für Pianoforte zu zwei Händen*. Breitkopf & Härtel, 1910-11.



Example 3.255. Fr. Liszt: *Études d'exécution transcendante d'après Paganini* (1838), nr. 5, bars 81-84.[819]



Example 3.256. Fr. Liszt: *Grandes Études de Paganini*, nr. 5 (1851), bars 74-77.[820]

Reminding us of the issue in Beethoven's opus 1/3, here also the left and right hand are conscientiously given their own notation: from the double small rest before the glissando to the upward and downward pointing stems at the end of the run, only the run itself merges the two hands in its notation.[821]

The *Totentanz* for piano and orchestra is another piece from the end of the 1840's worth highlighting here. Like the Magyar works discussed above, this is a piece with a history of installments. By 1849, an early version was finished. This version has not been studied yet on the basis of the historical source (it is an undisclosed part of a private collection) but Busoni stated that his 1919 edition of it – referred to as the *De Profundis* version because of a middle section being built upon this psalm[822] – was based on that 1849

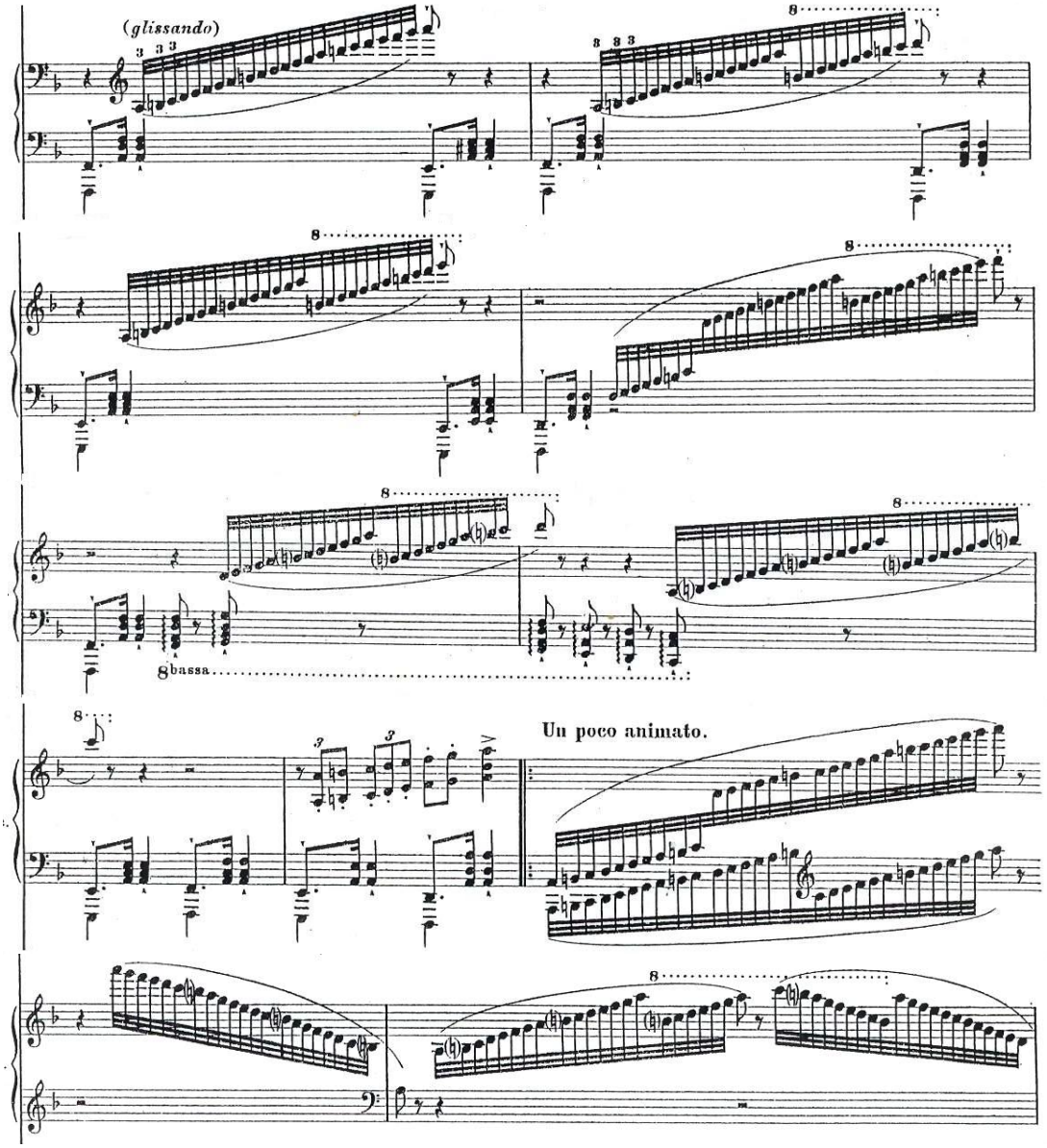
[819] *Franz Liszt - Musikalische Werke, Series II (Pianofortewerke), Vol.II, Etüden für Pianoforte zu zwei Händen*. Breitkopf & Härtel, 1910-11

[820] From the original 1851 edition by Breitkopf & Härtel. Reproduced by permission of the Ruth Dana Collection, Peter Jay Sharp Special Collections, The Juilliard School, New York, NY.

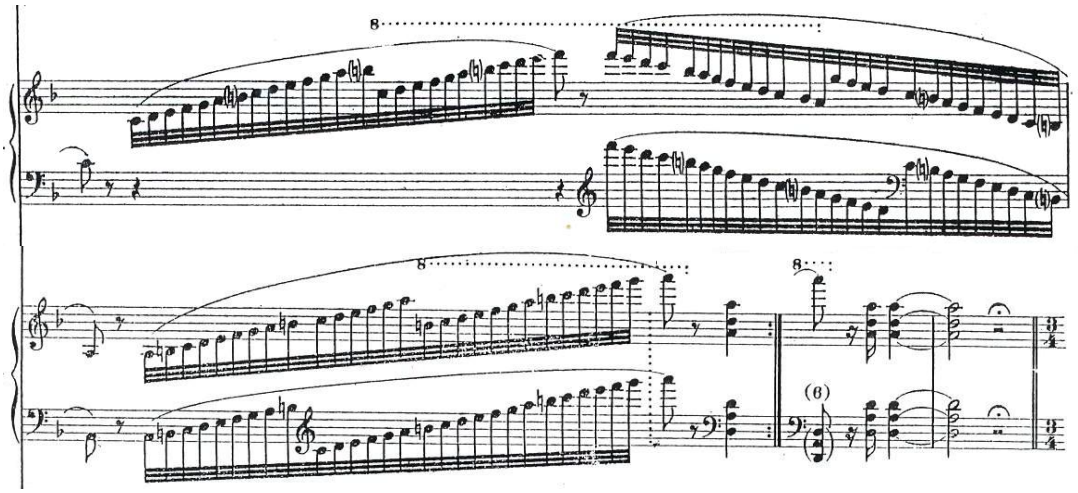
[821] Obviously, we do not agree with István Szelényi who, in the critical notes to the New Liszt Edition of the Paganini studies, writes: "In our sources there is no direction or graphic differentiation to indicate whether Liszt intended the glissando in sixths to be performed with one hand or both hands." (Szelényi 1971, p. 121.)

[822] This version of *Totentanz* is not to be confused with another of Liszt's works for piano and orchestra, called *De Profundis, Psaume Instrumental*, and which uses the same De Profundis material.

source.[823] There are many differences between the early score and the final variant, but according to the Busoni rendition, the glissandos in variation II had already been part of the earliest version. (Ex. 3.257.)



[823] Is unfortunate that we cannot check whether or not Busoni's version is solely based on materials that were composed in or before 1849. Howard 1998, p. 14, mentions that Liszt had carried out some intermediate revision on the piece in 1853, suggesting that those revisions may have been worked into the manuscripts Busoni worked from while preparing for his edition.

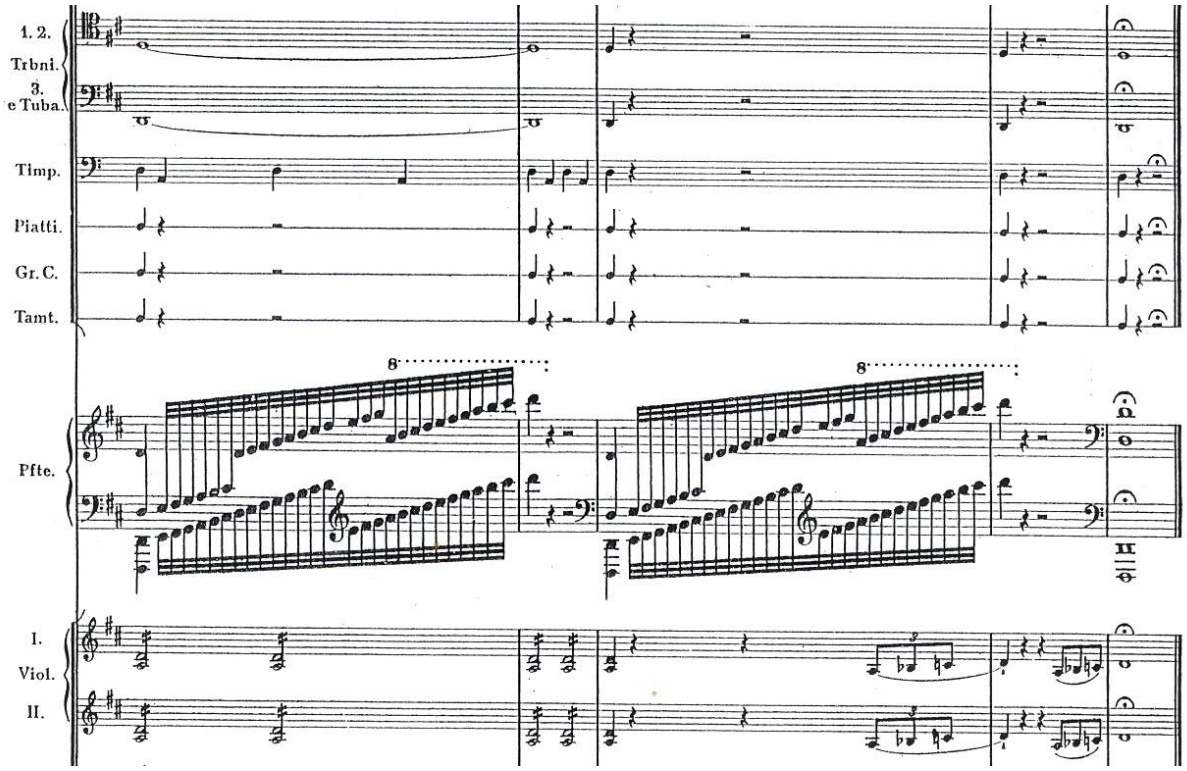


Example 3.257. Fr. Liszt: *Totentanz – Phantasie für Pianoforte und Orchester* ("1849" – *De Profundis* version by Busoni, 1919 edition), Variation II.[824]

Like in *Patineurs*, the glissandos are all of the single note type. They are a lot faster, however: in the *Totentanz* they often cover four octaves in one beat at about the same tempo for a quarter note as in the *Illustration*, where there is an average of two octaves on one beat (or five on three beats). Of great interest is how Liszt differentiates the endings of the glissandos. We can safely assume that Busoni was a faithful editor (he put the word glissando in brackets, a carefulness that present day editors do not always display) and that he followed Liszt when the latter decided to end some glissandos with a spiccato mark and not connected through the bow to the slide, while letting other glissandos' bows go up to and including the last note, which then has no accentuation mark.

This first version of the *Totentanz* does not yet have the *Allegro animato* section towards the end of the piece with the upward two-hand glissandos as we know them from the commonly performed final version and neither does the solo version, which Liszt made in the 1850's (published in 1865). However, at the very end of the early version, a closing section that was never kept for subsequent versions, three instances of two-hand D major runs appear in the score with a note by Busoni stating that "According to a crossed-out passage, which is equal to this one, the runs should be played 'glissando' on the white keys."[825] (Ex. 3.258 shows two of the three sets of glissandos)

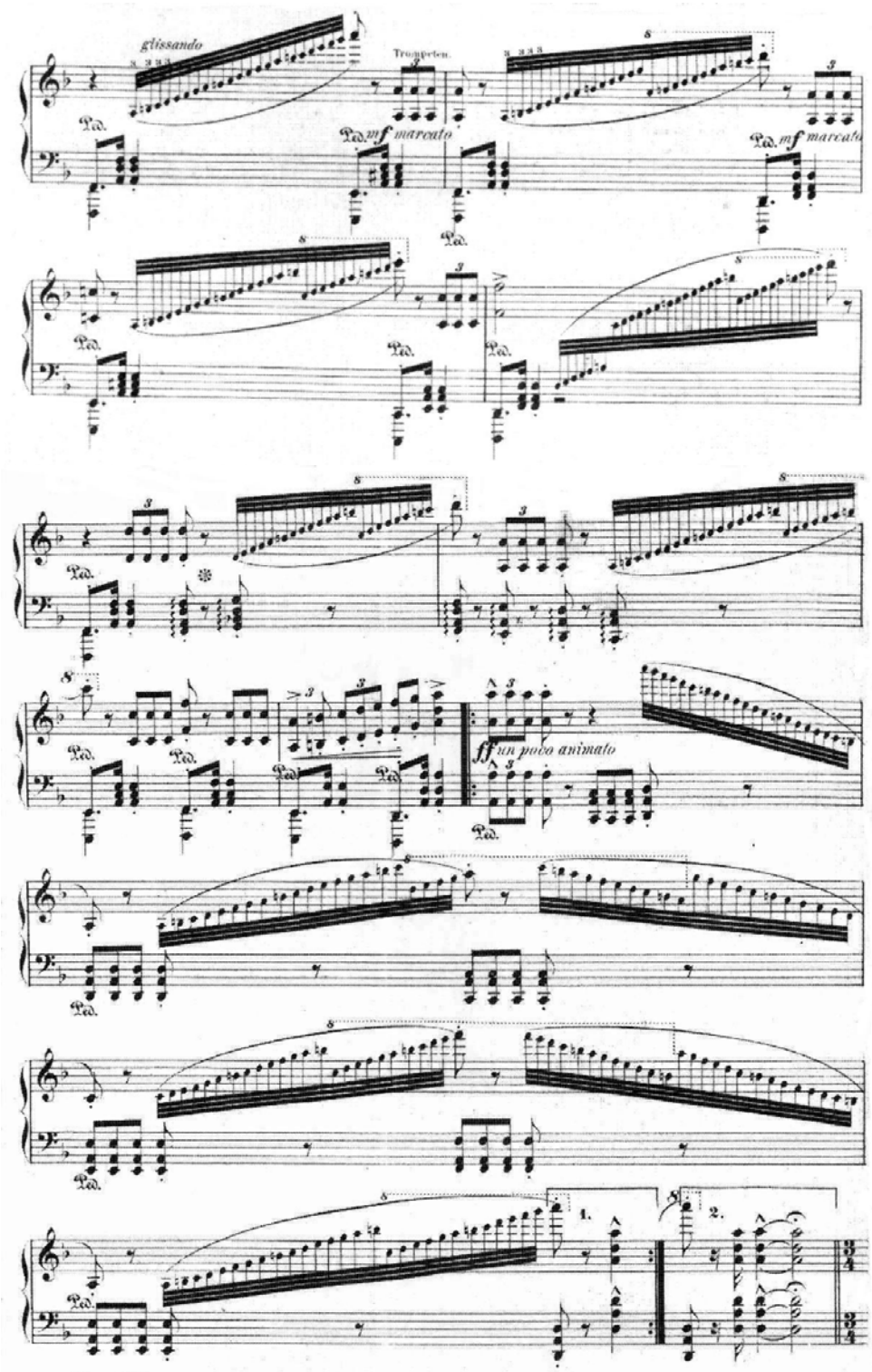
[824] Reproduced by permission of Breitkopf & Härtel KG.
[825] "Nach einer ausgestrichenen Stelle, die sich mit dieser deckt, sollen die Skalen 'glissando' auf den weißen Tasten ausgeführt werden."



Example 3.258. Fr. Liszt: *Totentanz – Phantasie für Pianoforte und Orchester* ("1849" – *De Profundis* version by Busoni, 1919 edition[826]), last bars.

In the solo version, the second variation is built from exactly the same material as the concertante variants, but some of the glissandos are adapted to allow for the pianist to play also the main orchestral parts. (Ex. 3.259.)

[826] Reproduced by permission of Breitkopf & Härtel KG.
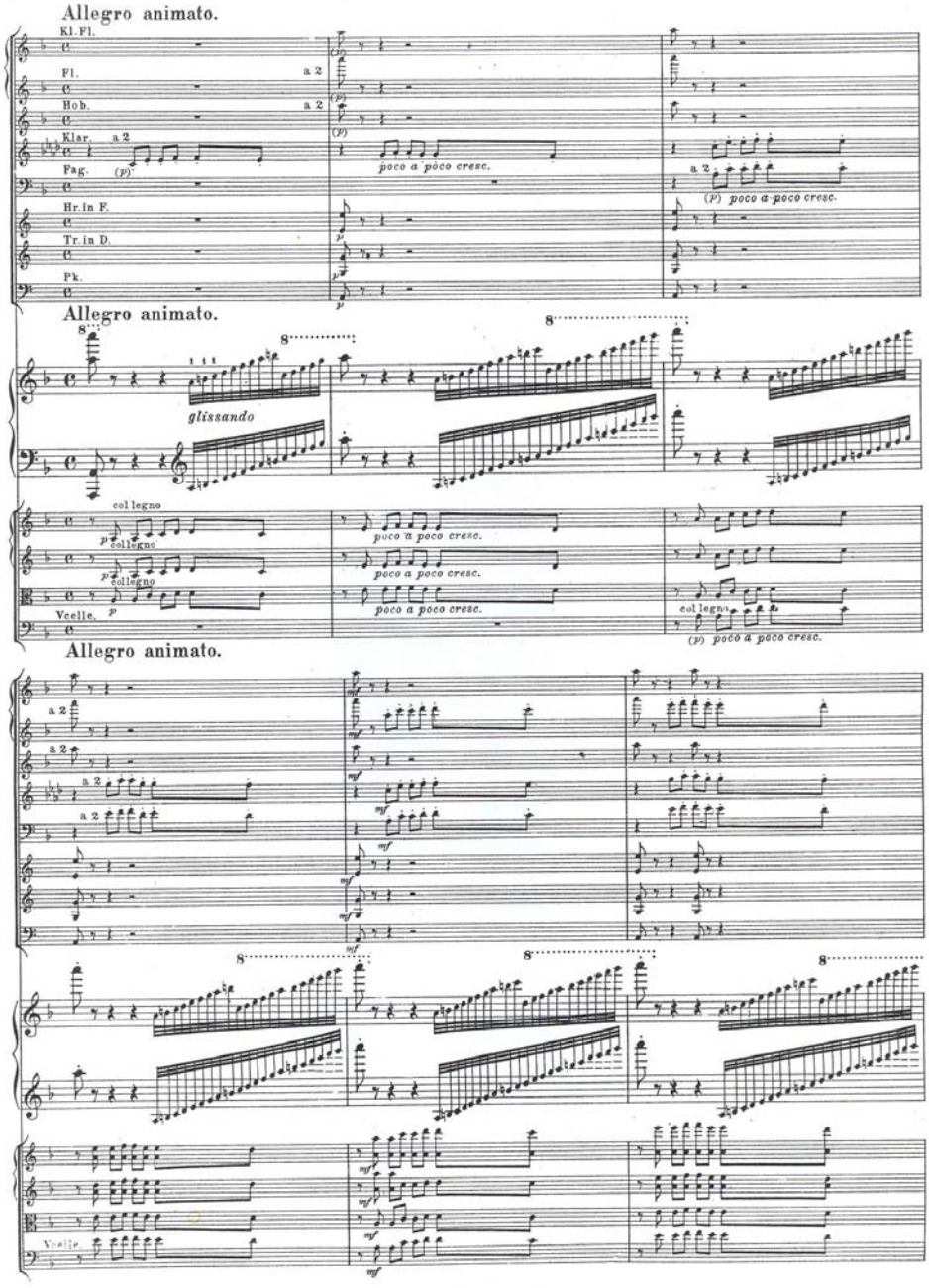


Example 3.259. Fr. Liszt: *Totentanz* (solo version, 1865), Variation II, bars 13-21.[827]

In the second part of this variation (bars 17-20), the solo version is more difficult because the beginning and ending of the glissandi have to be played by the right hand, whereas in the concertante version these notes could be played comfortably by the left hand. The use of two hands for one glissando allows for a cleaner effect since there does not have to be shift of hand position between the gliding and the endnote.

[827] Excerpt taken from the first edition of this solo version by C.F.W. Siegel (Leipzig, 1865, plate number 2185). Reproduced by permission from Musikverlag Fr. Kistner & C.F.W. Siegel, c/o Andryk Verlag GmbH.

In 1865 a final concertante variant of this composition was also published. The second variation glissandos are exactly the same as in the *De Profundis* and solo versions, but at the end of the piece a new eight bar section is integrated featuring upward two-hand glissandos that remind us of the end of the earliest version, although they are here much faster. (Ex. 3.260.)
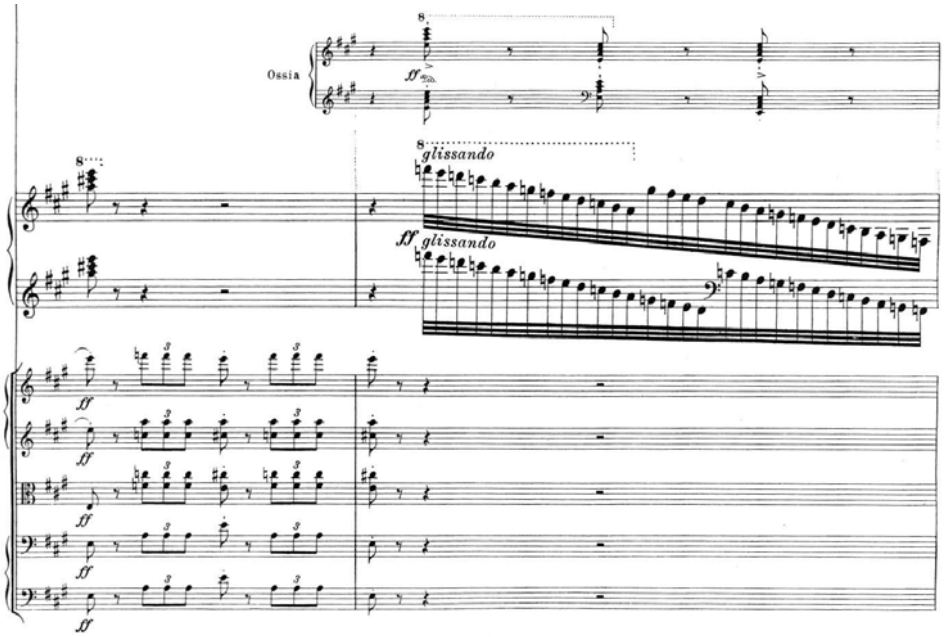


Example 3.260. Fr. Liszt: *Totentanz* (final version, 1865), opening bars *Allegro animato*.[828]
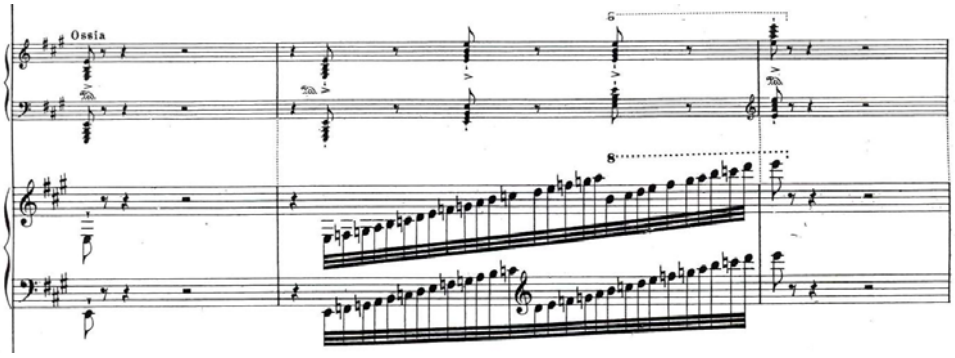
Another concertante work containing glissandi and of which we mainly know the 1860's final version but which was started much earlier, is the 2nd piano concerto. The earliest

[828] Excerpt taken from the first edition of this solo version by C.F.W. Siegel (Leipzig, 1865, plate number 2185). Reproduced by permission from Musikverlag Fr. Kistner & C.F.W. Siegel, c/o Andryk Verlag GmbH.

sketch using some of the basic musical material has been found to date from 1828.[829] A first full composition, to be considered a solo draft for the eventual 2nd concerto, was finished in circa 1838 and is now known as the *Concerto sans orchestre*[830]*.* Neither contains any glissandi, but the 1838 variant already included the material to which Liszt later added the famous glissandos shown in the final 1861 version (published in 1862). (Ex. 3.261-3.263.) It is furthermore interesting to see how Liszt uses the glissando in the same relation to the orchestra in his 1860's versions for both the *Totentanz* and the 2nd concerto: in both pieces Liszt considered extended two-hand glissandos for the soloist to punctuate the orchestral tutti. (Compare ex. 3.260 and 3.261-263.)

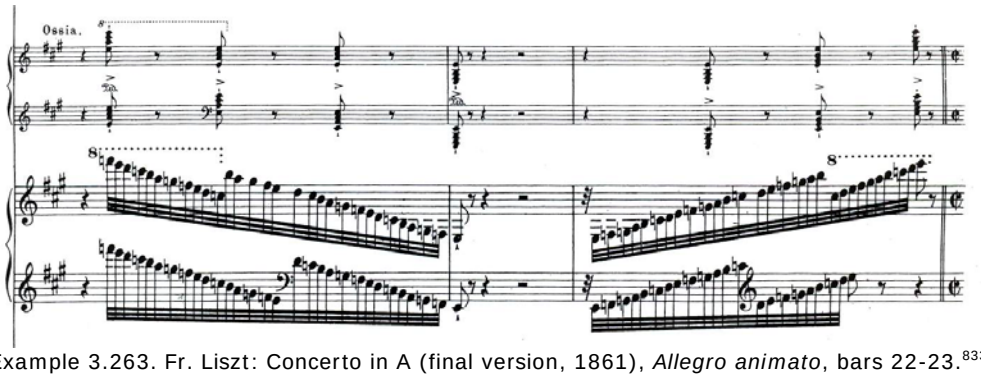


Example 3.261. Fr. Liszt: Concerto in A (final version, 1861), *Allegro animato*, bars 17-18.[831]



Example 3.262. Fr. Liszt: Concerto in A (final version, 1861), *Allegro animato*, bars 19-21.[832]

[829] Howard 2002, p. 7.
[830] Howard 2004, p. 5.
[831] *Franz Liszt's Musikalische Werke. Serie I, Band 13.* Leipzig: Breitkopf & Härtel, 1907-36, plate F.L.
[832] *Franz Liszt's Musikalische Werke. Serie I, Band 13.* Leipzig: Breitkopf & Härtel, 1907-36, plate F.L.

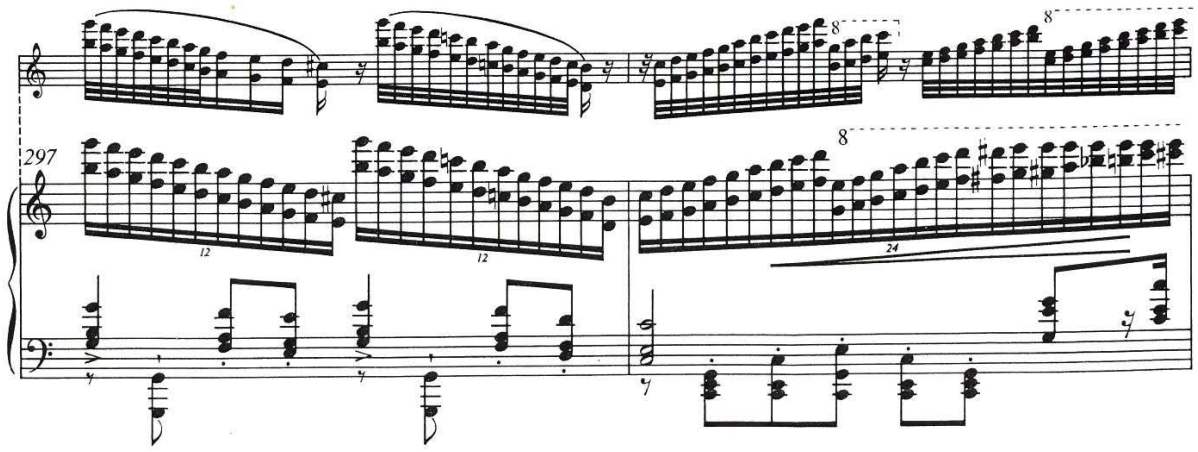


Example 3.263. Fr. Liszt: Concerto in A (final version, 1861), *Allegro animato*, bars 22-23.[833]

3.3.2.3.2.4 Away from C major

One aspect of Liszt's use of the glissando requires separate attention. Almost throughout the years he explored this technique, it can be seen to evolve away from its typical C major environment.

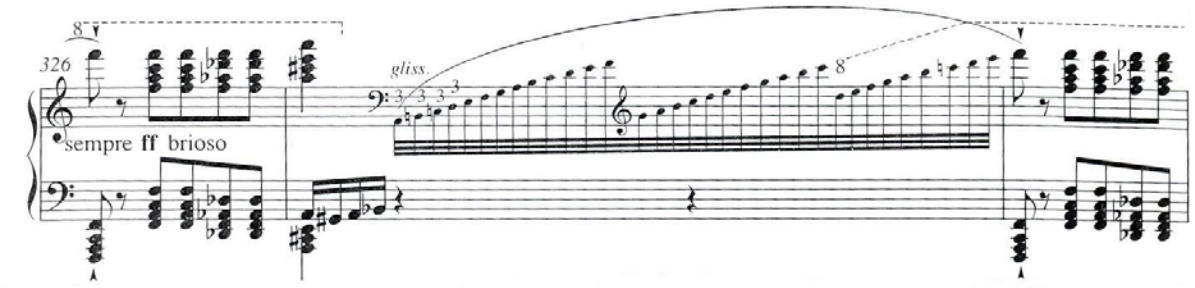
Already Scarlatti and Benjamin Carr had combined glissandos with F major chords in the other hand. From the 1840's onwards, we find Liszt tinkering with the glissando's basic C major identity. If Haydn had switched from octave glissandos to single note runs because of the nuisance a sharp can be to a glissando (see above, 3.2.6.1.8), Liszt "tonally adjusts" his downward glissandos in sixths by having them end on a sharp in the ossia to the 1st version of his *Lucrezia Borgia* paraphrase, going so far as to allow for slowing down and prepare for the transition. (Ex. 3.264, bar 297.)



Example 3.264. Fr. Liszt: *Fantaisie sur des motifs favoris de l'opéra Lucrezia Borgia de G. Donizetti*, 1st version (1840), bars 297-298.[834]

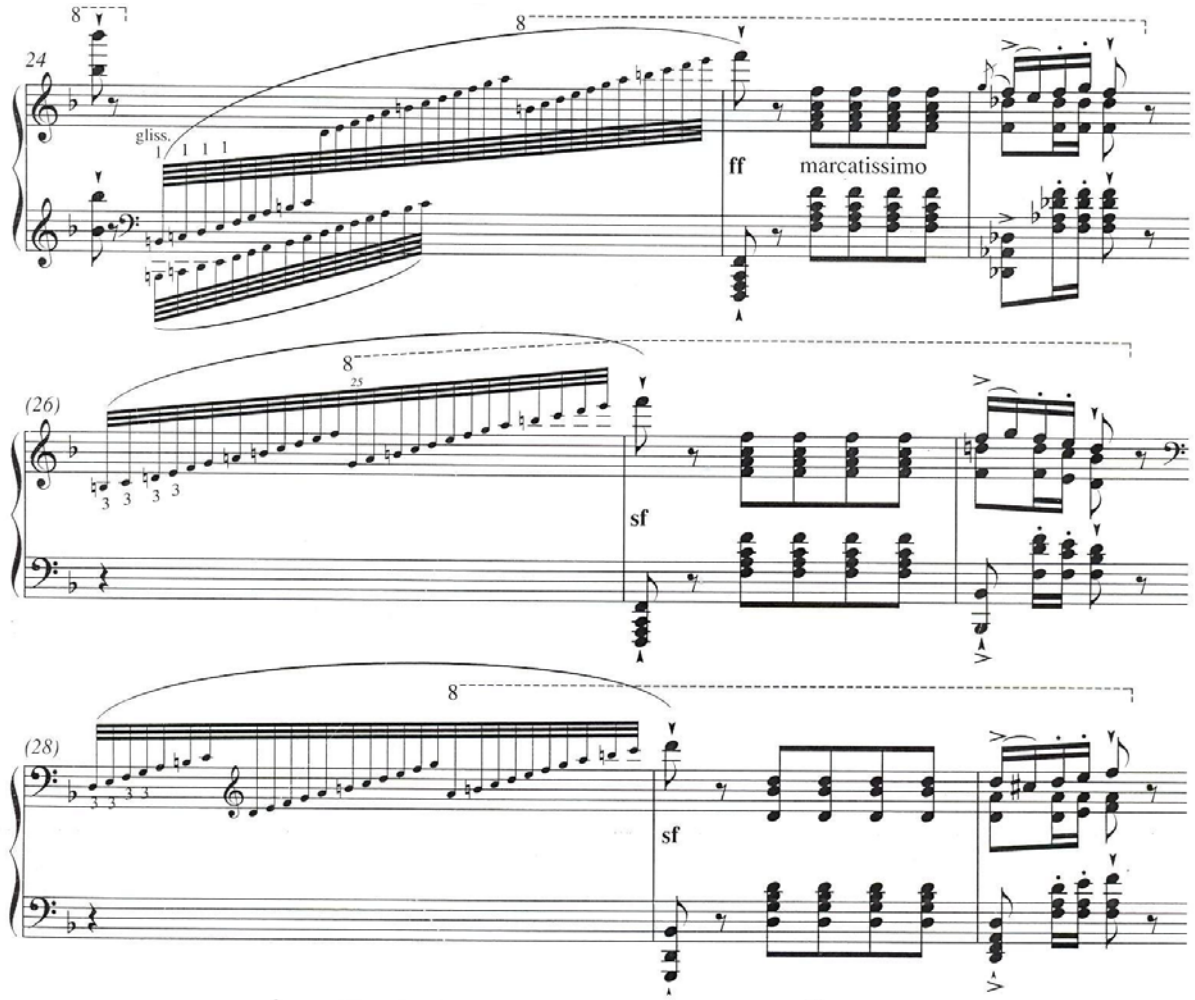
Another instance of modulatory use of the glissando in Liszt's works is found in the *Grosse Konzertfantasie über Spanische Weisen* (1845). Ending a passage on an A major chord, the ensuing glissando takes us back to a major third below (F major), a harmonic transition Liszt would use many times in the future. (Ex. 3.265.)

[833] *Franz Liszt's Musikalische Werke. Serie I, Band 13.* Leipzig: Breitkopf & Härtel, 1907-36, plate F.L.
[834] New Liszt Edition, Series II, Volume V; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.



Example 3.265. Fr. Liszt: *Grosse Konzertfantasie über spanische Weisen* (1845), bars 326-328.[835]

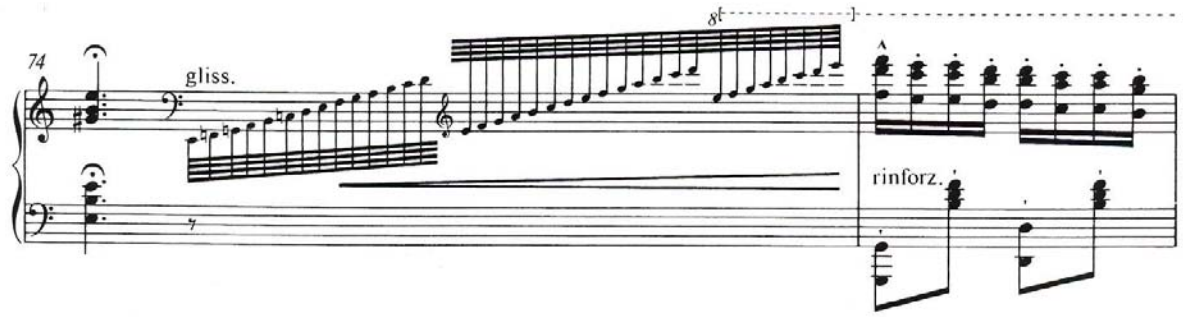
In this same piece, the glissando is used with a variety of chords – including B♭ and D♭ – that do not fit the glissando's "proper" key of C major. (Ex. 3.266.)



Example 3.266. Fr. Liszt*: Grosse Konzertfantasie über spanische Weisen* (1845), bars 24-30.[836]

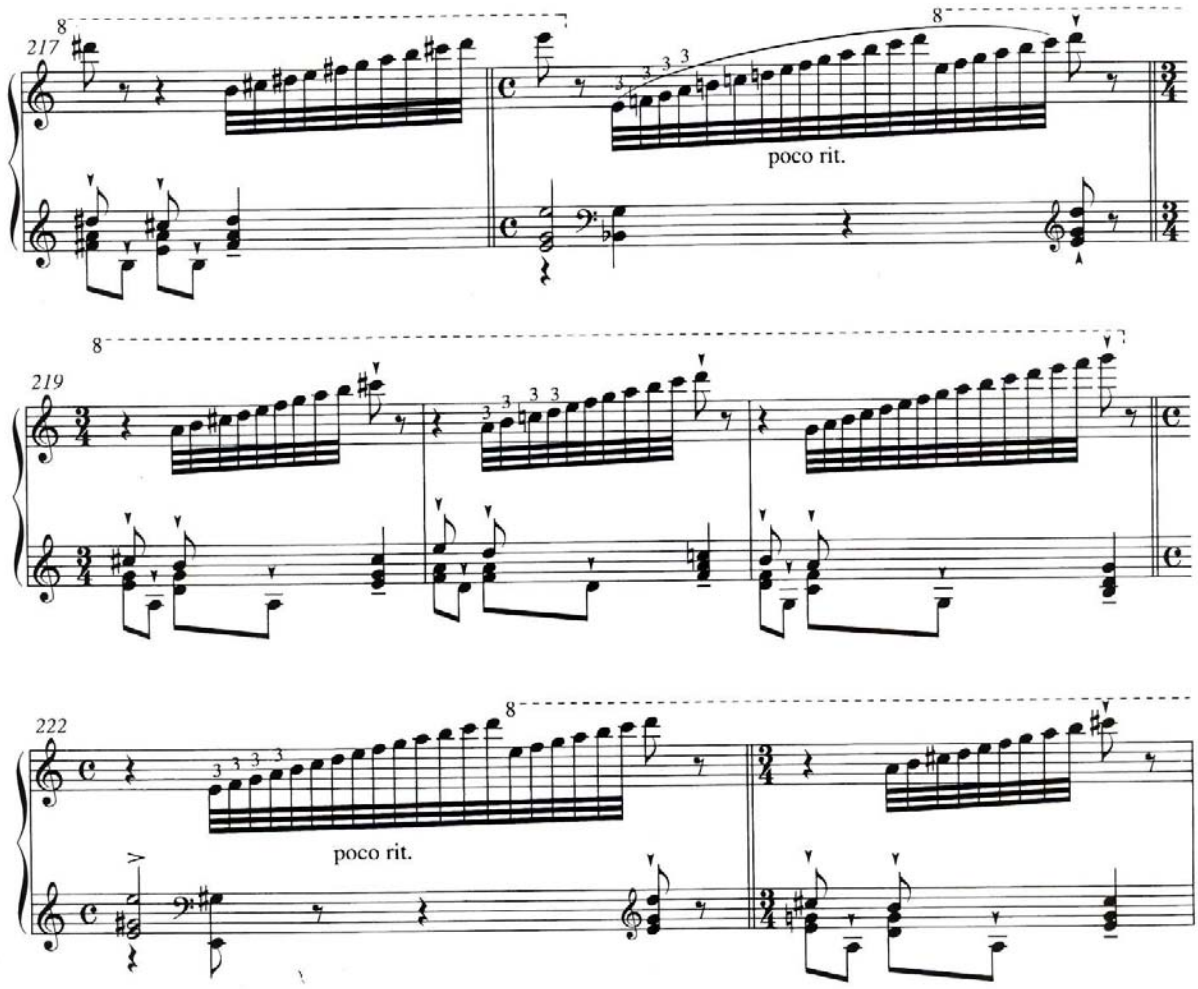
If the tempo in the *Konzertfantasie* is sufficiently high to lose sense of friction between the glissando and the harmony underneath it, the downward third modulation in *Schwanengesang und Marsch aus Erkels Hunyadi László* (1847) is perhaps long enough to make the modulation from E to C less of a surprise then it structurally is. (Ex. 3.267.)

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[836] New Liszt Edition, Series II, Volume VI; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.



Example 3.267. Fr. Liszt: *Schwanengesang und Marsch aus Erkels Hundyadi* (1847), bars 74-75.[837]

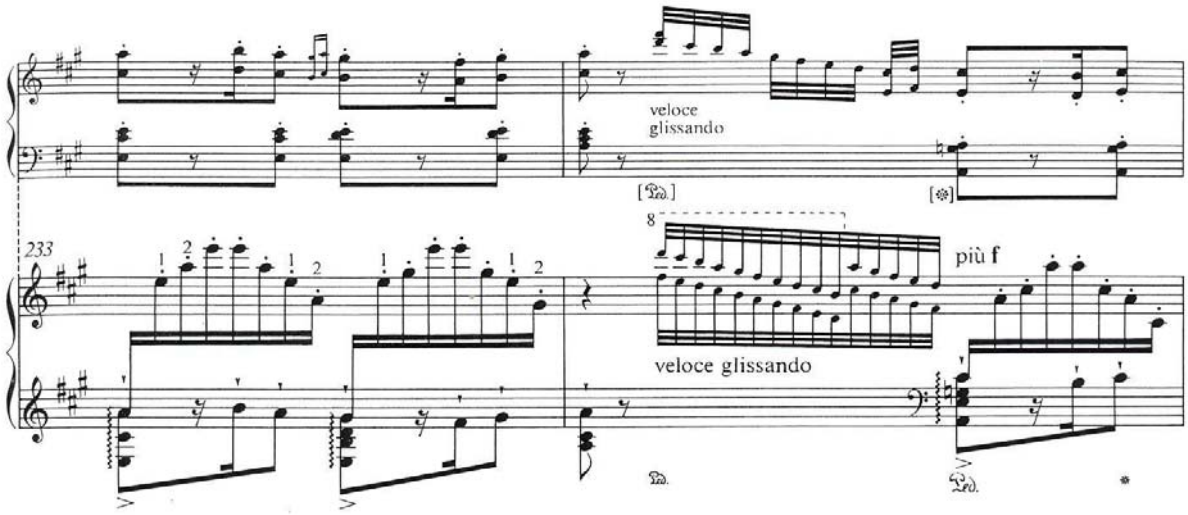
Whilst Liszt keeps on using glissandos to smooth over the transition from one key to another (e.g. between A major and F major as in the *Fantasie über ungarische Volksmelodien* – ex. 3.243), he also starts to write glissandos *during* non-C-major harmonies, such as in bars 218 and 222 from *Illustration du Prophète* (ex. 3.268).



Example 3.268. Fr. Liszt: *Illustrations du Prophète de G. Meyerbeer*, nr. 2: *Les Patineurs* (1849), bars 217-223.[838]
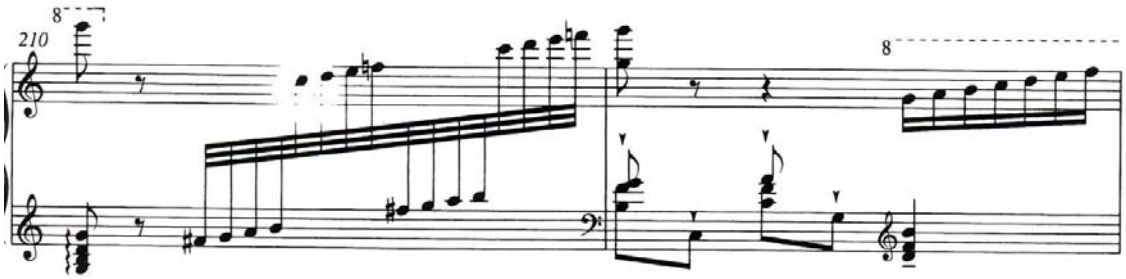
[837] New Liszt Edition, Series II, Volume VIII; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[838] New Liszt Edition, Series II, Volume IX; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.

Nevertheless: not all glissandos were now to be superimposed on non-C-major chords. In the same Meyerbeer transcription, Liszt does still use individually articulated runs over chords like A7+ and B7+. (See bars 217, 219 and 223 in example 3.268.) In the 1840's, it seems that A major was still a bridge to far in terms of applying a glissando onto such harmony: in his fantasy over Mozart's Don Juan opera, Liszt asks for *veloce glissando* but writes individually articulated runs over A major harmonies. (Ex. 3.269.) He would overcome this inhibition with his 2nd piano concerto (see ex. 3.261 and 3.263).



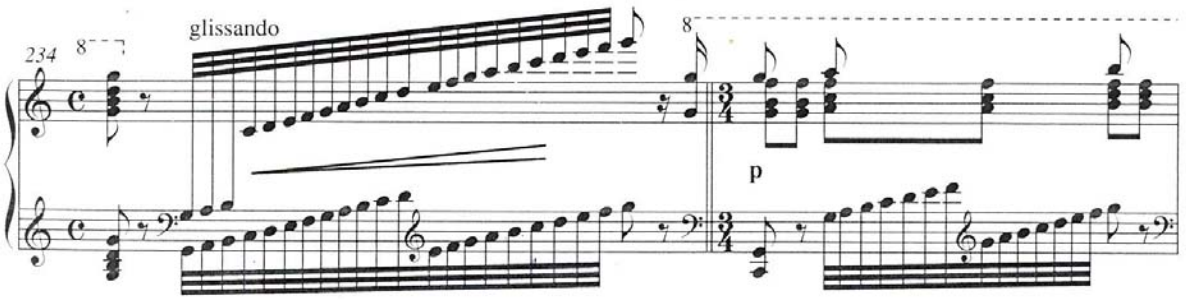
Example 3.269. Fr. Liszt: *Réminiscences de Don Juan de Mozart* (1841), bars 133-134.[839]

Returning to the Meyerbeer transcription: Liszt also distinguishes between proper runs and different kinds of glissandos to mark different sorts of structurally important points in the melodic pace – see for instance the subtle differences between bar 210 (where Liszt takes us to the repeat of the first part of the theme) and 234. (Compare ex. 3.270 and 3.271.) In this case, the structural point in the phrase is the same in both bars, but in bar 234 Liszt signals the move to a new "instrumentation" of the theme, with larger chords and longer, lower glissandos, requiring a larger introductory gesture than the single 16-note run from bar 210. Similar differentiations are found comparing bars 218 and 320 (first half of the second part of the phrase in first and second variation – single-note glissando becomes broken chord) and bars 222 vs. 324 (second half of the second part of the phrase in both variations – compare ex. 2.268 and 2.272).

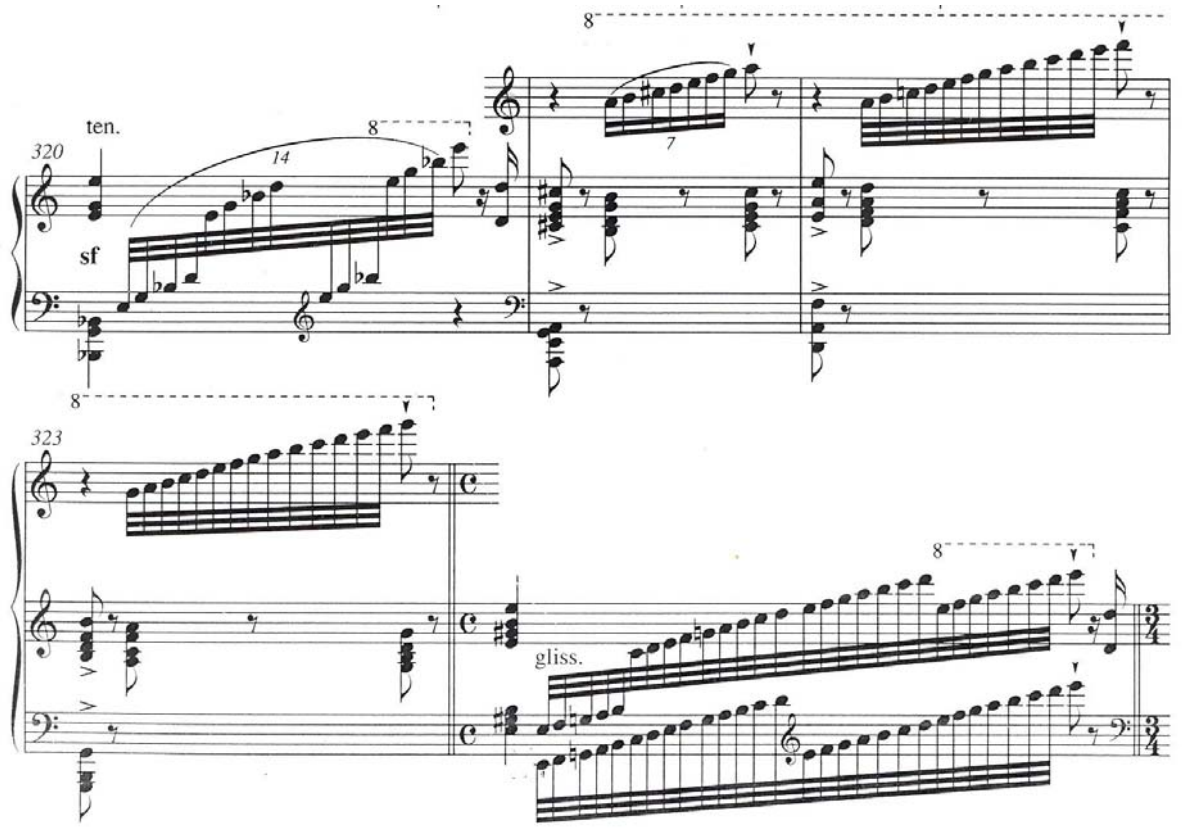


Example 3.270. Fr. Liszt: *Illustrations du Prophète de G. Meyerbeer*, nr. 2: *Les Patineurs* (1849), bars 210-211.[840]

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[840] New Liszt Edition, Series II, Volume IX; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
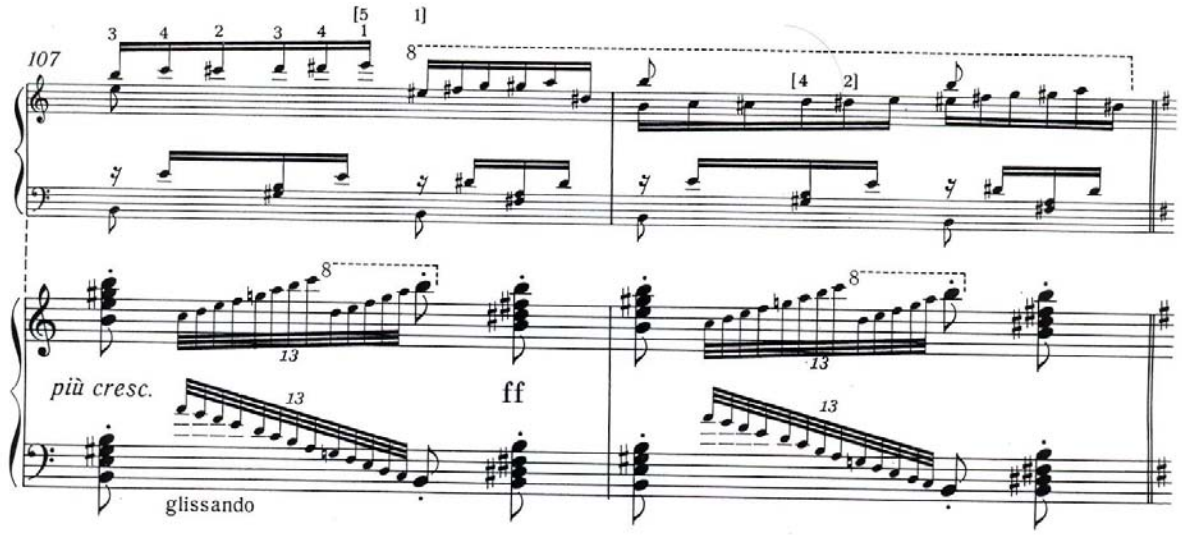


Example 3.271. Fr. Liszt: *Illustrations du Prophète de G. Meyerbeer*, nr. 2: *Les Patineurs* (1849), bars 234-235.[841]



Example 3.272. Fr. Liszt: *Illustrations du Prophète de G. Meyerbeer*, nr. 2: *Les Patineurs* (1849), bars 320-324.[842]

Gliding over E major seems to have struck Liszt's fancy in particular: we see it return in the 5th Paganini study (1851 – see ex. 3.256), the *Rhapsody Hongroise* number X (1853 – example 3.273), the first *Mephisto Walzer* (1856) and the concerto in A (1861 – see ex. 3.261).

[841] New Liszt Edition, Series II, Volume IX; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[842] New Liszt Edition, Series II, Volume IX; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.

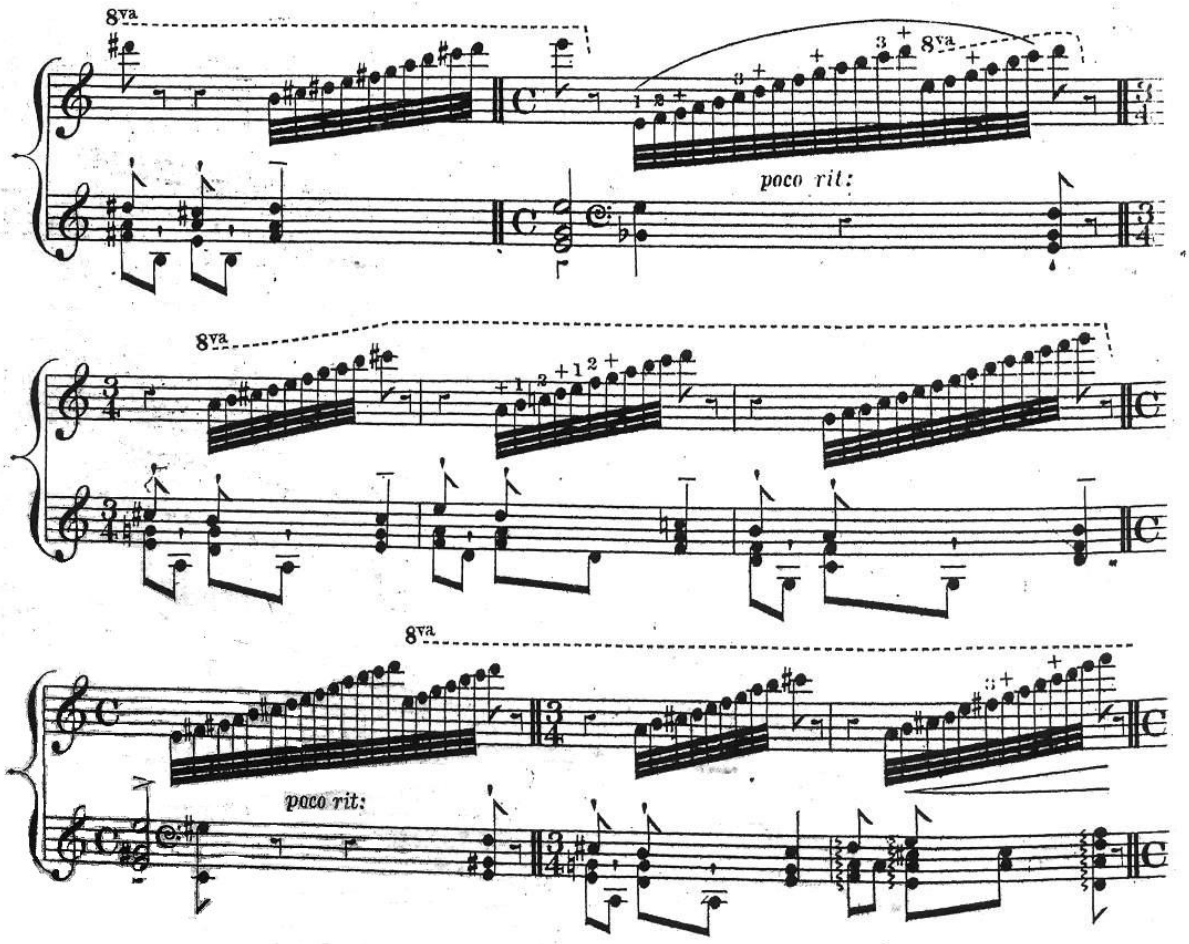


Example 3.273. Fr. Liszt: *Rhapsodies Hongroise X* (1853), bars 107-108.[843]

In the tenth rhapsody, white keys are further glided over on top of the harmonies of B7, d7, G7+ and C. In the *Réminiscences de Lucrezia Borgia* they appear over F(7), G7+ and C (first, 1840 version) as well as E7+, d7 and F/d (second, 1848 version). (See ex. 3.223, 3.232, 3.247.)

Not every publisher shared Liszt's progressive view on mixing diatonic glissandos with non-C major chords. When Chappell issued the *Illustrations* in 1852 in London, all such glissandos were converted to runs that fit the harmony underneath. (E.g. bars 222 and 224 in ex. 3.274.) Being a little overzealous, the editor gave some white key runs a proper fingering, even when this is completely unnecessary as they can be glissandos like so many of them before and afterwards in this piece. (See bar 218 and 220.)

[843] New Liszt Edition, Series I, Volume X; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.



Example 3.274. Fr. Liszt: *Illustrations du Prophète de G. Meyerbeer*, nr. 2: *Les Patineurs* (1849), London edition (1852), bars 217-224.[844]

3.3.2.3.2.5 Morphology: beginnings and endings II

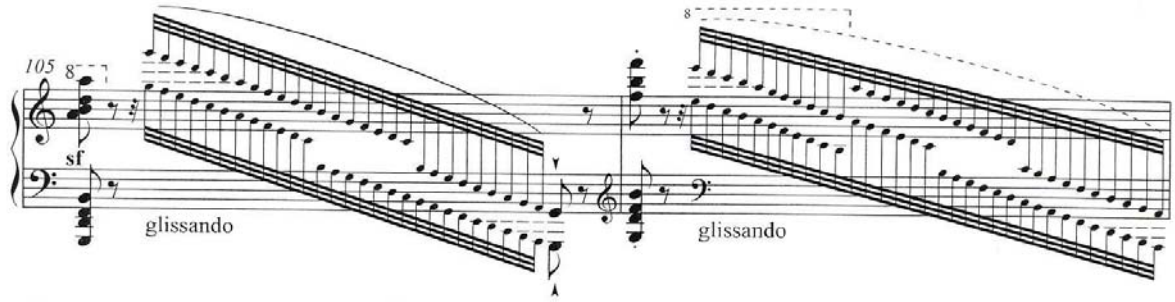
In all the 32 pieces for which Franz Liszt composed glissandos (including two from the 1830's), we found 372 runs designated this improper technique, with the following characteristics as to their beginnings and endings[845]:

Beginning:		
- Unmarked	266	
- Marked	153	
by an		
o Agogical stress (prolonged first note)		46
o Articulatory/dynamic stress (^, >, *rfz*)		93
o 8th rest		2
o 32nd rest		4
o 64th rest		8
Ending		
- Unmarked	132	

[844] GB-Lbl h.895.(6.). Reproduced by permission.
[845] Some glissandos had more than one marking, e.g. a beginning with an agogical and a dynamical stress.

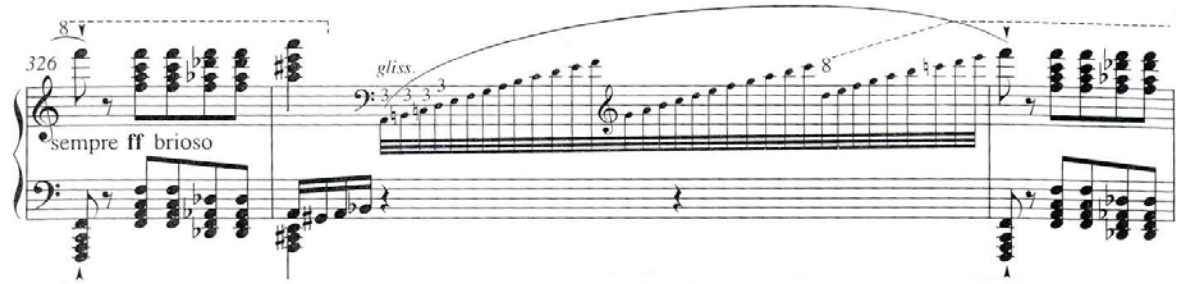
- Marked 240
  by a
    - Articulatory/dynamical stress (*stacc.*, *spicc.*, **^**, **>**, comb.) 240

Liszt's predilection for unmarked beginnings is new and personal: while most of the glissandi in the works of his predecessors or colleagues are characterized by marked beginnings (see all above), almost three quarters of his glissandi have a "flying start." Sometimes we can deduce his reasoning for an unmarked start of a glissando, or at least detect indications of what may have played a role. In *Gaudeamus Igitur,* he may have wanted to avoid that to many stressed beats become tedious. (Ex. 3.275.)



Example 3.275. Fr. Liszt: *Gaudeamus Igitur*, 1st version (1843), bars 105-106.[846]

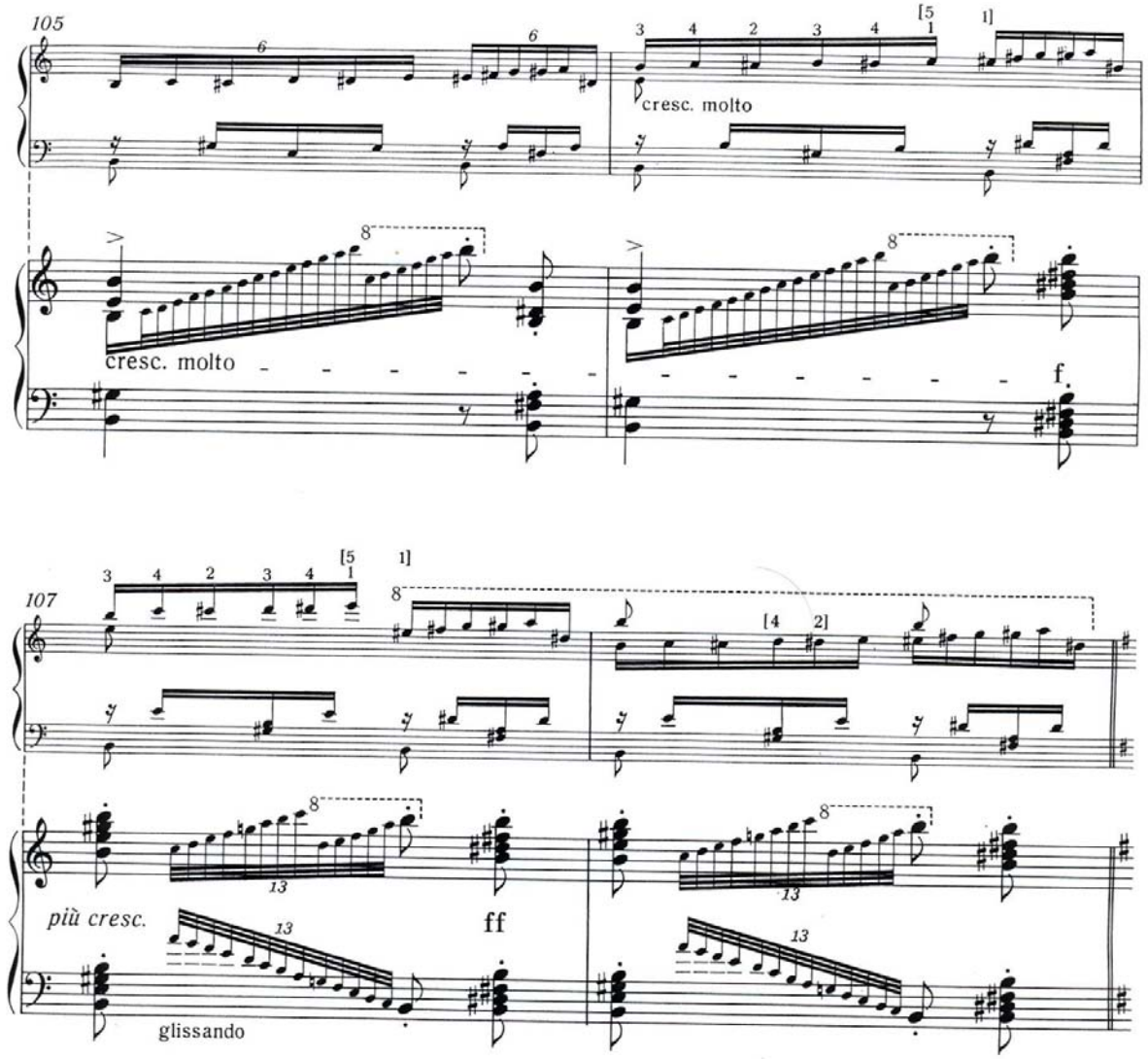
In the *Grosse Konzertfantasie über spanische Weisen* the glissando is a continuation of a groupetto ornament. (Ex. 3.276.)



Example 3.276. Fr. Liszt*: Grosse Konzertfantasie über spanische Weisen* (1845), bars 326-328.[847]

At times the difference between ways to notate a glissando that departs from a certain note says something about the interpretation of the passage. In ex. 3.277 the first two glissandos are connected to the first beat, which is stressed and prolonged; the next two glissandos are separated. The latter also departs from the *b*, which can be considered a prolonged start of the glissandi, but the notation is different to assure the staccato articulation of the chords on the first beat.

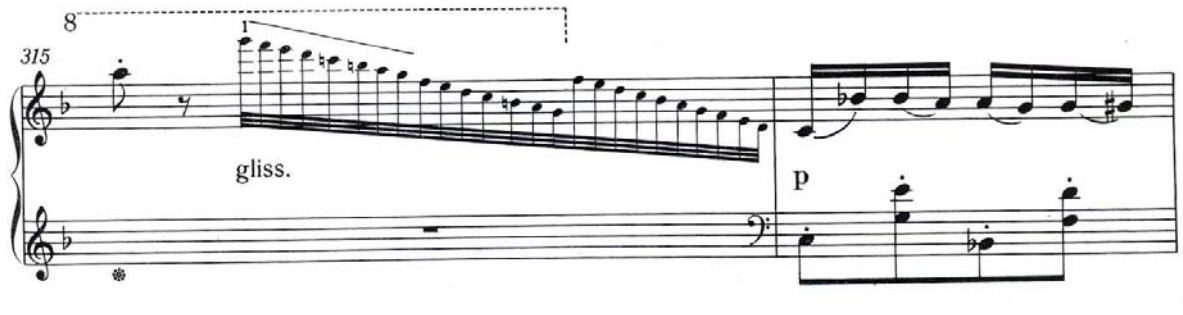
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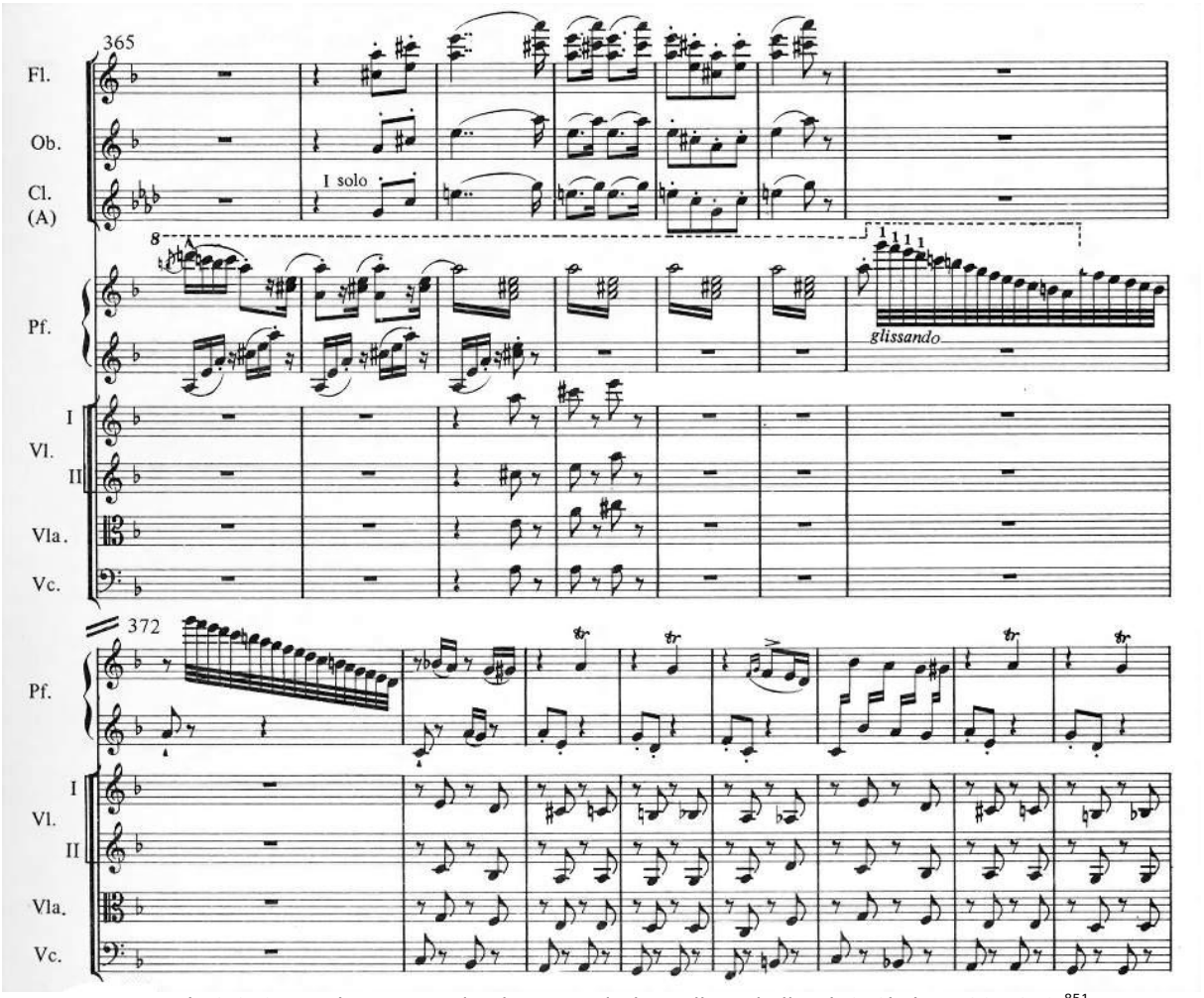


Example 3.277. Fr. Liszt: *Rhapsodies Hongroise X* (1853), bars 105-108.[848]

In two versions of the material that makes out the XIV. rhapsody, we can see how the instrumentation of a melody can determine the ending of a glissando. In the solo version, the right hand needs to change back to its proper position at the end of the glissando but before playing the c^1 of the main theme. (Ex. 3.278.) In the concertante version, the accompaniment is transferred to the orchestra, leaving the pianist's left hand free to take over the beginning of the melody. (Ex. 3.279.) In this way the run can glide all the way to its very last note (b^1 in bar 371; d^1 in bar 372) without having to sacrifice any of its last notes to let the hand change its position.[849]

[848] New Liszt Edition, Series I, Volume IV; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[849] In the first edition (Leipzig: Gustav Heinze, n.d. [1864]. Plate G.61, as found in US-Nyj: 2 L699 AA Dana v.11 p.13-33) there are no *spiccato* signs yet – those appear only with the two-piano arrangement (Leipzig, Edition Peters, n.d. [1910], Plate 9894) by Hans von Bülow, the dedicatee of the work, and have been taken over since.



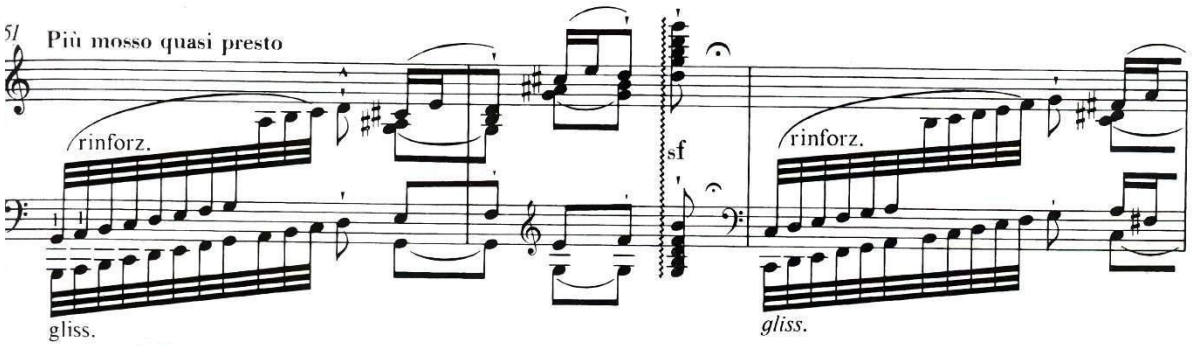
Example 3.278. Fr. Liszt: *Rhapsodie Hongroise XIV* (1853), bars 315-316.[850]



Example 3.279. Fr. Liszt: *Fantasie über ungarische Volksmelodien* (1852), bars 365-379.[851]
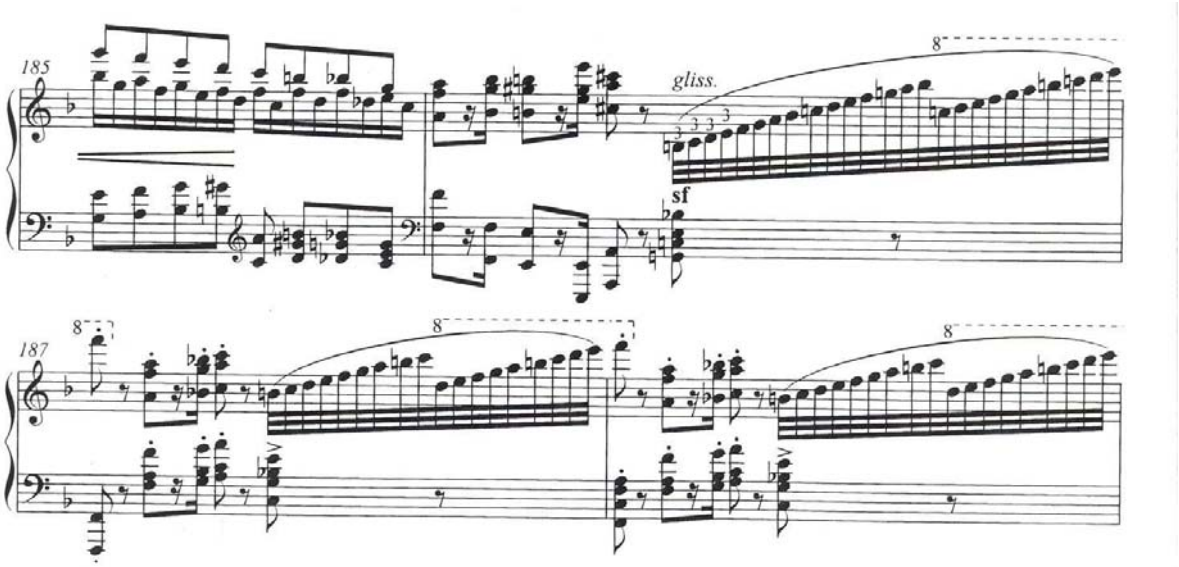
In the *Schwanengesang und Marsch aus Erkels Hundyadi* the *rinforzando* emphasizes the entire downbeat without any particular accent on the first note of the glissandos. The use of the heavy thumb to do the gliding certainly helps to raise the volume of that first beat. (Ex. 3.280.)

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[851] From the Eulenburg edition, nr. 1298, plate number EE 6685. Reproduced by permission of Schott Music GmbH & Co. KG.



3.280. Fr. Liszt: *Schwanengesang und Marsch aus Erkels Hundyadi* (1847), bars 51-53.[852]

In the *Andante, Finale und Marsch* based on the opera *König Alfred* by Joachim Raff, the sforzando is only required on the first of the 6 glissandos, the one that introduces the modulation. (Ex. 3.281.)



Example 3.281. Fr. Liszt: *Andante, Finale und Marsch aus der Oper König Alfred* (1853), bars 185-188.[853]

At times, the notation is odd, as in the 2nd concerto, where the downward glissandos end on a *spiccato* note and the upward ones do not. The differentiation is carried out consistently in the passage, so it is unlikely to be a printer's mistake overlooked by Liszt. More likely, Liszt saw the upward glissandos in this work as open-ended. (See above, ex. 3.261-3.263.) We discerned a similarly willful differentiation in the early *Totentanz* version (ex. 3.257). In the later incarnation of that work, Liszt notated some glissandos in small print while marking their endings with larger note heads, indicating that these are to be played distinctly – i.e. individually articulated – even when the sheer speed of the glissando (e.g. ex. 2.359-3.260) would seem to demand an open ending.

Even if we cannot always point at clear and logical reasons for using a particular beginning or ending, we can conclude that Franz Liszt made a conscious difference between marked and unmarked endings, and the differences in consequences for the performance techniques should be taken into account.

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3.3.2.3.2.6 Fingerings II

As for the fingerings in Liszt's glissandos: he did not always indicate them, but when he did, it was mostly only for the right hand. Chronologically, he starts out inversing what was the tradition in the previous decades, i.e. mostly *3* and rarely *2* for upwards glissandos in both hands (compare with *2*(/*3*) before – see 3.3.2.2.6.1.). However, he chooses almost as often the thumb for the right hand, inward as well as outward. Some of those instances are two-hand glissandos, however, and it is not clear whether Liszt would have meant the thumb indication for *both* hands (e.g. ex. 3.280.) In that case, the performer's arms would be in very different positions compared to each other: the right wrist and arm would be positioned away from the body while the left wrist and arm would be held against the body. If, on the other hand, the right hand uses the thumb while the left hand a *2* or *3*, both wrists and arms would be held symmetrically and more comfortable.

O= outward
I= inward
R= right
L= left

In the column with the types, all types of glissandos in that piece are listed. In the column with the fingerings, those types that have a fingering indication are specified if not all types have a fingering. The titles are often abbreviated for reasons of space. See Table 3.1 for the complete information.

1840's-1860's: fingerings in Liszt single-note glissandos

date	fingering	type		composition
1840	*3*	OR,	IL	*Hussitenlied*
1843	*1*IR	OL,	IRL	*Gaudeamus Igitur* I
1845	*1*/*3*OR	ORL,	IL	*Grosse Konzertfantasie*
1846-47	*1*OR	OR,	IL	*Schwanengesang*
1847			IR	*Ungarische Nationalmelodie*
1847	*2*		IR	*Magyar dalok* 10
1848		OR		*Zigeuner-Epos* 8
1848	*3*	OR		*Zigeuner-Epos* 11
1849	*3*OR, *1*OR	ORL,	IRL	*Totentanz De Profundis*
1849	*3*	OR,	IL	*Illustration du Prophète*
1851		OR,	IL	*Paganini Etude*
1852	*1*		IR	Hungarian fantasy
1853	*3*OIR, *2*ORL	OR,	IRL	X. Rhapsody
1853	*1*IR, *3*OR	OR,	IR	XIV. Rhapsody
1853	*3*		IR	XV. Rhapsody
1853	*3*	OR		*Andante, Finale und Marsch*
1853	*1*IR		IR	*Gaudeamus Igitur* II
1850's	*3*OR, *1*OR	OR,	IR	*Totentanz solo*
1860	*3*OR, *1*ORIL	OR,	IL	*Bacchanal*
1861		OR,	IL	*Mephisto Walz 1*
1861	*1*	OR		*Valse de l'opéra Faust*
1865	*1*	OR,	IRL	*Totentanz* final version
1868	*3*	ORL,	IL	*Konzertstück*

As for fingerings in double-note glissandos Liszt onyx indicated them for glissandos in thirds in this 20-year period. As in the previous period (3.3.2.2.6.1.), they are mostly for *42*.

For the double-note glissandos Liszt only really marked the fingerings for the glissandos in thirds. That those in octaves do not require specification anymore is understandable: in former times the *51* fingering only served to indicate the gliding technique more than the actual fingering. That the glissandos in sixths do not have any fingering added anymore is less self-evident. In the late 1830's Liszt still showed them to be best played with *41* (see 3.226 and 3.227), he must afterwards have found that it did not matter much.

1840's-1860's: fingerings in Liszt double-note glissandos

date	3rds	4ths	6ths	8ths	composition
1840	*42* IR		-- OR, IR		*Lucrezia Borgia* 1
1843	-- OR, IR		-- OR	-- OR	*Gaudeamus Igitur* 1
1847	*42* IR				*Magyar Rapszódiák*
1848	*4-/42* IR	*41* OR	-- OR, IR		*Lucrezia Borgia* 2
1853	*42* IR				XV. Rhapsody

3.3.2.3.2.7 Speed II

We have seen how Liszt notated some long glissandos outside of the available meter (e.g. the 1838-39 *Magyar dalok* nr. 9 in ex. 3.226 and 3.227), counting on rubato to make them feasible. Once, in the 1843 version of *Gaudeamus Igitur* (ex. 3.234), he included a hemiola passage to prepare the listener (and performer) for just such a rubato necessity: the 4-octave two-hand glissando (one of which in octaves) would otherwise not be possible in that one beat. At other times he foresaw a fermata to provide time in which to stretch the meter and fit the long glissandos (ex. 3.246).

But Liszt could also make matters of speed difficult from another perspective: in the 1840 first version of the *Lucrezia Borgia* paraphrase (ex. 3.223) and two of his *Rákóczi-Marsch* versions (1846-48 – ex. 3.237 and 3.239) the glissandos are in fact almost too slow to be played with much comfort. The glissando function in these examples can explain that Liszt used such extremes in the same decade. The really slow glissandos mentioned are accompaniments to melodies in the middle register, leaving a range of just a few octaves for the glissandos above. At the same time, the tempo of melodies cannot just be molded to fit the needs of glissando-speed. The combination of these two factors leads to slow glissandos. The very fast two-hand glissando in *Gaudeamus Igitur*, or the 5-octave two-hand glissando in one beat in *Les Patineurs* (ex. 2.251), on the other hand, have no bearings on anything else going on in that time. Their speed can be adjusted without distorting the musical flow because they are the very punctuation defining that meter.

Two more examples best serve to show how Liszt was aware of the consequences of a glissando's length and speed is found in the *Fantasie über ungarische Volksmelodien*. (Ex. 3.279.) The glissandos starts an eight note earlier than in the solo version of this composition (*Rhapsodie Hongroise XIV* – 3.278), adding a little rhythmic edge to the transition between the tremolos and the jumpy theme, but also giving the pianist more time to play all the notes. Perhaps Liszt aimed at achieving better projection of the sound in this concertante setting: adding pressure to play the glissando louder slows it down, which coincides with the earlier start. In a later decade Liszt would demonstrate to take such matters into account yet again when writing the final version of the *Totentanz* and changing a glissando from a 4^{+}-octave range in one beat to 4 octaves when the tempo

quickens (*un poco animato*), and finally to 3 octaves in the *Allegro animato*. (Compare ex. 3.257, 3.260.)

3.3.2.3.2.8 Dynamic range II

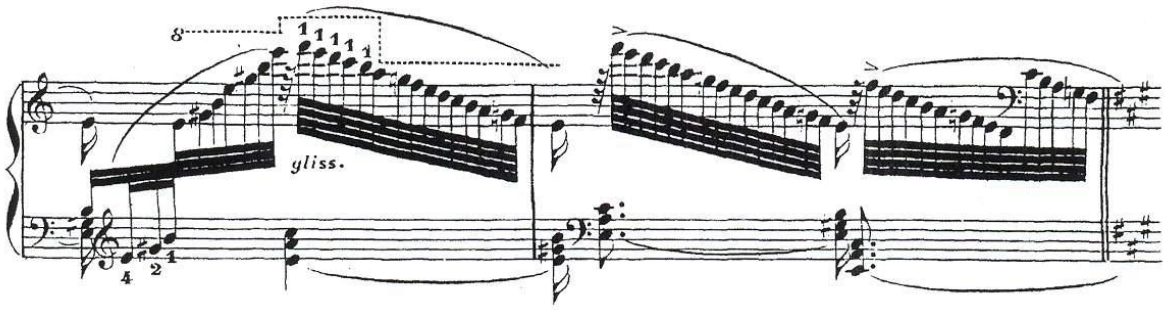
The one matter in which we find Liszt less than innovative was in the field of glissando dynamics: most of his glissandos are written *forte:* 252 instances versus 64 *piano* and 44 *cresc*.[854] This stands in contrast to for instance Herz who clearly experimented with *piano* and *pianissimo* glissandos, even in the double-note types that are more difficult and require more pressure to obtain regularity in sound quality.

3.3.2.3.3 The glissando outside of Liszt's oeuvre
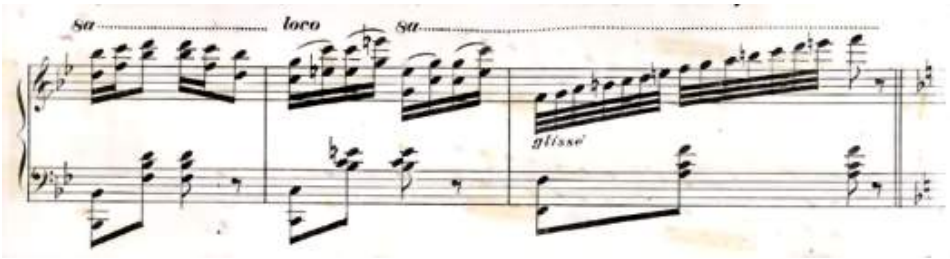
As many glissandos as Liszt may have written, and as much progress his work represents in terms of the development of the technique, he was not the only composer in the middle of the 19th century to be using the glissando. Those that did either followed in Liszt's footsteps, or continued some of the practices that had started earlier.

3.3.2.3.3.1 Away from C major II

Another example of composers following what Liszt' tried out, is the way glissandos where used over harmonies that are not in C major. We have seen how Liszt went far in this matter (3.3.2.3.2.4) – his colleagues and successors, however, mostly did not really dare where he had gone. Joachim Raff wrote glissandos over A minor harmonies (ex. 3.282), Julius Schulhoff and Ferdinand Croze over F major (ex. 3.283 and 3.284). Both these keys are closely related to C major; F major had already been used underneath glissandos in the 18th century (e.g. Scarlatti).

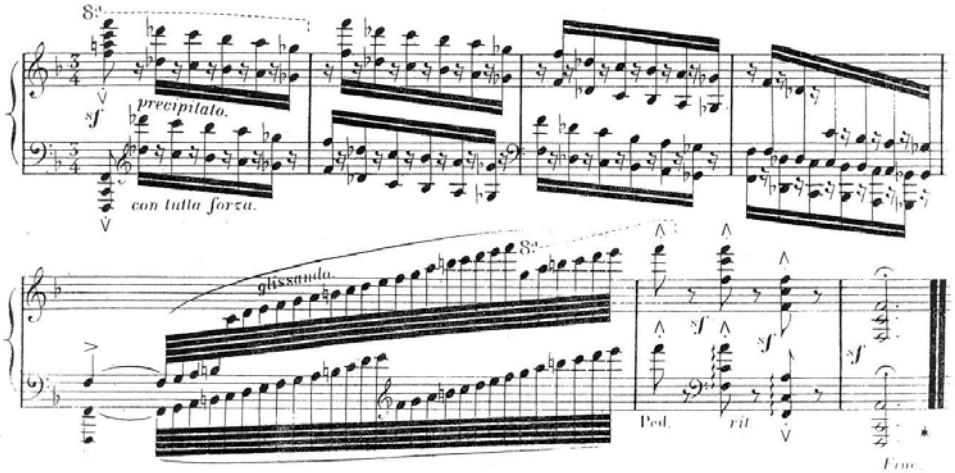


Example 3.282. J. Raff: *Schweizerweisen* opus 60, Nr.4, bars 138-139.



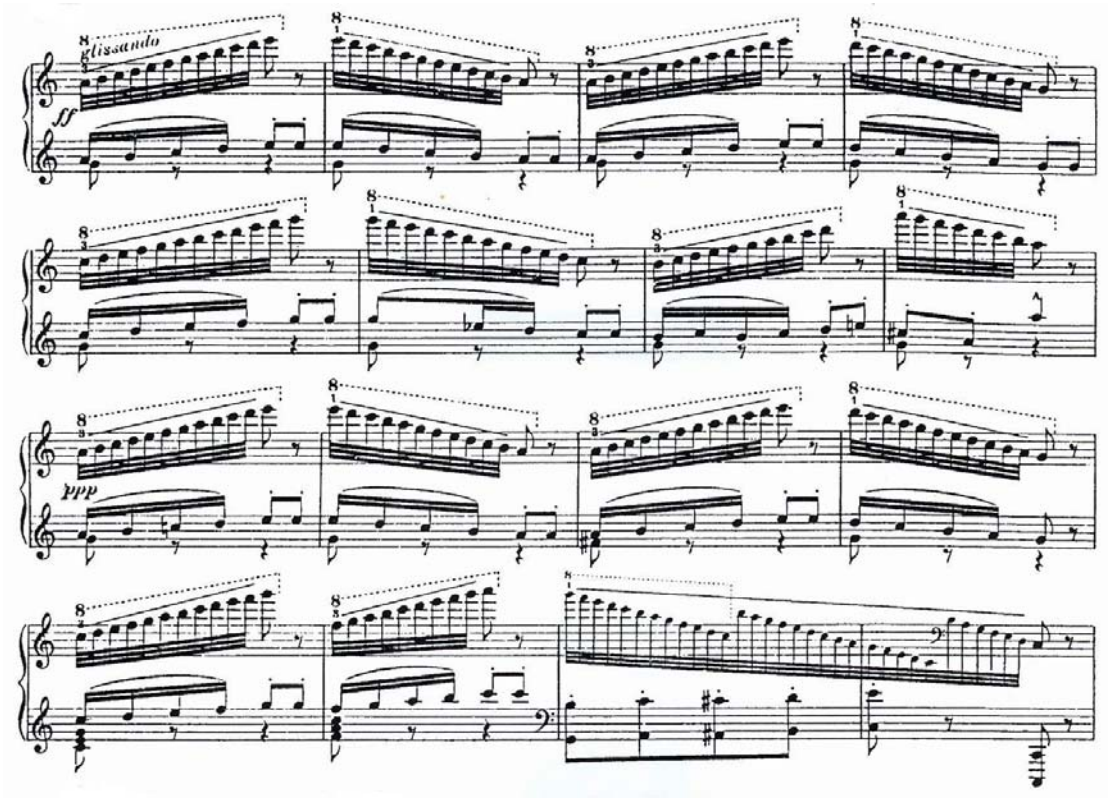
Example 3.283. F. Croze: *Polka, Etude de Concert,* bars 98-100.

[854] The others have no particular dynamic indication.



Example 3.284. J. Schulhoff: *Le Carnaval de Venise* opus 22 (1849), final bars.

In his fantasy on Moniuszko's opera *Halka*, Carl Tausig followed his teacher's efforts more closely, gliding over harmonies such as C minor, A major and D major. (Ex. 3.285.)



Example 3.285. C. Tausig: *Fantasie Halka* (1858>), bars 324-339.

3.3.2.3.3.2 Fingerings III

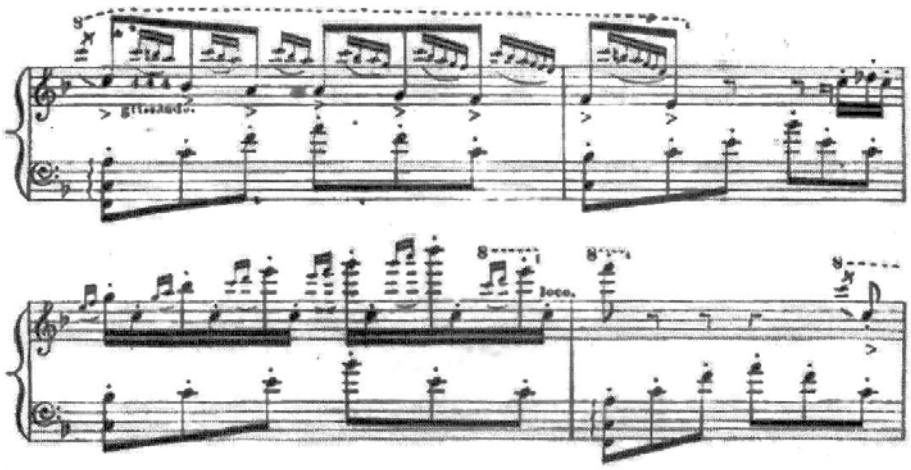
As with Liszt, or even more so, other composers often neglected to indicate the fingerings they had in mind for their glissandos:

1840's-1860's: fingerings in single-note glissandos outside of Liszt

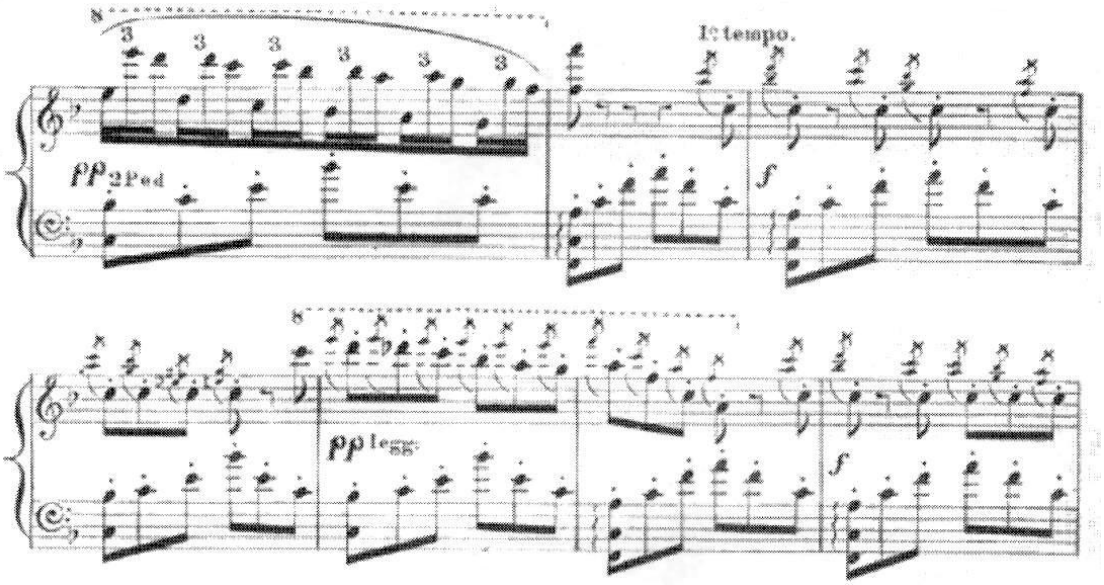
date	fingering	type		composition
1840	*3*	OR		Strauss *Carnevals-Quadrille*
1847	*2*	OR,	IR	Herz opus 158
1847	*1*	OR		Herz *Henrietta's Waltz*
1848	--	OR,	IR	Grobe *Salut to New York*
1849	--	OR,	IL	Schulhoff *Carnaval de Venise*
1851	*4*OR, *1*IR	OIR		Quidant *Mystères du coeur*
1851	*1*		IR	Raff *Schweizerweisen*
1851	--	OR		Rubinstein concerto
1852	*4**RI; 1IR		IR	Jaell *Carnaval of Venice*
1853	--	OR,	IR	Van der Weyde *Carnaval*
1853	--	OR		Croze *Polka*
1855?	--	OR		Tausig *Aufforderung*
1855?	*1*	OR,	IR	Tausig *Man lebt nur Einmal*
1858	*3*		IL	Smetana *Ballade*
1850's	--	OL,	IL	Berwald *Marche Triomphale*
1860	*3*OR, *2*IL	OR,	IL	Tausig *Das Geisterschiff*
1861	*3*OR, *1*IL	OR,	IR	Tausig *Halka*
1862	--	OR		Richards *O Luce di quest anima*
1864	*2*	OR,	IR	Raff *Kunkel's Leonore March*

* = flesh (back) of the finger

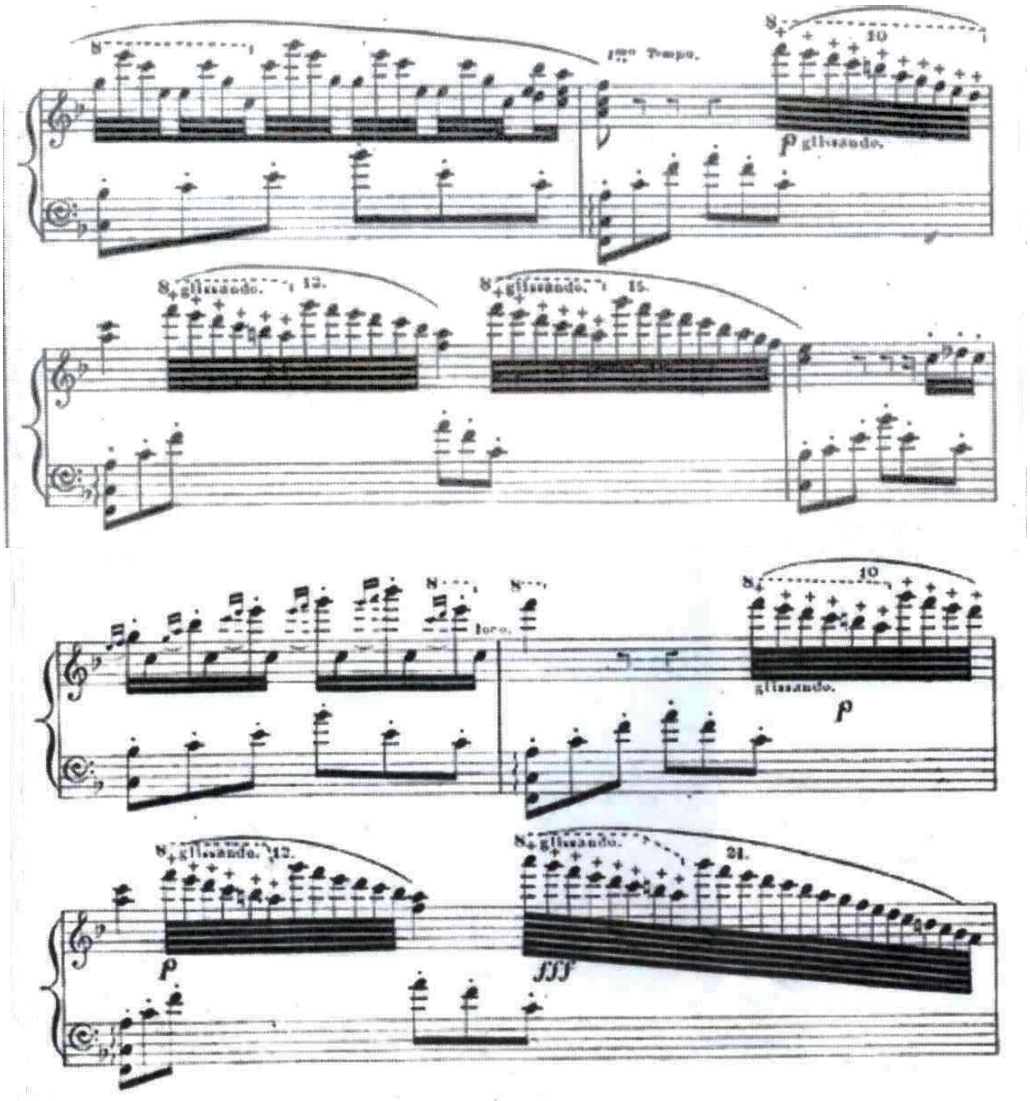
Here also the thumb gains some prominence in single-note glissando fingering, although *2* and *3* remain in sight. The odd ones out are Quidant and Jaell, both asking for the fourth finger. Jaell even thinks of a way to put the *flesh* of the fourth finger to use. The glissandos (some with the thumb, both in *forte* and *piano*) in his *Carnaval of Venice* are connected intrinsically with the ornaments in other variations of the famous tune. (Cf. ex. 3.286 with 3.287 and 3.288, especially the relation between the triplets in bar 54, the glissandos in bar 40-41 and the big glissandos in bars 71-76.)



Example 3.286. A. Jaell: *Carnaval of Venice*, bars 40-43.

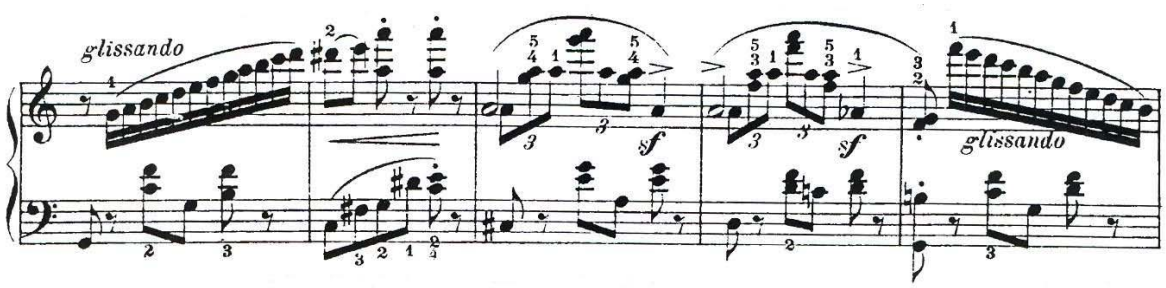


Example 3.287. A. Jaell: *Carnaval of Venice*, bars 54-60.



Example 3.288. A. Jaell: *Carnaval of Venice*, bars 70-76.

In his 1861 fantasy on *Halka* (see ex. 3.285) Tausig wrote a sequence of alternating upwards and downwards right hand single note glissandos, consistently prescribing *3* for upwards and *1* for downwards. This is certainly the most comfortable fingering for sustained glissando playing in alternating directions, but Tausig did not always think of it this way: in the second of *Valse-Caprices* (1858>) he prescribes the thumb for both up- and downward glissandos, probably because of the general *forte* dynamic in this passage. (Ex. 3.289.)



Example 3.289. C. Tausig: *Valse-Caprices* (1858>), nr. 2 *Man lebt nur Einmal*, bars 225-229.

As far as double-note glissandos are concerned, the *42* fingering for the glissando in thirds seems to have enjoyed consensus. That is, in as far as fingerings for double notes were indicated at all. Of course the octave glissando had little real use for such indication, i.e. they could hardly be played with anything but *51*, and since there was now a habit of adding a word to show that gliding was called for, there was no reason to still add the fingering as defining proof of the technique.

1840's-1860's: fingerings in double-note glissandos outside of Liszt

date	3^{ds}	6^{ths}	8^{ths}	composition
1842	*42* OIR	*51*/*41* OIR		[Czerny opus 500]
1844			--	Wallace *Midnight Waltz*
1845	*31* OR			Kalkbrenner *Sonate*
1847	*42* IR			Herz opus 159
1848		--		Raff opus 43
1851	*42* OR			Quidant *Mystères*
1855			--	Tausig *Aufforderung*
1858			--	Smetana *Ballade*
1863			--	Brahms *Paganini Variation*
1869			--	Balakirev *Islamey*

The indication by Czerny concerns the fingerings he included in the 1842 supplement to his grand 1839 piano method opus 500. The title indicated that it was about "the art of performing the older and newer piano compositions," and the work included "a list of the best piano works of all composers since Mozart until the newest time."[855] Part one of this supplement concerned performance practical advice on "the newest compositions by Thalberg, Döhler, Henselt, Chopin, Taubert, Willmers, Fr. Liszt and others." When discussing Liszt, Czerny refers to the first version of the *Fantaisie sur des motifs favoris de l'opéra Lucrezia Borgia* (1840), printing an excerpt with more fingerings than

[855] Badura-Skoda 1963, p. 7. The title of the supplement: *Die Kunst des Vortrags / der älteren und neueren / Claviercompositionen / oder: / Die Fortschritte / bis zur neuesten Zeit / Supplement / (oder 4ter Theil) / zur grossen / Pianoforte-Schule / von / Carl Czerny / Op. 500 / in 4 Capiteln nebst einm Verzeichnis der besten Clavierwerke aller Tonsetzer seit Mozart bis auf die neueste Zeit.*

originally in Liszt's score. What is important here, regarding Czerny's input, is the fact that he indicates *42* for both downward and upward glissandos in thirds. The more comfortable *31* for the upward motion is nowhere mentioned. Instead, he puts the emphasis on keeping the fingers high and slanting, and using the nail rather than the flesh when possible.

3.3.2.3.3.3 Editing the glissando II

3.3.2.3.3.3.1 Diverging opinions on clarifying past composer's intentions

Part two and three of Czerny's supplement to his opus 500 (see above) is devoted to Beethoven's piano works. When writing about opus 1 nr. 3, opus 15 and opus 53, Czerny each time mentions the use of the glissando and offers an alternative for performers with small hands.[856]

For opus 1 nr. 3:

> The slided octaves in the 2nd part [of the *Menuetto*] [are to be played] in the way we have already discussed for Listz's compositions and in the solo sonata opus 53. Smaller hands simply take the top notes, with usual fingering, but very powerful.[857]

For opus 15:
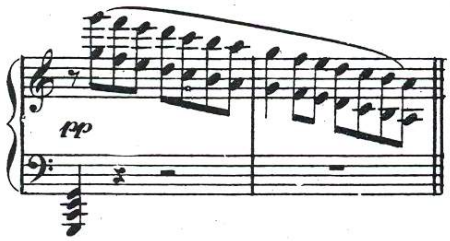
> The reentry into the main theme (after the 2nd part) consists again of the octaves glided with two fingers (as in the solo sonata opus 53) and from there smaller hands can take the run simply [i.e. as a single-note glissando], but on the other hand lengthen it with an extra octave downwards at higher speed.[858]

Taking together Czerny's remarks for both opus 1 nr. 3 and opus 15, it is unclear what he means with "einfach nehmen" ("to take simply," as in "easy" or "singular"). He either means that the octave glissandos can be taken as single-note glissandos or as individually articulated runs. The latter seems to be the case for opus 1 nr. 3 because he specifies "with usual fingering." That specification is not in the text for opus 15. But opus 15 is treated *after* opus 1 nr. 3 in Czerny's supplement, so one could deduce that he imagined the reader to have kept that specification in mind.
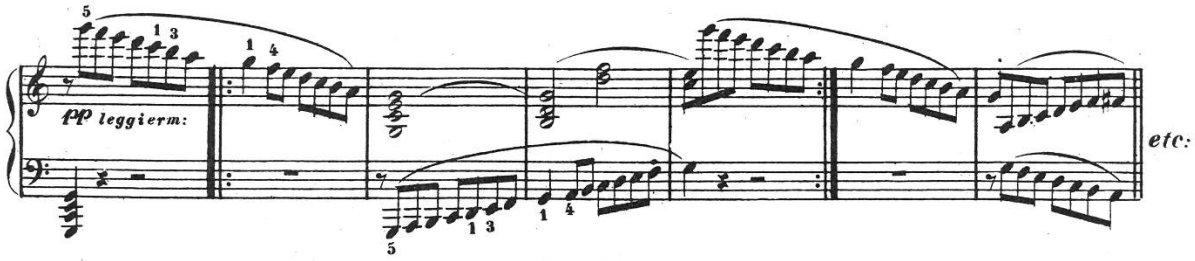
For opus 53 Czerny wrote:

> The next passage

[856] See also 3.2.6.1.5, 3.2.6.1.7. and 3.2.6.1.13.
[857] Badura-Skoda 1963, p. 88 (96 in the facsimile page numbering by Czerny): "Die geschliffenen Octaven im 2ten Theil auf jene Art, die wir schon bei *Liszts* Compositionen und in der *Solosonate* Op: 53 besprochen haben. Klein're Hände nehmen die obern Noten einfach, mit gewöhnlichem Fingersatz, aber sehr kräftig."
[858] As reproduced in Badura-Skoda 1963, p. 105 (p. 97 in Czerny's original publication): "Der Wiedereintritt in das Hauptthema (nach dem 2ten Theile) besteht wieder in den, mit 2 Fingern geschliffenen Octaven, (wie in der Solo-Sonate Op:53) und klein're Hände können daher den Lauf einfach nehmen, aber dagegen mit vermehrter Geschwindigkeit um eine Octave abwärts verlängern. "See 3.2.6.1.7. When Czerny lists his advice on the concerto, he had already discussed the sonatas, hence the word 'wieder'.



is to be glided in the way we have already presented in the 3[d] part of this School, and recently also in the previous chapter with the discussion of the Liszt works. Those, whose smaller hands make the performance of this passage impossible, will play it as follows:



Even in this way it will not sound empty at great speed.[859]

It is further not possible to conclude exactly how much Czerny had gotten his insights from Beethoven directly. It is highly likely that all of it was discussed between the two of them. What is most interesting, however, is the fact that Czerny advises alternatives for pianists with small hands. Haslinger had already printed an *ossia* for the concerto instance (see 3.3.2.2.5) but gave no specific reason for doing so, nor for the particular choice in how the alternative was composed. For sure, many of Czerny's pupils were women with smaller hands than most of the male students, and whom the pedagogue would have wanted to at least try and accommodate. The supplement was also part of a publication, i.e. a commercial enterprise aimed at as wide an audience as possible. But that this would have been the only concern of Czerny's shows that only the stretch of the octaves was considered a potential problem in the early 1840's, not any of the other aspects of octave glissando playing, such as the key-dip and-weight. (See below 3.3.2.4.1.) In this pedagogical supplement Cerzny did not print any of the original octave runs so we cannot see if and how he would have adapted any aspect of the notation. Later (<1851) he edited the complete sonatas for publication[860], adding the written sign "glissando" to the octave passage in opus 53 while keeping the *51* fingering.

[859] Badura-Skoda 1963, p. 51 (59 in the facsimile page numbering by Czerny): "Die folgende Stelle […] ist auf jene Art zu schleifen, die wir schon im 3ten Theilm dieser Schule, und neuerdings auch im vorhergehenden Kapitel bei besprechung der Liszt'schen Werke dargestellt haben. Von denjenigen aber, deren klein're Hände die Ausführung dieser Passage unmöglich machen wird sie wie folgt gespielt: […] Bei der grossen Schnelligkeit klingt sie auch auf diese Weise gar nicht leer."

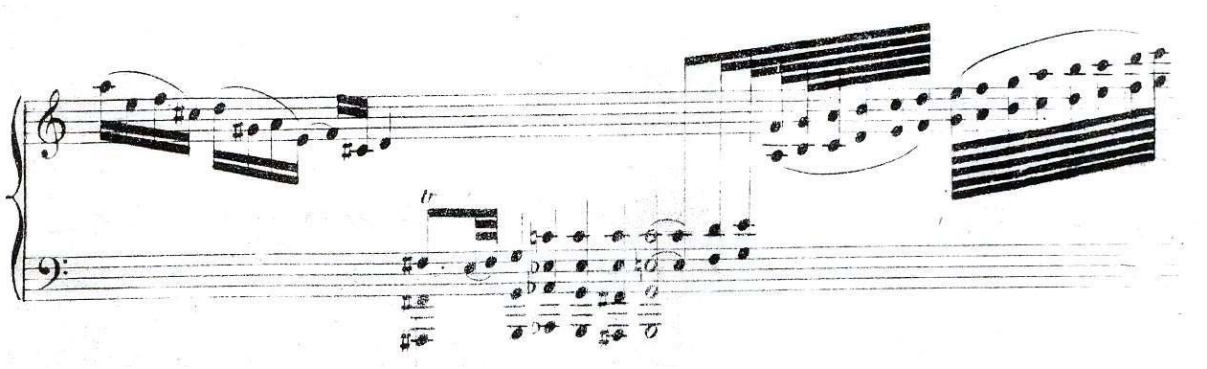
[860] *Sonates pour le Pianoforte Beethoven. Edition revue, corrigée, métronomisée et doigtée par Ch. Czerny. A Bonn. chez N. Simrock.* Copy used: G-BNba C 53/5. Dating according to G-BNba: <1870 because the publisher moved to Berlin in 1870. As Czerny died in 1851, and presuming the revisions, corrections, metronome markings and fingerings are indeed his, this edition would have been ready by 1851. As such, it would show relevance to the first half of the 19th century.

In Ignaz Moscheles' edition of Beethoven's piano trios (1844-1861)[861], the editor marked his intentions: "In this Edition the utmost care has been taken to mark by Maelzel's Metronome the Author's time to each Movement." To the minuet and trio of opus 1 nr. 3, not only a tempo indication of 𝅗𝅥.=69 was added for the benefit of the player, the instance of the downwards octave run in bar 27-28 in the minuet's trio was provided with a fingering *41* and a slur as well. In the Bote & Bock edition (1853-1855)[862] of the same trio's, *glissando*, a slur and the dynamic indication of forte were added to the same bar. Sometime towards 1860, Liszt's edition[863] also includes *glissando* and a slur.

Not all masterpieces from the past were considered in need of much adding on. Sometimes certain crucial details were even left out. In a ca1850 edition of Hummel's concerto opus 85[864], no signs of a glissando are found: the text is as in the original. In Beethoven's opus 53, the ca1835 Böhme edition[865] as well as the above-mentioned Moscheles edition[866] (1858-1867 for the sonatas) left out the original *51* fingering above the octave runs. No replacement – with words such as glissando or sdrucciolando[867] - is deemed necessary, showing possible confidence in the performer's ability to spot a glissando even when no specific markings indicate it.
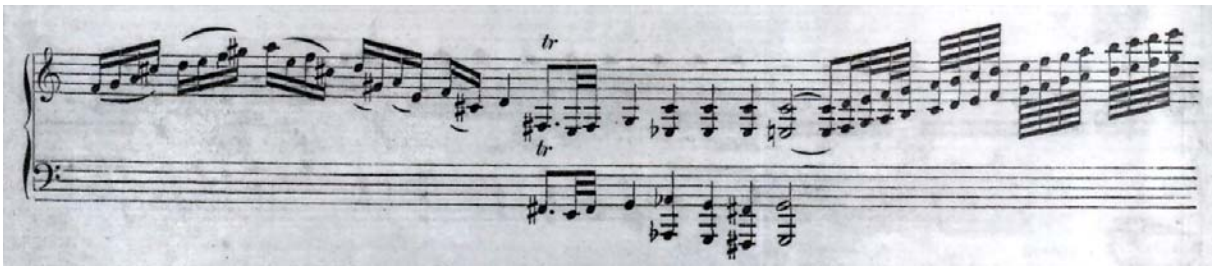
In 1845, Fétis still edited Mozart's Variations with historical care[868], only cutting the run in half with two slurs, much like the 1803 Simrock edition (see 3.2.6.1.12), but without any indication of glissando. (Ex. 3.290.)

[861] *Beethoven's trios for the Piano Forte, Violin, and Violoncello, edited by I. Moscheles. In one volume. Entered at Stationers' Hall. Complete Edition. London: Cramer.* Copy used: G-BNba C 243/11. Dating according to G-BNba.
[862] *Trios für Pianoforte, Violine und Violoncelle. Beethoven. Berlin: Ed. Bote & G. Bock.* Copy used: G-BNba C 1/41. The dating is not 100% assured. Thanks to Stefanie Kuban of the Beethoven Haus for providing me with at least an indicative period.
[863] *Sämmtliche Trios für Pianoforte, Violine (Clarinette) und Violoncell / von Ludwig van Beethoven. – Wolfenbüttel : Druck und Verlag von L. Holle; New-York: Th. Hagen; London: Augener & Co.; Paris: A. Bohné. – (Erste vollständige Gesammtausgabe / Ludwig van Beethoven. Unter Revision von Franz Liszt ; 7).* Copy used: G-BNba C 1/23. Date: after 1859 according to G-BNba. Eckhardt & Mueller 2002, volume 14, p. 869 give 1857-1861.
[864] *Grand concert pour le pianoforte op. 85*, Amsterdam: Theune & C°. Kalverstr. 66. Plate number 581.
[865] *Grande Sonate pour le pianoforte composée et dediée à Monsieur le Comte de Waldstein par Louis Van Beethoven. Hambourg, chez Jean Aug Böhme.* Copy used: G-BNba C 53/24. Dating is estimated by G-BNba: there is no mentioning of this edition in Whistling and Hofmeister until 1844.
[866] *L. v. Beethoven's sämmtliche Sonaten für Pianoforte. Neu herausgegeben mit Bezeichnung des Zeitmasses und Fingersatzes von J. Moscheles, Professor am Conservatorium zu Leipzig. Stuttgart : Stich, Druck und Verlag von Eduard Hallberger.* Copy used: BNba C 246/43 or C 53/6. Dating according to G-BNba: the Moscheles series first appeared in 1858 (see preface in the part of the edition which contains opus 2 – G-BNba C 2/15), the title page changed in 1867 (see G-BNba C28/14, the part of this edition which contains opus 28).
[867] Moscheles used "sdrucciolando" in the second of his 1836 *Due Fantasie*.
[868] *Bibliothèque classique du Pianiste. Oeuvres choisies de Mozart pour piano seul. 7ème volume. Sonate en ut mineur. Sonate en Fa mineur. Sonate en Fa majeur. Fantaisie ut majeur. Sonate, 4 mains, en fa. Fantaisie, d° fa mineur. Air varié en ut majeur. d°, une fièvre brulante. Par Fétis père. Paris, Schonenberger. Boulevard Poissonière, 28.* Plate number S.1241.



Example 3.290. W.A. Mozart: Variations on *Lison dormait* K.V. 264 (1778), Fétis edition (1845), bar "63d."

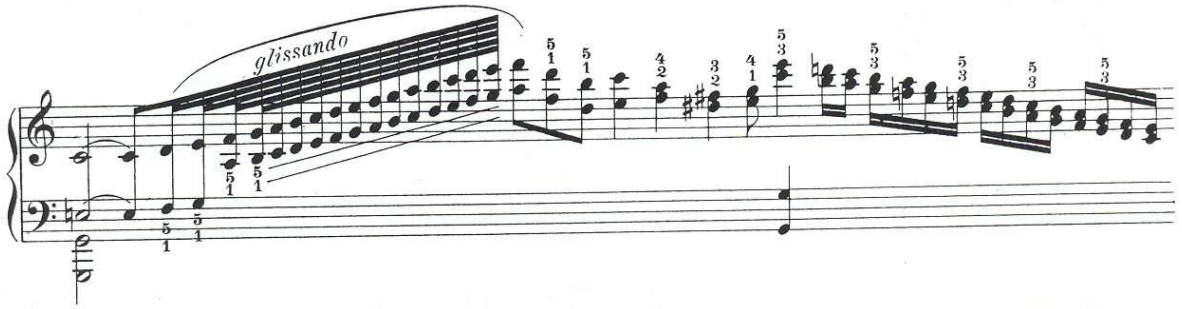
But the convictions could easily run towards the other extreme: Holle's edition of Mozart's had already left out the slur of the run in sixths, changed the rhythmic value from the original 128ths to 64ths and regrouped them to "clarify" the metric division, all by 1854. (Ex. 3.291.)



Example 3.291. W. A. Mozart: Variations on *Lison dormait* K.V. 264, Holle Edition (1854), bar "63d."

With such a clear separation between the half notes in both hands and a run notated so rhythmically, a player would not automatically think of a one hand glissando technique.

On the other hand, the ultimate Mozart edition for the glissando fan would have been Peters' 1869 issue, edited by Köhler and Schmidt[869], and printing all possible signs for the glissando technique without altering anything about the rhythm. (Ex. 3.292.)
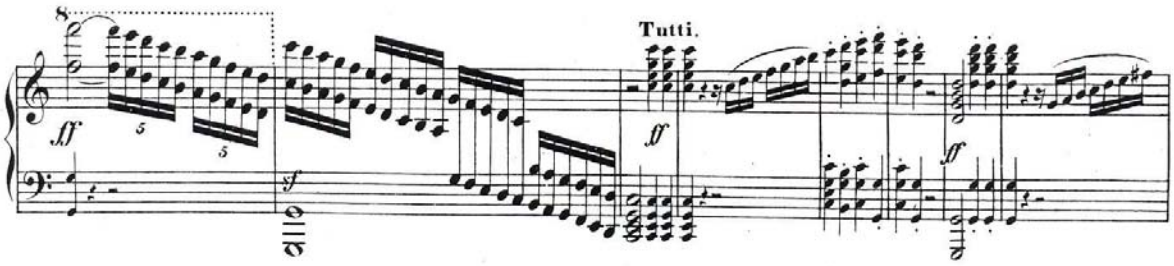


Example 3.292. W.A. Mozart: Variations on *Lison dormait* K.V. 264 (1778), Peters edition (1869), bar "63d."

[869] Peters Edition N° 273, plate number 6695.

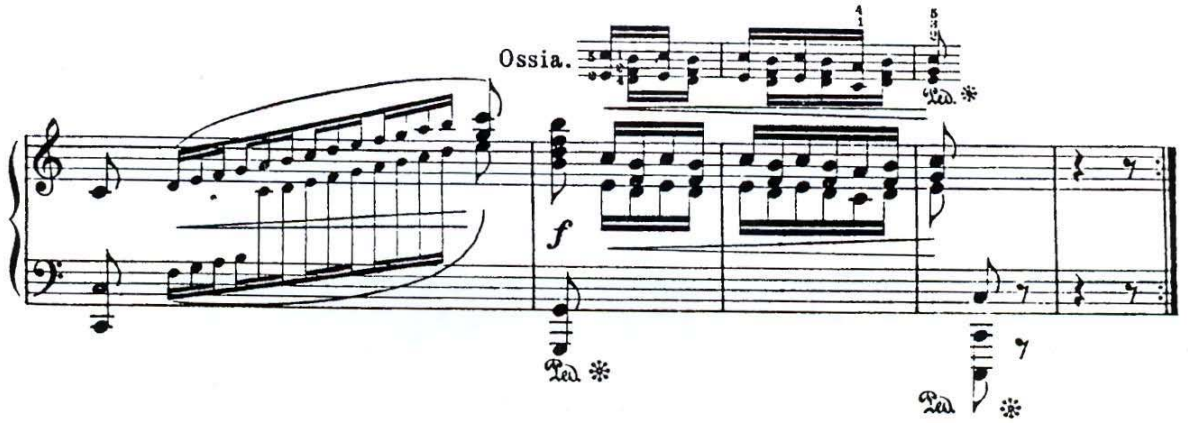
3.3.2.3.3.3.2 Enhancing the effect

In the Henri Litolff edition of Beethoven's concerto opus 15, published after 1864[870], the original notation has disappeared and the Haslinger ossia (see above 3.3.2.2.5) now takes its place in the text. (Ex. 3.293.)



Example 3.293. L. van Beethoven: Concerto opus 15, 1st movement, Litolff edition (1864), bars 344-351.

In this age of the transcription, the dividing line between editing, arranging, transcribing and recomposing is not always a very visible one. In the case of one of the Scarlatti sonatas that Carl Tausig edited in 1869[871], the K. 487 with the original fast run in the last bar to which Czerny added *glissando* (see ex. 3.44 for the original), Tausig did well to warn the performer of his role by indicating the piece was now by "Scarlatti-Tausig." (Ex. 294.)



Example 3.294. D. Scarlatti: Sonata K. 487, Tausig edition (1869), final bars.

If the tempo is kept steady, the fast run in sixths cannot be performed other than by gliding with both hands, possibly one hand.

[870] *L. van Beethoven's Tonschöpfungen für das Pianoforte zu zwei Händen arrangiert von Louis Winkler. In Braunschweig : Henry Litolff's Verlag.* Copy used: G-BNba C 15/6. Dating according to G-BNba.
[871] On the back of the score that we saw (B-Ac) it is stated that the manuscript bears the inscription "Berlin, 1869", and that it had been in the possession of Mrs. Dr. Hildegard Koppe (née Spindler), Moscow, who was a favourite pupil of Tausig in 1868-71. The first performance of this piece would have been by Tausig at his last concert at the Berlin Singakademie.

3.3.2.3.3.4 Adolph Kullak: *Die Ästhetik des Klavierspiels* I

One of the most important 19th century books on piano playing was written by Adolph Kullak (1823-1862), brother of Theodor. After having studied philosophy and receiving a doctorate, Adolphe devoted his life to music, writing a book on *The Art of Articulation*[872], one on *The beauty in music*[873] (1858) and then finally, in 1861, his *Aesthetics of Piano Playing*.[874] The latter is not a piano method as such, rather a broader treatment of piano playing, with a certain focus on aesthetic and philosophical considerations.[875]

The book consists of two parts: one on the general "idea" and one on treating the "Klavierschönen" in particular. In the first part he handles the past, meaning and peculiarities of the keyboard, the history of piano virtuosity, and piano methods and writings on piano performance (until 1860). In the second part Kullak discusses technique (chapters 4-11) and presentation (12-18). It is in chapter 10, after the mechanics, techniques, articulation, position, staccatos, scales, fingerings, trills and tremolos, that we find quite an elaborate discussion of the glissando.

First, Kullak describes into much practical detail the mechanics of the glissando technique, linking – like Hummel – its origin to the slide from a black key to an adjacent white one. He consistently draws attention to aspects such as the position of the hand ("in octaves, the hand must completely give up its inclination towards the direction of the movement, with the other double notes only a little"[876]), the difference in difficulty between upwards and downwards glissandos ("With octaves, the glissando in the direction of the thumb is the easier, in the direction of the pinky it is more difficult"[877]) and the importance of the nail ("in the later case, the fifth finger is positioned vertically so that the nail hits the new key. – The nail is significant in all double note glissandos"[878]).

After such general insights, he separately regards different categories of the glissando:

1. on white keys
2. on black keys
3. chromatic
4. chords, double notes, octaves on white keys
5. octaves over black keys
6. chromatic octaves

Compared to the white key glissando, the one on the black keys is considered more difficult, and Kullak advises that "cases like c#-a# or d#-f# must be practiced in particular."[879] Tausig's pseudo-chromatic glissando (see 3.3.2.4.4.5) is treated also in Kullak, though Tausig is not referred to and the example shows a black key glissando in the right hand (white key glissando in the other hand) in stead of the other way around in Tausig's piece, suggesting several circumstances at the time. Either Kullak did not particularly have Tausig's example in mind, or Tausig's piece was written before 1861

[872] Die Kunst des Anschlags.
[873] Das Musikalisch-Schone.
[874] Kloppenburg 1951, p. 236.
[875] Kullak died a year after the publication; the 2nd and 3d prints were revised by H. Bishoff, the 4th to 9th by Walter Niemann. From the 2nd edition (1876) these philosophical side of the treatise is already cut out.
[876] Kullak 1861, p. 216: "[...] nun muß die Hand bei Octaven ganz, und bei anderen Doppelgriffen ein wenig die Neigung nach dem Bewegungszuge hin aufgeben."
[877] Kullak 1861, p. 216: "Bei Octaven ist die Richtung nach dem Daumen hin die Leichtere, nach dem fünften hin schwerer;[...]."
[878] Kullak 1861, p. 216: "[...] bei dieser stellt sich der zuletzt genannte Finger mit dem Vordergliede senkrecht, so daß der Nagel die neue Taste bestreicht. – Die Bedeutsamkeit des Nagels tritt bei allem Doppelgriffe hervor."
[879] Kullak 1861, p. 215: "Fälle wie cis, ais, oder dis, fis sind besonders zu üben."

(and that Kullak did not want to copy it exactly), or other such chromatic (or simple one hand black key) glissandos were known, or Kullak just deduced its possibility on his own.

That his treatment of the glissando, in general as well as in specific details, sounds as if it all belongs to the basic tools of piano technique, may accurately reflect historical reality. It may also be that Kullak's imagination was a fertile one, and that he wrote down what he considered relevant, whether or not it had already appeared in compositions. But even then, the book is a valuable source of information on the glissando around the middle of the 19th century, allowing us to (carefully) assess the glissando's general position in the repertoire as perceived in his day and age, especially as Kullak's perspective incorporates aesthetical viewpoints. For Kullak, the glissando is "a decorative kind of passage," and although "a certain delicacy and skill" are also necessary, "the glitter of their effect is nevertheless not proportionally related to the art of performance technique, and no expert judgment will put it on the same height of the other parts of the latter."[880] He further mentions that "a singing quality is not possible,"[881], and states that "sensory attraction prevails"[882] as – at maximum speed – "the sound affects the ear like a dazzling line on the eye."[883] It is worth noting how Kullak considers that "it is in the longer runs that the glissando shows it own specific worth,"[884] making an allusion to the speed of the glissando.

Next to aesthetics, Kullak can be down to earth as well, giving practical advise for the study of the glissando. Here a second set of interesting opinions come to light. In terms of performance technique (especially the smooth course of the arm movements), Kullak sees the glissando as the completed development of what is prepared in the technique of playing scales. On the most concrete level, Kullak warns that "over larger distances the sensitive skin can experience disadvantages during practice"[885] but that "one would do well to practice every finger individually and all possible finger combinations in the Glissando up and down over the whole keyboard."[886] When he discusses the position of the fingers, we can deduce some relevant performance practical information. His advice that double note slides executed with the flesh are "not impossible but not recommended,"[887] combined with his statements that one of the double note fingers "is closer to the line of the black keys,"[888] and "the finger with the higher number stays closest to the front edge of key"[889] means that he does not envision e.g. a *31* fingering for an upward glissando in thirds, but rather *42*. This is in keeping with our findings in the printed scores. (See 3.3.2.3.2.6 and 3.3.2.3.3.2.) Interesting to note is how he writes that "the almost perpendicular finger brushes with the broad nail side and the necessary sideways motion in a powerful thrust, which pronounces the tones clearly, up
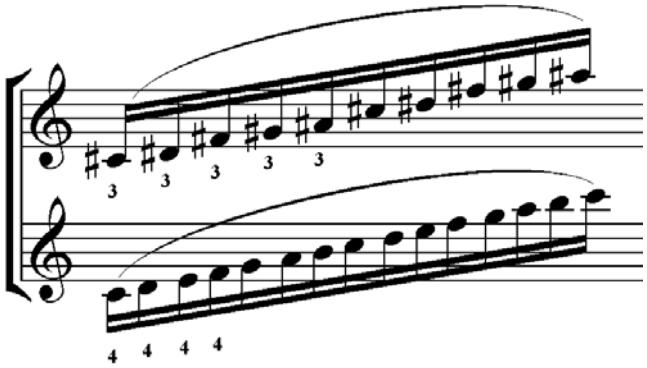
[880] Kullak 1861, p. 216: "[...] so steht doch der Glanz ihrer Wirkung zu der technischen Kunst in keinem proportionalen Verhältnisse, und wird von keinem fachkundigen Urhteile in eine Reihe mit den anderen Theilen der Leßteren geseßt."
[881] Kullak 1861, p. 215: "Ein Singen ist in dieser leicht über die Tasten gleitenden Fingerbewegung nicht möglich."
[882] Kullak 1861, p. 216: "Der sinnliche Reiz ist ganz vorherrschend."
[883] Kullak 1861, p. 216: "[...] die Töne wirken auf das Gehör wie eine blendende Linie auf das Auge."
[884] Kullak 1861, p. 216: "In seiner eigentlichen Wirtsamkeit erscheint das Glissando bei langen Tonreihen."
[885] Kullak 1861, p. 216: "[...] bei größeren strecken trägt eine empfindliche Fingerhaut besoders beim Ueben Nachtheile davon."
[886] Kullak 1861, p. 216: "Man thut wohl daran, jeden Finger für sich, und alle möglichen Fingercombinationen im Glissando auf und nieder über die Ganze Tastatur zu üben."
[887] Kullak 1861, p. 218: "Eine Ausführung mit der Fleischseite ist nicht unmöglich, aus oben angegebenen Gründen aber nicht in gleichen Weise zu empfehlen."
[888] Kullak 1861, p. 216: "[...] der andere Doppelgriffinger nähert sich mehr der Linie der Obertasten, [...]."
[889] Kullak 1861, p. 218: "Der mit der höheren Zahl bezeichnete Finger steht bei Doppelgriffen dem vorderen Tastenrande am nächsten."

to the last tone of the prescribed passage."[890] This last bit may be more theoretical than practical, although we have seen exercises in Herz' method (3.3.2.2.4.4) where he also seems to intend glissandos to go all the way to the last note, without losing any sounds right before the very last note (or the first non-gliding one) is played.

Most interesting is his advice on gliding over black keys:

> The finger and hand position is the opposite of the previous type [white key glissando], and lets the finger brush the keys with its inner flesh side. Several fingers at the time can implement the slide as well. Clarity and smoothness are here by far more difficult than in the previous kind, and require much practice.[891]

Apparently, black key glissandos were performed with the flesh of the fingers, palm towards the keys and fingernails in the air. With this in mind, the fingering for his example of a "chromatic" glissando (which he rightfully recognizes as being possible "only through deceiving the ear") must be meant for two hands, with the right hand glissando performed with the flesh of the 3rd finger. (Ex. 3.295.)



Example 3.295. A. Kullak: "chromatic" glissando.[892]

Nevertheless, Kullak goes on to explain his example as a one-hand affair, whereby the black keys must be glided over with the nail of the longer (i.e. 3rd finger):

> Upwards, the white keys are glided over with the nail, the black keys with the reverse side of a longer finger. Downward this Glissando is more difficult, but when necessary it can be obtained through the reversed action, by a slide with the flesh side of both fingers.[893]

He may have thought of this more while pondering it than actually trying it out. We have not encountered any upward chromatic one-hand glissando anywhere. Godowsky notated one downward such run (see below 3.3.2.4.4.5), but it is just this direction that allows the ergonomics of the glissando to match the make of the hand. Godowsky's composition was also written three decades after Kullak's *Aesthetics,* as were Rosenthal's exercises for this technique. Kullak must either have deduced the technique from a two-hand pseudo-chromatic glissando like in Carl Tausig's +/- 1860 *Geisterschiff* (although he did

[890] Kullak 1861, p. 217: "Der fast senkrecht stehende Finger streicht mit der breiten Nagelseite und der dazu erforlderlichen Seitenwendung in einer Druckkraft, die deutlich die Töne zum Erklingen bringt, bis zum letzten Tone der Vorgeschriebenen Passage."
[891] Kullak 1861, p. 217: "Die Finger- und handhaltung ist der vorigen gerade entgegengesetzt, und streicht der Finger mit der inneren Fleischseite. Auch können mehrere Finger zugleich den Strich ausführen. Deutlichkeit und Glätte sind hier bei weitem schwerer als in der vorigen Art und bedürfen größerer Uebung."
[892] As in Kullak 1861, p. 218.
[893] Kullak 1861; p. 218: „Die Untertasten werden hierbei aufwärts mit dem Nagel, die Obertasten mit der Kehrseite eines längeren Fingers gestrichen. Abwärts ist dies Glissando schwerer, würde aber erforderlichen Falles auf die umgekehrte Weise, durch ein Strich mit der Fleischseite beiden Finger, zu erreichen sein."

not bother to mention this piece), or such techniques were used in more compositions than we found, probably also in improvisations.

Equally confusing is his advise on his fourth category – chords, double notes, octaves on white keys:

> With sixths only one finger can slide with the nail, with octaves, however, none. With the octaves, the thumb top must be kept a little higher.[894]

If no fingernail can be used for octave glissandos, Kullak must have had small hands and an old piano with a lot of chamfering on the keys so that the thumb (and 5th finger) can glide over the keys stretched in the direction of the glissando's downward (upward) movement.

Considering Kullak wrote all this around 1860, he seems to have been little aware of all of Liszt's efforts in the development of the glissando, particularly when it comes to its tonal environment. A claim like "All these passages are only applicable in C major, and can occur in F major with a slight deception of the ear. (Schulhoff's "Carneval de Venise")"[895] is quite outdated by the late 1850's when considering what Liszt had achieved by then. More interestingly, is how Kullak brings up the subject of the quasi-glissando, something which we will see more of at the end of the 19th century and the beginning of the 20th:

> Just like such a Glissando, tone sequences sound without raising the knuckles, either in one hand alone, or by the one hand overtaking the other. To this kind belong short figures of 3-5 tones (perhaps up to 6, at the most 7), which, as in Liszt's "Regata veneziana," are quickly grinded together, and which work like the Papageno flute. If both hands lie beside each other and complement each other by crossing one another, then runs can be implemented at the very speed of the Glissando in the most diverse tonalities [...][896]
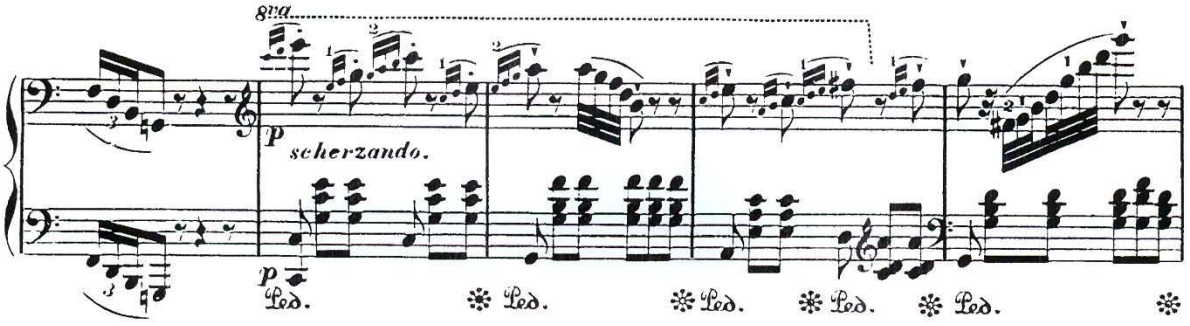
The *Regata veneziana "Notturno"* is the 2nd of Liszt's 1837 *Soirées Musicales* and has many "slides" (not glissandos) as part of the main melodic material. (Ex. 3.296.) Apparently Kullak was not familiar with all of Liszt's piano works, for already twenty years before this edition of Kullak's *Ästhetik* Liszt himself had literally indicated "quasi glissando" in his 1841 *Réminiscenses de Don Juan* (see 3.3.2.4.4.3). At any rate, Kullak makes it clear that a quasi glissando is a way to implement glissando speeds in any key (i.e. also outside of C major) and without much finger articulation.

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[894] Kullak 1861, p. 218: "Bei Sexten kann nur ein Finger mit dem Nagel streichen, bei Octaven aber keiner. Bei diesen muß sich die Daumenspiße ein wenig hoch halten."

[895] Kullak 1861, p. 217: "Alle diese Passagen sind nur C-dur anwendbar, und können mit einer leisen Täuschung des Gehöres auch in F-dur vorkommen. (Schulhoff „Carneval de Venise")"

[896] Kullak 1861, p. 217: "Ganz ähnlich wie solches Glissando klingen Tonfolgen, ohne Aufheben der Knöchelglieder, entweder in einer Hand allein, oder durch Uebersetßen und zusammensetßen beider Hände gespielt. Hierher gehören also kurze Figuren von 3–5 Tönen (vielleicht bis zu 6, höchstens 7), die, wie z.B. in Liszt's „Regata veneziana" schnell aneinander geschleist werden, und ähnlich wirken sollen wie die Papagenopfeife. Liegen beide Hände neben einander und ergänzen sich durch Uebersetßen, so können auch in den verschiedensten Tonarten Läufer ganz in der Geschwindigkeit des Glissando ausgeführt werden, [...]"



Example 3.296. Fr. Liszt: *Regata veneziana "Notturno",* bars 5-9.[897]

For octave glissandos on black keys, Kullak explains that

> If the thumb glides in its own direction, then it must slide over the keys lightly, with its top in the opposite direction of the movement and with its side on the keys. It is more difficult if the top of the thumb is the normal direction.[898]

If the last sentence were to be taken as "difficult, but not impossible," this would mean that he envisioned the possibility of a downward octave glissando with the thumb in the direction of the glissando's movement. This seems incredible today and may only have been possible on a light keyboard with the sides of the keys rounded enough in order to not hurt the top of the thumb.

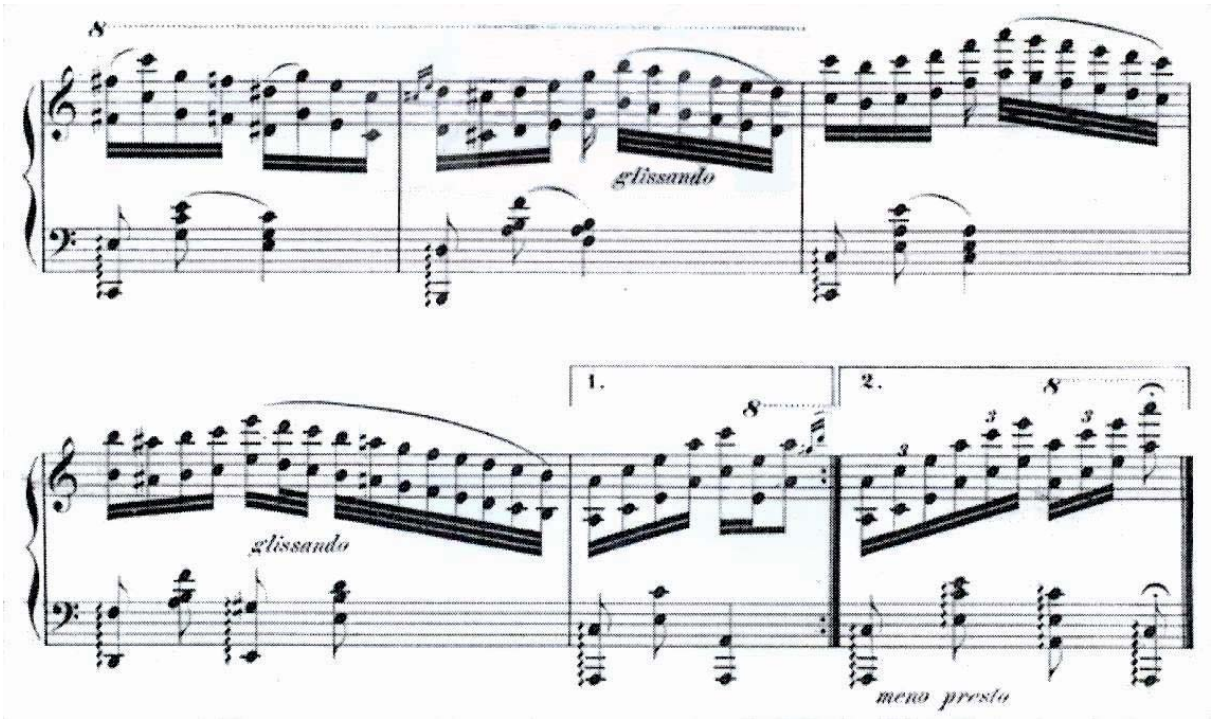
That he considers octave glissandos over black keys more difficult, especially in the direction opposite of the thumb, sound very credible, and may be the reason we have not encountered this in any music up to this 1861 point in time. Similarly theoretical seem the 'chromatic octave glissandos', which are formed with one hand gliding in single notes or octaves over white keys, while the other one simultaneously slides over black keys in the same direction either in octaves or single notes. Kullak here ends his essay on the glissando with the remark that "the effect is grotesque and approaches the unmusical."[899]

3.3.2.3.3.5 Morphology: beginnings III

As the 19th century progresses, the sensitivity of composer-pianists towards details of the glissando's performance practice starts to benefit musical expression. In Brahms' 13th variation on Paganini's theme – perhaps written with Beethoven's opus 53 in mind (which Brahms had played in public only a few years before[900]) – he differentiates between open and prolonged beginnings of octave glissandos. (Ex. 3.297.) The first ones are not connected to anything before them and can commence straight away by hitting the keys in the hand position required for gliding and assumed while the hand is in the air due to the wrist action between the last melodic octave and the glissando. The final glissando stands in contrast to the previous ones. Much more than the open beginning, the prolonged first note of a glissando has been a common one, especially in octave glissandos. Here, in bar 11 of Brahms' variation, the gliding 32nd notes are tied to the glissando's prolonged first octave e^2-e^3, which is also still part of the melody. This means that, here, either the glissando position has to be assumed *while* being on the e^2-e^3 octave, or that the last melody-octave is played with the hand directly in glissando position. In any case, the articulation of the last glissando's glided part will be tied to the

[897] 1882 edition by Martens Brothers (New York).
[898] Kullak 1861, p. 217: "Soll der Daumen nach seiner Seite hingleiten, so muß er sich leicht an die Tasten legen, die Spiße nach der dem Bewegungszuge entgegengeseßten Seite umbiegen und mit der Schneide über die Tasten gleiten. Schwerer ist es, wenn die Daumenspiße die normale Richtung beibehält."
[899] Kullak 1861, p. 218: "Der Effekt ist grotesk und reicht ins Unmusikalische hinüber."
[900] See Hofmann 2006. Brahms had played the sonata in concert in 1849 and 1860.

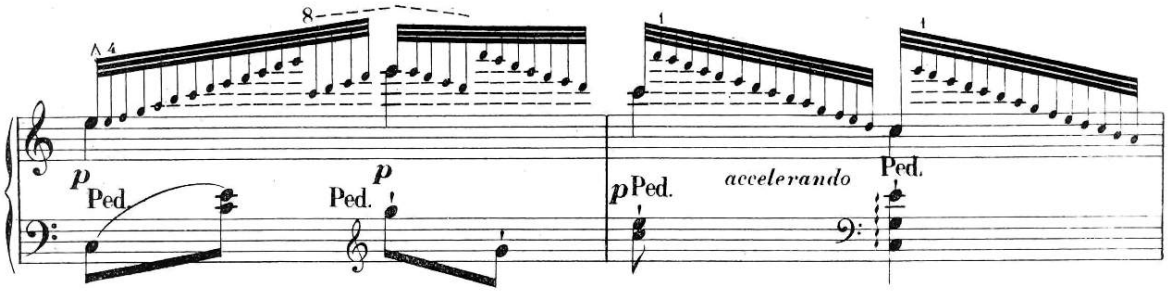
e^2-e^3 and never sound accentuated. That makes for the musical difference between the last and the previous glissandos, which will be accentuated (they will sound *rinsforzando*) because the hand hits them from above the keyboard. This difference is further highlighted by the slur, which indicates that the e^2-e^3 is already part of the final gesture, and allows for a little rubato just before the run to set of its beginning.



Example 3.297. J. Brahms: *Variationen über ein Thema von Paganini* opus 35 (1862-63), Book I, variation 13, bars 8-13.[901]

Another example of the musical consequences (and interpretative potential) in the relation between the glissando's morphology and its notation is seen in Quidant's "falling stars" piece. It ends with consecutive downward glissandos that follow each other immediately and start much higher than the ending of the previous glissando. (Ex. 3.298.) The combination of the specific hand position and the big leap between the endnote and the next glissando ensures that the notation has to be interpreted. Especially the soft first couple of glissandos cannot start before the hand has brought the thumb all the way back to the upper reaches of the keyboard, ready to play the first notes of the glissandos without aggression and risk of unwarranted accents. The notation could have easily shown the physical reality of playing this passage, though the composer did not deem it necessary to precisely notate what pianists would find out anyway once they tried to play these glissandos. What remains, then, is the liberty of the performer to decide how much time he wants or needs in between the melodic C's and the start of each downward glissando that follows. The more time, the faster the glissando will have to be. The balance between the different glissandos, i.e. the discrepancy between the speed of the downward thumb glissandos and that of the other glissandos in this piece will be the deciding factor in interpreting this passage.

[901] First edition: Winterthur: J. Rieter-Biedermann, n.d. (1866), plate 436.a.b.



Example 3.298. A. Quidant: *Les Mystères du coeur* opus 32 (1851), Nr. 4: *Les Etoiles Filantes*, bars 116-117.

3.3.2.4 1870s-1890s The glissando's development slowing down

From the 1870's onwards, there is a certain decline in the compositional use of the keyboard glissando. (See 3.3.2.1, fig. 3.1.) In the last 30 years of this century we found only 108 glissandos in 26 pieces. If the number of compositions is not that far below the average for the whole period 1815-1900 (1/5th of the total number of compositions in a little over 1/3^{d} of the chronology), the glissandos themselves represent a mere 16% of the total. With fewer glissandos in fewer compositions from fewer composers, the conclusion is simple: the interest in the glissando is fading. We shall first look at the main reason for this decline, then discuss the individual consequences.

3.3.2.4.1 Changing keyboard characteristics

The historical evidence is clear on the fact that, in the second half of the 19th century, the glissando slips out of favor. The reasons for this fact were not just a question of musical aesthetics, though. Even if Kullak expressed second thoughts on the artistic value of the glissando (see 3.3.2.3.3.4), not all facets of the glissando had been worked out yet by the 1870's, and the intrinsically C-major device could certainly be kept alive in the ever more chromatic textures. Even if most of the potential could be perceived as having been explored, there was still reason enough for further exploiting what was attained. That there is nevertheless a decline in the use of the glissando can be explained better when looking outside of its musical evolution: it is the constructional evolution of the instrument which took care of the glissando's fall from grace. Over some 60 years, several aspects of keyboard design that affect the pianist's finger and hand response changed dramatically. Some of these aspects are crucial to the comfort of playing the glissando, e.g. the weight that the finger has to depress to make a sound, the distance the key has to be pushed down to, and the span of the octave that has to be grasped. These factors in keyboard design had been evolving from before 1800, but the last decades of the 19th century saw limits being reached that could determine the feasibility of glissando playing on a contemporary instrument.

First, the weight of the keys on the piano had been growing steadily, up to a point where they became too heavy to press down sideways (as needed in a glissando) without hurting the fingers. Fig. 3.2 gives an idea of the extent (in grams) to which this evolution took place over about two centuries, showing roughly a 100% increase in average touch weight for the middle of the keyboard between the beginning and end of the 19th century.[902]

[902] All touch weight data is compiled from Mobbs 2001, p. 18-24 and concerns averages of outweigh for minimum sound "with the dampers in place, i.e. with the touch in its heavier mode" on horizontal grand pianos. Mobb's data for touch weight in the treble is slightly less consistent than for middle C (it concerns f^3 until 1846 and between 1931-1983 but c^4 between 1847- 1926) but generally points to the same proportions and evolution.

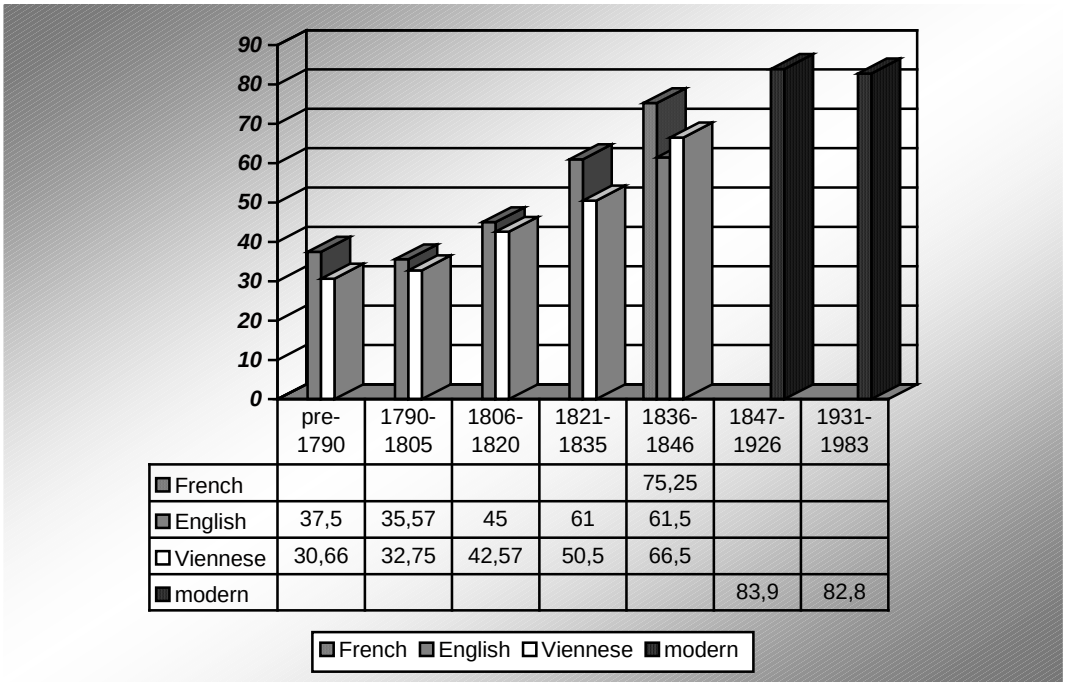


Figure 3.2. Evolution of average touch weight (in grams) <1790-1983 for c^1 – dampers on.

These averages show a step-by-step chronology as if there were gaps in the evolution. A more detailed chronology nevertheless shows the same picture: the French pianos measured here, started out in 1840 with 68 grams (going to 82 in 1846), which is comparable to the highest weight of the Viennese (69 for a ca1840 Henschker) and the English (68 for a 1844 Broadwood), both of which are their peak numbers for this period.[903]

Glissandos are of course never performed on middle C only, but the measurements for the high treble show the same evolution. (Fig. 3.3.)[904] Here also, the French and modern touch weights are altogether heavier than on the Viennese and English actions.

We did not include the data concerning the bass (F^2), as this is less relevant here: very few glissandos were ever written in that low octave anyway.

[903] Mobbs 2001, p. 19.

[904] Mobbs 2001, p. 20, table 2 mistakenly calculates (or at least prints) the mean English touch weight between 1821-1835 as 37 grams instead of 45.5.

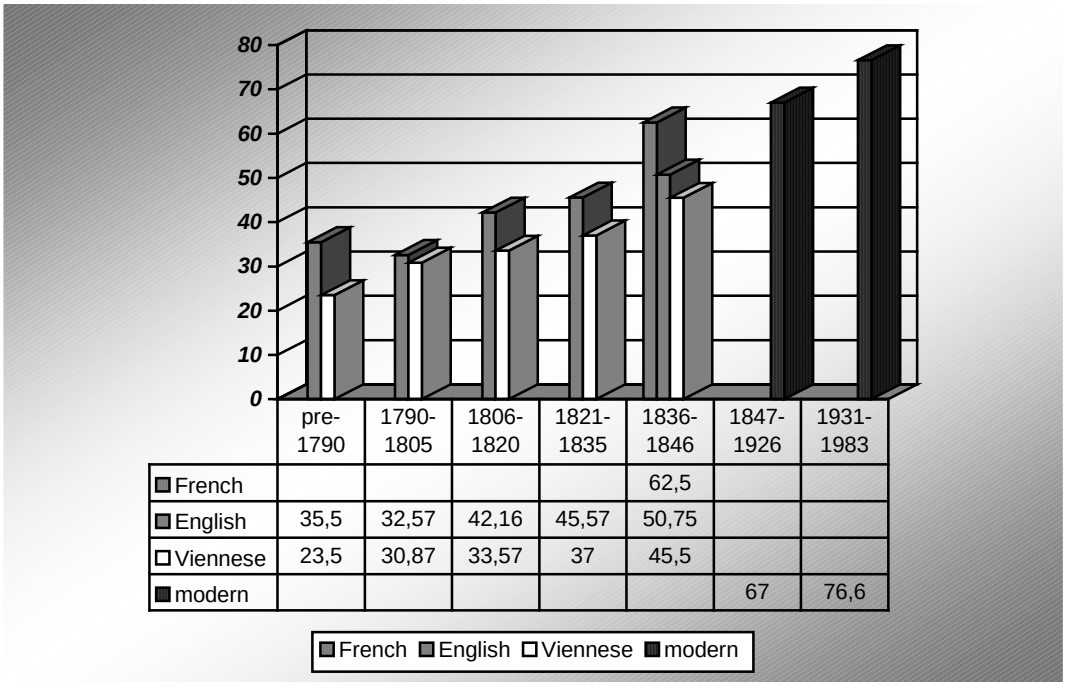
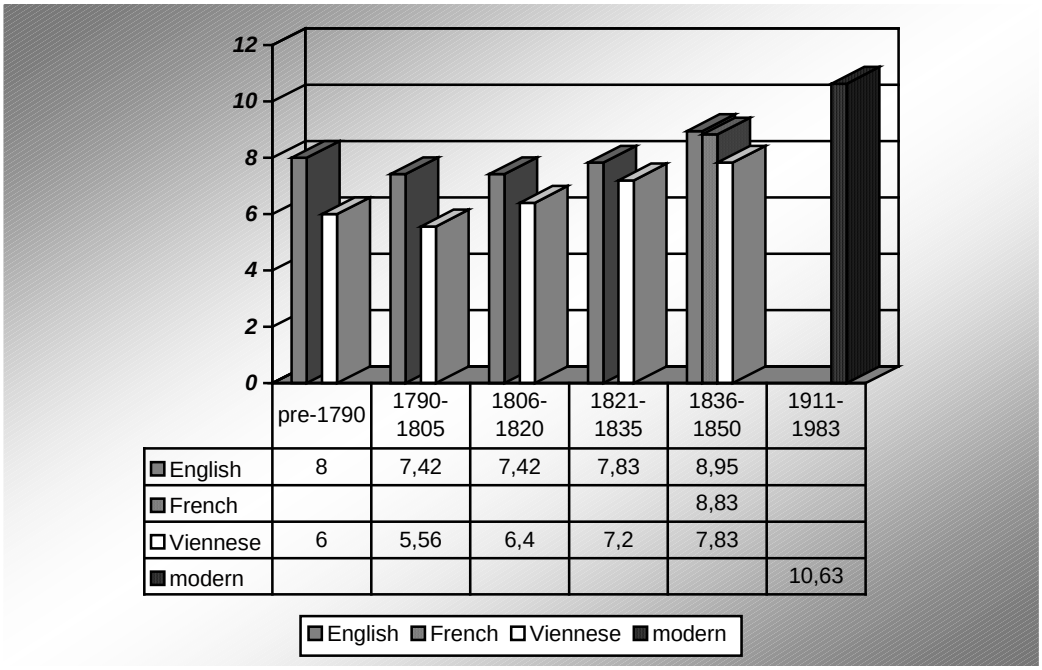


Figure 3.3. Evolution of average touch weight grams <1790-1983 for f^3 (c^4 between 1847-1926) – dampers on.

With the dampers raised, the touch weight is less heavy by an average of 9.23% for German/Viennese action types between 1815 and 1840 and by 5.38% for English type action between ca1821 and 1844.[905] That this difference "usually goes unnoticed by the performer"[906] is of little importance here, as most glissandos in the second half of the 19th century are played with the dampers off. But if some Almon Kincaid Virgil really demanded from his advanced students that they set his Practice Clavier at 142 to 227 grams touch weight (it could go as high as 567 grams)[907], then glissando practice would certainly have been painful, it at all possible.

The key-dip, i.e. the distance a key has to be depressed to obtain sound, gained 1.5 to 2 millimeters in the first half of the 19th century and more than 50% by the next century. (Fig. 3.4.)[908] By itself this may not be too impressive, but when playing a double-note glissando of, for instance, three octaves, an extra +60 millimeters have to be pushed down. Added to heavier keys and the energy needed to glide over wider keys, these millimeters become meaningful. Especially when they so easily compare to the length of an average fingernail. The deeper a key has to be depressed, the sooner the top of the next key will be as high as the end of the fingernail where the flesh begins, certainly when considering that this finger is most likely bent at +/- 45°.

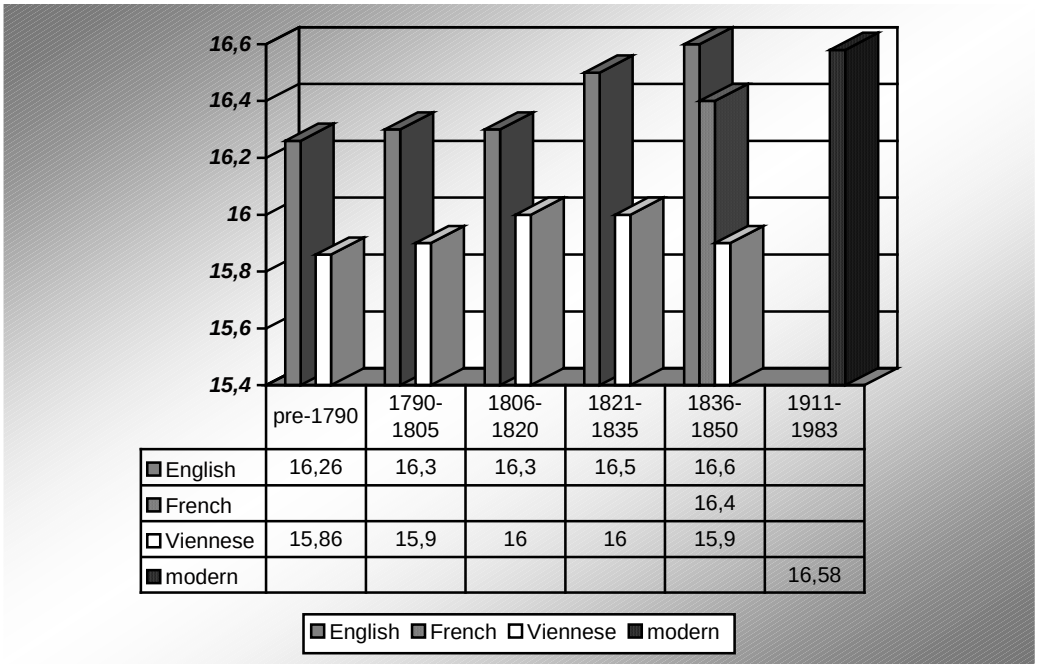
[905] Calculated from Mobbs 2001, p. 23. Taking into account temperature, humidity and wear on the instruments, Mobbs 2001 (p. 18) estimated the accuracy of his measurements to be no greater than +/-10%.
[906] Mobbs 2001, p. 25.
[907] Mobbs 2001, p. 25. The Practice Clavier was a silent device with adjustable resistance weight for each key, used to strengthen and increase finger dexterity.
[908] All data on key-dip is compiled from Mobbs 2001, p. 26-28.



	pre-1790	1790-1805	1806-1820	1821-1835	1836-1850	1911-1983
English	8	7,42	7,42	7,83	8,95	
French					8,83	
Viennese	6	5,56	6,4	7,2	7,83	
modern						10,63

Figure 3.4. Evolution of average key-dip (millimeter) <1790-1983 for c^1.

The evolution of the octave span shows that an increase of 0.3 centimeters between 1805 and 1850 (e.g. on English pianos), or of ½ cm when switching from a Viennese to a French instrument around 1840 means that this very extra space has to be covered by the stretch of the hand between the 1st and the 5th (or 4th) finger. (Fig. 3.5.[909]) For glissando playing, it means that much less margin to comfortably bend the 5th finger inwards towards the palm so that the oblique nail can push down the keys it needs to glide over.



	pre-1790	1790-1805	1806-1820	1821-1835	1836-1850	1911-1983
English	16,26	16,3	16,3	16,5	16,6	
French					16,4	
Viennese	15,86	15,9	16	16	15,9	
modern						16,58

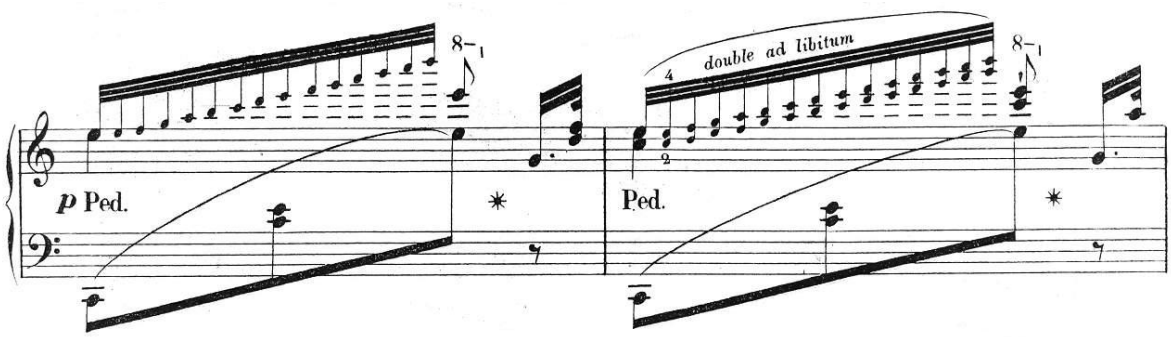
Fig. 3.5. Evolution of the keyboard's octave span (millimeters) <1790-1983.

[909] All data accumulated from Mobbs 2001, p. 29.

An important accomplice in facilitating glissando playing is the chamfer on the keys, i.e. the angled relief that breaks the sharpness of the edge it is cut out from. The more the edge is chamfered, the easier the finger can push down a key from the side, which is essential to glissando playing. Viennese pianos from around 1800 certainly had chamfering on the top of the white keys, but there is no detailed data yet on 19th century instruments. A last keyboard measurement detail that can have an influence on glissando playing is the gap between the accidentals: the wider that distance, the harder it is to glide over the black keys. There is no data yet for comparisons of keyboards after 1850, however, so that their impact on the arrival of the black key glissando in the early 1860's cannot be assessed.[910]

Of course, not every piano from every builder in every country underwent every one of these changes in extreme measure, and not every composer had at all times the latest piano at his disposal. But even with a few of the more moderate of these changes together, a composer that was also a pianist and would recognize the consequences when writing a glissando could easily and rapidly decide to write less of them. And since most of the significant changes had taken place by the 1850's, the pianos available in concert halls in the 1870's would in most cases likely have been recent models on which composer pianists experienced at first hand the hardship of glissando playing, even if they did not have a recent piano model at their home.

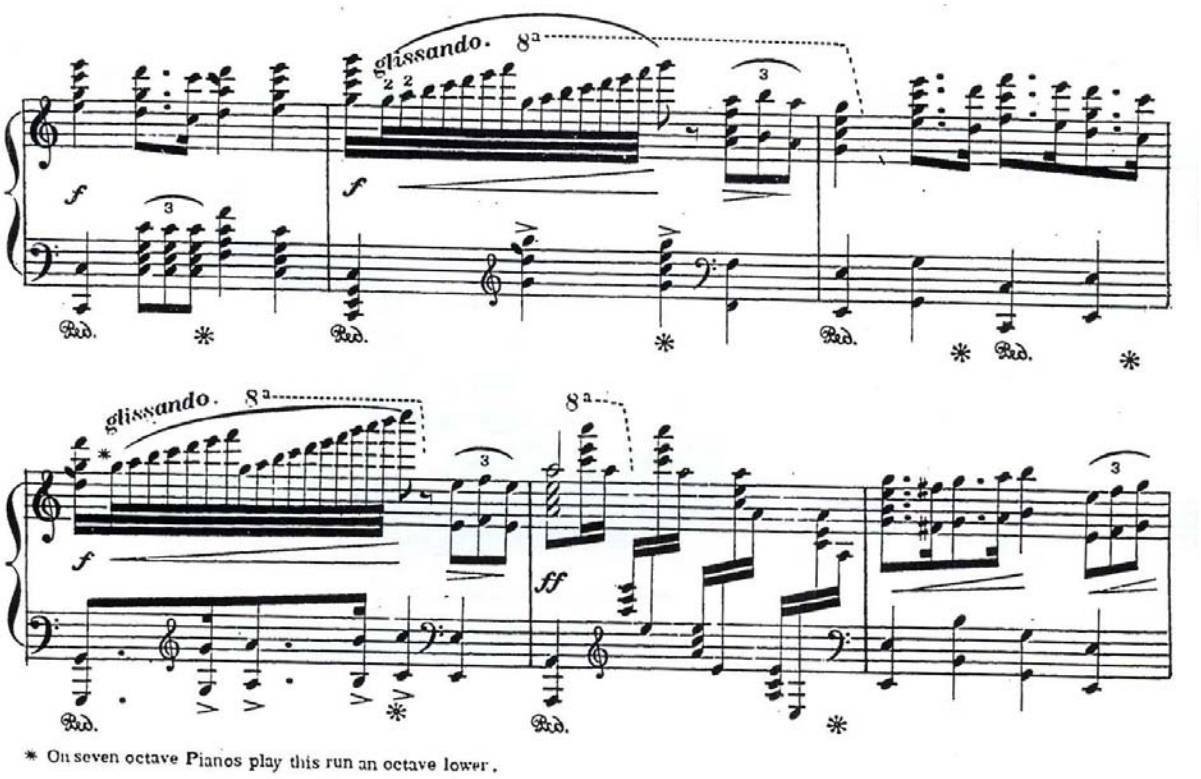
At any rate, already around the middle of the 19th century we can see signs of a changing attitude towards glissando writing, easily linked to heavier keyboards. Liszt's period of cutting down on the most virtuoso glissando writing (see 3.3.2.3.2.3) would certainly have been influenced by the changes in piano building. Other composers started to leave certain decisions up to the performer, e.g. Quidant, who offered the choice of playing double- or single-note glissandos in the fourth piece of his 1851 *Les Mystères du coeur* (Ex. 3.299.)



Example 3.299. Alfred Quidant: *Les Mystères du coeur* opus 32, Nr. 4: *Les étoiles filantes* (1851), bars 111-112.

Added to changes in weight, dip and width of the keys was the expanding range of the keyboard itself. Besides wider keys resulting in a wider keyboard, notes were added as well, the impact of which is noticeable in glissando practice. In 1850 the first edition of Liszt's *Illustrations du Prophète de G. Meyerbeer* had included ossias for glissandos on a smaller keyboard than the main text needed (3.252 and 3.253). In 1864, when Raff wanted a 2.5 octave glissando up to the high c^5 for his *March* on Kunkel's *Leonore,* he also (and still) took into account that not every pianist might have access to the newest type keyboard. Whereas Liszt had shortened the glissandos for smaller keyboards, Raff added an apologetic footnote to propose to play the octaves an octave lower if necessary. (Ex. 3.300.)

[910] Mobbs 2001, p. 30 and 33 lists measurements for the gap distances between accidentals on keyboards for c1795-1846 and 1911-1983.



Example 3.300. J. Raff: *Kunkel's Leonore March* (1864), bars 117-122.

3.3.2.4.2 Editing the glissando III

Some of the editions of older works that publishing houses issued in the 19th century's last couple of decades also show a marked change in attitude. Some editors still believe in the merits of retrofitting glissando notation or indication (e.g. the 1882 edition of Hummel's opus 85 containing *51* fingerings[911]; Simrock's 1870> edition[912] of Beethoven's trio opus 1 nr. 3 added a *51* fingering, *glissando*, a slur and *fortissimo*) but at the same time a new trend is set by simplifying glissando passages or by providing easier ossias. In 1842 Czerny had shown the way with his alternatives for small hands in Beethoven's instances with octave glissandos. The reason is not specified but as some of the cases concern mere single-note glissandos, it cannot have been a question of a pedagogical incentive only.
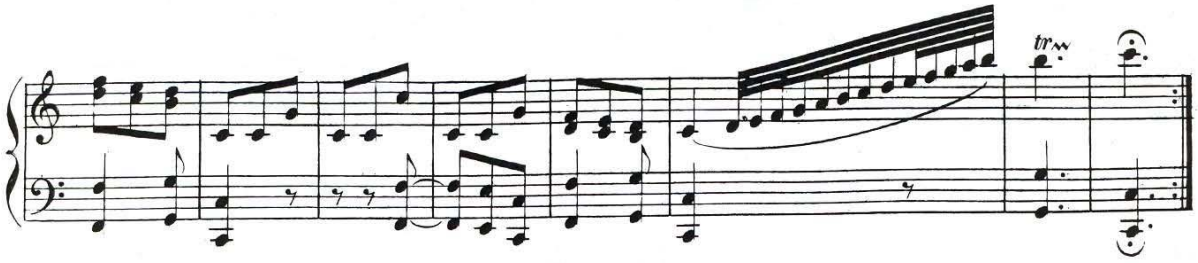
3.3.2.4.2.1 Leaving out glissando signs

The Scarlatti sonatas in the *Trésor des Pianistes* series (1861-1872) were taken over from Czerny's 1937 edition except that some details were changed. The one sonata in which Czerny had added *glissando* to the final run (ex. 3.209), seems to have been deemed in need of correcting: the *glissando* has disappeared and the rhythm was changed to make it look as if an ordinary (albeit extremely fast) run was asked for (ex. 2.301).

---

[911] Peters Edition No. 714 (Herausgegeben von Ad. Ruthardt). Copy seen at the Dutch Music Institute: NMI 44 D 108.

[912] *Trios für Pianoforte, Violine u. Violoncell von L. van Beethoven. Neue revidirte, verbesserte und mit Fingersatz versehene Partitur-Ausgabe. Berlin, bei N. Simrock.* Copy used: G-BNba C 1/8. Dating according to G-BNba.



Example 3.301. D. Scarlatti: Sonata K. 487, Czerny edition (1861-1872), final bars.[913]

3.3.2.4.2.2 Easier ossias

Besides trying to leave the glissando out of the picture, there were efforts to provide the performer with alternatives that were easier than the (perceived) original. Some time after 1873 Carl Maria von Weber's first concerto opus 11 was printed for Breitkopf & Härtel's *Klavier-Bibliothek* with ossia versions above the original octave glissandos.[914] The editor Reinecke adds the word *glissando* to the original notation, while providing an ossia with a right hand upward single-note glissando and a few left hand quarter note octaves which go down from the dominant to the tonic. The 1883 Litolff edition for two pianos (editor Leonhard Emil Bach)[915] gives the performer an *ossia* containing no glissandos but an upwards sequence of G major dyads (thirds and fourths) in the right hand, alternated with left hand single notes.

In the Steingräber edition of Beethoven's opus 15 (1881-1890[916]), editor Theodore Kullak (1818-1882) quotes Czerny (from his opus 500), elaborates on that idea *and* provides his own alternative:

> On this *glissando* Czerny remarks: "The re-entry into the principle theme... is again effected by a glissando, glided with 2 fingers (as in the solo sonata opus 53) and smaller hands may therefore take the run simply, in which case it should be prolonged to the octave below, with increased speed."
>
> Like this:
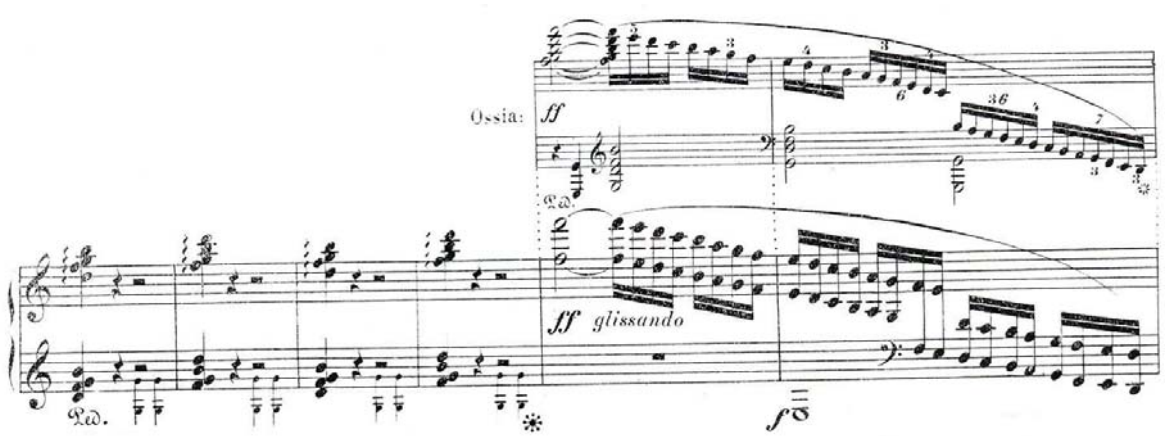


[913] D-Mbs: 2 Mus. Pr. 1440. Reprinted by permission.
[914] This edition – Nr. 21352 – is subtitled: *Clavier-Concerte alter und neuer Zeit. Bach, Beethoven, Chopin, Dussek, Field, Henselt, Hummel, Mendelssohn, Mozart, Reinecke, Ries, Scharwenka, Schumann, Weber. Zum gebrauch beim Conservatorium der Musik in Leipzig genau bezeichnet und herausgegeben von Carl Reinecke.*
[915] Litolff Nr. 1465
[916] *Beethoven's Concerte für Pianoforte / mit Fingersatz und der vollständigen, für Pianoforte übertragenen Orchesterbegleitung versehen von Franz Kullak. – [Klavierauszug]. – Hannover: Steingräber Verlag; New York: Edward Schuberth & C.-o 23 Union Square*. Copy used: G-BNba C 15/22. Dating according to G-BNba: the preface is dated 1881, the terminus ante quem is 1890 since the publisher moved to Leipzig in that year.

> (Less in keeping with the style (anachronism), but maybe more efficient, would be to prolong the glissando a n o c t a v e f u r t h e r y e t.) One could just as well play the o r i g i n a l r e a d i n g – by leaving out the contra G – with b o t h h a n d s as ordinary runs or, which is nevertheless more difficult, as *glissando*.[917]

Judging from the excerpt, Kullak interpreted Czerny's word "einfach" as meaning a single-note glissando, although Czerny may have meant it to signify an individually articulated run (see 3.3.2.3.3.3.1).

Around 1890, another such – "critical" – edition[918] printed *glissando* with an *ossia* containing properly fingered scales (one octave higher) and left hand chords (ex. 302).



Example 3.302. L. van Beethoven: Concerto opus 15, 1st movement, Breitkopf & Härtel edition (c1890), bars 340-345.

Around the turn of the new century, Hans von Bülow edited a "critical and instructive edition with explanatory remarks for students and teachers" (1896-1913)[919], with the *51* fingering for the relevant passage in Beethoven's sonata opus 53 (see 3.2.6.1.13), together with an *ossia* (ex. 3.303) that contained the remark:
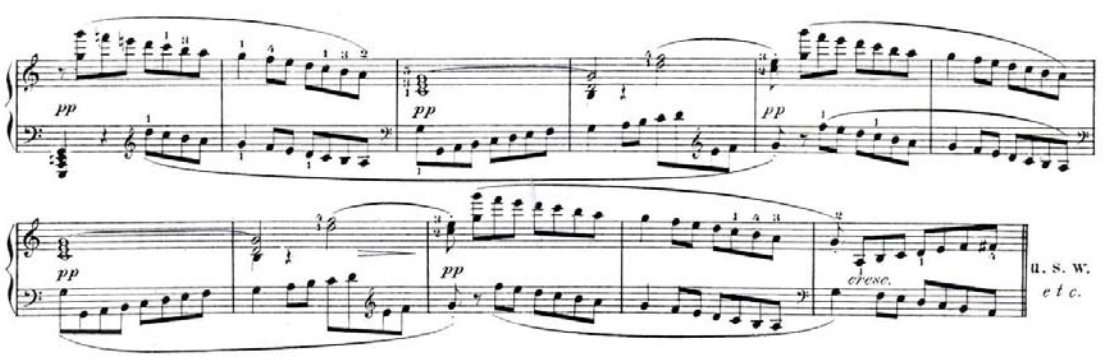
> The octave glissandos in both hands, "pianissimo" even, are impracticable on the modern pianoforte with English mechanism. The Editor alters the passage as

[917] Footnote **) on p. 23 of the Steingräber score (see previous fn.): "Zu diesem *glissando* bemerkt Czerny: "Der Wiedereintritt in das Hauptthema.... besteht wieder in den, mit 2 Fingern geschliffenen Oktaven (wie in der Solo - Sonate Op. 53) und kleinere Hände können daher den Lauf einfach nehmen, aber dagegen mit vermehrter Geschwindigkeit um eine Oktave abwärts verlängern." Also etwa: [example]. (Weniger styllvoll (Anachronismus), aber vielleicht zweckmässiger würde es sein, das *glissando* um n o c h e i n e O c t a v e zu verlängern.) Mann könnte auch ebenso gut die O r i g i n a l-L e s a r t – unter Fortlassung des Contra-G – m i t b e i d e n H ä n d e n als g e w ö h n l i c h e Tonleiter, oder, was freilich schwieriger ist, als *glissando* zur Ausführung bringen."

[918] *Ludwig van Beethoven's Werke: neue kritisch durchgesehene Gesamtausgabe für Unterricht und praktischen Gebrauch; (Orchester für Klavier übertragen. – [Klavierauszug] – In Leipzig: Verlag von Breitkopf & Härtel.* Copy used: G-BNba C 242/8. Dating according to G-Bnba.

[919] *Sonaten und andere Werke für das Pianoforte = Sonatas and other works for the pianoforte / von Ludwig van Beethoven. [English translation of the instructive text by J. H. Cornell]. – Stuttgart und Berlin: J. G. Cotta'sche Buchhandlung Nachfolger; New York: Edward Schuberth & Co.; London W.: Augener Limited. Band 5: Beethovens Werke für Piano solo von op. 53 an: zweiter Teil. – In kritischer und instruktiver Ausgabe mit erläuternden Anmerkungen für Lehrende und Lernende / von Hans von Bülow.* Copy used: G-BNba C 246/23.

follows, and finds that the effect does not run contrary to the intentions of the composer.[920]



Example 3.303. L. van Beethoven: Sonata opus 53, 3d movement, von Bülow edition (1896-1913), bars 464-474.
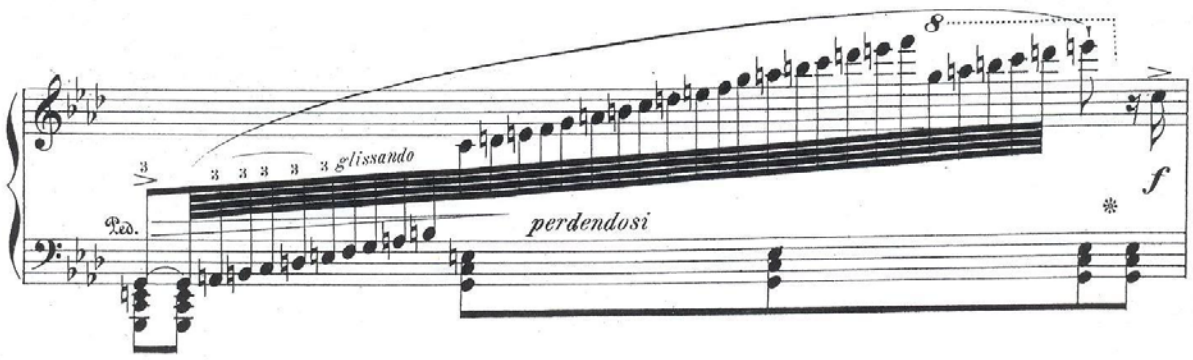
Oddly, an editor could mistakenly think that the original was more difficult than he imagined. In 1889 Augener published an edition of Liszt's 5th Paganini study in which the editor imagined offering a simpler version of the original, explaining in a footnote that he himself played these glissandos in sixths (see ex. 3.256)

with thumb nails as Liszt has marked the glissando octaves for both hands which occur at the end of his Totentanz. This is perhaps the best way. Players who are not afraid of injury to the skin may adopt the old fashioned fingering 41 or 51 for either hand.[921]
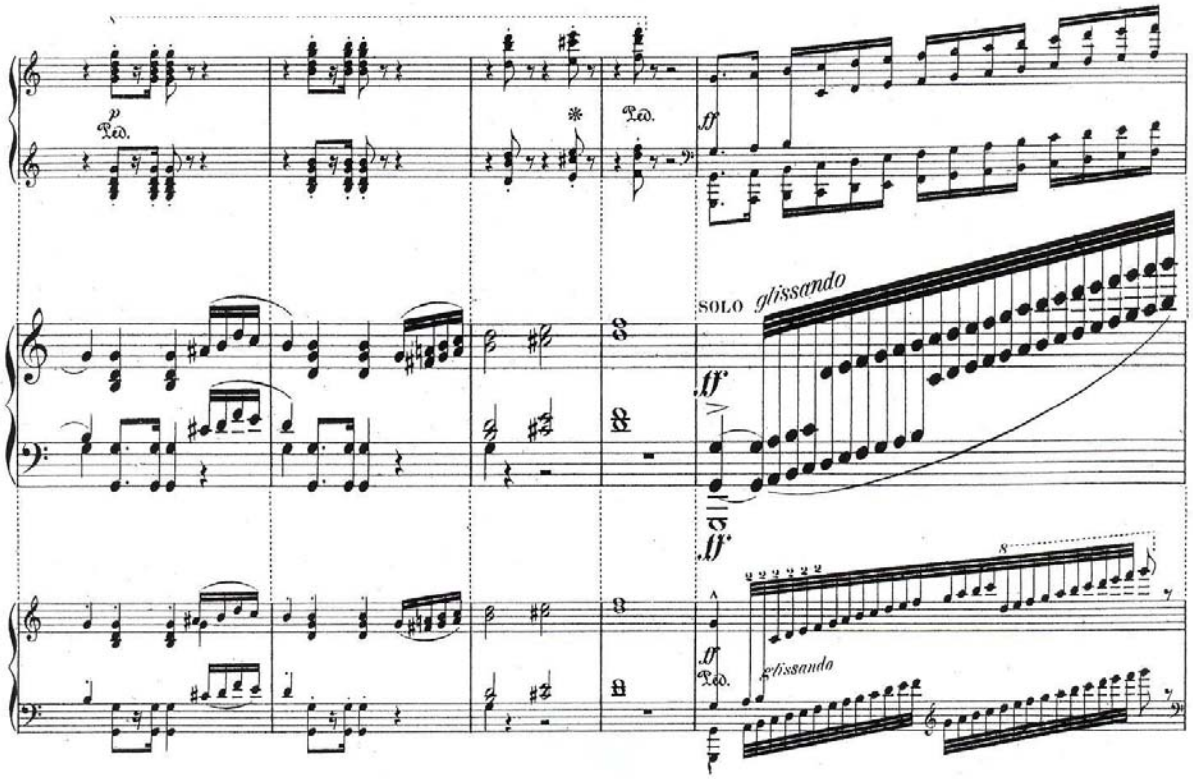
3.3.2.4.2.3 Arranging the original text

Next to republications of older masters with the neutral excuse of "critical" editorship, some such editions were rather arrangements of the originals. The revision was not put in the footnote below or ossia above, but straight into the text. If Liszt acknowledged historical glissando passages without "revising" them in his Beethoven edition around 1860 (see above, 3.3.2.3.3.3), he edited Weber's *Concert-Stueck* more actively in the 1870's.[922] In the opening Larghetto, the long right hand run still only gets the epitaph 'glissando' added (ex. 3.304), but the octave glissandos in the march and the finale are replaced by more practical – if not more efficient – two-hand renderings. (Ex. 3.305 and 3.306.)

[920] "Die Octavenglissando's [sic] in beiden Händen und zwar "pianissimo" sind auf unseren heutigen Flügeln mit englisher Mechanik unausführbar. Der Herausgeber ändert die Stelle, wie folgt, und findet, dass die Wirkung der Absicht des Tondichters nicht zuwiderläuft."
[921] No.6223A-B, plate number 11454.
[922] According to Eckhardt & Mueller 2002, volume 14, p. 869, Liszt's revision would have taken place from 1868 to 1874, while the publication dates of the second volume (in which the *Concert-Stueck* was issued) would have been 1871 (first edition) and 1883 ('rev.').

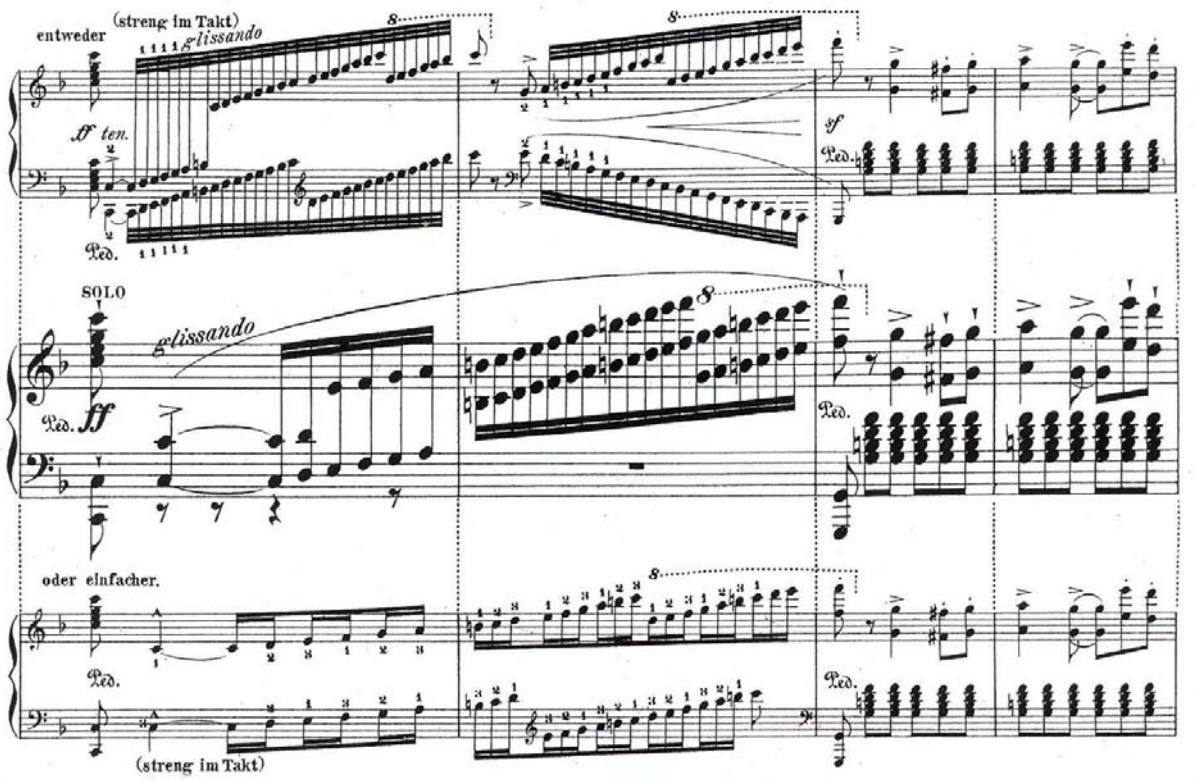


Example 3.304. C. M. von Weber: *Concertstück*, *Larghetto Affettuoso*, Liszt edition, bar 52.[923]



Example 3.305. C. M. von Weber: *Concertstück*, *March,* Liszt edition, bars 30-34. The middle system represents von Weber's original text (edited by Liszt), the top system is Liszt's version for the pianist when accompanied by orchestra, the bottom system shows Liszt's version for solo piano without orchestra.

[923] *Instructive Ausgabe Klassischer Klavierwerke. Ausgewählte Sonaten und Solostücke für das Pianoforte von Carl Maria v. Weber. Bearbeitet von Franz Liszt. Neueste revidirte Auflage. Nr. 444 Concertstück. F moll. Op. 79.* Stuttgart: Verlag der J.G. Cotta'schen Buchhandlung. 1888. The plates of this issue have number 25.26.



Example 3.306. C. M. von Weber: *Concertstück, Presto giojoso*, Liszt edition, bars 100-107. The middle system represents von Weber's original text (edited by Liszt), the top system is Liszt's version for the pianist when accompanied by orchestra, the bottom system shows Liszt's version for solo piano without orchestra.

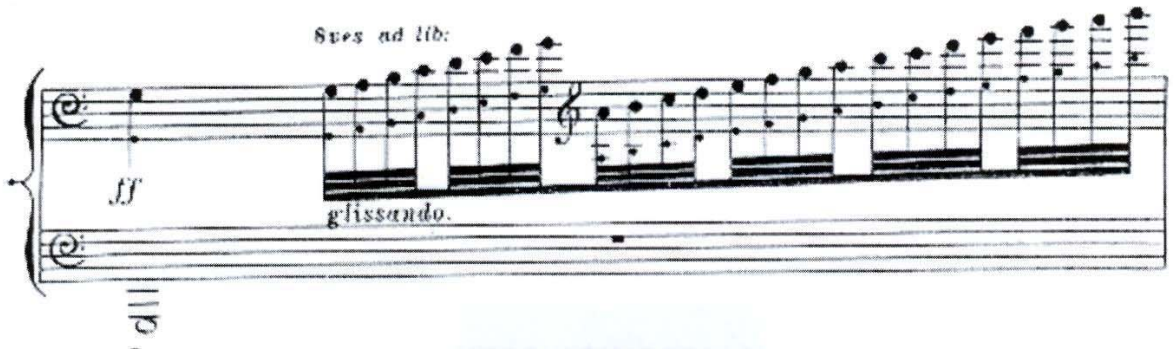
Interestingly, the glissando in the march, towards the re-entry of the theme in the orchestra, ends on the last beat of the bar instead of on the entry of the theme itself, as in the original. (Compare bar 34, ex. 3.305, middle and bottom systems.) In doing his own thing, Liszt gives the bar-long upbeat a second upbeat. The loss of the original octave glissandos' impact in the finale is compensated for by the fact that Liszt's rendering requires much more speed and can be executed much more loudly due to the strong thumbs asked for in both the parallel and contrary movements in his version for piano and orchestra. (See the top system in ex. 3.306.) That Liszt leaves out the octave glissando in bar 36 of the March when playing his arrangement with orchestra (ex. 3.305, top system) is due to his advice that

> At this second repeat of the March the pianist should be heard clearly above the whole orchestra.[924]

Apparently, Liszt's experience with orchestras of his day taught him that in this particular instance, despite his power and strong thumbs, only individually articulated octaves could compete with a full orchestra in *fortissimo*.

In 1874, Sydney Smith (1839-1889) made a solo "paraphrase" of Weber's *Concert-Stueck* in which he left out the two octave glissandos in the presto finale altogether, indicating the original octave glissando in the march as an option. (Ex. 3.307.)

[924] As quoted from the *Nota Bene* on the bottom of p. 20 in this edition (see previous fn.): "Bei dieser zweiten Wiederholung des Marsch's soll der Clavierspieler über das ganze Orchester deutlich gehört werden."

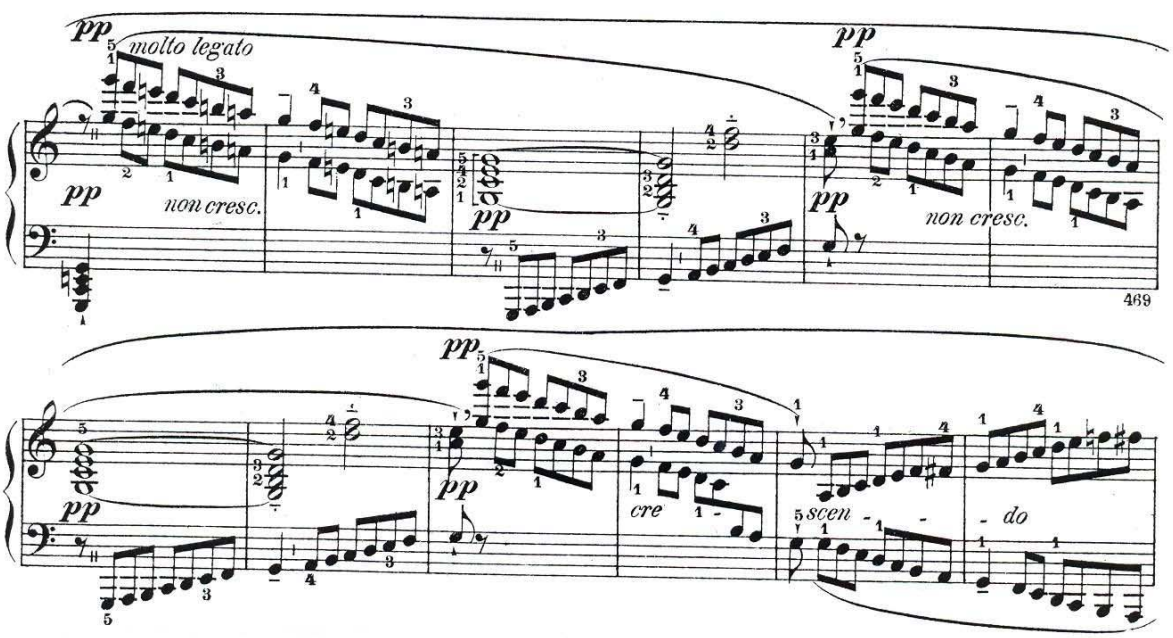


Example 3.307. S. Smith: *Weber's Concertstück (Paraphrase)* opus 107b, bar 123.

In 1884, Auguste Dupont issued a series of piano music as an *Ecole de Piano du Conservatoire Royal de Bruxelles*[925]. In the 10th book, J. Haydn's *Fantasie* contains the octave runs in the right hand staff (see ex. 3.57) but with fingerings for the left and right hand, and showing only in a footnote the original passage with a *51* fingering and *glissando ad lib.* added to it.

Beethoven's opus 53 sonata was subdued to the same fate. In 1885, the Riemann edition[926] replaces the original text with an alternative version (ex. 3.308) while the original is tucked away in a footnote with the remark:

> i.e. octave glissando, which is – especially in pianissimo – impossible to perform on our present day grand pianos. The break before the start of the octaves can be long enough, so that there is enough time to add the left hand.[927]
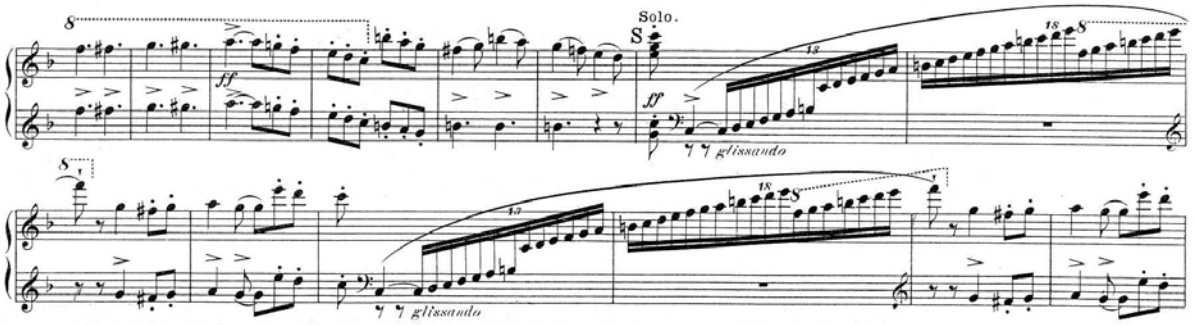


Example 3.308. L. van Beethoven: Sonata opus 53, Riemann Edition (1885), bars 464-475.

[925] Leipzig & Bruxelles: Breitkopf und Härtel.

[926] *Sonaten für Klavier / von Ludwig van Beethoven. Kritisch revidiert, mit Fingersatz und genauer Bezeichnung der Phrasierung hrsg. von Hugo Riemann*. – In Berlin: Verlag und Eigentum von N. Simrock. – (Hugo Riemanns Phrasierungsausgabe; 2). Copy used: G-BNba C 246/2. Dating according to G-BNba.

[927] "d.h. Octaven-Glissando, das auf unsern heutigen Flügeln, zumal pianissimo, unausführbar ist. Die Cäsuren vor dem Einsatz der Octaven können ziemlich erheblich sein, sodass Zeit genug ist, die Linke Hand hinauf zu führen."

The single-note glissandos in the four-hand adaptation by Gustav Martin Schmidt (1880's or later)[928] of von Weber's *Concert-Stueck* – replacing the original octave glissandos – have less to do with the original being impossible on a recent keyboard, but rather with the impracticality of playing octave glissandos while sharing the seat with another performer and only having half of the keyboard to play on. Yet, that not *both* players are asked to play simultaneous single-note glissandos an octave apart (thus making one octave glissando) must be a result of the general attitude of simplifying such double-note glissandos. (Ex. 3.309.)



Ex. 3.309. C.M. von Weber: *Concertstück,* four-hand edition by C.F. Peters (1880's or later), *Presto giojoso*, bars 94-107, treble part.

Such changes in appreciation were widely being concocted, but this does not mean that the glissando had completely run out of favor with editors. During the second half of this century, editions were still issued on a more historically responsible basis. In 1893, the edition of Beethoven's opus 53 that Ernst Pauer supervised[929] indicated *41* fingering for both hands without any alternative offered. Nevertheless, such editions formed a minority compared to the above kinds of publications.

3.3.2.4.3 Adolphe Kullak: *Die Ästhetik des Klavierspiels* II

New issues of the *Aesthetic of Piano Playing* by Kullak provide us with yet another example of how past ideas on the glissando were (re)arranged by next generations that lived the Zeitgeist of the 19th century. The second and third edition of this book (see 3.3.2.3.3.4), both revised and edited by Hans Bischoff, are telltale of the glissando's fate. In the second edition (1876), the glissando is still treated in some of its diverse facets, but the whole is considerably shortened. Notably the performance technical details (hand and finger position, practice, easier vs. harder direction) for the black key glissandos and double note glissandos are left out. Any trace of Kullak's aesthetical ideas on the glissando has disappeared. In the section which handles the glissandos in categories, the chromatic glissando, the octaves on the black keys, the chromatic octaves have also gone, and of the original section treating chords, double note and octave glissandos, only the title has remained.

The editor – Bischoff – does not hide his personal feelings about the glissando: if Kullak's idea of a decorative type of passage work could still have been taken in a neutral way, the revised text immediately adds condescendingly

[928] *Concertstück / von / Carl Maria von Weber / Op. 79 / Für Pianoforte zu vier Händen / arrangirt von / Gustav Martin Schmidt.* Leipzig: Edition C.F. Peters, plate nr. 6381.
[929] *Pianoforte sonatas / by L. van Beethoven. Ed. by Ernst Pauer. – London: Augener & C.o. Volume 2.* Copy used: G-BNba C 246/7. Dating according to the Monthly Musical Record, see G-BNba.

> which was much in vogue at Weber's time but now as good as totally out of fashion, partly because it concerned a different instrument than those of today, partly because it entails a musically completely worthless and very cheap effect.[930]

Were Kullak showed some honest enthusiasm referring to the white key glissando ("The latter resembles an easy gliding on a smooth ice-skating ring, and a newer composer could name a composition based on it the 'ice skating dance'."[931]), the new edition has surgically left out exactly this passage.

In the third edition of his book (1889), all remains the same, only the mentioning of Schulhoff's *Carnaval de Venise* is replaced by "Liszt's Faustwalzer," maybe to uplift the level of Kullak's examples in order to compensate for Schulhoff's all to obvious disappearance into oblivion or to counterbalance the belittling of the glissando's aesthetic worth.

3.3.2.4.4 Further developments

Despite the downfall of the glissando from its most intense usage to the point of stagnation – in numbers of glissandos per work or composer that is – not all had been tried with this technique yet. Before the end of the period under scrutiny, several more evolutionary steps are to be noticed, but also the continuation of some of the previous developments.

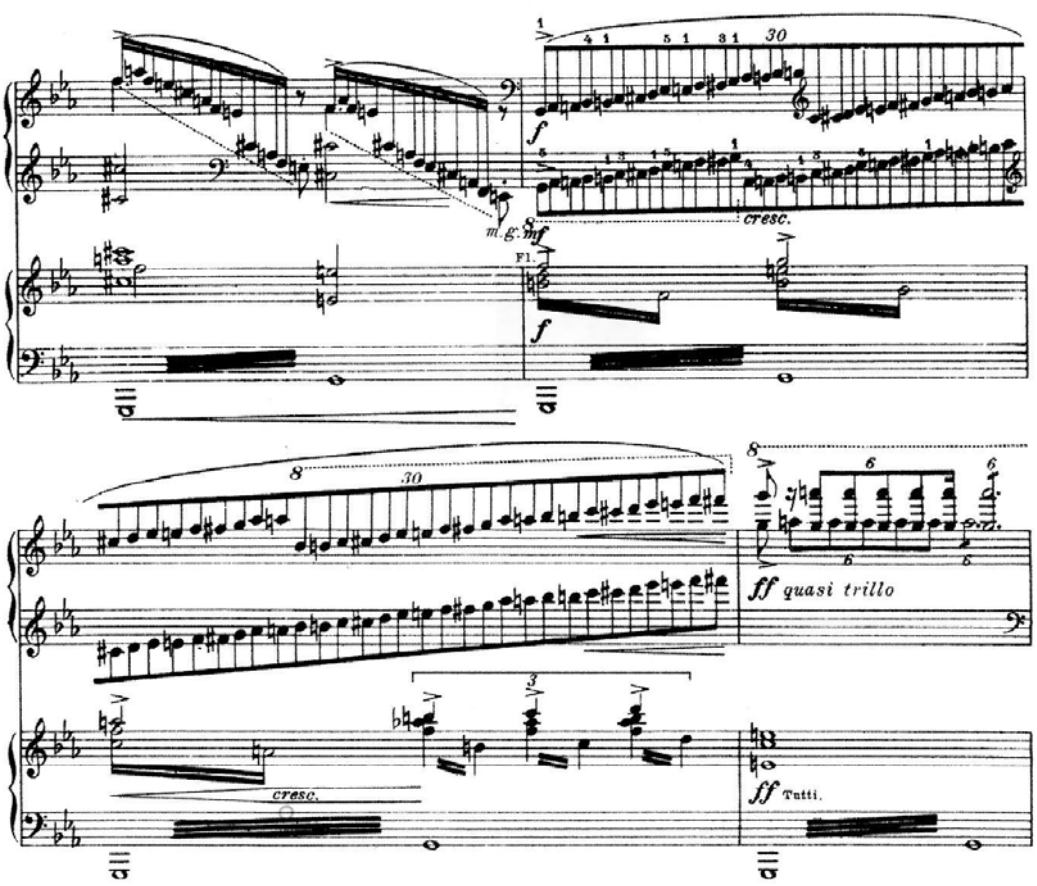
3.3.2.4.4.1 Concerto glissandos II

The tradition of including glissandos in piano concertos had never been gone from the 19th century. In the 1850's Rubinstein had written a long single-note glissando of just over five octaves (36 notes) in his second concerto opus 35, but while he refrained from using the glissando in his subsequent concertos (he wrote 5 octave long chromatic scales in both his 1854 third and 1864 fourth concertos), near the end of the century composers appear to have competed over writing the longest concerto glissandos. Saint-Saëns pushed to 38 notes (5.5 octaves) in his fifth concerto (1896), Rimsky-Korsakov ran up to 41 notes in his opus 30 (1882) and Delius reached a full 6 octaves (42 notes) in 1897. Until now most concerto glissandos had been isolated instances within the composition. Even in Liszt and von Weber the glissandos, however many of the in one work, did not have a real inherent connection with the rest of the material. Delius played around with this aspect of glissando writing, trying to incorporate it in a larger organic development: from long chromatic runs (ex. 3.310) to long diatonic back and forth runs (ex. 3.311), to a diatonic run turning around as a glissando (ex. 3.312) and, finally, a triadic two-hand glissando (ex. 3.313).

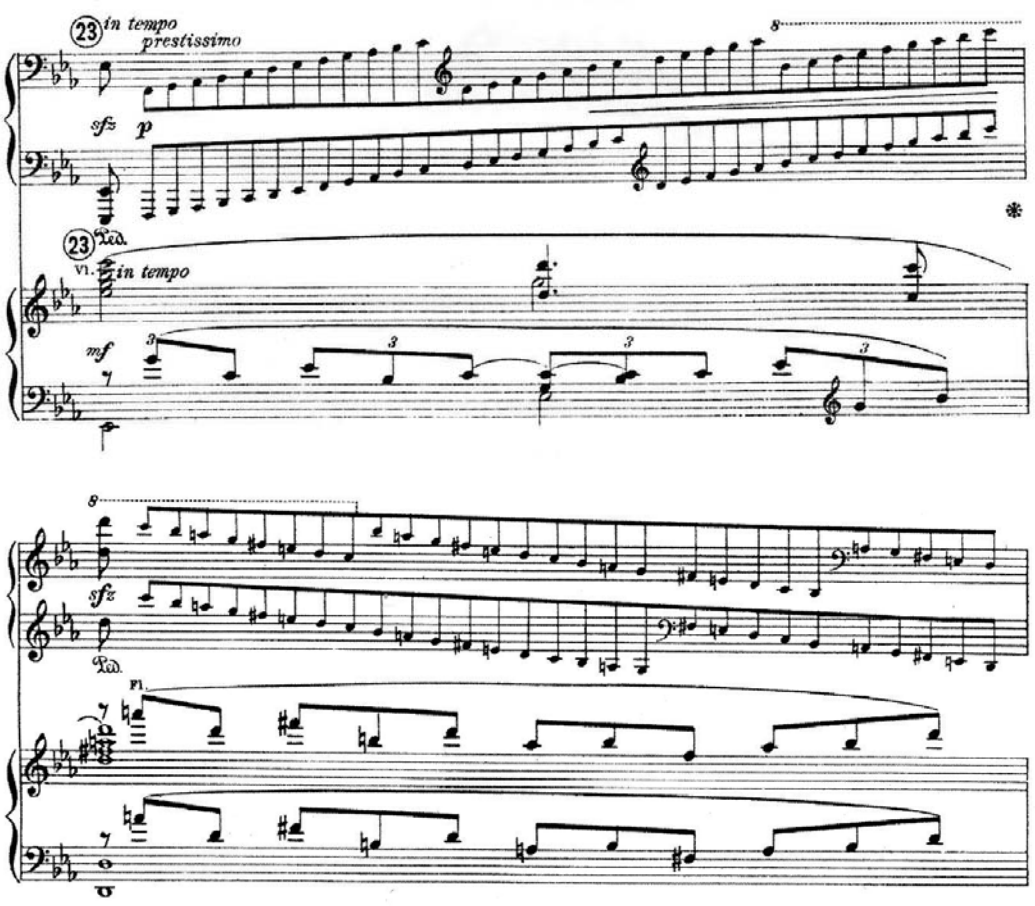
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[930] Kullak 1876, p. 238. "...die etwa zu Weber's Zeit sehr en vogue war, jetzt aber so gut wie ganz außer Mode ist, weil sie theils anderer Instrumente bedarf, als die heutigen, theils einen musikalisch gänzlich werthlosen, und noch dazu sehr billigen Effekt enthält."

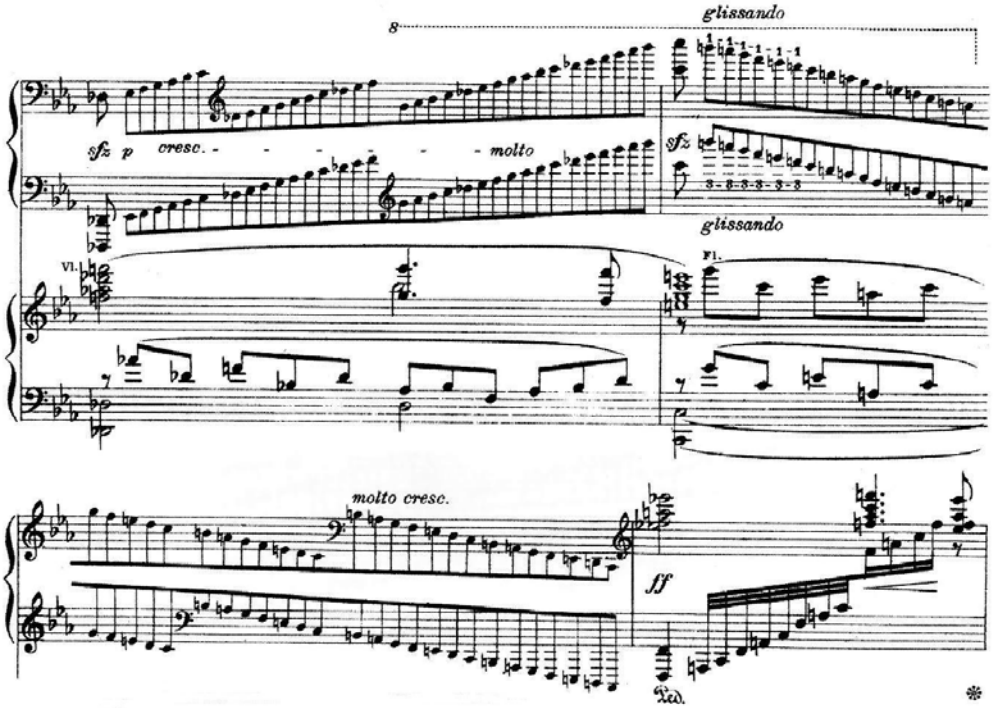
[931] Kullak 1861, p. 217: "[...] ein neuerer Componist konnte eine darauf basirte Composition mit Recht den Schlittschuhtanz benennen.". More than a decade before Kullak wrote this, Liszt had written his second of three paraphrases *Illustrations du Prophète* (based on Meyerbeer's 1849 opera *Le Prophète*), also known as *Les Patineurs* or *Der Schlittschuhläufer* (the ice skaters). We do not know whether Kullak wanted to make a hidden reference to this work or whether it is a coincidence.



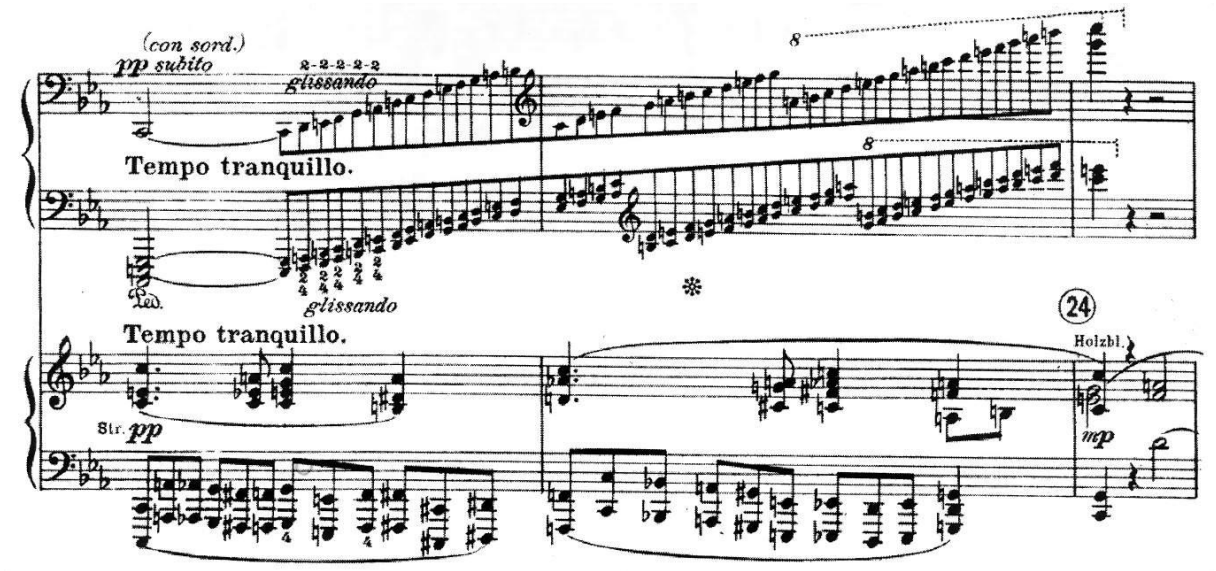
Example 3.310. Fr. Delius: Concerto in c (1897), bars 147-150.



Example 3.311. Fr. Delius: Concerto in c (1897), bars 296-297.



Example 3.312. Fr. Delius: Concerto in c (1897), bars 298-299.



Example 3.313. Fr. Delius: Concerto in c (1897), bars 306-308.

3.3.2.4.4.2 Fingerings IV

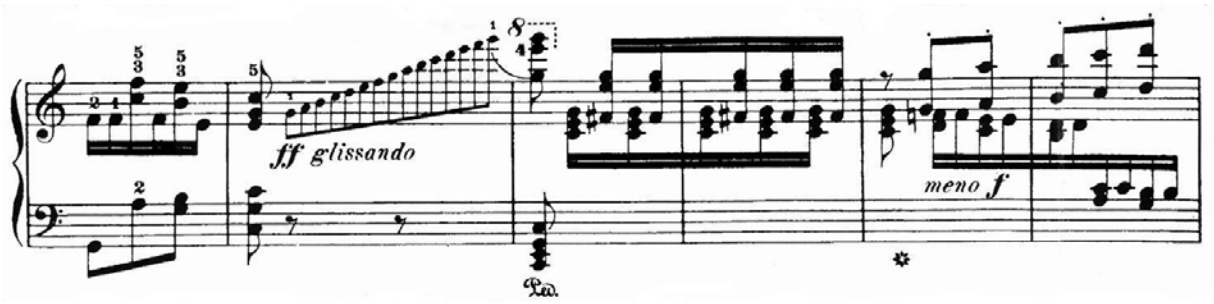
In the late 19th century the single-note glissando was now almost exclusively indicated – if at all – to be played with the strongest fingers.

Date	fingering	composer/*piece*
1874	*1*ORL, IL; *2*OR; *3* OR	Weber/Smith *Concertstück*
1876	*3* OR	Liszt *Ranz de Chèvres*
1877	*3* OR	Smetana *Polka*
1880	--	Rubinstein *Toréador*
1880	*3*/*1* OR & IL	Liszt *Liebesszene*
1880	*3*	Saint-Saëns *Marche Militaire*
1882	*3* OR	Rimsky-Korsakov concerto
1882	*1* OR; *3* IR	Bonamici left hand study
1883	*3* OR	Wagner/Busoni *Marcia Funebre*
ca1883	*3* OR; --IR	Paderewski *Variations et Fugue*
1884	*1* ILR ; *2* OR	Saint-Saëns *Rhapsodie*
1885	*1* OR	Moszkowski *Caprice*
1886	--	Saint-Saëns *Aquarium*
1887	--	Busoni Merlin transcription
1889	--	Glazunov *Ruses d'Amour*
1890	--	Debussy *Suite Bergamasque*
1891	--	Debussy *Fantoches*
1892	--	Smith *La vie pour le Czar*
1893	--	Tchaikovsky *Scène Dansante*
1893	--	Paderewski *Fantaisie Polonaise*
ca1894	*1* OR	Moszkowski *Phantasiestück*
1896	--	Saint-Saëns concerto
1897	*1* IR, *2* OR, *3* OL	Delius concerto

Significantly, the less strong right hand fingering (2nd in Delius) is for a *pianissimo* glissando (ex. 3.313). Saint-Saëns' use of the thumb for inward glissandos and the 2nd finger for outward gliding shows his pianistic affinity with the comfort that fingering can provide when choosing it based on the morphology of the performer's bodily position. Bonamici indicates *1* when the rest of the hand plays a chord underneath the first note of the glissando. When there is no chord, his fingering is *3*.

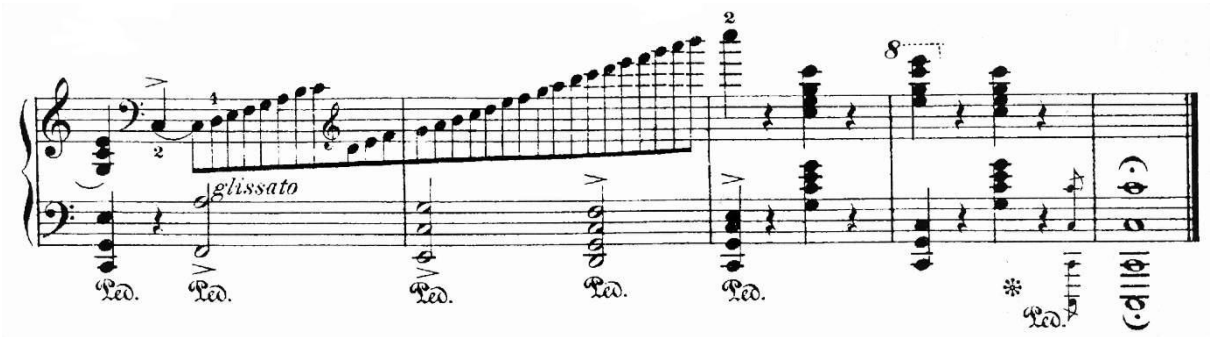
The reason for a specific fingering is far from discernable. From our present day perspective, we can easily state that the thumb comes in handy for achieving an intense tone or a high volume because of the pressure that can be exercised on the thumb due to the large surface of the nail and the little danger of hurting the flesh right above it. But how pianist-composers decided on the use of the thumb or the third finger is not clear. There are not always specific dynamic markings accompanying those particular instances either, at least not to show any difference from other glissandos where, for instance, the thumb is not required.

An interesting insight in glissando fingering is furnished by Moszkowski, who differentiates between fingerings for the glissando compared to those for beginning and ending notes. In the *Caprice espagnol* opus 37 (1899) he uses the last note of the gliding part as the pivotal note on which to swing the hand in the proper position to play the following chord (ex. 3.314). He seems to have like this sophisticated technique as he used it again twice in his opus 80 (ca1900).



Example 3.314. M. Moszkowski: *Caprice espagnol* opus 37, bars 99-104.

In the sixth fantasy piece opus 52 (c1894) – *Beim Feste* – Moszkowski begins and ends the glissando with *2* on the properly articulated notes, while gliding with the thumb. (Ex. 3.315.)



Example 3.315. M. Moszkowski: *Phantasiestücke* opus 52, nr. 6: *Beim Feste*, final bars.

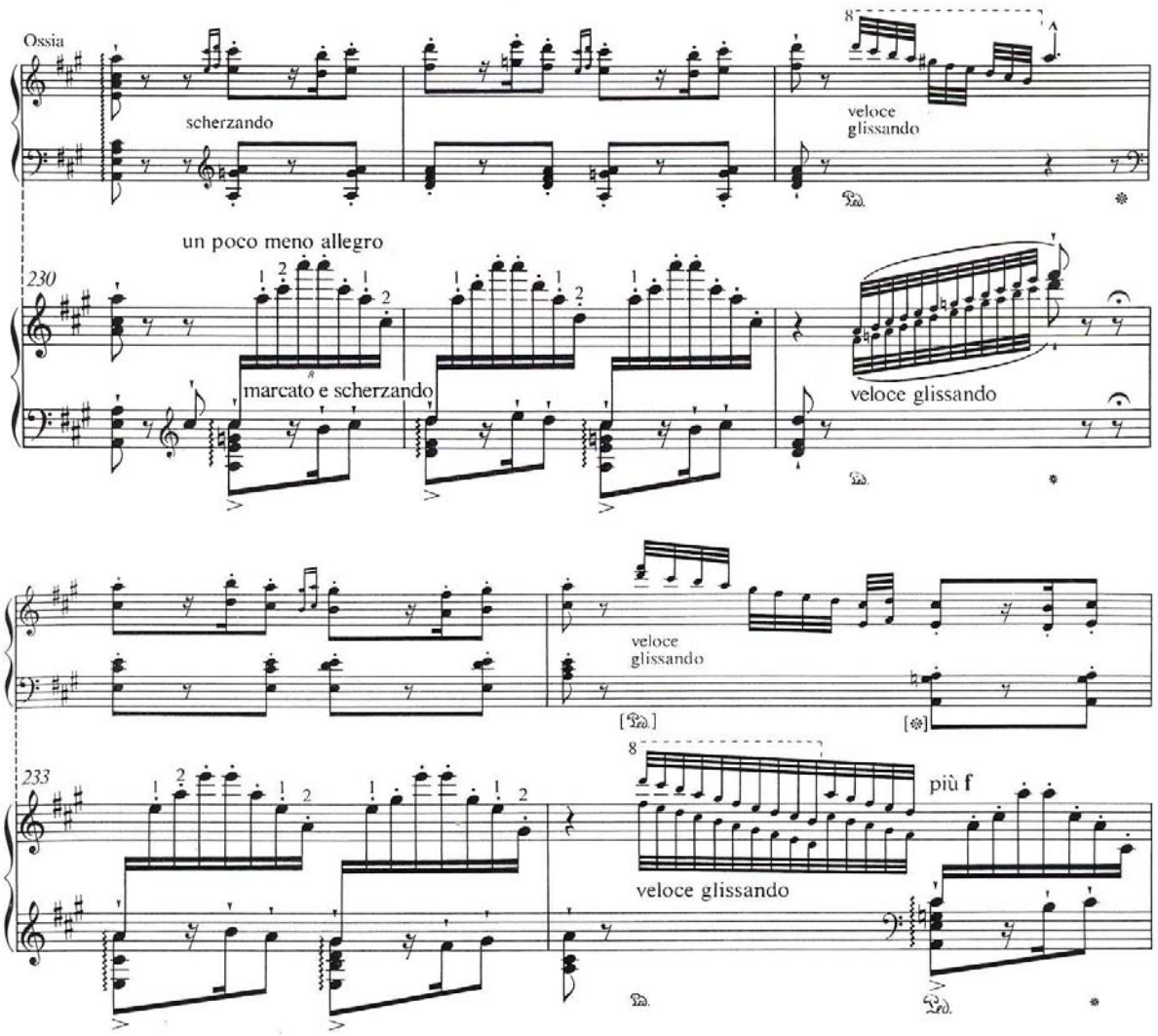
As for double note glissando fingerings, no new elements are detected compared to the previous period (1840's-1860's): if indicated, most fingering for thirds is still *42*.

Date	3ds	Black & White	8 vs	composer/*piece*
1870			--	Rubinstein *Rousskaja*
1872			--	Brahms *Hungarian Dance*
1874			--	Smith *Concertstück*
1876	*42* OR			Liszt *Ranz* ossia
1893	*41* IR			Paderewski *Fantasie*
1897	*42* IL			Delius concerto
1899		*42* IR		Chopin/Godowsky waltz

The black-and-white glissando will be discussed below. (3.3.2.4.4.5.)

3.3.2.4.4.3 Quasi Glissando

In 1841 Liszt had written down his paraphrase on Mozart's *Don Juan* and in one section (in A major) he included some very fast runs with the indication *veloce glissando*. (Ex. 3.316.) What he meant by this was "at the speed of gliding," to make sure that no rubato was used to stretch the tempo beyond the capacity of the melody in order to include all the notes with crystal clear articulation. At this time he did not yet dare to write glissandos over D and A major harmonies (see 3.3.2.3.2.4) so he wrote runs that should sound like glissandos, both in the main text and in the *ossias*.
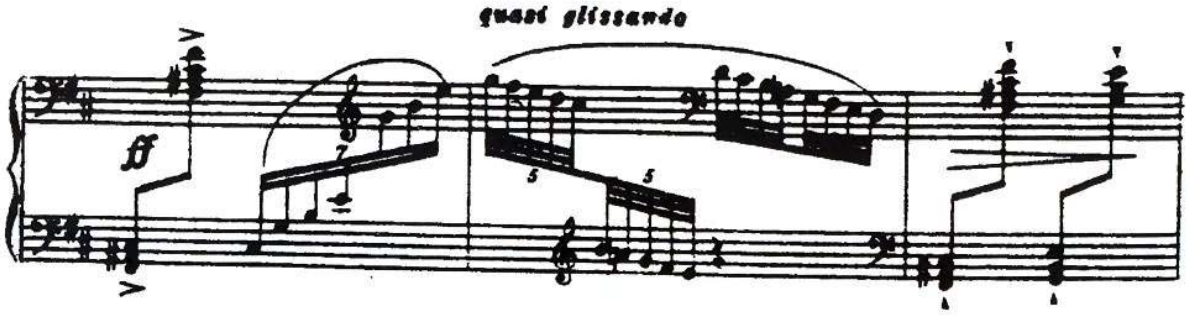


Example 3.316. Fr. Liszt: *Réminiscenses de Don Juan* (1841), bars 230-234.[932]
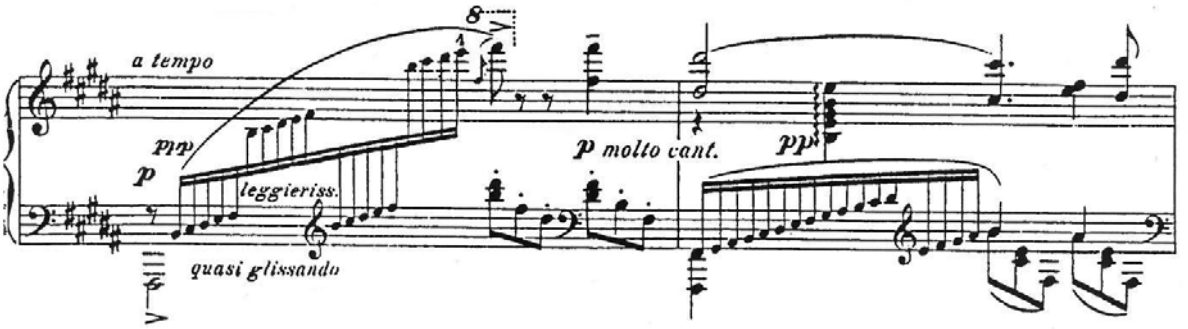
Late, in the 1890's, other composers took over this idea in their own works, e.g. Tchaikovsky, Felix Blumenfeld and, especially, Emil Sauer.

Some of these *quasi* glissandos are mere runs that could have been real glissandos if only they had been written in C major (ex. 3.317 and 3.322). Others are combinations of runs and permutations of broken chords (e.g. ex. 3.318, 3.319, 3.320, 3.321, 3.323) that could under no conditions be glided over. All of them are expected to incorporate one or more aspects typical of the gliding articulation, though none such details are specifically indicated in the scores. However, there are telltale signs of ergonomical behavior (the DNA, as it were, of the glissando), such as the use of alternating hands to avoid the passage of the thumb, thus enabling the smoothest possible regularity in the sequence of sounds (e.g. ex. 3.317-321 and 3.323), or the alternation of black- and white-key hand positions that form the basis for the composition of the runs (ex. 3.319 and 3.321).
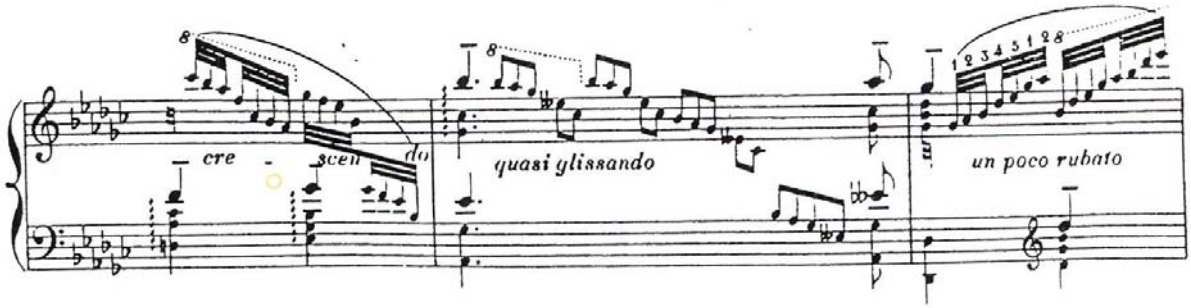
[932] New Liszt Edition, Series II, Volume V; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.



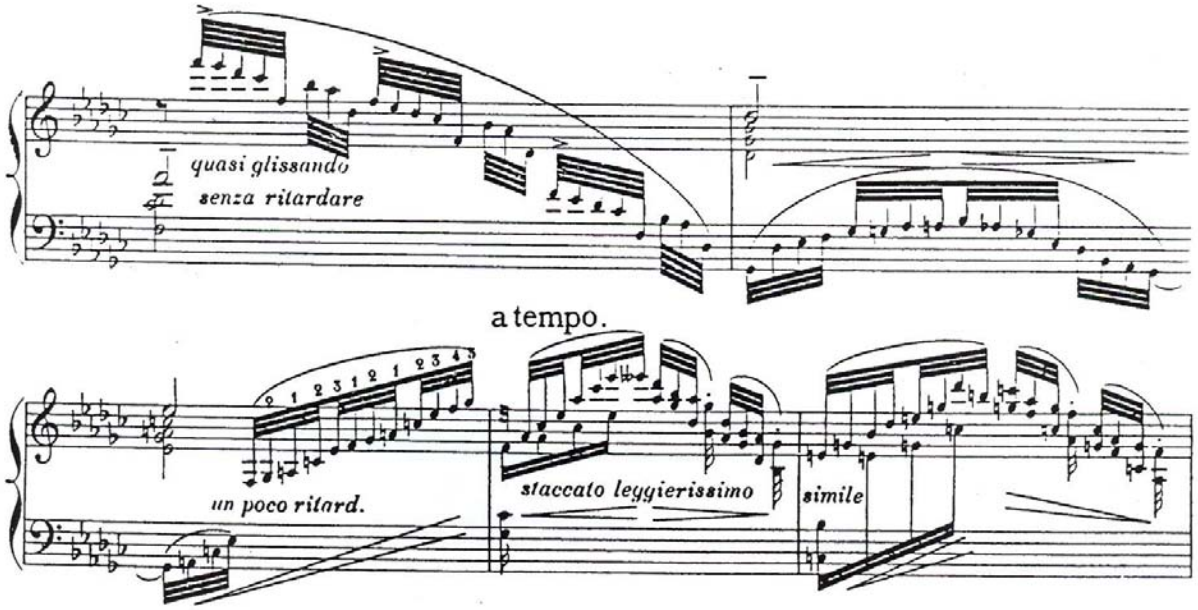
Example 3.317. P.I. Tchaikovsky: *Danse caractéristique* opus 72 nr. 4 (1893), bars 167-169.



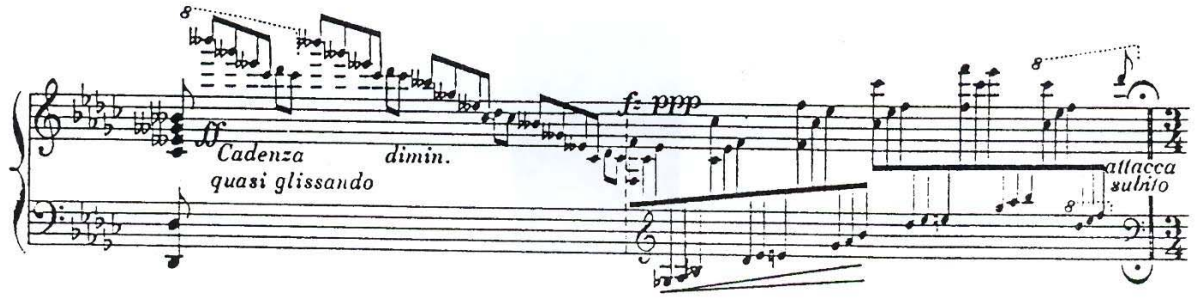
Example 3.318. F. Blumenfeld: *Nocturne-Fantasie* opus 20 (1895), bars 93-94.



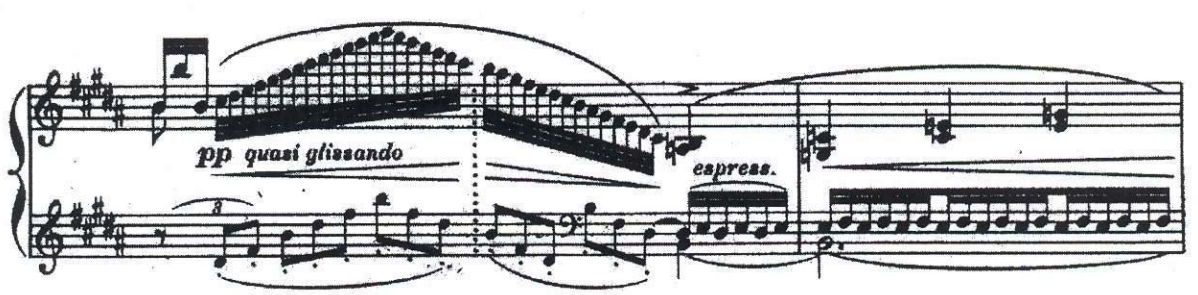
Example 3.319. E. Sauer: *Konzert-Etüde* nr. 1 (<1897), bars 38-40.
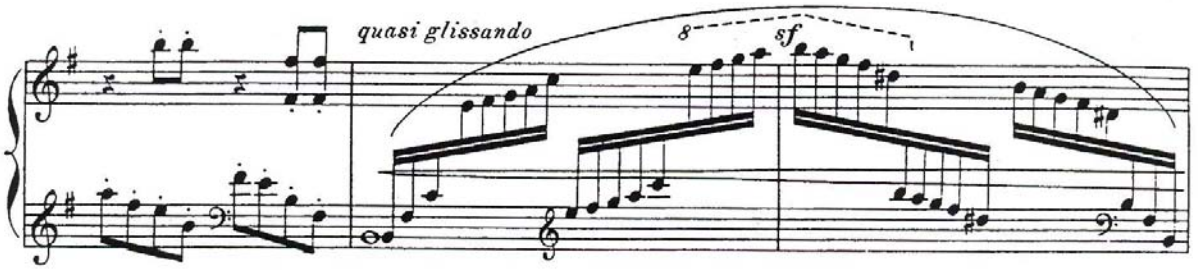


Example 3.320. E. Sauer: *Konzert-Etüde* nr. 1 (<1897), bars 59-63.



Example 3.321. E. Sauer: *Konzert-Etüde* nr. 1 (<1897), bar 214.
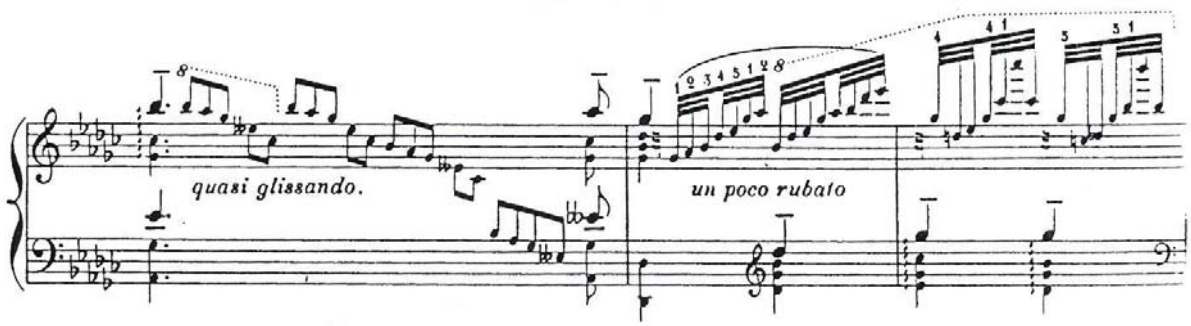


Example 3.322. E. Sauer: *Konzert-Etüde* nr. 6 *Espenlaub* (1897), bars 46-47 (48).



Example 3.323. E. Sauer: *Konzert-Etüde* nr. 7 *Meeresleuchten* (1899), bars 126-128.

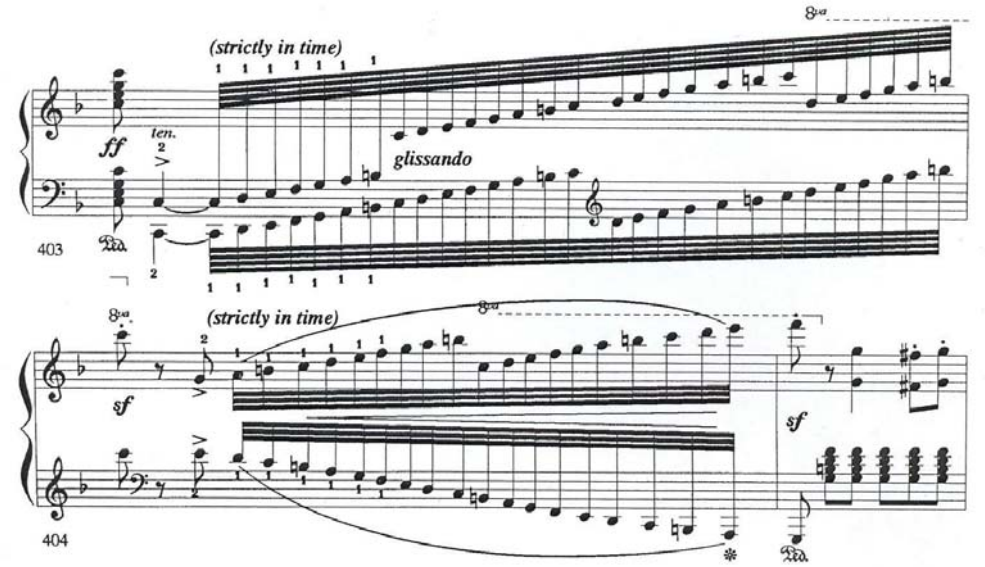
The indication *quasi glissando* suffers from the same problem as its counterpart in that it does not sufficiently demarcate until when it is valid, e.g. are bars 61 and 62 in ex. 3.320 also *quasi glissando* (only the next bar, 63, indicates a new type of articulation) and is the whole cadenza in 3.321 to be played as if it were a glissando? In that same piece (*Konzert-Etüde* 1) Sauer uses a total of four *quasi glissando* instances (bar 39 – see ex. 3.319 – is repeated later in the piece) and right after two of them he writes what could effectively be a black-key glissando. He nevertheless adds fingerings for individual articulation and apparently does not think of it as a (*quasi*) *glissando*. (See bars 168 in ex. 3.324 and bar 40 in ex. 3.319.)



Example 3.324. E. Sauer: *Konzert-Etüde* nr. 1 (<1897), bars 167-169.

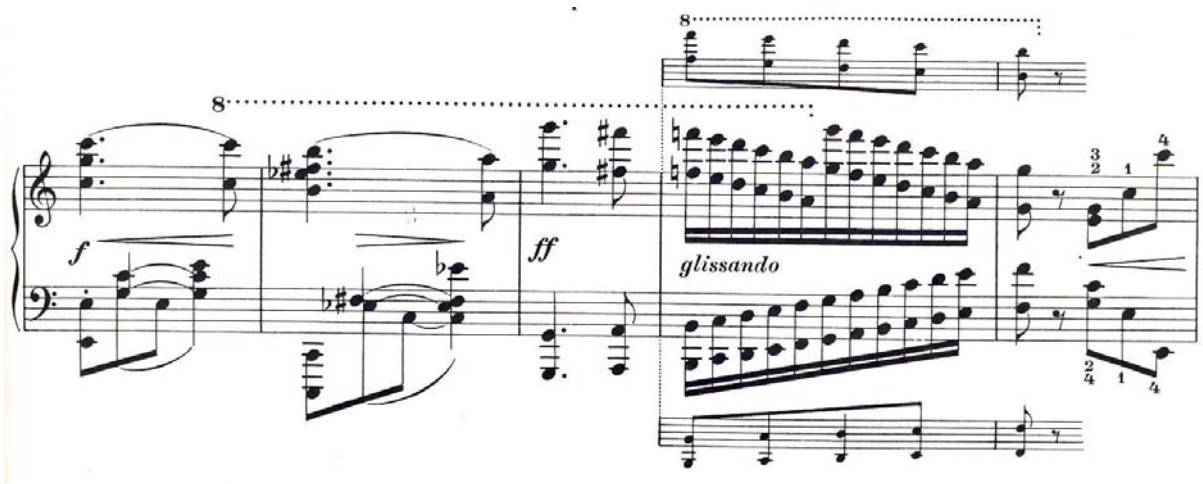
3.3.2.4.4.4 Morphology: beginnings and endings IV

We have seen contrary motion glissandos throughout the previous decades: e.g. in Herz (ex. 3.161, 3.180) or Liszt's tenth *Hungarian Rhapsody* (example 3.273). One of the interesting consequences of plotting glissandos onto a geographical system is the way its constituents have to adapt to the concurrent harmonies in tonal music. A glissando is basically a run filling up a gap between two notes that have to fit in with the harmonies of the moment. Where as parallel runs each fill up a gap of the same length if they have their beginning and ending notes in common, contrary runs (and glissandos) may have to fill up two different gaps if they need to start and end on notes that make harmonic sense. In Liszt's example (3.273) the glissandos take off from the B in the right hand chord at the beginning of each bar, resulting in 13 notes for each glissando to reach their ending. In one of Herz's cases (ex. 3.161), the number of notes in the right and left hands are not the same because the jumps in both hands are different. As there is no unlimited number of combinations that allow the performer to start and finish such contrary motions on harmonically sound notes in the glissando's key of C major (to stay on white keys), not all such glissandos have the same number of notes, as in e.g. Liszt's 1868 version of Weber's *Concert-Stueck* (ex. 3.325.)



Example 3.325. Fr. Liszt: Carl Maria von Weber's *Concertstück* opus 79 (1868), bars 403-405.

In one case, this kind of ergonomically defined piano writing fits in with an already prevalent attitude in a composer's idiom. Contrary motion glissandos can be an example of how a technique adapts to habits already present in the works of a composer. In one of Brahms' Hungarian dances, two contrary movement octave glissandos of different lengths, traceable (even more than his Paganini variation – cf. above) to the Beethoven sonata opus 53 which Brahms had on his repertoire as a concert pianist[933], are in keeping with his predilection for contrary movements between bass and soprano lines in many of his pieces.[934] (Ex. 3.326.)
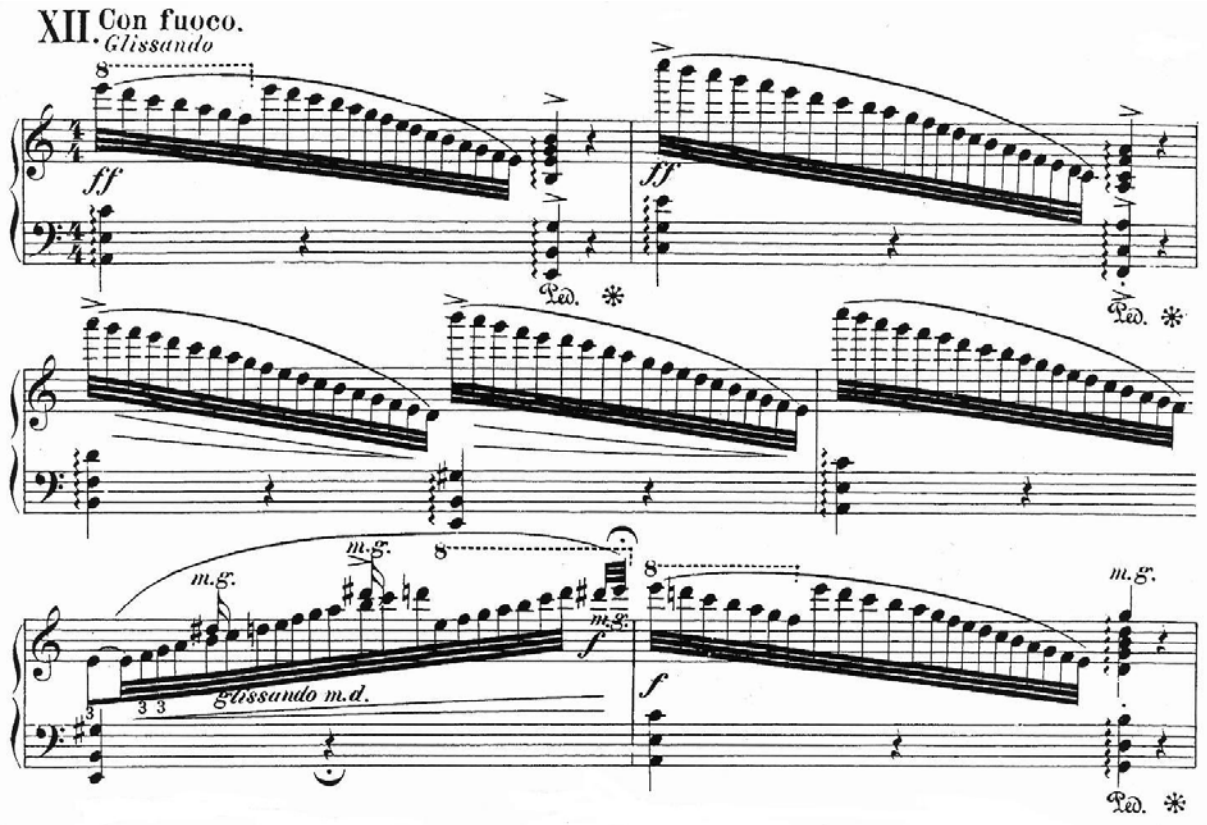


Example 3.326. J. Brahms: *Hungarian Dance* Nr. 8 (1869>), bars 111-115.[935]

Most interesting in some of the two-hand contrary motion glissandos (3.180 & 3.326) is how they are written purposefully to finish on adjacent positions of the hands. This also is a question of morphology: if the point of arrival of both hand movements is physically

[933] See Hofmann 2006.
[934] This is not only the case in his piano writing. His symphonies consistently show the same tendency to juxtapose contrary movements of melodies and their bass lines.
[935] *Johannes Brahms: Sämtliche Werke. Band 15: Studien und Bearbeitungen für Klavier.* Leipzig: Breitkopf & Härtel, 1926-27. Plate J.B. 78

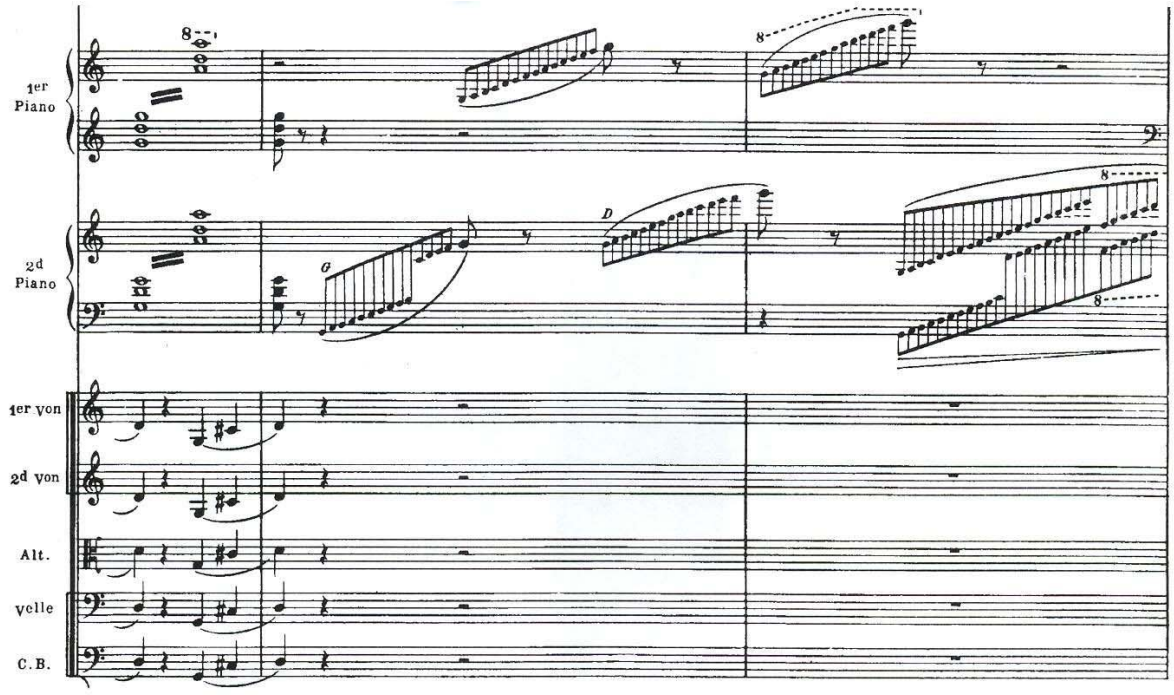
close, the aim is much more easy. Outward two-hand glissandos (3.273 and 3.325) are therefore more difficult: they are as risky as big two-hand contrary motion leaps.

Another issue regarding the morphology of a glissando is presented by the problem of realistically notating it, as we have demonstrated above in Quidant's piece (ex. 3.299). Paderewski also decided not to bother with the incompatibility between classical music notation and the glissando's morphological consequences. In his opus 11 (ca1883) he devoted a whole variation to the glissando technique, systematically using the out-of-time arpeggiation of chords to allow a glissando to stop prematurely in order for the hand to travel all the way up again to start a new glissando. (Ex. 3.327.)
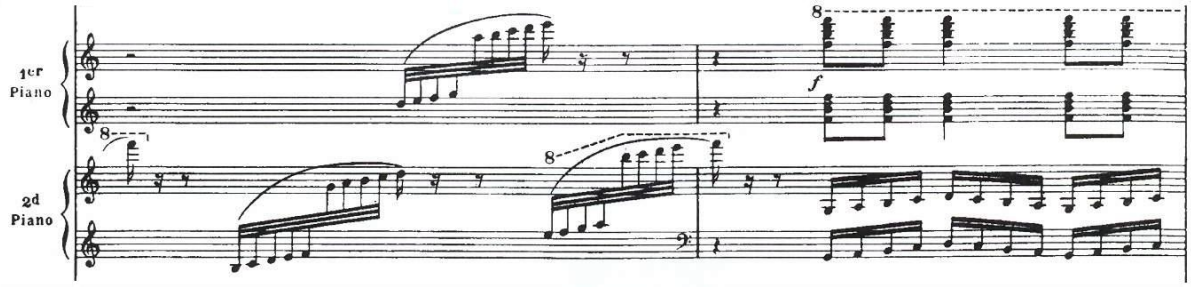


Example 3.327. J.J. Paderewski: *Variations et Fugue sur un thème original* opus 11 (ca1883), variation 12, opening bars.

Glissandos as in the Quidant example can be said to be without a beginning, as some in the Paderewski excerpt are without any real ending. At those unpronounced parts of their morphology – agogically and dynamically – those glissandos are open. But if these particular instances of open beginning and ending are the result of performance practical considerations only, Saint-Saëns wrote such glissandos that need unpronounced beginnings because of musical reasons. In the final of his *Carnaval des Animaux*, a multiple glissando passage is rhythmically based on the ♩♩ | ♩𝅘𝅥𝅯 -motif that opens the last as well as the first movement. (Ex. 3.328.)



Example 3.328. C. Saint-Saëns: *Le Carnaval des Animaux* (1886), *Final*, bars 8-10.
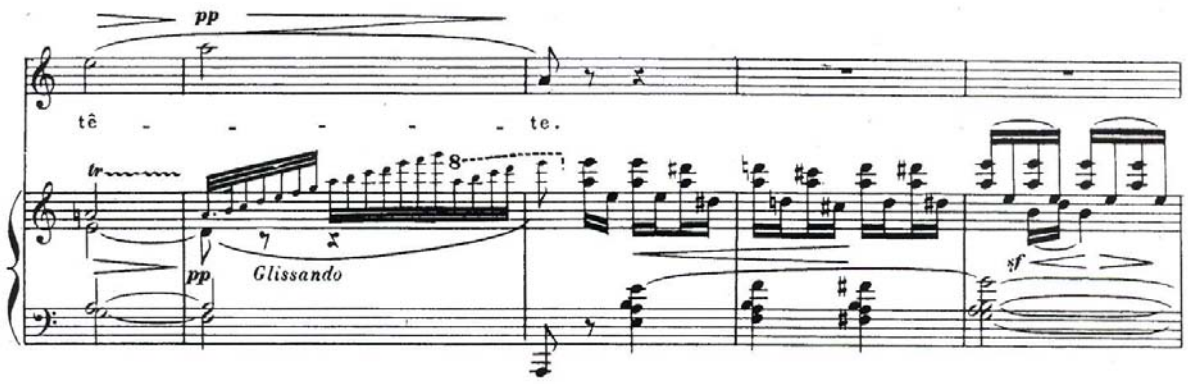
To respect that motivic connection, the first note of the first glissando should not be accentuated. Moreover, at the prescribed *molto allegro* speed there is no time to play the first notes with individual articulation and then switch to gliding position. The same goes for the endnotes, therefore the glissandos are best played with the right hand and the endnotes with the left hand. It is interesting to see how Saint-Saëns returns to this idea later on in the finale. (Ex. 3.329.) Here he only uses 3.5 octaves for the whole passage instead of 5 and in fact writes one long run instead of four 2-octave glissandos that go up by one-octave step. The difference between the two passages essentially lies in the (lack of) rhythmic articulation of the whole passage. In the glissando instance, the endnotes are functional (reminding us of the motif as used earlier on in the string parts, e.g. in bar 8, ex. 3.328) and each has a glided anacrusis. The second passage is one long run divided over two keyboards. No beat should here be stressed, except possibly the last one. In fact, it is the second instance (bar 77) that should sound like one long glissando, much like the two-hand glissando in bar 10 of this movement.



Example 3.329. C. Saint-Saëns: *Le Carnaval des Animaux* (1886), *Final*, bars 77-78.

Another example of the tension between the glissando's notation and its performance (at the same time demonstrating how glissando writing in chamber music gained renewed interest in the late 19th century after a long period of compositions for piano solo and concertos only) is found in Debussy's song cycle *Fêtes galantes*. In the second song,

Fantoches (1892)[936], Debussy lets a glissando begin with a 64th after a dotted 32nd note (which is meant to be the end of the trill). (Ex. 3.330.) There is no sense in trying to differentiate between the 64th and the next glided notes. Debussy merely wanted to somehow indicate that the glissando is to start after the first beat, and not on any accentuated part of the meter. In fact, the dotted 32nd accurately conveys the need for some extra time to switch the position of the hand.

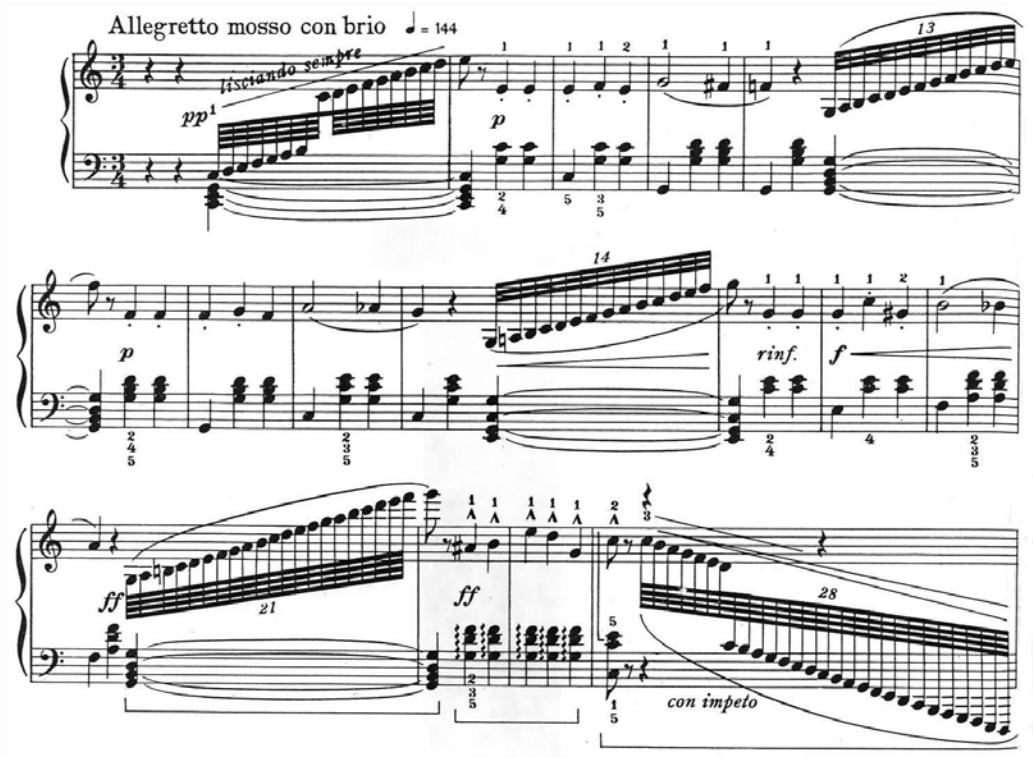


Example 3.330. Cl. Debussy: *Fêtes galantes*, 1st series (1892), *Fantoches*, bars 58-62.

Further demonstrating some specific consequences of the glissando's ergonomical needs is Bonamici's third *Étude mélodique* (1882) for the left alone. At this point in the chronology it has been a while since any composer wrote a glissando study. Not counting the excerpts in the piano methods, we can only think of Czerny's opus 365 nr. 31 and Liszt's Paganini study in E, though the latter is not a glissando study *in strictu senso*. In fact, Ferdinando Bonamici (1827-1905)[937] is the first composer we found to have written a real concert study based on the glissando, an *etude* that is intended to have enough musical interest in aspects of glissando playing to be worthy of public performance instead of serving the mere purpose of home practice.

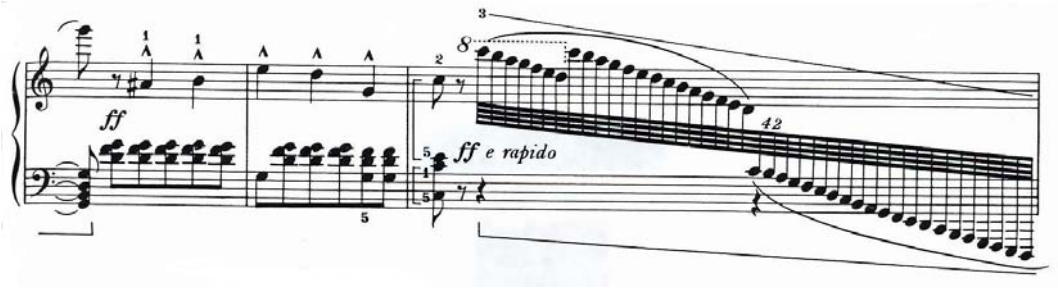
The etude opens pianissimo but *con brio* and immediately makes clear that a serious amount of rubato will be needed to musically fit the glissandos in the metric structure. (Ex. 3.331.)

[936] This song is part of the first series (*En Sourdine*, *Fantoches*, *Claire de Lune*) of *Fêtes galantes*. An earlier version of these three songs appeared in the *Recueil Vasnier* from 1884. We did not find a copy of that early version to compare with the 1892 version here reproduced. The second series of Fêtes galantes (*Les ingénues*, *Le faune*, *Colloque sentimental*) was written in 1904.
[937] Not to be confused with Giuseppe Buonamici (1846-1914).



Example 3.331. F. Bonamici: *Études Mélodiques* opus 273 (1882), nr. 3 in C, bars 1-16.

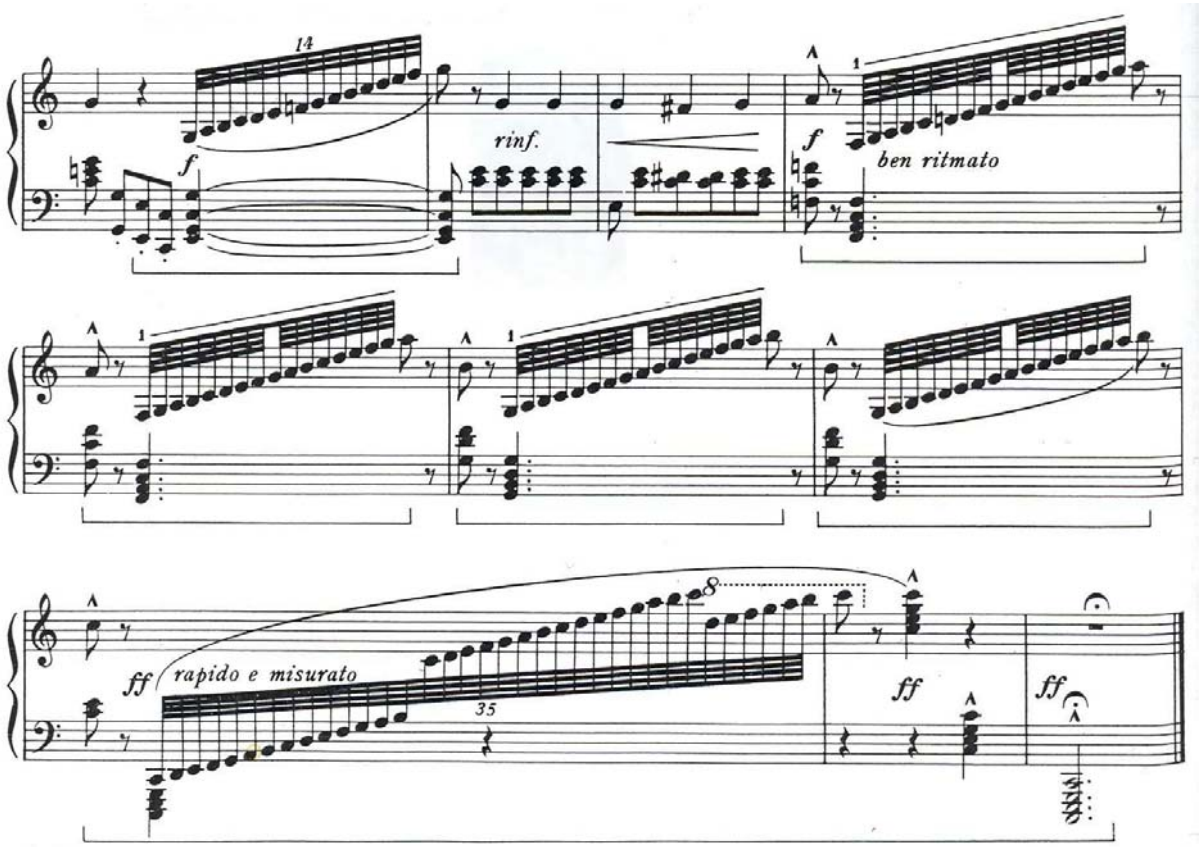
In the middle of the piece a glissando even has to cover six octaves in less than one second. The warning *rapido* (ex. 3.332) – comparable to *con impeto* in the previous ending of this phrase (bar 16 in ex. 3.331) – indicates that this closing glissando should require no rubato, and demonstrates the difference with the other glissando functions in this piece.[938]



Example 3.332. F. Bonamici: *Études Mélodiques* opus 273 (1882), nr. 3 in C, bars 30-32.
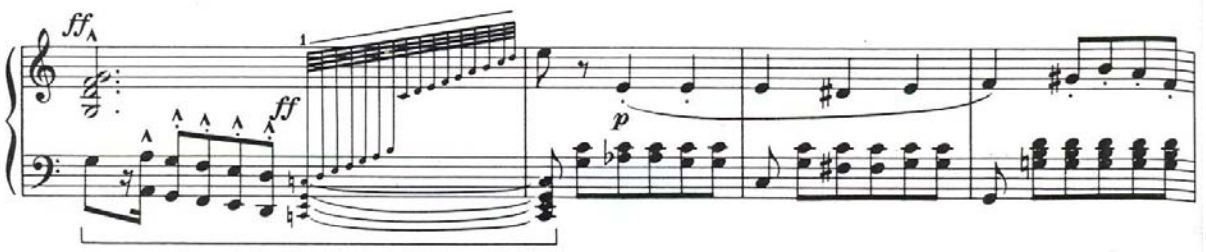
In the last part of the study, the composer admits that the 5-octave glissando is impossible to be played in time, putting the performer at ease with the indication that it should be fast but *misurato*, i.e. "moderately," this time in contrast with the *ben ritmato* for the bars before. (Ex. 3.333.)

[938] The tempo is ♩=144, two beats then make 74



Example 3.333. F. Bonamici: *Études Mélodiques* opus 273 (1882), nr. 3 in C, bars 64-73.

The composer of this melodic study clearly differentiated between different functions a glissando can have in a melody. In their history, many previous glissandos represented merely the filling of gaps left by jumps, or a technique to play runs at a tempo that is too fast for individual fingering. Those glissandos were mostly also part of the melody, but Bonamici uses this technique more as an integral constituent of the melodic material for this piece, with its own character traits that can be put to use, and with all the rubato that the proper melodic material would be allowed. In 16 bars (ex. 3.331) he builds up the length, dynamic and pitch range of 4 glissandos, wittily contrasting this organic structuring with a prompt change of direction. He can want them *con brio*, *con impeto*, *misurato*, *rapido* or *ben ritmato* (bar 67). In the three times that it appears in this composition, the main melody is given three different characters, each time indicated at the opening glissando: *pianissimo* but *tre corde* with the theme in staccato (first bars), *pianissimo* but *una corda* and *leggerissimo* with the theme in *legato* (bar 17) and *fortissimo* but the theme in *non-legato* (bar 56). Each time, the glissandos have to be played differently, if only because of the different speeds and pressures needed to accommodate the dynamics. All in all, this whole piece can be considered a serious exercise in rubato playing for both the solo left hand (with all the jumps to play the bass and soprano, e.g. ex. 3.331) and the glissando (e.g. bar 56 in ex. 3.334).
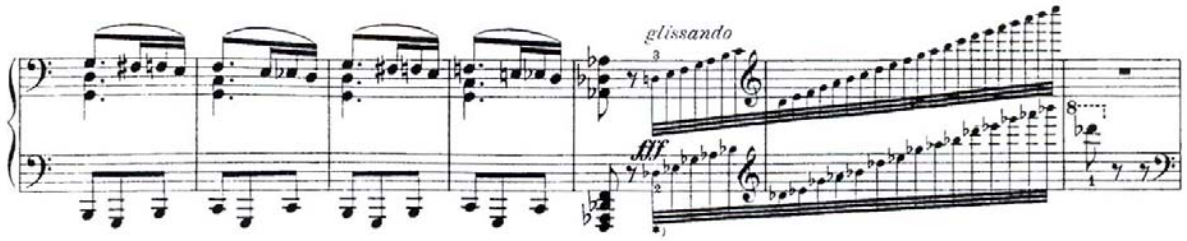


Example 3.334. F. Bonamici: *Études Mélodiques* opus 273 (1882), nr. 3 in C, bars 56-59.

Bonamici is also one of the rare composers to use another name than *glissando*. As Moszkowski preferred *glissato*, the past participle of the imaginary-Italian *glissare* (see ex. 3.315) that relates to the equally imaginary present participle *glissando*, the native Italian Bonamici writes *lisciando*, one of the few real Italian words used to identify the technique. (See ex. 3.331, bar 1.)

3.3.2.4.4.5 Pseudo-chromatic glissandos

Considering the extent to which Liszt went in escaping the glissando's C major constraints, one could be surprised that he did not come up with the then so-called "chromatic" glissando. It was his favorite student, Carl Tausig, who wrote history in 1860 when he decided to try out this predictable and yet curious bitonal glissando combination. (Ex. 3.335.)

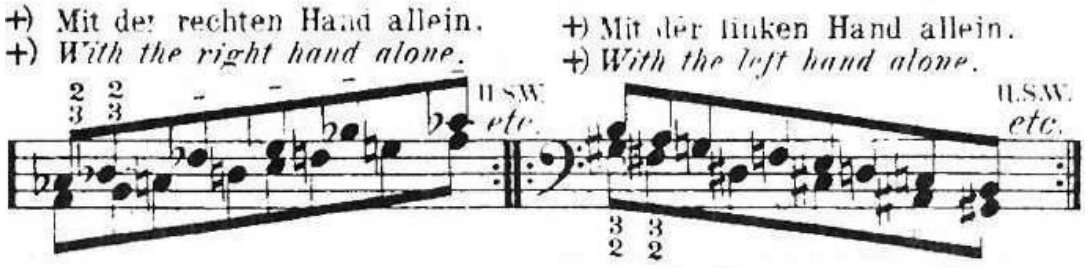


Example 3.335. C. Tausig: *Das Geisterschiff* opus 1 (1860), bars 154-160.

The asterisk refers to a footnote and gives us a remark from the "editor":

> glide the 2nd finger not with the surface, but rather – to avoid hurting the finger – with the side (from the middle joint to almost the top) over the black keys and simultaneously the right hand's 3d finger with the nail over the white keys. Effect: chromatic scale.[939]

About a decade later we see this effect evolved into a one-hand glissando, mentioned as a "supplement" to a chapter on the glissando in Moriz Rosenthal's school for the modern virtuoso. (Ex. 3.336.)



Example 3.336. M. Rosenthal: *Schule des höheren Klavierspiels. Technische Studien bis zur höchsten Ausbildung* (1892), XIII. *Glissando-Uebungen,* supplement.
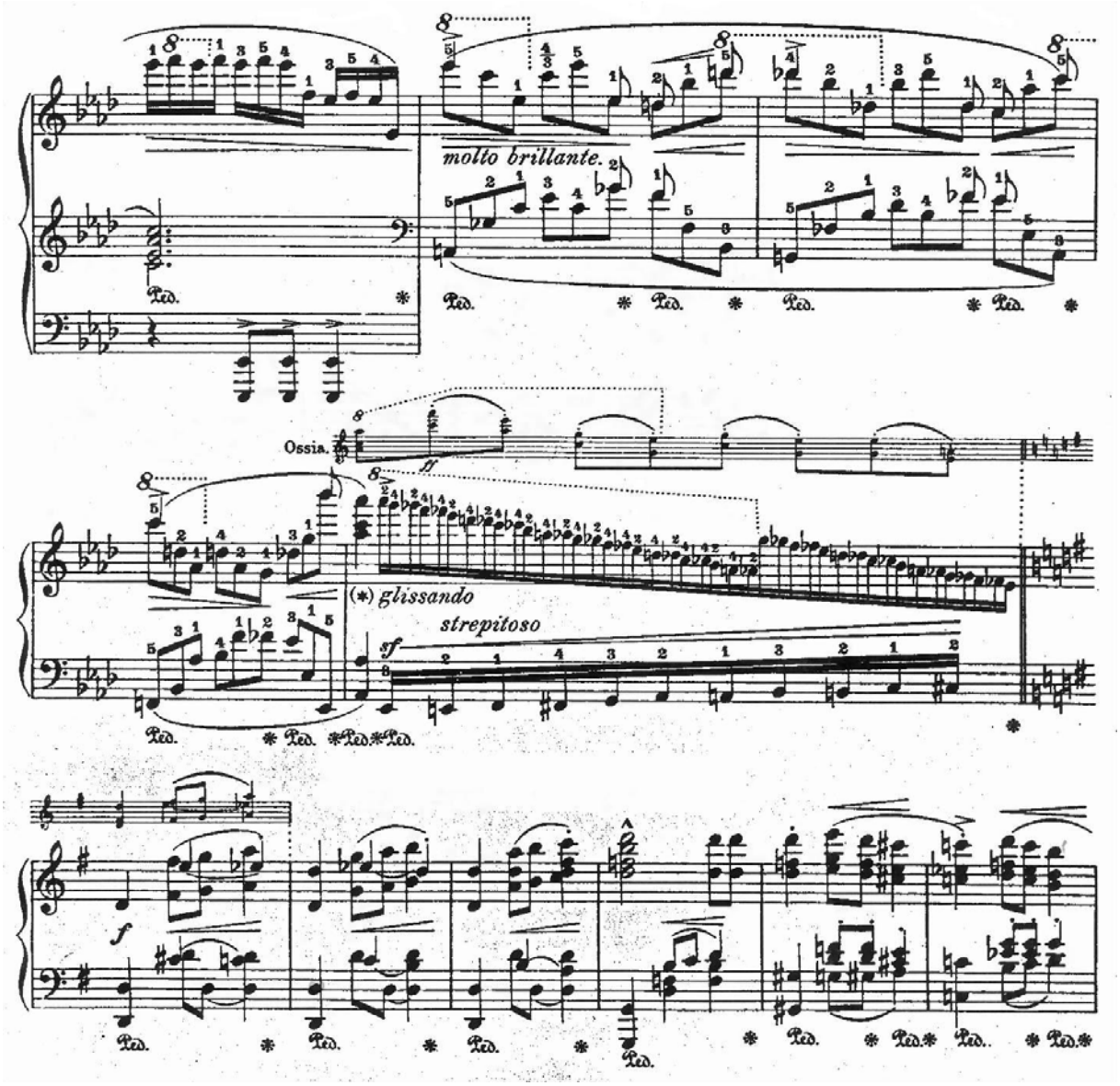
[939] "Anm. Des Herausgebers. Den 2. Finger der linken Hand nicht mit der Oberfläche, sondern – um Fingerverletzung zu vermeiden – mit der seitlichen Kante (vom Mittelgelenk bis fast zur Spitze) über die Obertasten und gleichzeitig den 3. Finger der rechten Hand mit der Nagelseite über die Untertasten gleiten lassen. Effekt: Chromatische Tonleiter."

Once again (see above, 3.3.2.3.3.4) we are tempted to wonder about how realistic such a glissando could have been. In the preface to this method, the editors claim to have collected "exercises that are adequate to the requirements of modern pianoforte technique," and that "the student having overcome the difficulties presented in this volume, will find nothing insurmountable in either classical or modern music."[940] The suggestion therefore is that the black- and white-key double glissando was considered a part of modern virtuoso piano technique. But, even with late-19th century chamfering of the keys, such a passage should have been painful for the right and left hand 2nd fingers on the black keys. That the example was added as a supplement reinforces the idea that Rosenthal thought of it from a rather theoretical perspective, trying perhaps – like Hummel (3.3.2.2.4.1) – to be complete and contemporary in his treatment of the "modern" glissando by adding whatever was thought appropriate, whether or not it was common practice or even realistic. The preface could further be read in that sense:

> It is to be hoped that this work – its contents, and graded arrangement of the same – may contribute materially to the development of the technic [sic] necessary to artistic pianoforte playing.[941]

In fact, that very same decade brought us a real-life example of such a "chromatic" glissando: in 1899 Godowsky wrote a *Concert-Paraphrase* on Chopin's first waltz and included a one-hand black-and-white glissando. (Ex. 3.337.) The most awkward notation is in clear need of a footnote explaining how the right hand's second finger is gliding over the black keys while simultaneously the same hand's fourth finger glides over the white keys. Contrary to Rosenthal's fingering, Godowsky proposes to use the back of the fingers, less painful but perhaps not easier than using the nails. For the environment it is embedded in, this glissando is perhaps a little saturated, chromatically speaking, but it disguises well the brusque modulation from Ab major to D major.

[940] As quoted from the bilingual Berlin edition by A. Fürstner, plate number A. 4461.4464 F.
[941] As quoted from the bilingual Berlin edition by A. Fürstner, plate number A. 4461.4464 F.



Example 3.337. L. Godowsky: *Concert-Paraphrase. Chopin's Valse*, opus18, bars 100-110.

3.3.3 The other extensions

Apart from expanding the range of the instruments and the merely numerical increase of the orchestra, 19th century "serious" music knew no groundbreaking novelties in sonority. New colors where realized with existing means of orchestration.[942] In anti-climactic contrast to the boom we have witnessed at the end of the 18th century, the further development in the 19th century of the extended piano techniques is sharply limited to a focus on the glissando. As much as that focus is concentrated and effective, the past efforts in the field of keyboard clusters and inside-piano playing are now all but ignored.

3.3.3.1 1820's-1880's The organ thunder: new developments in cluster writing

In the 18th century the secularization of the organ's function and the evolution of its timbral identity as well as its repertoire had changed the way it was used. By the 19th century, this episode of growing decadence was perceived to bring the music for organ close to losing all worth and proper character. All the time clusters were in use, as evidenced by Grétry's 1820 complaint about musicians with descriptive tendencies: "Some debonair organists have imagined to apply their arms to paint chaos; this childish sublimity has always made real artists smile."[943] More interesting than Grétry's aesthetical opinion on the sublime is the fact that he mentions the arm, rather than the feet or the hands. In the 19th century organist start to experiment with the cluster as it had been handed down to them through tradition. Away from the static clusters of olden times, the focus is now directed towards new types of clusters. The cluster's habitat changed as well: instead of empowering music with symbols of God's wrath as in the *Judex Crederis*, it was now used more to depict more down to earth phenomena as found in nature's storms.

3.3.3.1.1 ca1828/30[944] Jacques-Marie Beauvarlet-Charpentier: *Théorie d'orgue*

Sometime in the late 1820's Jacques-Marie Beauvarlet-Charpentier (1766-1834) wrote his *Theory of the organ to know its different effects, as well as the name and mixture of its registers.*[945] In it he listed some imitations to which the organ is suitable:

> The **whistling of the winds** is executed with the foundation, by posing the forearms on the keyboard of the Great Organ, and pushing them at will from left to right and from right to left.
> The **thunder effect** is executed with the Jeux du grand-Choeur, in the same way as above, by using the pedals repeatedly and with power.

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[942] See Raes 2002.
[943] "Quelques organistes débonnaires ont imaginé d'appliquer leurs bras sur le clavier pour peindre le chaos; cette sublimité puerile a toujours fait sourire les vrais artistes." From his 'Mémoires ou essays sur la musique', 1820, p.317, as quoted in Pirro 1962, p. 1365.
[944] See Lopes 2008, p. 81-83, where the reasoning behind the dating of this theory is quoted (in footnote 167) from « Perrot J.-L. (1989), *L'orgue en France de 1789 à 1860*, Thèse de Littérature et Civilisation française, Mention Musicologie, Université Lyon II Lumière, p. 105. »
[945] Lopes 2008, p. 81: « *Théorie d'orgue pour connaître ses différents effets, ainsi que le nom et le mélange de ses jeux.* »

> The **cannon shot** is operated also on the Jeux du grand-Choeur, by posing the two hands across the lowest octave in the bass, by posing at the same time the left foot on the last keys of the pedal.
> The **rolling of the drums**, same registration; the left hand has to beat or roll, while the right hand is applied crosswise and marks the movement of the march that one wants to execute. This has to be operated in the bass octaves, and the pedals must be held crosswise at all times.[946]

Beauvarlet-Charpentier is not very clear as to the details of the cluster usage, but he applies the technique to more imitative purposes than anybody before him, at least as far as our evidence tells us. New also is the transposition of the military effects to the organ: until now we witnessed an apparently strict separation between the cannon shots in pianoforte and harpsichord repertoire and the thunder in organ music. Most interesting, however, is the "whistling of the wind," for which Beauvarlet-Charpentier introduces moving clusters. Unfortunately, we could not find any examples in his own works to show how he would have deployed these effects exactly. He may not have used any in his compositions, perhaps only in improvisation. At any rate, it seems that the wind clusters are back and forth glissandos with the complete forearm over the keyboard.

3.3.3.1.2 1833 Sigismund Neukomm: *A Concert on a Lake*

"Chevalier" Sigismund Neukomm (1778-1858) was Austrian by birth – a self-proclaimed child prodigy born in a house across from where Mozart had been born[947] – but lived in Paris from 1810 onwards. Thus his *Dramatic Fantasia* called *A Concert on a Lake, interrupted by a Thunderstorm*, the 16th of twenty-five *Original voluntaries or Grand Studies* for the 'expressive' organ, should be seen as an example of 19th century cluster use in France.[948]
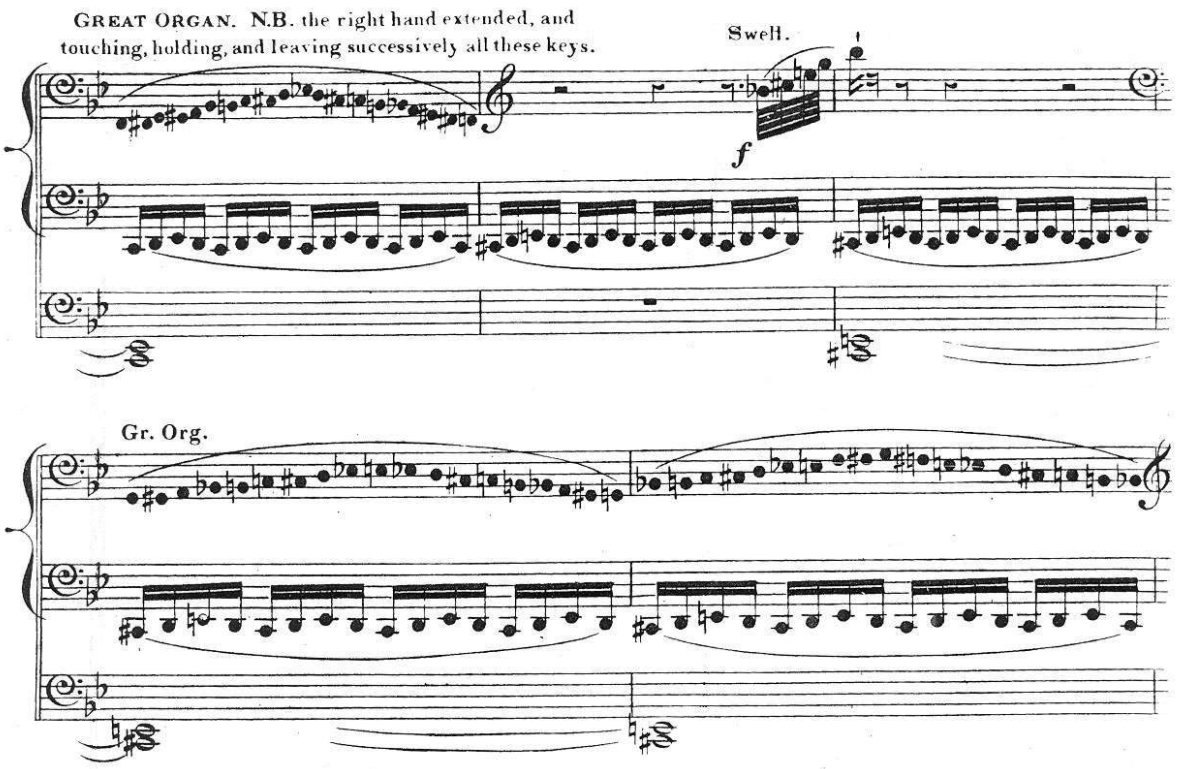
Of particular interest in this score, is the dual notation of the cluster, both new compared to the previous cluster pieces and both representing a different kind of cluster. The first three clusters are in the hand shape of a major sixth or seventh. (Ex. 3.338.)

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[946] Lopes 2008, p. 83: « Le **siflement des vents** s'exécute avec les Jeux de Fonds, en posant les avants-bras sur le clavier du grand-Orgue, et les appuyant de gauche à droite et de droite à gauche à volonté. L'**effet de tonerre** s'exécute avec les Jeux du grand-Choeur, de la même manière que ci-dessus, en se servant des Pédales dans les coups redoublés.
Le **coup de Canon** s'opère aussi sur les Jeux du grand-Choeur, en posant les deux mains en travers sur la dernière octave de basse, et posant de même le pied gauche sur les dernières touches de la Pédale.
Le **roulement de Tambours**, mêmes Jeux ; la main gauche doit faire un battement ou roulement, tandis que la droite s'applique en travers et marque le mouvement de la marche que l'on veut exécuter. Cela doit s'opérer dans les octaves de basse, et les Pédales doivent être tenues en travers tout le tems. »

[947] According to his autobiographical sketch, as in Angermüller 1977, p. 31.

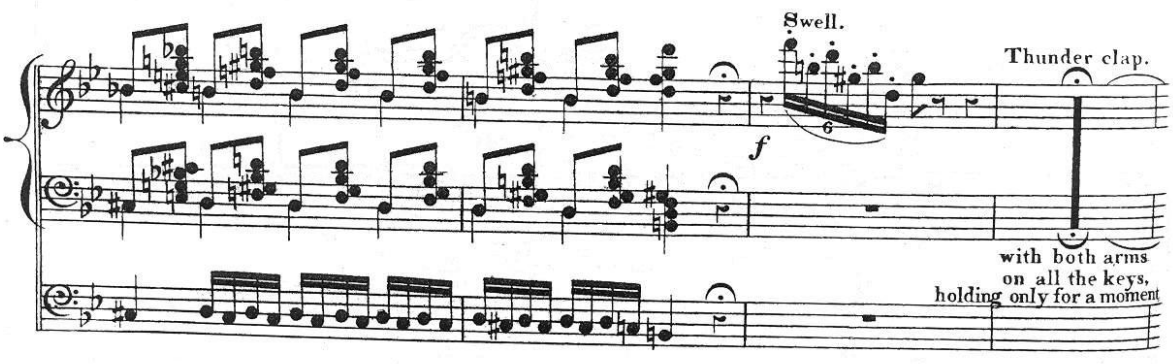
[948] We used a copy of the London edition by Cramer, Addison & Beale (?1845) that we found at US- Nyp (call number *ZB-3526 (r.1)), and which indicates this piece to be the 16th study in the set. Henck 2004, p. 46, fn. 121 states it to be the 12th in the French edition issued by Publimuses in Paris circa 1999.



Example 3.338. S. Neukomm: *A Concert on a Lake* (1833), bars 101-105.

The thirds in the pedal are indicated to be unstable: "only 32' Diap[8] / half drawn out; by degrees draw them out entirely." The performance note for the right hand indicates that we are dealing with clusters that are akin to Beauvarlet-Charpentier's moving clusters, but move within a fixed position on the keyboard. Cowell would – much later – still call Beauvarlet-Charpentier's clusters "fixed," and Neukomm's "moving" in the sense that they change shape by addition and subtraction of notes. In this case, the clusters build from one note to a major sixth or a minor seventh (ex. 3.338) and then leave off all the notes one by one until only the last one notated is left over.

The second cluster instance in this grand work consists of one huge, very fixed, two-arm cluster. (Ex. 3.339.) Interestingly, Neukomm notates the *resonance* of the cluster rather than the articulation (which is to be short according to the performance note) for the music that follows starts anew and nothing is tied over.



Example 3.339. S. Neukomm: *A Concert on a Lake* (1833), bars 132-135.

3.3.3.1.3 1836 Jacques Vogt: *Fantaisie pastorale et orage dans les Alpes*

Jacques Vogt (1810-1869) was famous for his improvised *Fantaisie pastorale et orage dans les Alpes*.[949] Its popularity is also said to have contributed to the fame of the organ in Fribourg[950], built by Aloys Mooser between 1824 and 1834 and under the care of Vogt from 1834 to his death. This organ (in the Gothic Cathedral of Saint-Nicholas) has over 60 stops on 4 manuals and pedal, thousands of pipes, and was mentioned in many travelers' descriptions, e.g. by Georges Sand/Franz Liszt, Harriet Beecher-Stowe, Louis Spohr and others. The instrument represents a strongly original synthesis between French and German style, between Classic and Romantic organ building, but may be most famous for the "Gewitterszenen" that were historically performed on it.[951]

It was this instrument that Franz Liszt wanted to see and hear on Sept. 15, 1836, when he visited Fribourg with Marie d'Agoult, George Sand and company during his pilgrimage through Switzerland. Liszt played on the "orchestra-organ" but apparently neither Mooser nor Vogt seem to have liked it much, so that Vogt took place at the instrument to play his famous *Pastoral fantasy and storm in the Alps*.[952] George Sand recorded her view on the scene for posterity, explaining how Vogt

> [...] tried, with the force of the arm, to make us understand the really great power, I confess, of musical charlatanism. He did so much with his feet and hands, and with the elbow, and the wrist, and I think, with the knees (all with an air of phlegm and most benevolent), that we had a complete storm, rain, wind, hail, far away cries, dogs in distress, prayers of travelers, disaster in the chalet, screaming of horrified children, bells of lost cows, roaring thunder, splitting pine trees, finally, devastation of the potatoes. As for me, naïve peasant, artist or rather crude artisan, enthusiastic of this harmonious clangor, and finding again in this picture of coarse effects the rustic scenes of my life, I approached the Fribourgian meastro and I cried out: – Sir, that is wonderful; I implore you to let me hear once more this thunderclap, but I believe that by seating yourself brusquely on the keyboard, you would produce a more complete effect yet.[953]

Vogt either took Sand's idea to hart in later performances, or the organ builder Joseph Dietsch had heard of this story and imagined the rest when commenting upon an 1845 performance by Vogt of his pastoral fantasy:

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[949] As for the dating of this work: George Sand commented upon it in 1836 (see below); Vogt may have improvised it before, even before 1834, when the Mooser organ was finished and when Vogt became its chief organist. (Jakob 1976, p. 21.)

[950] Fribourg is the name for the canton and its capital in Switzerland. The German name is Freiburg.

[951] Jakob 2001, p. 83-84.

[952] Jakob 1976, p. 23.

[953] As cited in Jakob 1976, p. 23 from Sand's *Lettres d'un voyageur* as it appeared in print in Paris in 1836 (Jakob 1976, fn. 36): « … essayait, à force de bras, de nous faire comprendre la puissance vraiment grande, je le confesse, du charlatanism musical. Il fit tant des pieds et des mains, et du coude, et du poignet, et je crois, des genoux (le tout de l'air le flegmatique et le plus bénévole), que nous eûmes un orage complet, pluie, vent, grêle, cris lointains, chiens en détresse, prière du voyageurs, désastre dans le chalet, piaulement d'enfans épouvantés, clochette de vaches perdues, fracas de la foudre, craquement des sapins, finale, dévastation des pommes de terre. Quant à moi, naïf paysan, artiste ou plutôt artisan grossier, enthousiasmé de ce vacarme harmonieux, et retrouvant, dans cette peinture à gros effets, les scènes rustiques de ma vie, je m'approchai du maestro fribourgeois et je m'écriai avec effusion : – Monsieur, cela est magnifique; je vous supplie de me faire encore entendre ce coup de tonnerre, mais je crois qu'en vous asseyant brusquement sur le clavier, vous produiriez un effet plus complet encore. »

> […] … (one hears the stops being pulled) and finally the organist ends by seating himself on the manuals… Fermata of three bars … […][954]

Vogt's pastoral fantasy has not come down to us directly in any written-out form, so we have no details to describe exactly which body parts he used to produce thunder and lightning effects. His successors at the Dom – to this day – continued performing interrupted pastorals in the same vain, basing their own improvisations on Vogt's (in)famous piece[955], and some of their versions were put down to manuscript, though apparently only schematically and without practical performance indications for the techniques.[956]

3.3.3.1.4 ca1850? Jules Blanc: *La Procession*

Not much is known about Jules Blanc, it may well be that the name is a nom de plume for a composer who decided to remain anonymous when publishing his opus 14 in a *Journal des Organistes*.[957] This piece, a *musical picture* for the organ and the only composition that is linked to Blanc, is called *The procession of a village feast, surprised by a storm.*[958] It is of interest to us as it contains a performance practice note with an explanation on how to play clusters:

> How to imitate a storm (thunderclap) on the organ: on organs that have a special treadle for thunderclaps, the 8' and 16' foundation registers are pulled and then the said treadle is pushed more or less to attempt at producing the far away thunder rolling; for louder thunderclaps, the reed pipes are added. When the organ does not have the said treadle, the feet are positioned across the pedal keys of the main pedal register to attempt the same effect by pushing more or less keys.
> On an organ without pedals the thunder can also be imitated. The underarm (elbow) is laid on the keyboard and the keys are pressed from left to right and from right to left depending on the desired effect.[959]

As far as the "treadle" is concerned, it may be that Blanc had a little plank in mind, lying on the pedals and with which the foot can press down several pedal keys at once. Charles Blanchet was to describe such an accessory a few decades later (see 3.3.3.1.6). However, Blanc describes the thing as being part of the organ and separates it from the
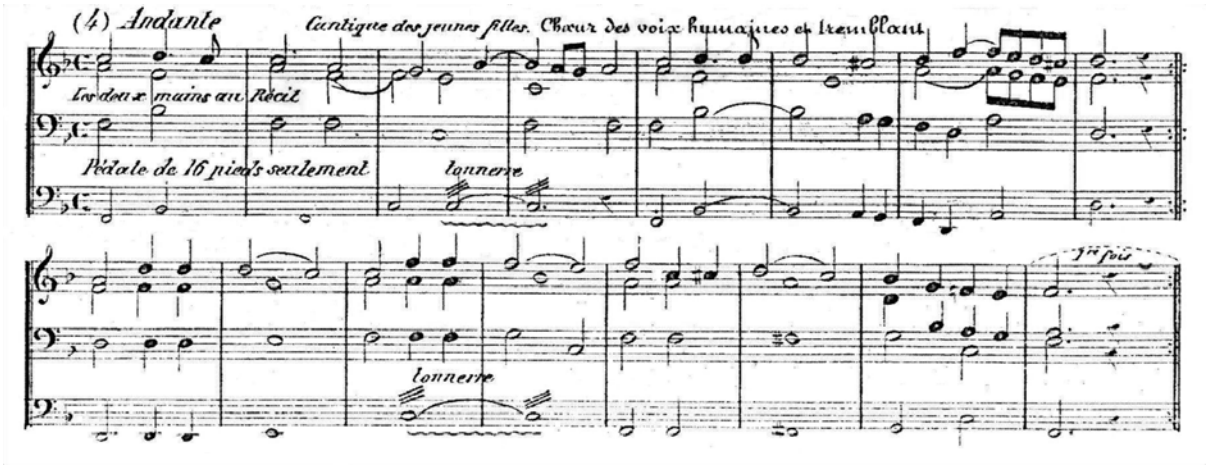
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[954] As cited in Jakob 1976, p. 41: "[…] … (on entend tirer les registres) et enfin l'organiste finit par se coucher sur ses claviers … Point d'orgue de trois mesures … […]".
[955] Henck 2004, p. 50. Vogt's successors were: Edouard Vogt, Paul Haas (1866-1942), Joseph Gogniat (1881-1954), Jean Piccand (1974-1983) and François Seydoux (1983-).
[956] Henck 2004, p. 50. In the university library of Fribourg a collection of such manuscripts can be found under the call number Ms L 999.
[957] Berger 1981. Unfortunately we have not located an original French edition or a manuscript of this composition.
[958] *La procession de la fête d'un village surprise par un orage. Tableau musical composé pour orgue par J. Blanc op. 14.*
[959] As quoted in Berger 1981, preface: "Wie man ein Gewitter (Donnerschlag) auf der Orgel imitieren kann: Bei Orgeln, die einen besonderen Tritt für Donnerschläge besitzen, zieht man die Grundregister von 8' und 16' und danach drückt man mehr oder weniger auf den besagten Tritt und versucht, das ferne Donnergrollen zu erzeugen; Für die stärkeren Donnerschläge nimmt man die Zungen hinzu. Wenn die betreffende Orgel den besagten Tritt nicht hat, stellt man die Füße quer auf die Pedaltasten des großen Pedalwerkes und versucht die gleiche Wirkung zu erzeugen, indem man mehr oder weniger Tasten drückt. Auf den Orgeln ohne Pedal kann man das Gewitter auch imitieren. Man legt die Unterarme (Ellenbogen) auf das Hauptwerk und drückt so von links nach rechts und von rechts nach links die Tasten entsprechend den Wirkungen, die man erzeugen will." Berger 1981 does not provide the original French text.

idea of pressing down pedal keys directly with the feet, which is too similar to pushing down a simple plank with the feet. It is therefore more likely that he meant a register operated by a separate specific kind of pedal or foot stop. Like with the piano, noises were made at the organ by way of mechanical contrivances as well as with the palms of the hands. A wide range of such untuned percussion accessories was developed, from a "storm pedal" (which, when depressed, draws down successively six or seven notes, starting from the lower part of the pedal board[960]) to a "drum pedal" (consisting of large, loud, stopped wooden pipes intended to give the effect of kettledrums when played staccato[961], or several pipes operated at once and tuned slightly apart from each other to give a "beating" effect[962]), and stops called *crash cymbal, rain, steamboat whistle, muted snare drum, triangle, wind, klaxon horn*, etc., some of them dating at least as far back as the early 16th century.[963] In case there was no mechanical way to produce the thunder, and no pedals, Blanc described the manual alternative of cluster playing.

The piece consists of eight 'situations':

1. The villagers go to the church on the sounds of the Musette
2. Bells and Fanfares announce the celebration
3. Start of the procession with drums and military music
4. Church song with girls (choir of human voices)
5. Start of the storm
6. Prayer of the girls to ask God to stop the storm
7. Return to the church of the procession
8. Return home of the villagers[964]
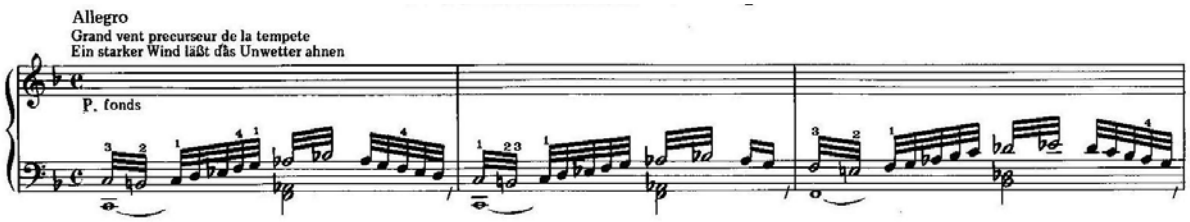
Thinking back to the battle pieces and their clusters, it is ironic here to find a peaceful procession in a village to be accompanied by a musette "imitating the military drum" in the third scene. It is the next episode that draws our attention, however: the sweet sounds of the choir are darkened by the approaching storm. (Ex. 3.340.)



Example 3.340. J. Blanc: *La Procession*, 4th movement: *Andante*.[965]
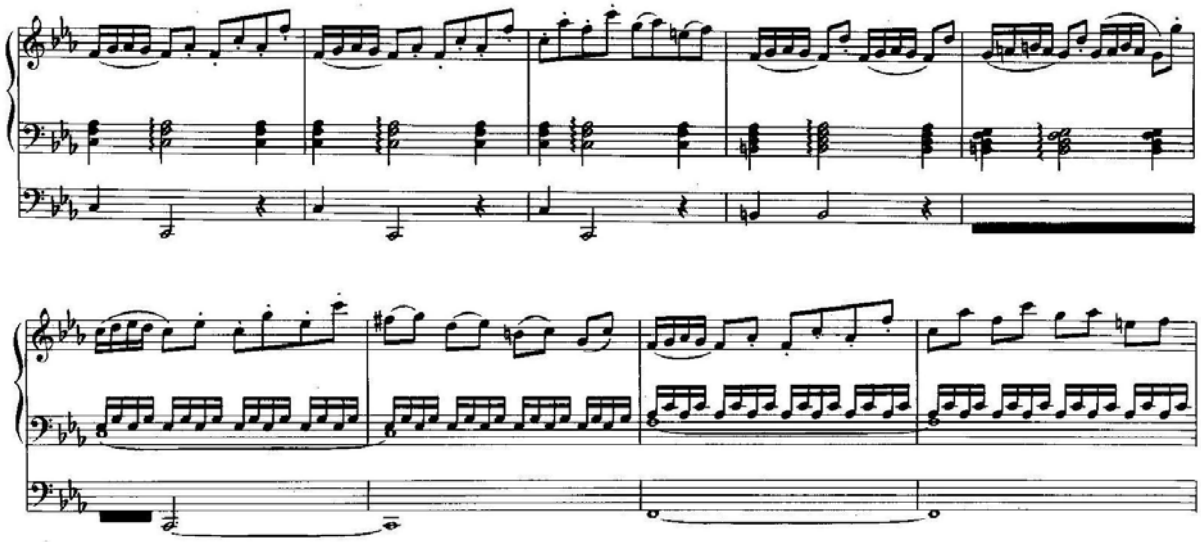
[960] Such thunder or storm pedals have been found on 19th century organs in City Hall, Glasgow (Gray & Davison 1853), in the Gounod residence, Paris (Cavaillé-Coll 1879), in St. Antoine des Quinze-Vingts, Paris (Cavaillé-Coll 1895), St. Eustache, Paris (Merklin 1876-79). See http://www.organstops.org/d/Donner.html (accessed January 21, 2009).
[961] http://www.organstops.org/p/Pauke.html (accessed January 21, 2009).
[962] Bicknell 2002, p. 607.
[963] See http://www.organstops.org/ (accessed January 21, 2009).
[964] 1. Les villageois se rendent à l'église au son de a musette. 2. Cloches et fanfares annonçant la fête. 3. Sortie de la procession avec tambours et musique militaire. 4. Cantiques des jeunes filles (Chœur de voix humaines). 5. Commencement de l'orage. 6. Prière des jeunes filles pour demander à Dieu de faire cesser l'orage. 7. Retour de la procession à l'église. 8. Retour des villageois à leurs demeures.

A "great wind" then announces the storm, much in the manner of Mussorgsky's depiction of *Gnomus* in his *Pictures at an exhibition*, later in 1874. (Ex. 3.341.)



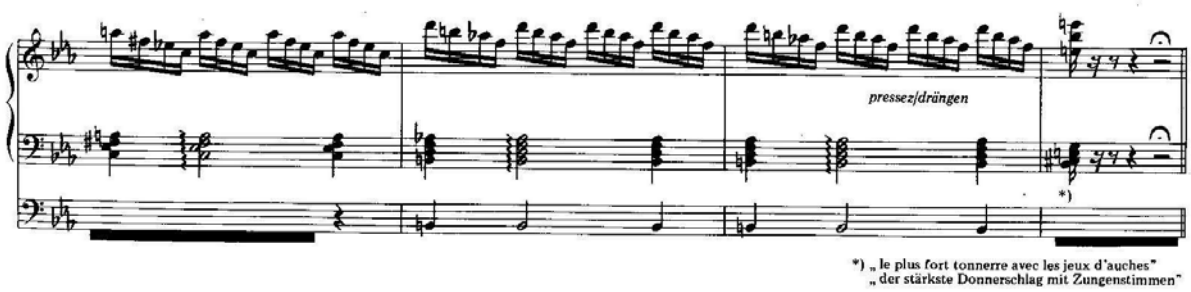
Example 3.341. J. Blanc: *La Procession*, 5th movement: *Allegro*, opening bars.[966]

The storm itself brings the thunderclaps closer. (Ex. 3.342.) The harmonic writing is simple but care is taken that the thunderclaps are metrically more or less natural and do not last an exact 4/4 measure.



Example 3.342. J. Blanc: *La Procession*, 5th movement: *Allegro*, bars 11-19.
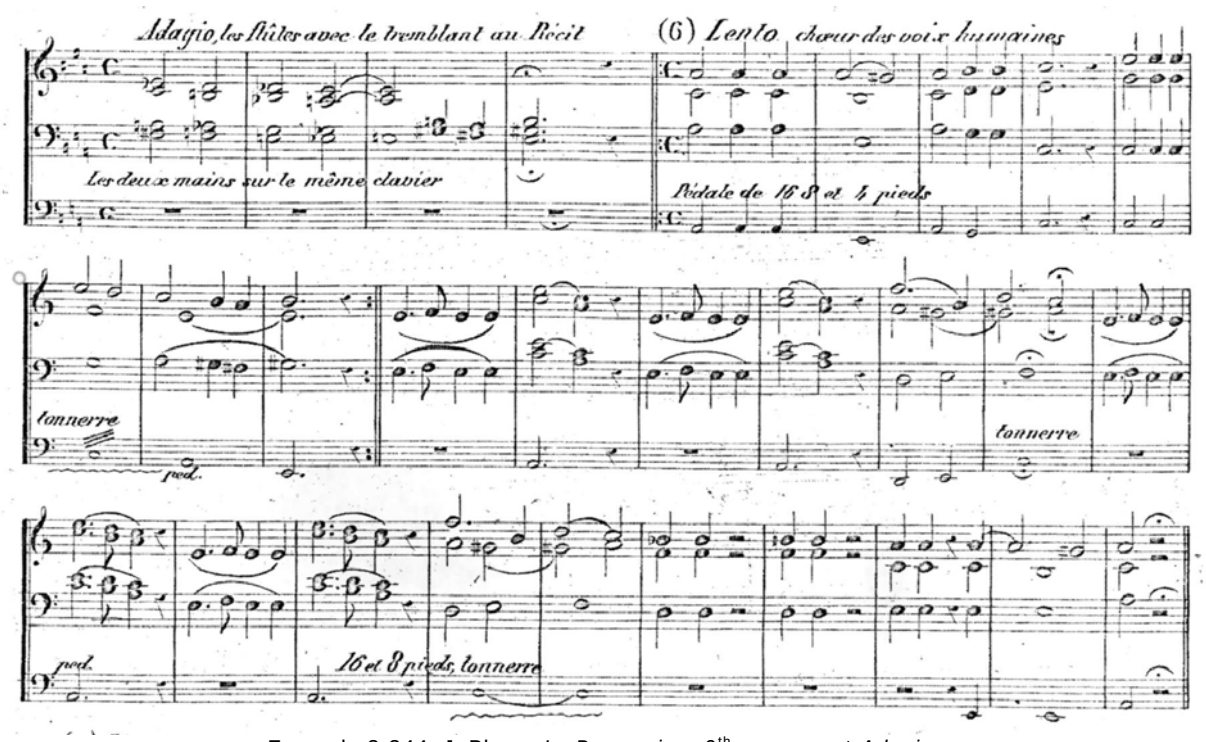
At the end of this movement, the loudest thunder – including the reed pipes – is heard above a diminished 7th chord. (Ex. 3.343.)



Example 3.343. J. Blanc: *La Procession*, movement 5: *Allegro*, bars 33-36. "The most powerful thunderclap with reed stops."

[965] I am grateful for Herbert Henck sending me the scans of two pages from the original edition, copies that had been given to him by François Sédoux. See also Henck 2004, p. 51, fn. 141.
[966] This and the following excerpt are taken from the Berger 1981 edition, which unfortunately changed the cluster notation into a more contemporary symbol.

Before the procession returns to the church, the prayers of the maidens are answered and God makes the thunder go away. This is depicted in stages, gradually leaving out registers: the first two clusters are to be played with the 16', 8' and 4', the last one is marked only 16' and 8'.[967] (Ex. 3.344.)
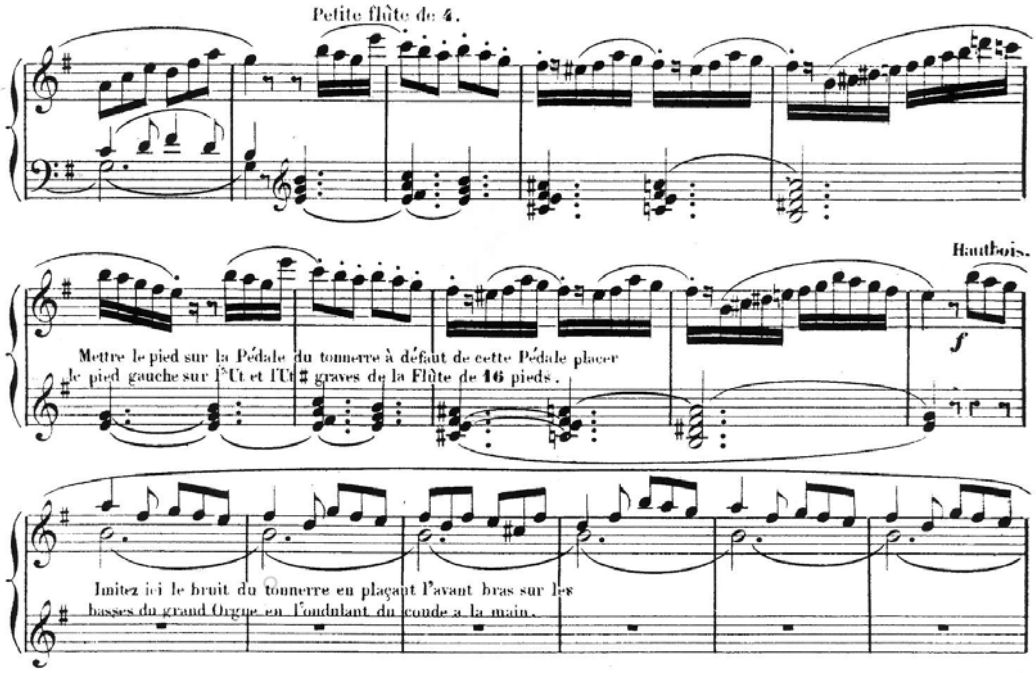


Example 3.344. J. Blanc: *La Procession*, 6th movement *Adagio*.

Besides differentiating dynamics for the cluster by way of adding and subtracting registers, Blanc seems to distinguish in his notation (at least in the 19th century edition) between several types of clusters. He either writes a *c* with a tremolo sign, the word *tonnerre* and a wavering line underneath (the latter reminding us of Corrette's *Grand Jeu avec le tonnerre,* see 3.2.2.7), or the same but without the tremolo sign, or just a *c* with *tonnerre.* (Compare ex. 3.340 and 3.343.)[968] But all cluster notation concerns the pedal works and can be meant to apply to the specific thunder treadle he mentioned, or, when such a treadle is not present on the organ, to the alternative footwork on the regular pedals. Blanc's third performance manner, for when there are no pedals at all on the organ, is not explained in any more detail than to use the "underarm (elbow)" on the keyboard and to press the keys "from left to right and from right to left depending on the desired effect" as he wrote in his performance practical note (see above). In the score, every cluster instance coincides with the two hands playing on the keyboard already, so Blanc must indeed have envisioned the use of the elbow, possibly to strike bass notes on the same keyboard as where the fingers play the rest of the music, or likely on a another keyboard, lower than the one for the fingers. The "desired effect" must then refer to either the inspiration of the performer, or to the differentiation in Blanc's cluster notation. In either way, the performer has to be creative, as Blanc nowhere explains how he intended the implementation of any up- or downward movement in the cluster technique.

[967] The Berger 1981 edition added *–4'* above the second cluster, intending the fading out of the thunder to be more gradual.
[968] Regrettably, the Berger 1981 edition replaces all three of Blanc's cluster notation types with one and the same thick black stripe.

3.3.3.1.5 1867 Louis James Alfred Lefébure-Wély: *Scène Pastorale*
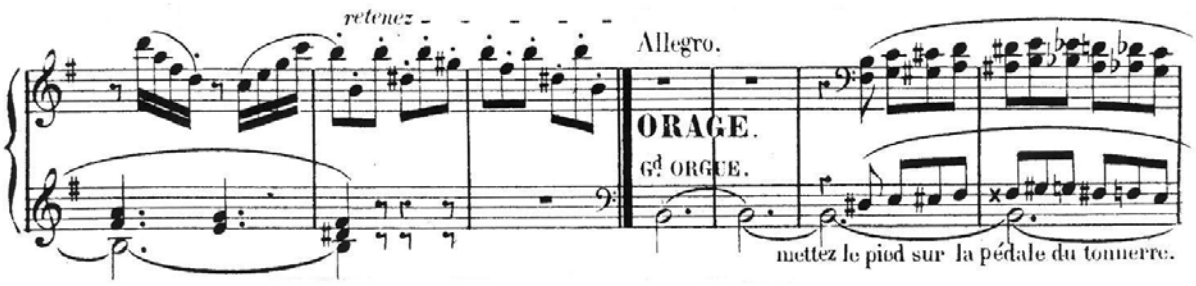
In a twelve-volume collection of pieces for the organ 'in all genres', entitled *l'Organiste Moderne*, Louis James Alfred Lefébure-Wély (1817-1869) included a *Scène Pastorale* "for an organ inauguration or a midnight mass."[969] The pieces were "written on motifs improvised during the services" at the Parisian church of Saint Sulpice[970], where he was organist during the last years of his life. His indications for executing the necessary interruptions are written out as textual imperatives. The first such instance is found at the 24th bar of a pastoral 6/8 allegretto (which comes after a 75 bar long 2/4 allegretto), where the performer is asked to put the foot on the "thunder pedal." Like Blanc (see above, 3.3.3.1.4), Lefébure-Wély took into account that not all organs had the luxury of such devices, and came up with some alternatives like placing the left foot upon the low C and C# in the 16' flute register, or placing the forearm on the basses of the Great Organ while "undulating" it from the elbow to the hand. (Ex. 3.345.)



Example 3.345. L.J.A. Lefébure-Wély: *Scène pastorale*, bars 94-109.[971] "Place the foot on the Thunder Pedal[;] when such pedal is lacking, place the left foot on the low C and C# of the 16' Flute." (Bar 99-103) / "Here imitate the noise of the thunder by placing the forearm on the bass notes of the Great Organ by undulating it with the elbow." (Bar 104 onwards.)
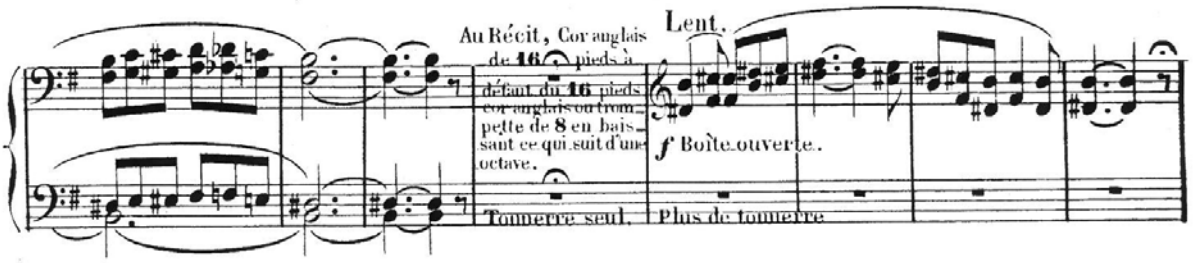
The textual indication leaves at least one important performance practical aspect to be desired: there is no way to know how long and at what precise moments the thunders have to start sounding. When the storm sets off (ex. 3.346), the thunder pedal is required again, but it is unclear whether this devices is needed during the whole storm or only during the bars the indication seems to apply to.

[969] The subtitle of the piece is « Pour une inauguration d'orgue ou Messe de minuit».
[970] On the title page of the collection it is indicated: « Ces Morceaux ont été écrits sur les Motifs improvisés aux Offices de St. Sulpice ».
[971] L'Organiste Moderne. Collection de Morceaux d'Orgue dans tous les genres en 12 livraisons. Paris, Costallat et Cie Éditeurs.
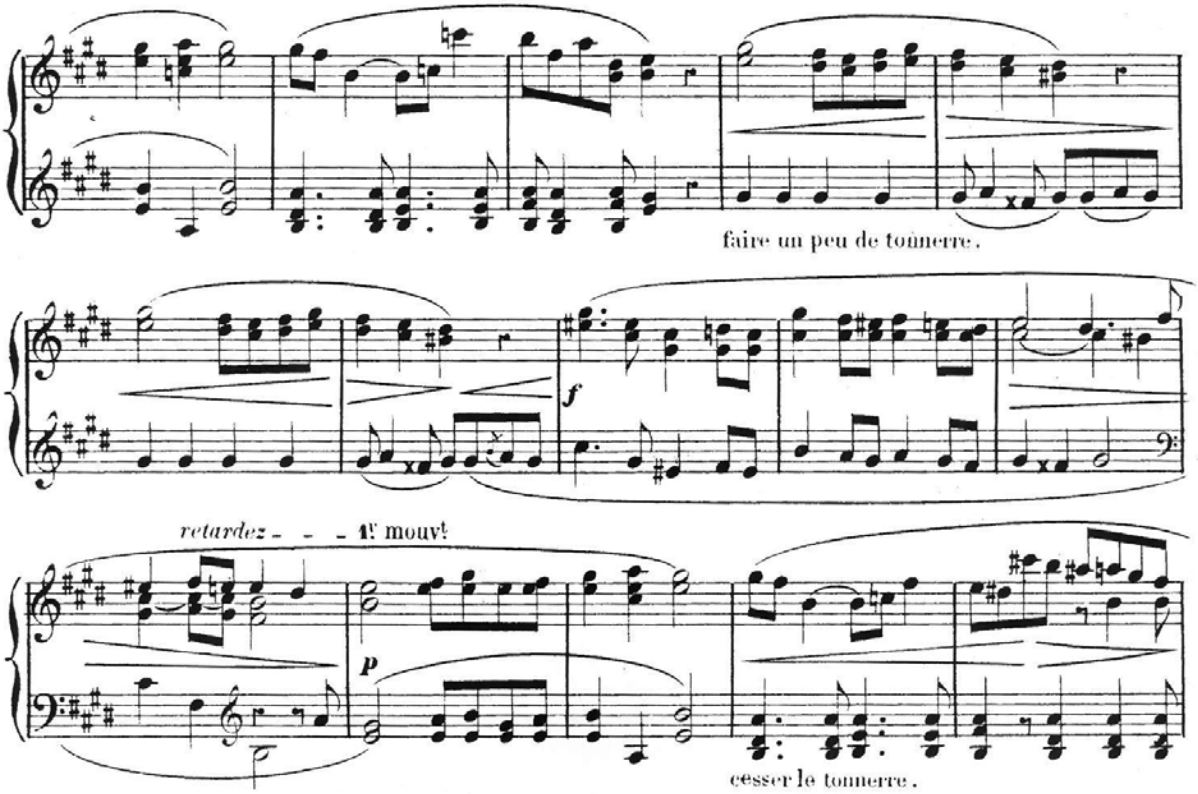


Example 3.346. L.J.A. Lefébure-Wély: *Scène pastorale*, bars 122-128. « Put the foot on the thunder pedal. »

When the storm settles, the thunder is heard alone and then "more." (Ex. 3.347.) Both these moments are very undefined: are they arm or foot thunders, roars or claps, more in terms of volume or duration?
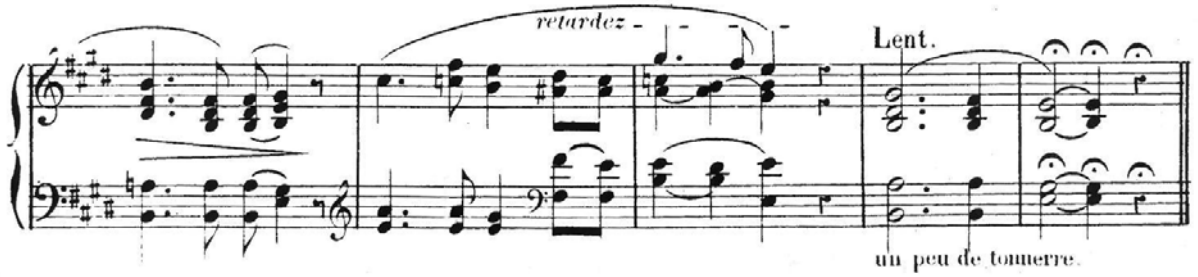


Example 3.347. L.J.A. Lefébure-Wély: *Scène pastorale*, bars 158-165. "Solo Thunder" in bar 161; "More thunder" in bar 162 (onwards?).

Equally unclear is the next instance, during the "invocation," where the way of "making a little thunder" until the cancellation ten bars later on seems to be left entirely to the musician's mood and inspiration. (Ex. 3.348.)
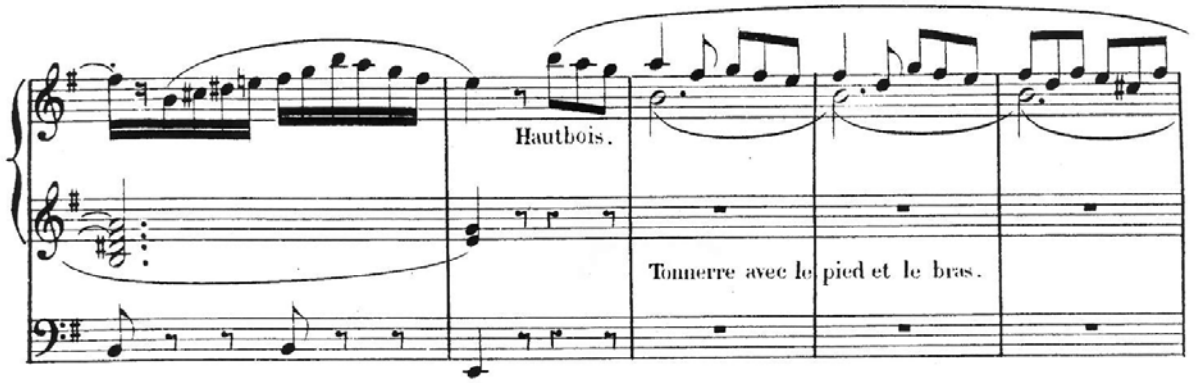


Example 3.348. L.J.A. Lefébure-Wély: *Scène pastorale*, bars 179-193.

At the end of this part, another "bit of thunder" accompanies an otherwise perfect cadence. (Ex. 3.349.)

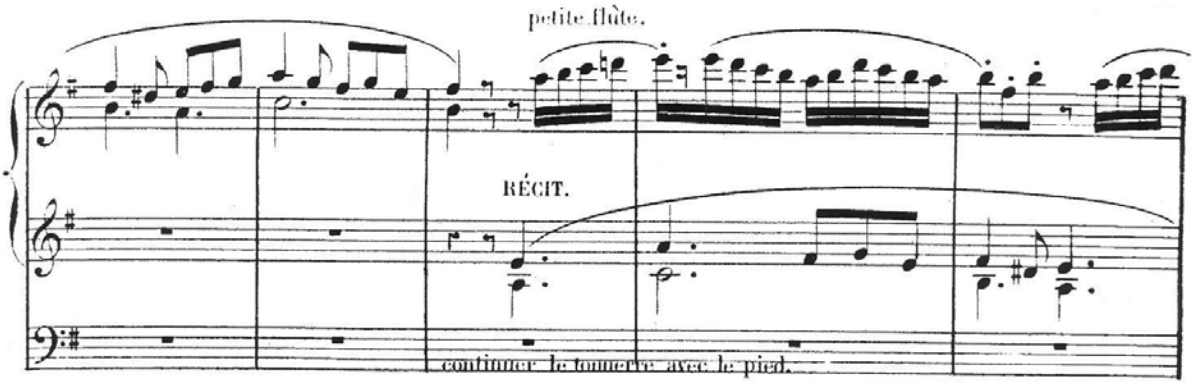


Example 3.349. L.J.A. Lefébure-Wély: *Scène pastorale*, bars 199-203.

When the pastoral returns, both kinds of thunder – by foot and arm – are still called for (ex. 3.350) and are mentioned to continue some eleven bars further (ex. 3.351), after which no mention of the technique is to be found in the rest of this 320 bar long "pastoral scene," which closes peacefully with some chants accompanied by bird song.



Example 3.350. L.J.A. Lefébure-Wély: *Scène pastorale*, bars 233-237. "Thunder with the foot and the arm."



Example 3.351. L.J.A. Lefébure-Wély: *Scène pastorale*, bars 244-248. "Continue the thunder with the foot."

3.3.3.1.6 1889 Charles Blanchet: *Scènes Pastorales et orage dans les Alpes*

Charles Blanchet (1833-1900) was another Swiss organist and composer composing a rustic scene set in the Alps and violently interrupted by a storm. In the foreword to his *fantasie de concert,* he writes about the organ as being

> [...] abundant with means to produce new effects, the use of which is not required in the works [of the old masters]. [...] It is therefore desirable that the organists preoccupy themselves more with calling on these advantages in their compositions. [...] The present fantasy aims at demonstrating the varied effects that one can obtain from the instrument of instruments these days.[972]

Among the "indispensable explications to perform this fantasy," Blanchet lists numbers and signs that he uses in the score, and indications of registration. The latter is elaborate enough to require the help of a second person. Notably

> the scene of the storm starts with a feeble wind, which increases little by little, and becomes a storm. ... The successive increase of the registers will produce the desired crescendo [...][973]

The organist, "well exercised in rendering the effect of the thunder, will refrain from prolonging it too much, as is indicated hereafter."[974] Blanchet continues with details on "the imitation of the thunder on the organ":

> The imitation of thunder is one of the most amazing effects the organ is gifted with to produce; it is also not to be doubted that, what is most impressive to the numerous tourists who, for half a century now, come here to admire the famous organ of Fribourg, is indeed the storm scene. Beethoven, Weber and other serious masters had already obtained this effect in the orchestra. Many organists are aware of the procedure, which consists in producing the imitation of the thunder on the organ; I do not have to inform them. As to those that wish to know it, they will hereafter find the explanation. On some organs the task is made easy by the presence of an accessory pedal destined to the effect of the thunder. The organists that do not have this means at their disposal will compensate by a little plank, provided at the bottom with three little ledges. The whole is placed on the five first chromatic pedal keys; the three ledges will reach the three large keys: C, D, E; and, in this position, the two spaces between the ledges of the little plank will rest on the two small keys: C#, D#. By weighing with the foot on the little plank, positioned like this, the five first pedal keys will sound together and produce a droning, which is essential to the imitation of thunder. The dimensions of the little plank and the ledges depend on the pedals for which it is intended.[975]

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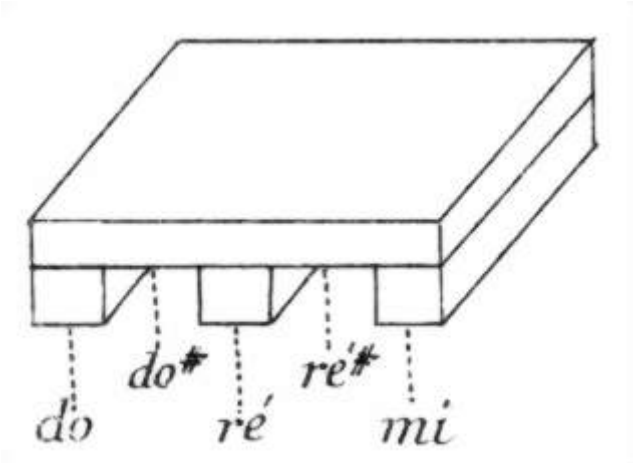
[972] From the « Avant-propos » in the score (Leipzig & Zürich: Gebrüder Hug, plate number G.H. 476) : « … abonde en moyens de produire des effets nouveau, dont ces oeuvres ne réclament pas l'emploi. […] Il est donc désirable, que les organistes se préoccupent davantage de faire appel à ces avantages, dans leurs compositions. […] La présente fantaisie a pour but principal de mettre en évidence les effets variés, qu'on obtient actuellement de l'instrument des instruments. »

[973] From «2°. De la régistration, etc.» of the «Explications indispensables à l'exécution de cette fantaisie» preceding the score: «[…] la scène de l'orage commence par un faible vent, qui augmente peu à peu, , et devient une tempête. […] L'augmentation successive des régistres, produira le crescendo voulu, […] ».

[974] From «2°. De la régistration, etc.» of the «Explications indispensables à l'exécution de cette fantaisie» preceding the score: «L'organiste, bien exercé à rendre l'effet du tonnerre, d'après l'indication donné ci-après, évitera de le prolonger trop. »

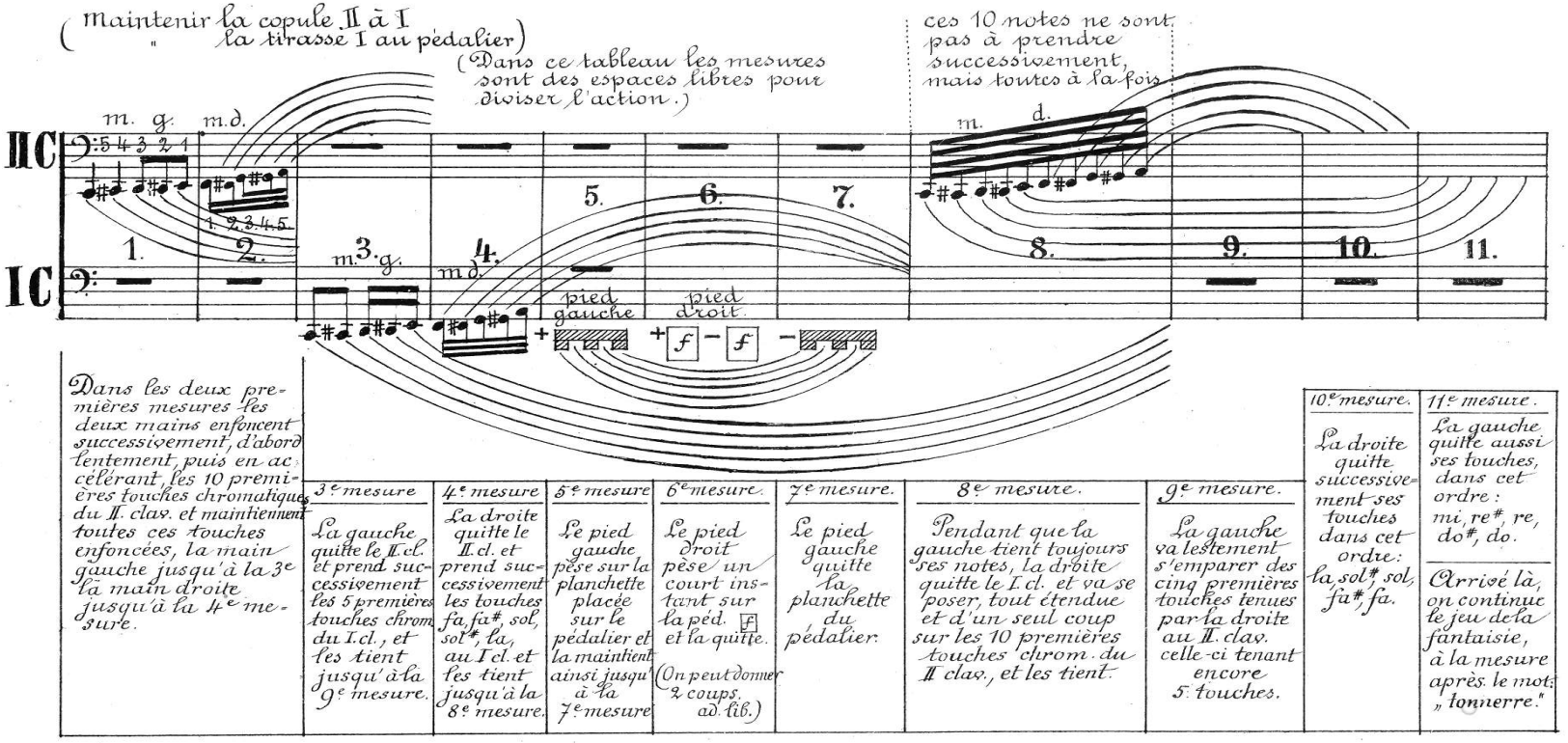
[975] As in the text preceding the score: « 3°. De l'imitation du tonnerre sur l'orgue »: «L'imitation du tonnerre est un des effets les plus étonnants, qu'il soit donné à l'orgue de rendre, aussi n'est-il pas douteux que ce qui impressionne le plus, les nombreux touristes qui viennent, depuis un demi siècle, admirer le célèbre orgue de Fribourg, c'est précisément la scène d'orage. Beethoven, Weber et d'autres maîtres sérioux avaient déjà obtenu cet effet de l'orchestre. Beaucoup d'organistes sont au courant du procédé, qui consiste à produire l'imitation du tonnerre sur l'orgue, je n'ai pas à les renseigner. Quant à ceux, qui désirent le connaître, ils en trouveront ci après l'explication. Sur quelques orgues la tâche est facilitée par la présence d'une pédale accessoire affectée à l'effet du tonnerre. Les organistes, qui n'ont pas ce moyen à leur disposition, y suppléeront par une petite planchette, pourvue pas dessous de trois petites listes. Le tout se place sur les cinq premières touches chromatiques du pédalier ; les trois listes atteindront les trois grandes touches : do, ré, mi ; et les deux espaces de la planchette, compris entre les listes, reposeront sur les deux petites touches : do#, re#. En pesant du pied sur la planchette,

Blanchet includes a drawing of this plank (ex. 3.352) and continues to explain in more detail the thunder effects that the performer will encounter in the score. (Ex. 3.353.)



Example 3.352. Ch. Blanchet: drawing of the little plank with the ledges, with which to perform clusters on the pedals (as printed in the explanatory notes preceding the score of his *Scènes pastorales et orage dans les Alpes*).

ainsi placée, les cinq premières touches du pédalier parleront ensemble et produiront un bourdonnement, qui est l'essentiel dans l'imitation du tonnerre. Les dimensions de la planchette et des listes dépendent de celles du pédalier, auquel on les destine. »



Pour chaque tonnerre il faut procéder comme il est dit ci-dessus. Si l'on n'a pas une péd. f à sa disposition, l'aide tirera d'un coup et pour un court instant, quelques forts régistres de pédale de 16' et 8' (selon les orgues, une trompette 8' et bombarde 16' font assez bon effet, si elles sont bien couvertes par les jeux de fond) Il est des orgues où la péd. ff pourra être préférée à celle de f pour les coups de tonnerre.

Example 3.353. Ch. Blanchet: explanations of the thunder indications for his *Scènes pastorales et orage dans les Alpes*
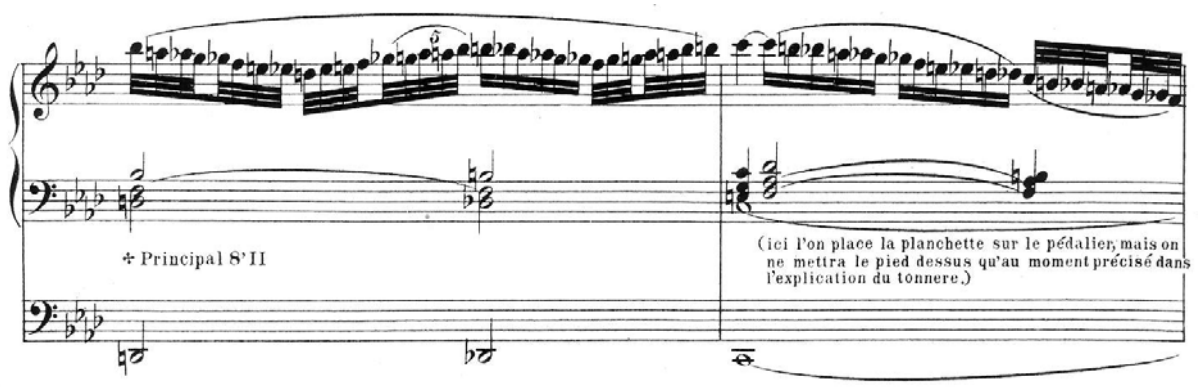
The sound effects as well as their notation are meticulously diverse:

> First and second keyboard (I & II) are coupled, first keyboard (Great Organ) is coupled to the pedal.
> In this scene the bars are free spaces to divide the action.
>
> In the first two bars the two hands successively depress, first slowly, then accelerating, the 10 first chromatic keys of the second keyboard and maintain depressing all these keys, the left hand until the 3rd the right hand until the 4th bar.
>
> 3rd bar: The left leaves the second keyboard and takes successively the 5 first chromatic keys of the first keyboard, and holds them until the 9th bar
>
> 4th bar: The right leaves the second keyboard and successively takes the keys F, F#, G, G#, A at the first keyboard and holds them until the 8th bar
>
> 5th bar: The left foot weighs down the plank placed on the pedals and maintains it like that until the 7th bar
>
> 6th bar: the right foot weighs for a short instance on the 'F' pedal and leaves it. (On can give two beats ad. lib.)[976]
>
> 7th bar: the left foot leaves the pedal plank
>
> 8th bar: while the left still holds its notes, the right leaves the first keyboard and is going to put itself, completely stretched and in one go, on the first 10 chromatic keys of the second keyboard, and holds them
>
> 9th bar: the left is slowly going to take over the five first keys held by the right at the second keyboard, the latter still holding 5 keys
>
> 10th bar: the right hand successively leaves its keys I this order: A, G#, G, F#, F
>
> 11th bar: the left hand also leaves its keys, in this order: E, D#, D, C#, C
>
> Arrived here, on continues playing the fantasy at the bar after the word "thunder"
>
> For each thunder the procedure is as described above. If one has no F pedal at one's disposal, the aide will pull at once and for a short instance, a few loud 16' and 8' pedal registers (depending on the organ, a trumpet 8' and bombarde 16' make a good enough effect, if they are well covered by the foundation registers). There are organs where the FF pedal would be preferable to the F one for the thunderclaps.

As much as the information in scores concerning thunder playing on the organ had grown in the 19th century, Blanchet's score leaves nothing to be desired in efficiency and meticulousness of notation. In fact, the extensive performance practical notes prefigure the late-20th century habit of long forewords to be studied before proceeding to the note text. In the score itself Blanchet refers back to these performance practice notes, making

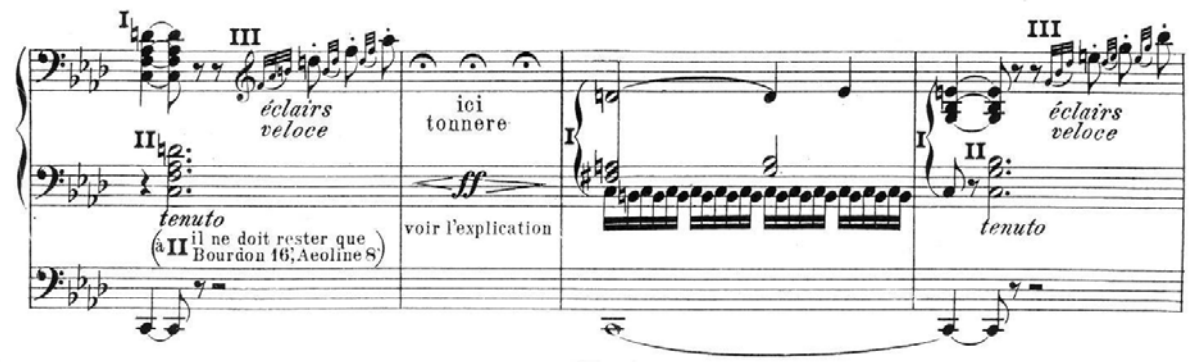
[976] According to the performance practical notes, the "F" sign indicates the pedal combination called "forte." It opens up ten registers that are part of the "piano" combination pedal plus nine more. "FF" indicates the combination pedal "fortissimo," with 16 more registers added to these 19. All of these registers were available at the organ of St. Francis at Lausanne.

sure that the instructions are followed with precision. He even indicates the precise moment at which the plank is put in place before being used (ex. 3.354).
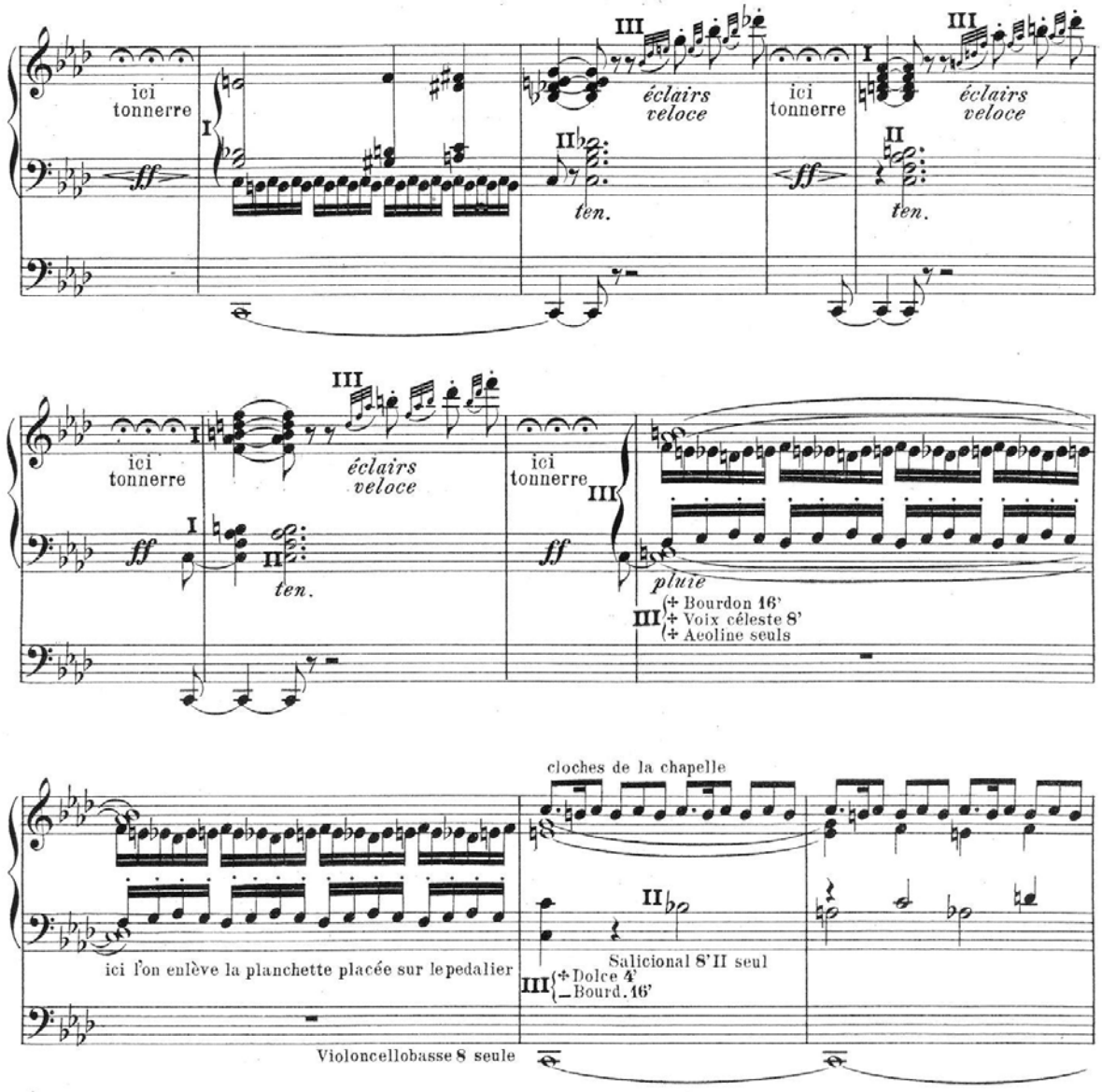


Example 3.354. Ch. Blanchet: *Scènes pastorales et orage dans les Alpes*, bars 164-165. "Here one places the little plank on the pedals, but one will put the foot on it only at the moment specified in the explanation of the thunder."

Once the lightning strikes, the thundering commences. (Ex. 3.355, 3.356.)



Example 3.355. Ch. Blanchet: *Scènes pastorales et orage dans les Alpes*, bars 170-173. "Fast lightning", "here thunder."



Example 3.356. Ch. Blanchet: *Scènes pastorales et orage dans les Alpes*, bars 164-169. "Here one takes away the little plank from the pedals."

The very elaborate performance notes in Blanchet's pastoral tone painting hardly compare to the mere five bars containing thunder (in a composition totaling 355 bars). Moreover, they stand in sharp contrast to the rudimentary indications that we have grown accustomed to in the few scores of such pieces from before Blanchet. Perhaps such lack of precise information had been due not only to the often very improvisatory character of the storm fantasies, but also to the purposeful secrecy surrounding specific playing techniques or tricks. At least in Fribourg it was forbidden for professionals during the "storm" to dwell on the organ gallery.[977] We can only guess at the reason for which Blanchet decided to go public with the complete details of this very particular trick of the trade. In any case, at the time of Blanchet the performance practice of the organ cluster was much more subtle than the few indications in the score itself would lead to believe. It is possible that this dichotomy between performance practice and its notation had been characteristic of the cluster technique for a long time before Blanchet.

[977] Jakob 1976, p. 41-42.

3.3.3.1.7 Miscellaneous bits and pieces

Besides the written-out examples of cluster usage in storm-music for the organ as shown above, the tradition of improvising such pieces continued in the late 19th century. In the 1869-1878 London period of Jacques-Nicolas Lemmens (1823-1881) the audiences loved his storm fantasy followed by a shepherd's song.[978] With the organist P. Ambros Meyer at the St. Leodegar church in Luzern (1874-88), the improvised storm fantasy became so much an obligato in the repertoire that traces of it are found in French and English poetry by passing tourists (e.g. *The Organ-Tempest of Lucerne*)[979].
As before, no such description of improvised storm pieces explicitly mentions cluster techniques. But if oral tradition can be relied upon to find out today what performance practical details were like in the mid-19th century, then it is of great interest to refer to some recent performers recounting the way they were taught the specifics of the techniques through the lineage of Vogt's successors at Fribourg:

> The effect of the whirlwind […] was achieved through chains of chromatically ascending and descending fifths in the right hand, with the rising and falling curved line symbolizing approximately the movement and ambitus.
> It was more complicated to have to imitate simultaneously "wind and thunder": […] The right hand was bound by imitating the wind through the chromatically consecutive rows of fifths (according to Dietsch they appear to also have been thirds); the left hand is to hold the diminished seventh chord on A# during the whole bar and the A# in the pedal also lasts for the whole bar. According to Mr. Piccand, the present organist at St. Nicholas […] there is only one satisfying possibility to perform this passage: while the left hand holds the seventh chord – the III. keyboard is prescribed – one must with the elbow of that same left arm depress several keys by hitting the bass part of a lower keyboard.[980]

As for the thunderclap, Mr. Piccand

> plays this passage by pushing the keys – from somewhere in the middle of the keyboard – starting with the flat of the hand up to the elbow and releasing the keys by first lifting the elbow, while now also the left arm produces ever deeper tones.[981]

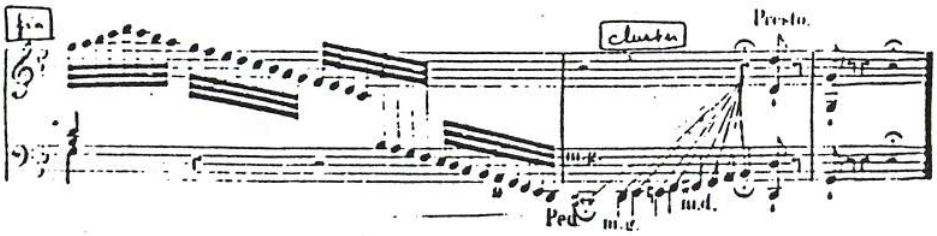
Vogt's improvisation *Fantaisie pastorale et orage dans les Alpes* (see 3.3.3.1.3) is also still performed today in Fribourg, in an arrangement by Paul Haas[982] but there are no

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[978] Jakob 1976, p. 21.
[979] Jakob 1976, p. 31.
[980] Seydoux 1977, p. 70: "Der effekt des Wirbelwinds wurde erziehlt […], indem mit der rechten Hand chromatisch auf-und absteigende Quinten aneinandergereiht wurden, wobei die auf-und niedergehende Wellenlinie ungefähr die Bewegung und den Ambitus symbolisieren sollte. Komplizierter was es, zugleich "Wind und Donner" nachahmen zu müssen: […] Die rechte Hand war dadurch gebunden, da sie durch die chromatisch aufeinanderfolgenden Quintenreihen (nach Dietsch scheinen es auch Terzen gewesen zu sein) den Wind nachahmen mußte; die linke Hand ihrerseits sollte während des ganzen Taktes den verminderten Septakkord auf Ais aushalten und auch das Ais im Pedal füllte den ganzen Takt. Nach Herrn Piccand, dem jetzigen Organisten zu St. Niklaus – dem an dieser Stelle herzlich gedankt sei – gibt es nur eine befriedigende Möglichkeit, diese Stelle auszuführen: Während die linke Hand den Septakkord hält – das III. Manual ist vorgeschrieben – muß man mit dem Ellenbogen ebenfalls der linken Hand auf einem unteren Manual in tiefer Lage schlagartig mehrere Tasten niederdrücken."
[981] Seydoux 1977, p. 70: "Herr Piccand führt diese Stelle aus, indem er die Tasten – etwa von der Mitte der Klaviatur aus – nach oben mit der flachen Hand beginnend bis zum Ellenbogen niederdrückt und dann die Tasten mit dem Ellenbogen zuerst abhebend wieder losläßt, während nun auch der Linke Arm nach unten immer tiefere Töne zum erklingen bringt."
[982] Henck 2004, p. 48-49.

precise prescriptions of interest to us. Much is left still to improvisation and only curved lines approximately indicate "whirlwind," "thunder" and "clap."[983]

Apart from thunders in storm pieces, the cluster was also used for the continuation of the *Judex Crederis* tradition. Sometime in the second quarter of the 19th century, Alexandre P.F. Boëly (1785-1858) wrote a *Fantasia sur le Judex Crederis* op. 38, n°4.[984] (Ex. 3.357.) He has been considered to try and emulate the classics by writing in counterpoint and hoping to reach the limits of pure music.[985] The palm cluster at the very end of the piece – depicting the falling of the skies – may not have been the reason for the criticism of his music (he left his post at the organ of Saint-Germain-l'Auxerrois because his music was thought to be too austere[986]), but from our perspective we can certainly see it as part of the "classics."
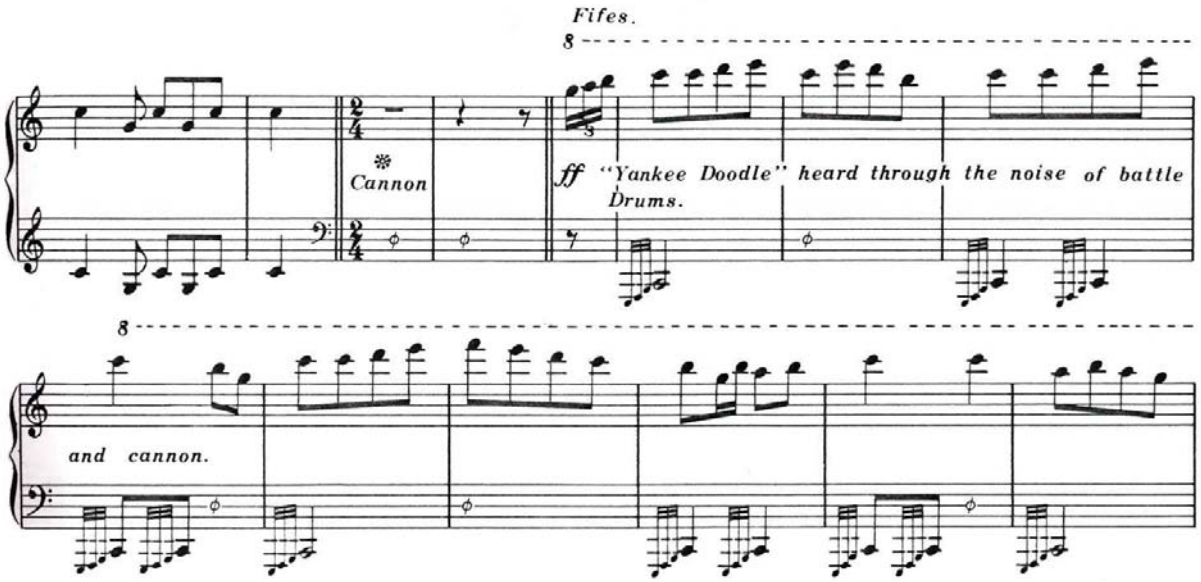


Example 3.357. A. P. F. Boëly: *Fantasia sur le Judex Crederis* opus 38, n°4 (<1858), final bars.

3.3.3.2 The piano cluster and related techniques

3.3.3.2.1 1866 Blind Tom: *The Battle of Manassas* I

There is little doubt that the canon cluster was known in the US – if only through the distribution of European pieces – but we could find only one indigenous instance of keyboard clusters: the *Battle of Manassas* by "Blind Tom." (Ex. 3.358.)

[983] Jakob 1976, p. 41: "Immerhin werden durch Wellenlinien im System der Notenlinien die ungefähren Abläufe von "Wirbelwind", "Donner" und "Knall" angedeutet".
[984] The work is posthumous, hence the tentative dating somewhere between 1825 and 1858. See François-Sappey 1989, p. 448-449.
[985] Pirro 1926, p. 1365.
[986] Idem.



Example 3.358. Blind Tom: *The Battle of Manassas*, bars 108-119.

The performance practice is written by the "editor":

> The Cannon is played by striking with both hands, (if both are at liberty; if not, with the left hand alone) and with the flat of the hand, as many notes as possible, and with as much force as possible, at the bass of the piano. This sign Ø will indicate when the Cannon is to be used. It must of course be struck as many times as there are signs, when more than one is used in the same measure. This indication Ø with it's [sic] directions is one of the earliest signs encountered for a cluster (editor).

The author of the music was Thomas Greene Bethune (1849-1908), a black pianist, born blind and a slave (owned by a certain Colonel James Bethune). As a very young child, not having studied the piano officially, he started playing music that he had heard others perform. A phenomenal memory permitted him to play any piece he had just heard, resulting in a repertoire of thousands of classical, popular and his own compositions. From 1858, and for several decades, he made acclaimed virtuoso tours of the US and Europe under the management of his guardian-owner.[987] *The Battle of Manassas*[988] was published in 1866 as part of a large collection of *Popular Marches, Battle Pieces etc. for Piano or Organ*.[989]

[987] Hinson 1975, p.5 and Southall 1990 p. 663-664. In the preface to the score of "Oliver Gallop by TOM" an article is quoted from the 1859 Baltimore Sun about "TOM" the "MUSICAL WONDER". The reviewer of one of Blind Tom's concerts asserts that "all preconceived ideas of music as a science, an art or an acquisition, were thoroughly baffled". As much as the writer was accustomed to regard music "as a gist, improved and perfected by cultivation and practice, we here find it perfectly developed, [...] constituting a part of his nature, as much so as the color of his skin. We have our reminiscences of Thalberg and other great masters but, with these, some idea of development, growth and all the advantages of education, sight, society experience and years of professional exercise – yet here is a being [...] destitute of all adventitious aid, scarcely sensible of his own wonderful nature, a master, a very phenomenon in the musical world."

[988] The Battles of Bull Run (named Manassas by the Confederate forces and still used today in the South) were fought near Manassas, Virginia on July 21, 1861 and August 29 and 30, 1862. The first Battle of Bull Run was the first major land battle of the American Civil War. See Davis 1981.

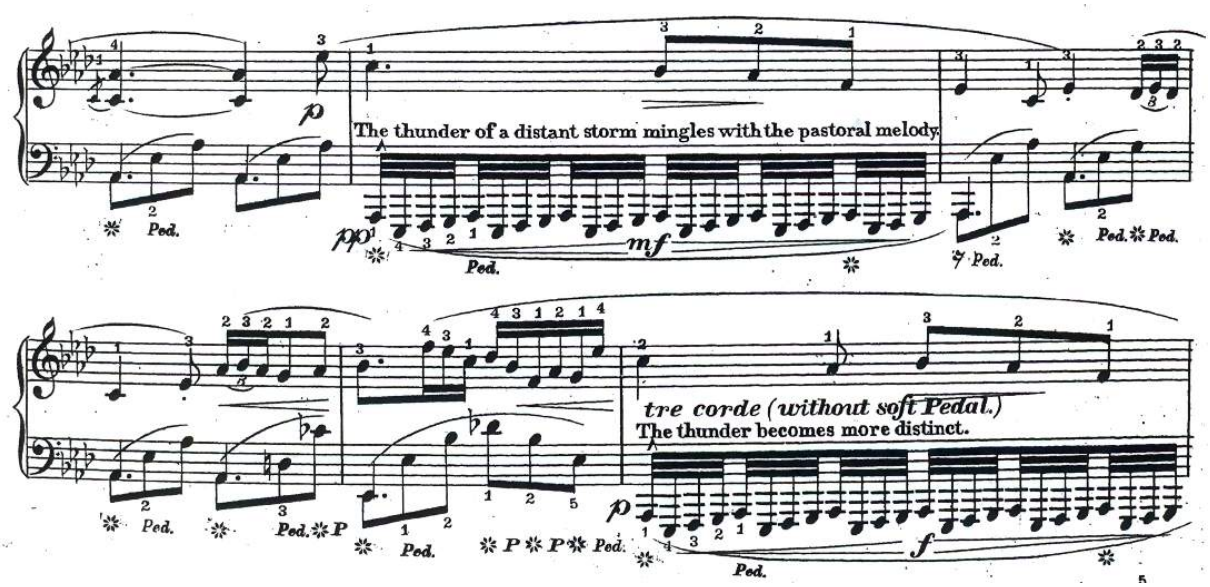
[989] In keeping with the habit, the publisher copyrighted the music. Only in 1894 was copyright renewed 'For Author." Other pieces by Blind Tom were published under the names of e.g. Prof. W.F. Raymond (*March Timpani*) or François Sexalise (*Wellenklänge*). At the end of the century, the system seems to have been reversed, with the apparantly popular hit *Military Band composed by Blind Tom (C.T. Messengale)*.

Blind Tom is said to have taken his seat at the piano and produced the piece after having heard the battle being talked of and read of for ten days.[990] The music and the techniques are visible products of improvisation rather than composition: the score has obviously been notated after-the-fact, with sometimes clumsy rhythmical notation of the cluster moments[991]. It may be that Bethune had not been exposed to the existing European cluster pieces published in the US but, even if he had, he makes much more use of the cluster than anyone before him, mixing the canon shots throughout the piece with the battle drum rolls to accompany *Yankee Doodle* as well as the *Marseillaise*, *Star Spangled Banner* and *Dixie*.

3.3.3.2.2 1888 Charles Kunkel: *Alpine Storm – a summer idyll*

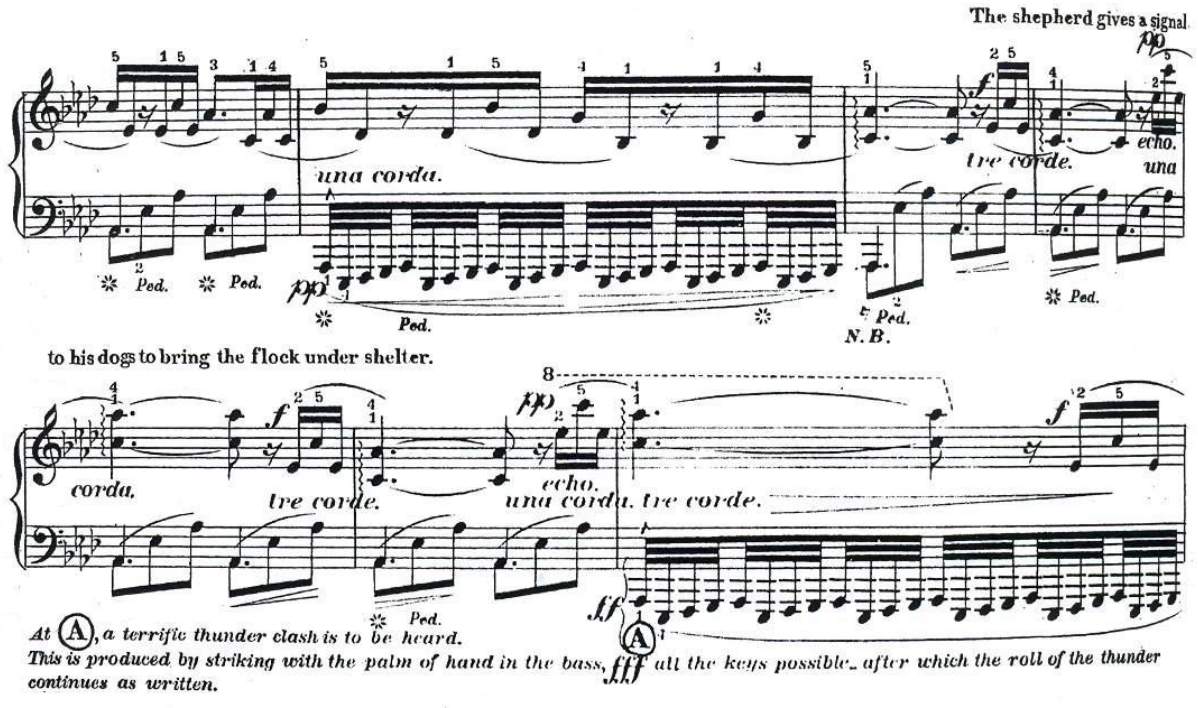
Charles Kunkel's *Alpine Storm* is the only European example in the 19th century piano repertoire after 1816 that contains cluster playing. That the piece tells the story of a young shepherd tending his sheep in the meadows of a peaceful Alpine valley, disturbed by the Storm King before the setting is restored to its full pastoral essence, is a clear reference to the tradition of programmatical organ pieces, of which we have traced the development throughout the 19th century.

Three times, Kunkel uses the most proper means to make the distant rumble of the storm audible (ex. 3.359). Only with the first "terrific thunder crash" does he indicate – with so many words – that the effect is to be "produced by striking with the palm of [the] hand in the bass, *fff* all the keys possible, after which the roll of the thunder continues as written." (Ex. 3.360.)



Example 3.359. Ch. Kunkel: *Alpine Storm. A summer idyll* (1888), bars 8-13.

[990] See the preface of the edition published by S. Brainards Sons Co, plate number 4907.
[991] The publication was most probably issued with commercial rather than performance practical ambitions.



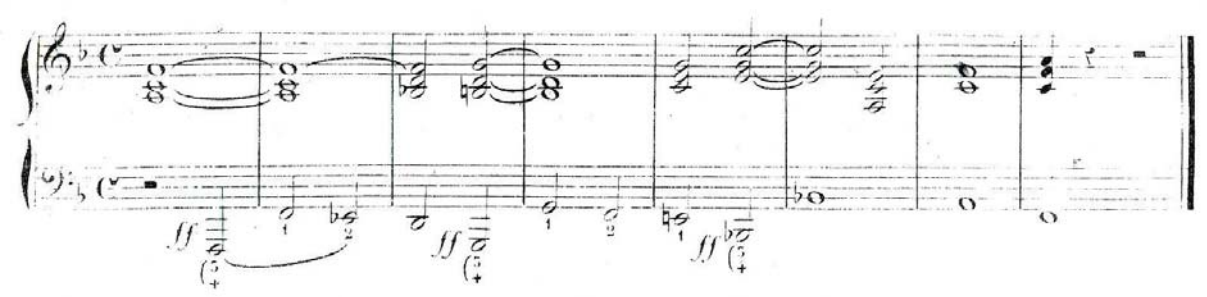
Example 3.360. Ch. Kunkel: *Alpine Storm. A summer idyll* (1888), bars 22-28.

Kunkel is the first composer who defines the cluster according to the size of the performer's palm ("all the keys possible") instead of indicating the number of notes or octaves on the keyboard. That he further allows the performer to decide just how to combine the cluster with the 32^{nds} shows how the whole instance is written in function of the performer's perspective. Kunkel only prescribes the cluster once in the whole composition, however, long before "the Storm King's lightning eyes flash and the thunders of his voice roll and reverberate," where proper bravura playing is called for to depict the scene.

3.3.3.2.3 Micro-cluster playing
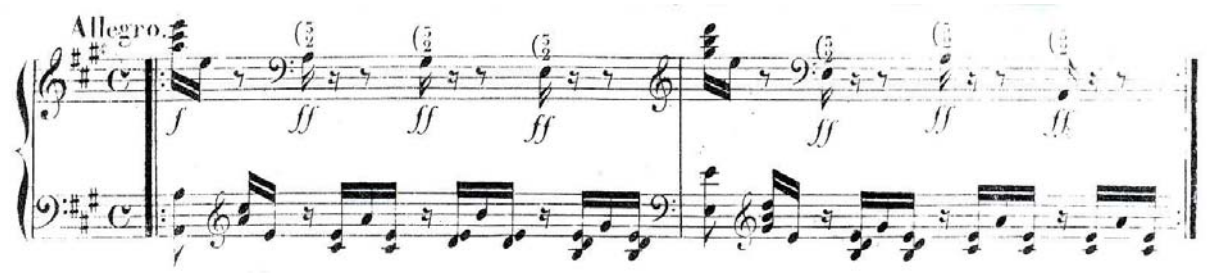
3.3.3.2.3.1 One note with two fingers

The very last chapter of part two (devoted to fingerings) of Czerny's grand piano method opus 500 (1839) discusses the use of two fingers on one key. Czerny advises this technique to obtain a powerful sound and he indicates how the two fingers should be pressed together so that a strong finger can supplement a weak one. (Ex. 3.361.)



Example 3.361. C. Czerny: example from Opus 500 (1839), part II, chapter XVI.[992]

Czerny claims this technique is good only for long bass notes but goes on to give another example where such fingering is 'permitted' for short bass notes. (Ex. 3.362.)
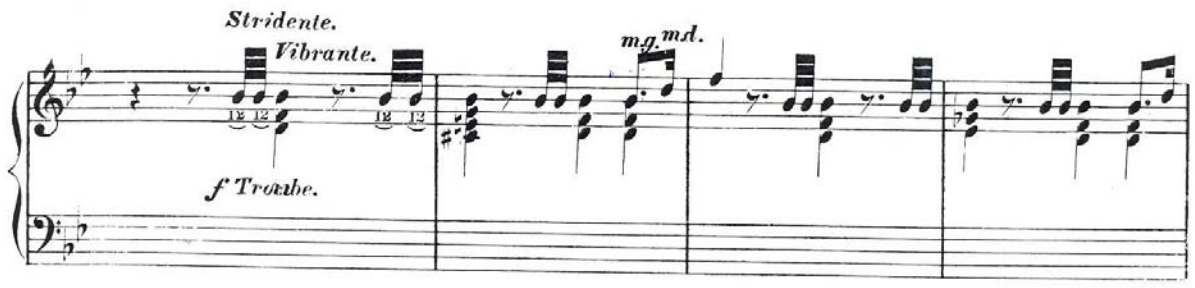


Example 3.362. C. Czerny: example from opus 500, part II, chapter XVI.[993]

Such fingerings come very naturally to pianists. In passages such as in these examples, the position of the hand alone will automatically make the combination of 4+5 or 2+3 the most comfortable fingering, even if no great power is required. In octave playing, the 4th and 5th fingers are always close to one another, and it is actually more of an effort to prevent one of them to also hit a key than it is to use them both on the same key. When crossing hands, the oblique and downward position of the hand that passes over the other hand makes it natural for the 2nd and 3rd fingers to work together. Again, it would be more difficult to make them *not* be close when pressing a key from that position.
In situations where extra force is needed, such double fingerings come most naturally. Czerny is of course aware of this and warns that one mustn't abuse ones force and deteriorate or detune the piano.

He concludes by stating that these sorts of fingerings are found only rarely. We found one other such example, with yet another double finger combination. In Gottschalk's 1862 paraphrase *Union* he prescribes the thumb and second finger (one hand per pitch) to stridently and vibrantly play a trumpet melody. (Ex. 3.363.)

[992] NL-Dhnmi mf VIII/223.
[993] NL-Dhnmi mf VIII/223.



Example 3.363. L.M. Gottschalk: *Union* (1862), bars 91-94.

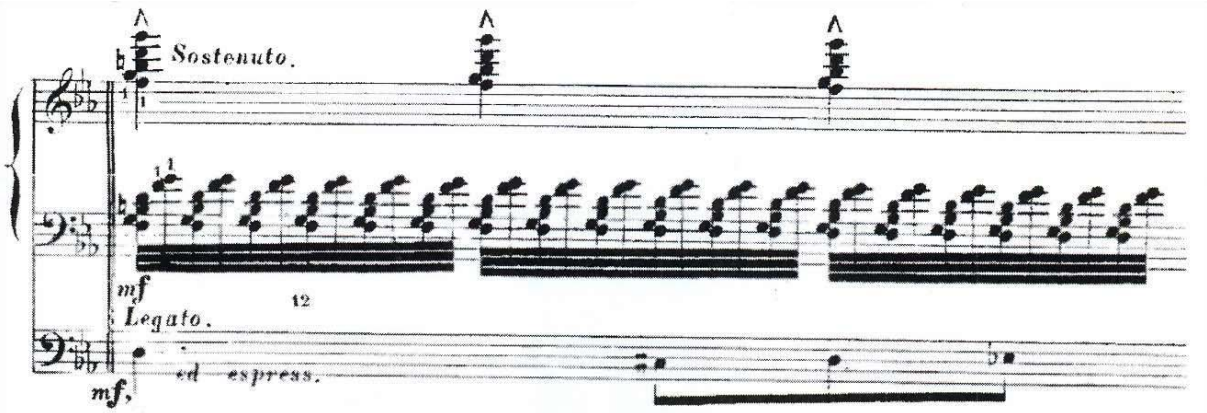
3.3.3.2.3.2 One finger on two notes

As early as the first half of the 18th century, chords had been written with more notes than there are fingers to play them. Scarlatti wrote many of his acciacaturas in ways that require the thumb to play two notes (e.g. in the left hand in bars 163, 164, 166, 167 and in the right hand in bars 162-168 in ex. 3.364).



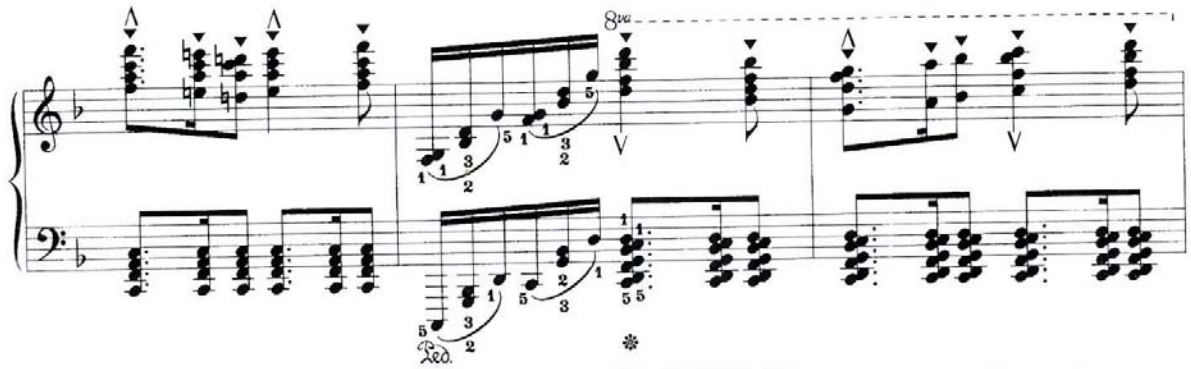
Example 3.364. D. Scarlatti: Sonata K. 119, bars 161-176.[994]

We do not consider such chords as clusters, but their composition indicates an interest in ergonomical writing, which is related to cluster writing on a conceptual level. The 19th century saw a marked interest in the ergonomics of chord playing. Using the thumb to play two notes – especially in the third inversion of a diminished seventh chord – was common practice, as demonstrated in countless works by the 19th century virtuosos. Charles Valentin Alkan also liked exploiting the morphology of the hand to cover big chordal stretches (ex. 3.365.) but took the technique a little further and applied it to the fifth finger as well. (Ex. 3.366.)
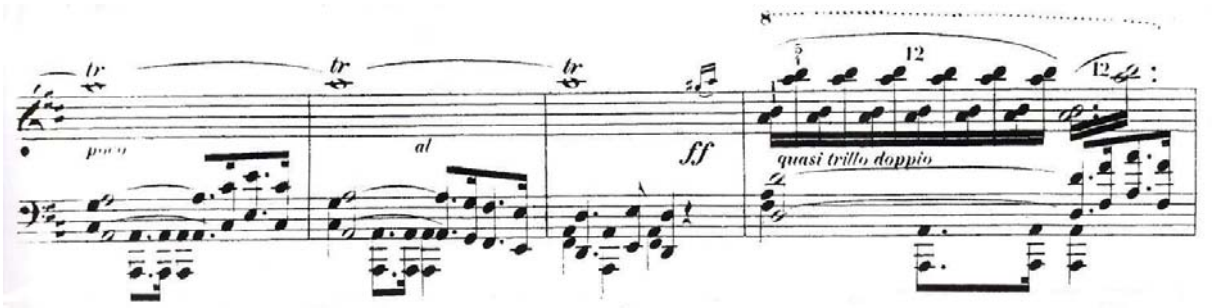


Example 3.365. Ch. V. Alkan: *11 grands préludes* for pedal piano or three hands, opus 66 (1865), nr. 5, bar 49.

[994] Reproduced with kind permission of the current copyright holder Irving S. Gilmore Music Library, Yale University.



Example 3.366. Ch. V. Alkan: *Etude alla Barbaro* (no opus number, no date), bars 73-75.

In Joachim Raff's 1848 *Fantasie über Motive aus "Der Barbier von Sevilla" von G. Rossini* the technique is creatively employed to orchestrate a trill into a *trompe l'oreille*, using improper fingerings to achieve a "quasi trillo doppio." (Ex. 3.367.)



Example 3.367. J. Raff: *Fantasie* opus 44 (1848), bars 170-173.

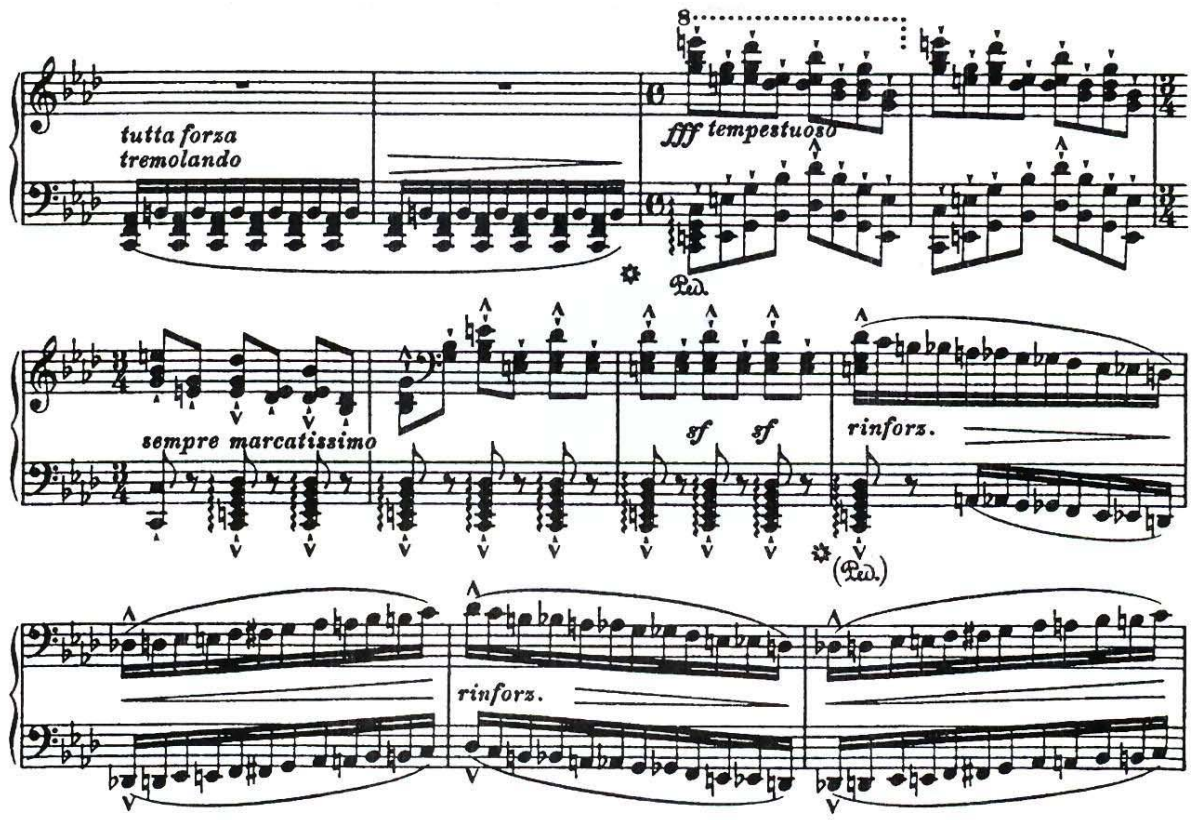
3.3.3.2.4 Quasi clusters

After the battle pieces of the Napoleonic era, the cluster seems to have gone out of the composer's mind. Only in a few instances do we find a mere hint at such an extension of the proper playing technique, reminding us of how the glissando was approximated in the *quasi* glissando.

3.3.3.2.4.1 1855 Franz Liszt: *Orage*

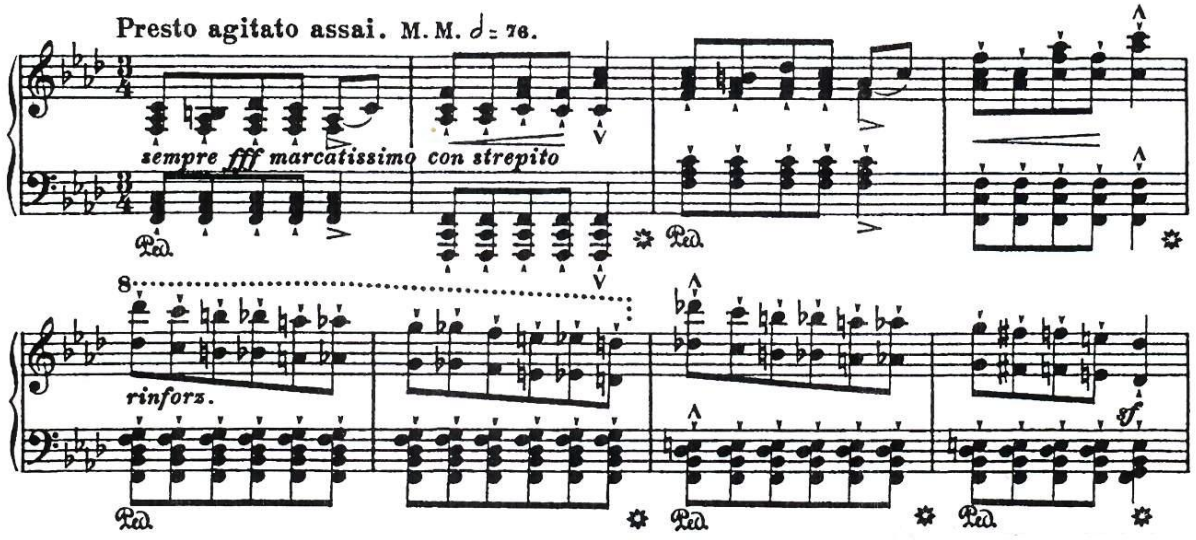
As much as Vogt (3.3.3.1.3) seems to have been unimpressed with Liszt's playing on the Fribourg organ in 1836 – Vogt must have been anxious to show the instrument at what he himself thought was its best – Liszt himself does not seem to have been interested in the thunder technique. We have not found in any of Liszt's works the use of the forearm or flat of the hand, let alone the need for the performer to sit brusquely on the keyboard. Yet, in that same year Liszt also wrote a Swiss storm composition: *Un soir dans les*

Montagnes – Nocturne pastoral. The composition was intended to be part of a set *Album d'un voyageur*, like George Sand's *Lettres d'un voyageur* in which she had written down her experience with Vogt's organ clusters. In this collection Liszt wanted to "give musical utterance to some of my strongest sensations, some of my liveliest impressions." The nocturne was one of the pieces he stated to "be characteristic of the surroundings in which I have stayed, of the scenery of the country, and the genius of the people to which they belong."[995] Even if Liszt may not really have had Vogt and his thunder in mind when writing these kind words, the concept of a pastoral interrupted by a storm surely refers to his encounter with the Fribourg organist. In this composition of young Liszt, the innocence of pastoral bless is disturbed by an agitated sequence of chromatic runs, tremolos, tempestuous chords and fast octaves. Most of it is nothing more than cliché, yet one detail is worth focusing on. At one of the several culmination points in the storm section, Liszt asks for *fff* marcatissimo chords in the left hand, playable only with a large hand or by striking the two top notes with the one thumb (ex. 3.368, bar 131-133). These are undoubtedly meant to be the thunder crashing down. Shortly afterwards the storm theme reveals similar dissonant chords in the low bass, this time combined with the wind howling through the right hand octaves.
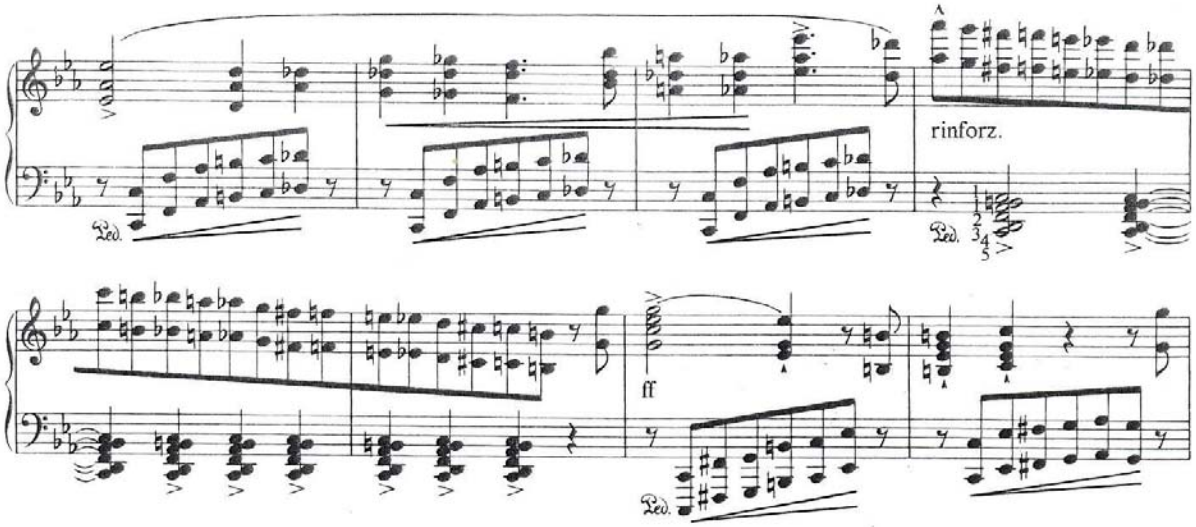


Example 3.368. Fr. Liszt: *Un soir dans les Montagnes. Nocturne pastoral* (1836), bars 127-137.

[995] Quoted from Liszt's preface in *Franz Liszt's Musikalische Werke. Serie II, Band 4.* Leipzig: Breitkopf & Härtel, 1916, plate F.L. 44: "[…] j'ai essayé de rendre en musique quelques-unes de mes sensations les plus fortes, de mes plus vives perceptions. » « caractériseront le milieu dans lequel j'aurai vécu, l'aspect du pays, le génie de la nation auxquels elles appartiennent. »



Example 3.369. Fr. Liszt: *Un soir dans les Montagnes. Nocturne pastoral* (1836), bars 142-149.

When Liszt reconsidered his Swiss recollections for a larger cycle of pilgrim pieces, he took the storm section out of the *Nocturne pastoral* and made it into a composition by itself, called *Orage*. Published in 1855 as part of the first (Swiss) book of *Années de Pèlerinage*, it was positioned after *Au bord d'une source,* easily functioning as the abrupt interruption of the tranquil scene at the well. The frontispieces of the two pieces connect them in that sense, with the first showing a pastoral drawing of a "Hirtenwonne" (complete with a verse on natural innocence from Schiller), and the second depicting two youngsters overtaken by a coming storm during their walk in the woods. Musically, both are joined by the way *Orage*'s opening on A♭ (the piece is really in C minor) directly follows on the A♭ major chord that closes *Au bord d'une source*. As in the first version of this piece, there is no real cluster in *Orage,* but the thunderous chords that go with the descending octaves have now become even more dissonant. (Ex. 3.370.)
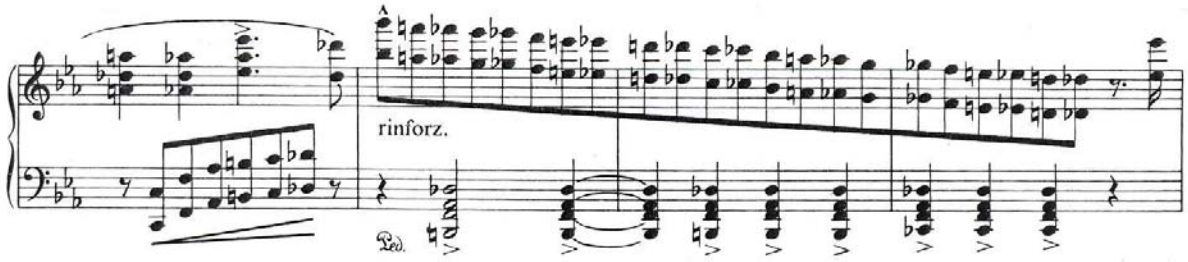


Example 3.370. Fr. Liszt: *Années de Pèlerinage, Première Année: Suisse* (1855), *Orage,* bars 12-19.[996]

The chord in bars 15-17 is not the only dissonant one in the piece but it is unique in that it is more compressed than the others, and by its reinforced C, clashing with both the *B*
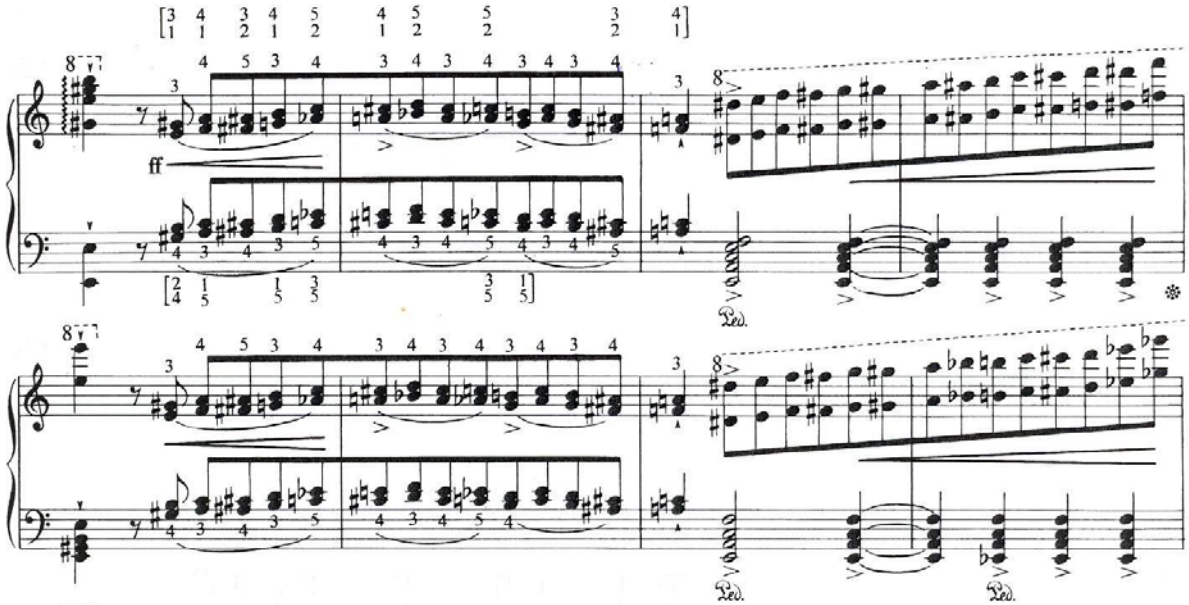
[996] New Liszt Edition, Series I, Volume VI; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.

and *D*. Comparable instances in this piece show milder inversions of this type of harmony. (Ex. 3.371.)



Example 3.371. Fr. Liszt: *Années de Pèlerinage, Première Année: Suisse* (1855), *Orage*, bars 25-28.[997]

After the opening chords, merely serving to harmonically connect the *Orage* to the previous piece, the chord at issue comes after a lot of regular triads and octave playing and contains the first real dissonant of the composition. Its position in the general structure and in the phrasing of the (newly composed) main theme – the syncopated banging breaking off the lyrical rise of the melody – represents a moment of surprise and fits in well with the suddenness of thunder sounds, more so than in the first version. Another clear association with Vogt's storm piece is found in Liszt's whirlwind thirds (ex. 3.372), reminding us of the wind and hail that George Sand heard in Vogt's playing, and of the curved lines that represent the whirlwinds in later written down versions of that paradigmatic organ piece (see 3.3.3.1.7).
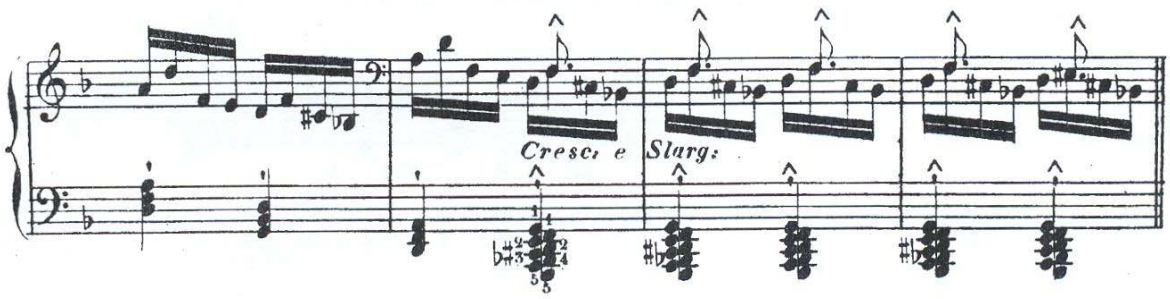


Example 3.372. Fr. Liszt: *Années de Pèlerinage, Première Année: Suisse* (1855), *Orage*, bars 38-45.[998]

The chord in bar 15-17 is not any more dense or dissonant than what is easily found in Scarlatti, but it is more cluster-like because of the connotations involved in the composition.

[997] New Liszt Edition, Series I, Volume VI; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.
[998] New Liszt Edition, Series I, Volume VI; Editio Musica (Budapest), licensed by EMB Music Publisher Ltd.

3.3.3.2.4.2 1859 Charles Valentin Alkan: *Une fusée, Introduction et Impromptu*

If Listz's chord in *Orage* is an imaginary cluster at best, the use of fingers to play more than one note at the time did lead to chords that came really close to clusters in the 19th century. In the *Impromptu* from *Une fusée* in d minor opus 55 (1859), Charles Valentin Alkan wrote chords that are still not of the full-blown palm or arm types, but represent an interesting step in the evolution from chromatic chord building to cluster theories. (Ex. 3.373.)



Example 3.373. Ch. V. Alkan: *Une fusée, Introduction et Impromptu* (1859), p. 384-387.

We don't know whether or not Alkan knew of the cluster writing by his compatriots in the previous century, but the military connotations in the choice of title – *fusée* meaning (military) rocket, signal flare, volley (next to a fast run in music) – are likely coincidences. At any rate, we can see the complex aggregate in bars 385-387 as the third inversion of a 13-chord (A-C#-E-G-B♭-D-F) touching upon the limits of harmonic tension (without losing sight of the tonal basis) like Balbastre did in his *Canonade*, or we can see it as a bid to integrate the cluster in functional harmony like Foucquet had attempted. (See 3.2.2.3.) More significant is the fact that Alkan seems to have tried hard to reach this level of complexity without giving up the proper playing technique of the fingers in favor of other body parts.

3.3.3.2.4.3 1860 Franz Liszt: letter to Ingeborg Stark[999]

Sometime during the summer of 1860, Franz Liszt wrote a letter in which he uses the example of a whole tone scale to let his imagination take him to the concept of the cluster. Picking up the subject of a score that Ingeborg Stark had given him – of an *Ouverture* by Baron Vietinghoff – Liszt asks to convey his complements to the composer and to mention to him a "little scale of chords"[1000] which he then inserts. (Ex. 3.374.)

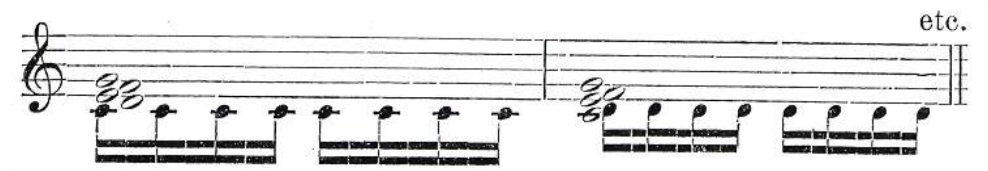


Example 3.374. Fr. Liszt: illustration in the letter to Ingeborg Stark (1860).

[999] Ingeborg Starck (1840-1913), later married to the pianist-composer Hans von Bronsart, was herself a pianist and composer, student of Liszt's.
[1000] La Mara 1893, p. 362: "petite échelle d'accords".

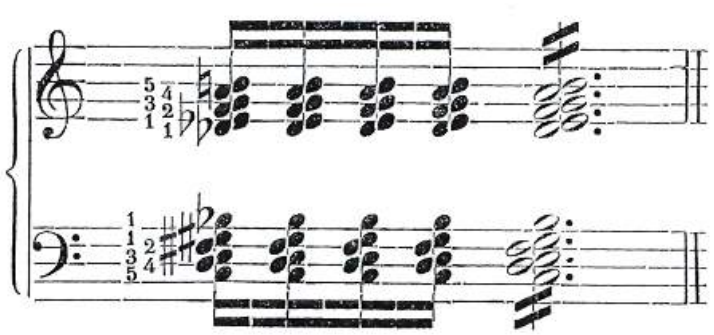
Apparently it is "but a very simple development of the scale that is *terrifying* for all the warped and elongated ears,"[1001] which De Vietinghoff seems to have used in the last *Presto* of his *Ouverture*.[1002] Liszt then goes into the matter further by rapid association and not without sarcasm:

> Tausig has already made "passable" use of it in his "Geisterschiff," and in the classes of the Conservatory, where the art of the *enraged dog* will be properly taught, the elementary exercises of the current Piano Methods



[Example 3.375. Fr. Liszt: illustration in the letter to Ingeborg Stark (1860).]

> which are of a sonority as disagreeable as incomplete, will be replaced by this one
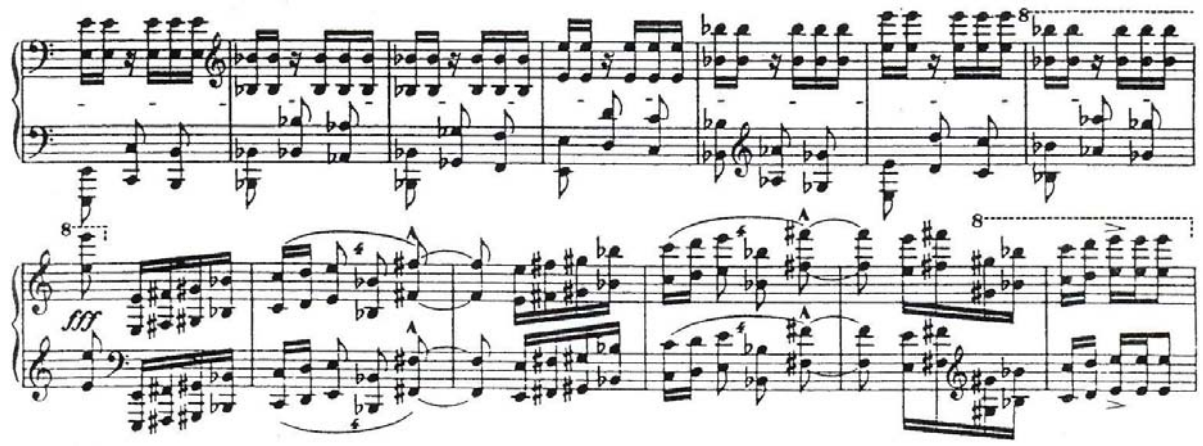


[Example 3.376. Fr. Liszt: illustration in the letter to Ingeborg Stark (1860).]

> which will also form the unique basis of the Treatise of Harmony, all the other chords, much in use or not, being left to be realized through the *arbitrary* deleting of one or other interval.
>
> Soon, then, the system will have to be completed by the admission of quartertones and half-quarter tones while waiting for better! –
>
> There you have the abyss of progress in which the abominable *Musicians of the future* are hurling us! Take care not to let yourself be infected with this plague of art![1003]

[1001] La Mara 1893, p. 362: “Ce n’est qu’un developpement très simple de la Gamme *terrifiante* pour toutes les oreilles bombées et allongées”.
[1002] Vietinghoff is reported to have taken the pseudonym of Boris Scheel. As in La Mara 1893, p. 362 – we have not been able to find this *Ouverture*.
[1003] La Mara 1893, p. 363: “Tausig dans son “Geisterschiff” en a fait déjà passablement usage, et dans les classes du Conservatoire où l’art relevé du *chien enragé* sera dûment enseigné, les exercises élémentaires des Méthodes de Piano actuelles [ex. 3.344.] qui sont d’une sonorité aussi *désagréable* qu’*incomplète*, devront être remplacés par celui-çi [ex. 3.345] lequel formera aussi la base unique de la Méthode d’harmonie, tous les autres accords, usités ou non, ne pouvant s’effectuer que par le retranchement *arbitraire* de tel ou tel intervalle.
Bientôt enfin il faudra compléter le système par l’admission des quarts et demi-quarts de ton en attendant mieux!- Voilà l’abîme du progrès dans lequel les abominables *Musiciens de l’avenir* nous précipitent! Prenez garde de ne pas vous laisser contagier par cette peste de l’art!”

The passage in Tausig's *Geisterschiff*, to which Liszt refers as "passable," is built on the wholetone series (see bars 83-92 in ex. 3.377) and extends the realm of strict tonality as much as the pseudo-chromatic glissandos in the same piece.



Example 3.377. C. Tausig: *Das Geisterschiff* (c1848), bars 80-92.

Contrary to what one authoritative commentator states, Liszt does not "defend the dissonances of the 'Music of the future'",[1004] rather he is cynical about both the sonority of what compares to a diatonic five-note cluster (when pointing to the piano method exercise), and about the arbitrariness of a system of such chords that would replace the intricately worked out structure of tonal harmony.

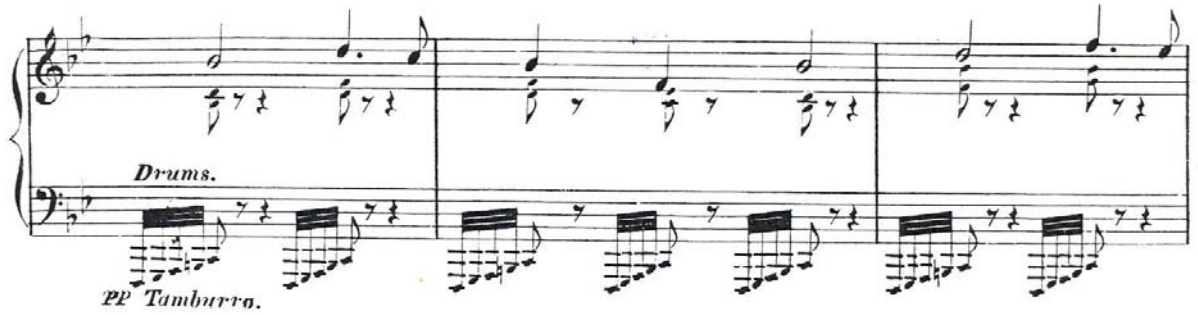
It is not immediately clear in how far Liszt's mocking tone coincides with his real feelings about the subject. The whole letter is infused with humoristic remarks and it is possible that Liszt's warning against artistic abysses and plagues was anticipating and taking into account the feelings Ingeborg Stark may have had on the subject of artistic progress.[1005] Nevertheless, as much as Liszt would be experimenting with ways to escape the constraints of tonality, he never took the gateway that leads to cluster playing. He would devise atonal harmonies and combine them or emancipate them by leaving them unresolved, write bagatelles *sans tonalité*, employ white-key seventh chords stacked just like in ex. 3.376 until they encompass all diatonic notes in the octave[1006], but he never wrote a cluster that meets our definition of it. As much as Liszt represents the pinnacle of 19th century development in keyboard playing, and as much as he adapted his technique to the morphology of the performer's physique, he never took it to the extreme. In matters of composition Liszt dared to push many boundaries but, in terms of improper keyboard technique, he did not go beyond the glissando.

3.3.3.2.3.4 1860's Bitonal drum rolls

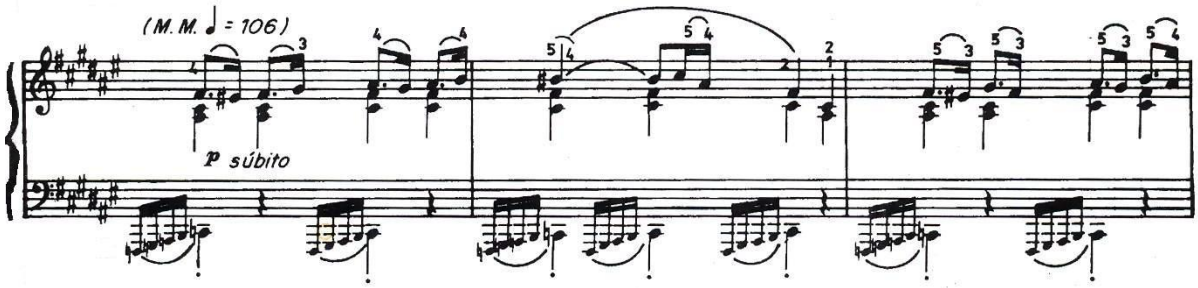
We did not encounter straight clusters in the works of American composer and pianist Louis Moreau Gottschalk (1829-1869) either, but some of his pieces contain "drum rolls" that can be considered as having some affinity with the cluster. In pieces like his 1862 paraphrase *Union*, or the 1869 triumphant fantasy on the Brazilian national anthem, drum rolls are still sounded in a manner very typical of keyboard battle pieces, i.e. fast upbeat tiratas in the bass. But Gottschalk did not bother adjusting the drum rolls to the key of the right hand. (Ex. 3.378 and 3.379.) The resemblance to an arpeggiated cluster

[1004] Walker 2002, p. 783.
[1005] Ingeborg Stark (later Ingeborg von Bronsart by marriage) was a pianist and composer, and had started taking lessons with Liszt in 1858. We have not seen any scores of her music to judge the extent to which she may have taken Liszt's compositional advice to heart.
[1006] Walker 2002, p. 783.

is tenuous as there is no specific performance technical indication that relates directly to palm-playing, but the noise effect of the bitonal version of the drum roll is close to the unpitched ideal of the cluster sound.



Example 3.378. L. M. Gottschalk: *Union* (1862), bars 125-127.



Example 3.379. L.M. Gottschalk: *Grande Fantaisie Triomphale sur l'Hymne national Bresilien* (1869), bars 208-210.

This type of drum roll is again symptomatic of how, in this period, composers did their best to work with the programmatic advantages of noise that clusters can provide them, without actually having to prescribe the improper technique. The diatonic rolls can be played as arpeggiated diatonic clusters (by rolling the flat of the hand over the white keys) with the exact same effect as by playing the notes with individual fingering, but the 19th century composer's state of mind was not set for the change of attitude that such performance practice would require.

3.3.3.3 Other extensions

3.3.3.3.1 Wilhelm Rust and his grandfather's work

The 19th century piano history is strikingly void of explorations into the insides of the piano. Except for one Otto Lemberg, who has been rumored to have "played with his fingers on the strings of a piano, intending to be humorous" in the early 1890's[1007] (but of whom we have found no trace), no interest in such techniques is discerned in this period.[1008] On the contrary, the efforts of Friedrich Wilhelm Rust were all but made oblivious by his own grandson.
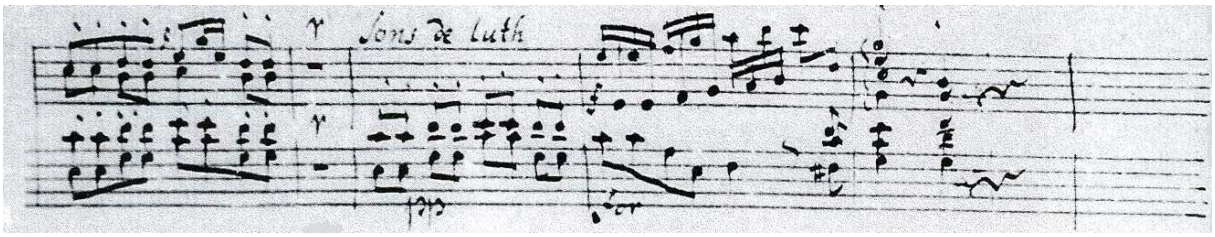
[1007] Henderson 1926.

[1008] Hicks 2002, p. 110 mentions Olga Samaroff to have "played on the strings with brushes and cloth as early as 1887", based on what she wrote in her newspaper column in 1926. (The New York Evening Post, Wednesday, February 3, 1926: "Music: Olga Samaroff's Daily Column – Henry Cowell's String Piano".) However, Hicks fails to see the sarcasm with which Samaroff tackled Henry Cowell in her review of his concert. In 1887 Olga

Wilhelm Rust (1822-1892) was his grandson and enjoyed a versatile education and career as violinist, pianist, organist, composer, singer, conductor, teacher and editor. From 1862 to 1875 he conducted the Berlin Bach Verein, also performing a very large number of contemporary composer's works. In 1870 he had become chairman of the Department of Counterpoint and composition at the Stern Conservatory and in 1880 he was appointed Kantor of the Leipzig Thomasschule in 1880.
His work for the Leipzig Bachgesellschaft – he edited 18 of the 26 volumes of the 1855-1881 Johann Sebastian Bach Werke[1009] – earned him the reputation of a fine scholar, still undisputed today. His numerous contributions to Bach studies earned him many honors (including the royal Prussian music directorship in 1864)[1010].

From 1885 to 1891, after his work on J.S. Bach, Dr. Rust prepared editions of seven of his grandfather's keyboard sonatas.[1011] Despite his reputation and apparent skills as an editor, Dr. Rust applied little professional editorial standards to the publishing of his grandfather's compositions. He retained much of the original in terms of its material, but on top of adding dynamic and expressive markings, he conversed textures, harmonies and keyboard compass to late 19th century level of achievement and habit, composed new materials to put in the place of existing passages or to add whole movements with, interpolated themes to enhance motivic interrelationships between movements, etc.[1012] One sonata was "edited" until the original 286 measures had grown to more than 500. Prof. Dr. Rust sometimes added programmatical titles or described special events or journeys in his grandfather's lifetime. These, so the grandson maintained, had originally inspired the composition of movements that he himself had in fact added, going as far as commenting on their great significance as 18th century music.

The most original efforts of the grandfather – his forays into the extended sound realms – were not enhanced by his grandson, but rather left out all together. Of these particular pieces (see 3.2.6.2.1), only the sonatas in C (Czach 10) and D (Czach 11) were included in the grandson's editions. Both underwent the whole array of updating techniques Dr. Rust could think of, including complete and newly composed movements. Examples 3.380-383 show the original and revised versions of the instances with lute and timpani sounds that we have discussed earlier.



Example 3.380. F. W. Rust: Sonata in C, Czach 10 (1792), third movement *Fugato*, bars 76-80, original manuscript.[1013]

Samaroff had been five years old. Next to comparing Cowell's interest in new timbres to a kitten galloping around on the strings of a piano, Samaroff obviously aimed to make the point of Cowell's experiments being childish.

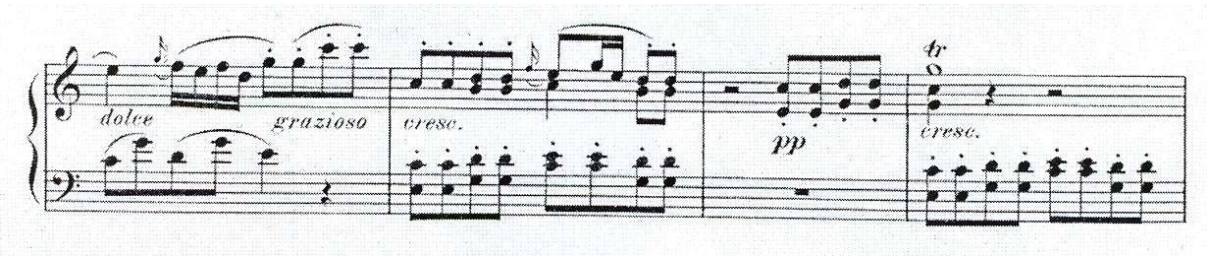
[1009] Dr. Rust started to work for the edition in 1853 and became its editor in chief in 1858.

[1010] Buchmann 2005, p.701.
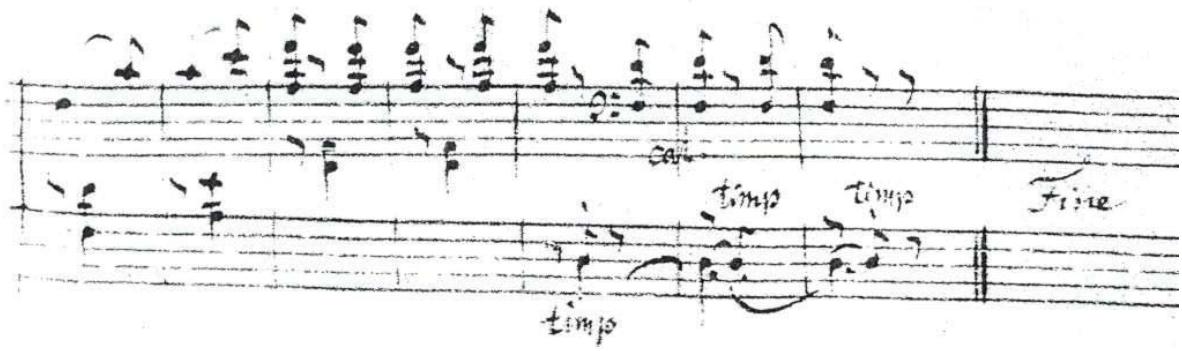
[1011] In F# (Leipzig: Max Hesse, 1885), in Db and d (Leipzig: C.A. Klemm, 1887), in A and E (so-called *Sonata erotica* and *sonata italiana*; Leipzig: C.A. Klemm, 1888), in D (Leipzig: E.W. Fritzsch, 1891) and in C (Leipzig: C.F.W. Siegel, 1891).

[1012] See Cook 1979, p. 21-74 for a complete comparison of the 19th century editions by Dr. Rust and the French 1914 edition by Vincent d'Indy. D'Indy was not 100% faithful to the original (contrary to his own statement in the preface) but at least he had only added some expressive and dynamic markings.
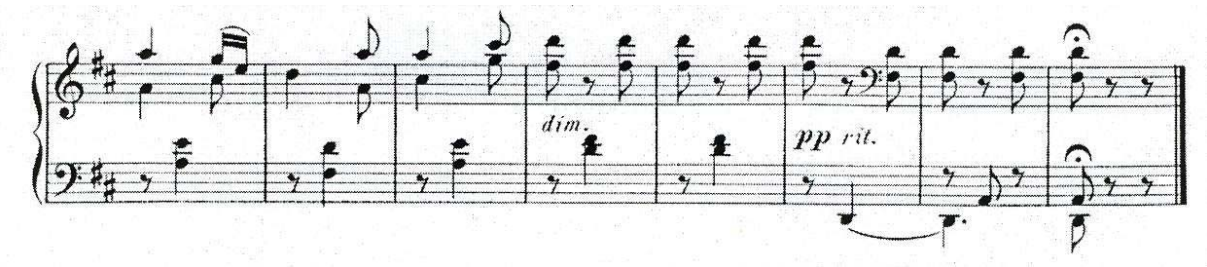
[1013] Manuscript at the Staatsbibliothek zu Berlin – Preussischer Kulturbesitz, Musikabteilung mit Mendelssohn-Archiv. (D-B Mus.ms.autogr. F.W. Rust 28 N) Reprinted by permission.



Example 3.381. F. W. Rust: Sonata in C, 3rd movement *Fugato più moderato*, Dr. Rust edition (1885-91), bars 75-78. [1014]



Example 3.382. Fr. W. Rust: Sonata in D, Czach 11 (1794), original manuscript, final bars.[1015]



Example 3.383. Fr. W. Rust: Sonata in D, Dr. Rust edition (1885-1891), final bars. [1016]

The lute sounds from the *fugato* in the C major sonata (ex. 3.380-3.381) can be played on any piano, so there is no valid reason for having left them out. Dr. Rust published both sonatas as "für Clavier oder Fortepiano," meaning for either the harpsichord or the pianoforte. If he had understood the indication to be for the lute register, he would have left it there for those who would play it on such an instrument. Dr. Rust also seemed to have been unable to find it in his heart to leave the whole bar silent as in the original. He may have considered it a mistake to be corrected. Or he may have considered it – just like the improper effects – to be too daring.

As much as Dr. Rust's enhancements are typical of this age of paraphrases and reminiscences, times and genres in which "bigger" was often thought to be "better," it is hardly surprising that Dr. Rust left out all the instances in the original Rust compositions

[1014] Reproduced by permission of the Bayerische Staatsbibliothek in München (D-Mbs 2 Mus. Pr. 3882/2).
[1015] Manuscript at the Staatsbibliothek zu Berlin – Preussischer Kulturbesitz, Musikabteilung mit Mendelssohn-Archiv. (D-B Mus.ms.autogr. F.W. Rust 7 N) Reprinted by permission.
[1016] Reproduced by permission of the Bayerische Staatsbibliothek in München (D-Mbs 2 Mus. Pr. 3882/1).

that contained any kind of extensions as we have seen earlier. However revealing or shocking to us today, this disillusioning case of "less is more" confirms the tendency we have already noticed. Extended techniques that result in the extension of the proper sound realm of the piano were hardly of any interest in the 19th century. If they were present in scores of earlier music, they would apparently be erased sooner than dealt with.

3.3.3.3.2 Playing with resonance

On the borderline of this study's subject, a few 19th century compositions show an interest in improper piano timbre: consecutively released keys of a chord can accentuate remaining resonance; silently (or very quietly) depressed keys act as filters for existing resonance.

3.3.3.3.2.1 Negative arpeggios

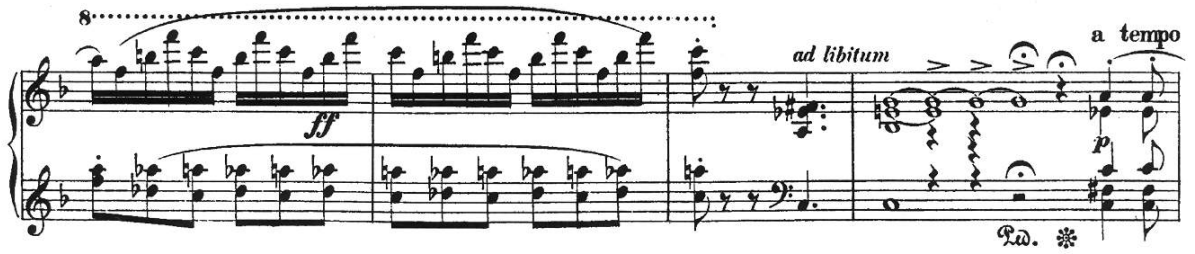
Because he nowhere used it in a published composition, we have not paid attention to it yet, but Beethoven has experimented with the effect of timbre filtering early on in his compositional career. In the so-called Kafka sketchbooks (1793-1794), Beethoven jotted down the following idea:
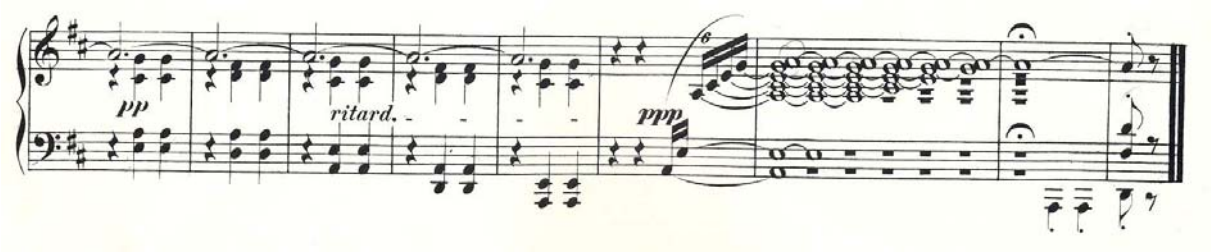


Example 3.384. L. van Beethoven: from the *Kafka sketchbooks*, 51v, p. 205[1017]

Beethoven did not use the idea in his compositions but we find the very same technique in several of Schumann's early works, for example in his first two officially numbered works: the *Abegg-Variationen* opus 1 (1829-30) and *Papillons für das Pianoforte* opus 2 (1829-1831). By releasing consecutive keys in a chord, the next one in line becomes audible as if accentuated (hence the three accents over the right hand in bar 75 of ex. 3.376). In opus 1 Schumann thus cleverly completes the title-theme *a-b♭-e¹-g¹-g¹* (notice how the *c* in the bass is released to make the second *g¹* stand out, reinforced by the damper pedal); in opus 2 the arpeggio that formed the A7 chord is echoed by releasing the keys in the same order. (Ex. 3.385-3.386.)

[1017] Reproduced from *Autograph miscellany from circa 1786 to 1799: British Museum additional manuscript 29801, ff. 39-162; the "Kafka sketchbook" / Ludwig van Beethoven*. Edited by Joseph Kerman. (1970, London: The Trustees of the British Museum), Volume II, p. 205. © British Library Board shelf mark Add.29801.

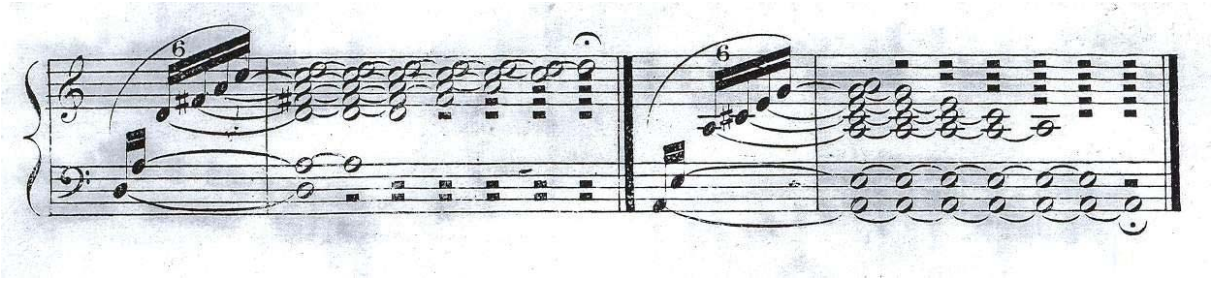


Example 3.385. R. Schumann: *Abegg-Variationen* opus 1 (1829-30), *finale*, bars 71-74.[1018]



Example 3.386. R. Schumann: *Papillons für das Pianoforte* opus 2 (1829-31), final bars.[1019]

In his next opus number, the *Etudes pour le Pianoforte d'après les Caprices de Paganini avec doigter, exercices préparatifs et avant-propos sur le but que l'éditeur s'y propose*, opus 3 (1832), Schumann's goal was "to get intimately close to the original while all the same adapting it to the character and mechanical means of the harpsichord [sic]."[1020] The chords he sets as "a kind of study for the Adagio" – referring to the slow part he extracted from Paganini's third *Capriccio* – are the exact same as in his previous opus number. (Ex. 3.387.)



Example 3.387. R. Schumann: *Etudes pour le Pianoforte d'après les Caprices de Paganini* opus 3, preface.
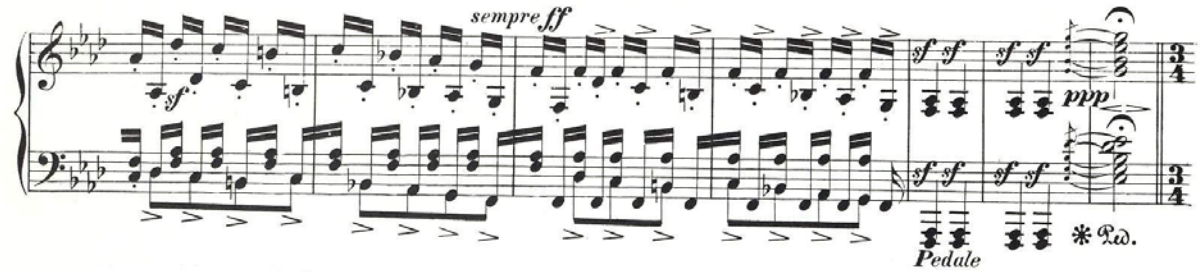
These inverse arpeggios do not appear anywhere in his arrangement of the third caprice for which he suggests them to be an exercise. When in *Papillons* Schumann had integrated the technique into the musical material, it is here explained as a general exercise in the essence of legato playing. In the five previous such exercises – all preparing for the third study – Schumann offers various drills for "silent finger substitution": from simple finger replacement in a scale, double notes and the outside voices of chords, to inner notes in chords and even taking over complete right hand chords with the left hand. It is in the line of these that the filtering exercise is to be understood: training the way the finger leaves the key while others are still depressing keys. As no aspect of the sound is altered by the action, this technique of taking over

[1018] *Robert Schumanns Werke Serie VII: Für Pianoforte zu zwei Händen.*Leipzig: Breitkopf & Härtel, 1881-1912. Plate R.S.39.
[1019] *Robert Schumanns Werke Serie VII: Für Pianoforte zu zwei Händen.*Leipzig: Breitkopf & Härtel, 1881-1912. Plate R.S.40.
[1020] « de s'attacher intimément à l'original tout en l'adaptant au caractère et aux moyens mécaniques du clavecin. »

already depressed keys is borderline improper, especially compared to what Friedrich Wilhelm Rust did with it on the clavichord. (See 3.2.6.2.1.)

3.3.3.3.2.2 Timbre filtering

Deviating from this particular form of filtering existing sounds through inverse arpeggios is the effect Schumann thought of for his *Carnaval* opus 9 (1834-35). (Ex. 3.388.)

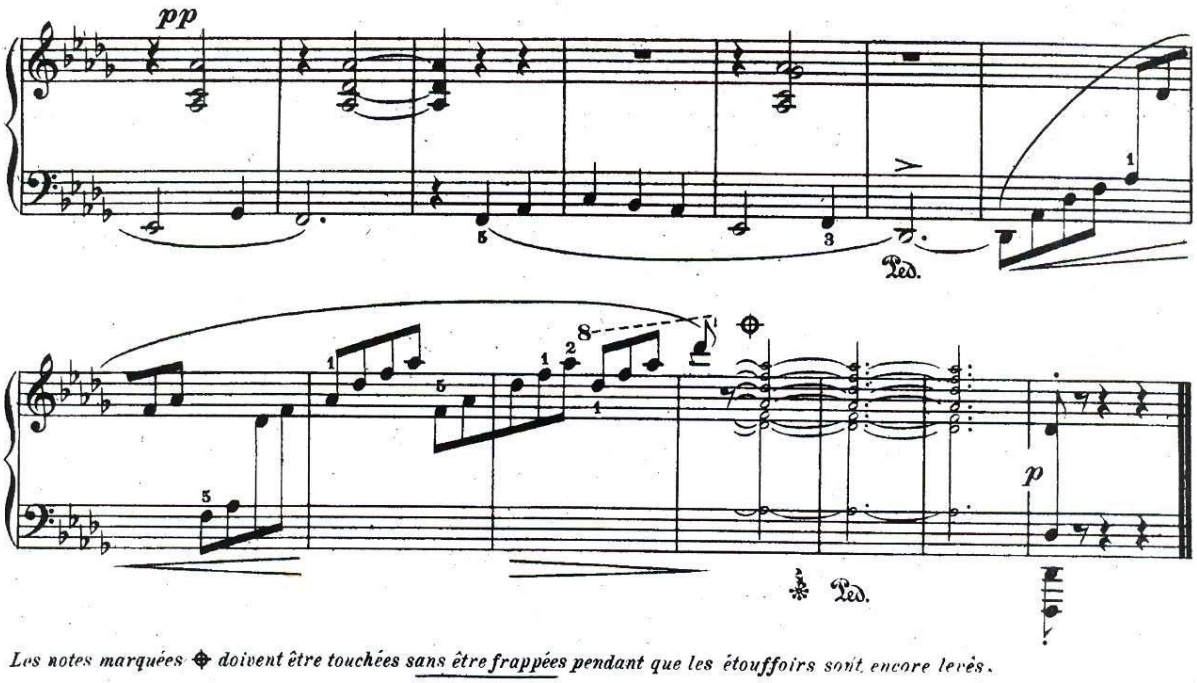


Example 3.388. R. Schumann: *Carnaval* opus 9 (1834-35), *Paganini*, final bars.[1021]

Very strikingly, this instance appears at the end of the *scène mignonne* depicting Paganini, as if referring to some flageolet effect on the violin. But there is no real flageolet sound: Schumann needs the performer to still *play* the E♭^{7} chord. The soft dynamic serves to hide the articulated sound beneath the loud bass notes. Only after these have died out, by releasing the pedal, does the indicated swelling effectuate the surprising modulation that brings the devilishly wild *Intermezzo* back to the gentle *Valse Allemande*. It is in fact the lifting of the pedal that allows for the new chord to "swell," adding to the E♭^{7} chord some vibrations that relate sympathetically to some of the notes in the loud deep bass chords. These extra vibrations enable the pianist to actually control the hairpin crescendo during sounds that cannot be manipulated anymore by proper finger technique.

More than 60 years later Saint-Saëns would write down the next step in the evolution of such a filtering technique. In his *Valse Nonchalante* (1898) he asks the performer to extract a 7-note D♭ major chord from the preceding 5-octave D♭ major harmony by silently depressing keys. (Ex. 3.389.)
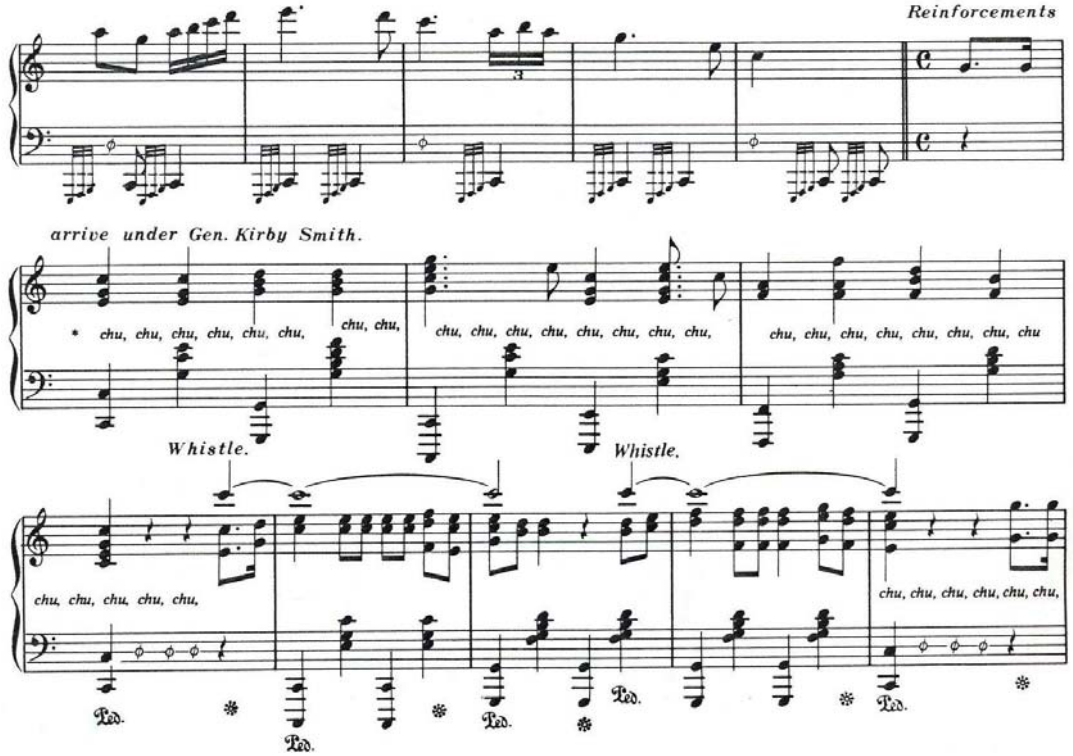
[1021] *Robert Schumanns Werke Serie VII: Für Pianoforte zu zwei Händen.*Leipzig: Breitkopf & Härtel, 1881-1912. Plate R.S.47



Example 3.389. C. Saint-Saëns: *Valse Nonchalante* (1898), final bars. "The notes marked ⊕ must be depressed without being hit while the dampers are still lifted."

3.3.3.3.3 1866 Blind Tom: *The Battle of Manassas* II

Apart from the clusters in his battle piece (see 3.3.3.2.1), Blind Tom introduced some new improper techniques into the printed repertoire. When – in the recounted story of the battle – the confederate reinforcements arrive by train, the pianist is required to use his vocal chords to add to the keyboard clusters (ex. 3.390).



Example 3.390. Blind Tom: *The Battle of Manassas*, bars 174-186.

Again a footnote explains the performance techniques:

> This "chu, chu" (imitating the noise of the engine) also the subsequent "Whistle" Tom makes with his mouth. Those of our players who may desire to add the exercise of their vocal organs to that of their fingers for their friend's amusement, can do the same; but the piece is complete without.

After this cacophony, the battle "rages more furiously" to end in a "retreat Il più presto possibile," the whole closed off with two solo cannon shots.

It may be impossible to accurately assess how this piece is representative for the use of extended techniques in the 19th century. It may be the most singular piano piece from before the 20th century; it may be one of many from the 19th century cabaret corner of musical repertoire. For sure it is the first piece we could find in which several essentially different extended techniques are used alongside each other, simultaneously even. Previously, battle- and storm-pieces would show the use of clusters *or* of glissandos, and Rust's interest to the glissando was confined to his sketches and not combined with his string piano techniques. Blind Tom developed his interest in programmatic performance to bring together some of the furthest extensions of piano playing technique.

3.4 ca1900-2000: The age of the extended piano

3.4.1 Historical context: (re)moving all boundaries

The context for what happened to the extended piano in the 20th century may be described from two perspectives. On the one side, there are the general, non-artistic developments that serve as metaphors to interpret the evolution of our subject, and on the other, those factors that can be traced as more direct influences.

Following up on what had already been a century-long tradition of exploring the world, a combination of increased travel power and unquenchable curiosity made 20th century mankind discover whatever was left unknown in the world, even venturing beyond to the moon and deep space. In the 19th century, such sense of expansion had led to developments in construction of the piano that could be linked directly to the evolution of our story, but compared to its predecessors the 20th century piano hardly evolved from the ideals and standards that had been set by Steinway in the late 19th century. Nevertheless, the urge to further explore unknown regions is mirrored in the fact that, by the end of the 20th century, every part of the piano had been tried out for sound production and virtually every conceivable attitude towards the instrument had been expressed. Even the aggressive self-serving interest with which humans have wanted to own the planet and its resources can be seen reflected in some Fluxus artists' extreme view of the piano as an object to be handled with a destructive lack of respect.

Another powerful symbol of the 20th century is the early 1900's break-through in physics, with Max Planck and Albert Einstein showing that energy and light is not emitted continuously but in particles.[1022] The consequent development of quantum physics led to the abandonment of a longstanding trust in the Newtonian framework of classic physics and can be set as an example of perhaps the most typical characteristic of 20th century modernism: breaking down barriers and taboos. If the 19th century pianistic evolution had been gradual and accumulative in every sense with an ever larger keyboard, an ever more powerful sound and ever more chromatic biotope to steer the evolution of keyboard writing, there had been no clashes, no real confrontations with the past. In contrast, the 20th century artistic changes were iconoclastic.

Easily comparable to the impact on natural science of Planck's accomplishment is what Schoenberg's denouncing of tonality did to music. But the concept of bestowing equality on the individual tones of the chromatic 12-tone collective is just as much a representation of the processes of emancipation and democratisation in society. From the suffragettes to the late-century attempts by the US to spread and support democratic ideals around the world, these ideas of representation and individual equality have pervaded the western world and are easy to relate to the rise in success of popular entertainment. The rise of popular culture, emancipating from its "low" artistic position compared to that of "contemporary classical" music, had been desired as early as 1918[1023], but really only came into play in the second half of the 20th century. Before, other developments can be discerned to have had direct influence on the artistic course of music and, more specifically, our subject.

Of the contextual factors relevant to the 20th century history of the extended piano, the foremost is technology. The application of 20th century scientific progress through the industrialised practices had a deep impact on everyday life. The combustion engine and

[1022] Roberts 1993, p. 810.
[1023] The Russian futurists decreed that art should be democratized. (Drijkoningen 1991, p.21.)

electricity quickly overshadowed horsepower and steam forces to become the main sources of power servicing the individual's freedom and comfort as much as society's industrial and other needs. In the US, electricity in homes rose from 24 percent in 1917 to nearly 90 percent in 1940.[1024] If there were still only fewer than 500.000 cars and trucks on the American roads in 1910[1025], motorised traffic was already important enough in the Paris city of 1909 to restrict the Champs-Elysées to this type of transport.[1026] The exposure to sheer noise on the streets must have left an indelible impression on more people than those who were already exposed to it in factories. If Dada favoured everyday life as artistic material, trying to transfer the concept of a "ready-made"" to music led straight to noise. Echoing the words of one contemporary commentator – "among the thousand symbols of ultimate energy, the dynamo was not so human as some, but it was the most expressive"[1027] – composers were inspired to mimic the machine with traditional acoustic instruments (e.g. Honegger's 1923 *Pacific 231* tone-picture of a train) and even use them to play parts in compositions (e.g. airplane propellers and electric bells in Antheil's 1924 *Ballet Mécanique*, or a factory whistle and a Ford horn in Frederick S. Converse's 1927 *Flivver Ten Million*, celebrating the 10.000.000th Ford automobile). Even dreams of entirely new sounds were fuelled by the optimistic promises of the machine age. Radio stations' sound studios, equipped to create sound effects for dramatic productions, became the cradle of electronic music. In the mean time, many new instruments were developed to produce new sounds (*Intonarumori*, *Trautonium*, *Theremin*, *Ondes Martenot*). In the second half of the century, machines to make sounds by synthesizing its components would all but dethrone acoustical instruments. But machines were imagined to replace the performer as well. Between 1910 and 1925, 85% of all pianos in the US were automated[1028], impressing composers like Stravinsky and Nancarrow to write a specific type of music that machines could play better than humans.

Looking for new sounds, composers widened their focus to look for unconquered musical outskirts. If Prokofief was convinced that much could still be written in C major, Alois Haba and many others ventured outside of the tempered tuning system, Cage sought to embrace *all* sounds, not just the pitched ones, and Cowell dreamed of the "whole world of music". Globalisation is a second major 20th century force to have had a marked effect on the development of the arts. From foreign worlds, indigenous cultural practices were brought back to the West and this exotism adjusted the artistic ears to unheard-of instruments (e.g. the gamelan) as well as philosophical attitudes that could be applied to aesthetic attitudes (e.g. Zen-Buddhism). But the time came that a "new" continent grew up to stand on its own legs: the United States of America became a "super power" and this was expressed in a changed artistic consciousness as much as in geopolitics. If the late-19th century American composer typically went to Europe to fine-tune his craft with lessons by German composers like Josef Rheinberger, Carl Reinecke or Joachim Raff,[1029] the 20th century is marked by US composers and performers that not only reacted against this "old school" practice by establishing – often from scratch – their own individual approaches, but even took their style to Europe, often scandalising the once venerated continent.[1030]

[1024] Wilson 1986, p. 25.
[1025] Wilson 1986, p. 26.
[1026] Information from the main exhibit at the Musée de l'automobile at Le Mans, France.
[1027] Adams 1946, p. 380.
[1028] http://www.qrsmusic.com/timeline.asp. Last accessed September 18, 2009.
[1029] E.g. Horatio Parker, George W. Chadwick and Edward MacDowell.
[1030] Foremost examples – at least in relation to our subject – include Henry Cowell, Leo Ornstein, George Antheil, John Cage, Morton Feldman and Earl Brown. This turn-around had effects that were noticeable as late as the end of the 20th century, with for instance Cage writing *Europeras* to "give back" to Europe their operatic tradition.

The artist's renewed need for professional profiling is a third major factor in the 20th century development of this story. As much as an *avant-garde* mission could lead to artistic progress for its own sake, the modernist composer was best off with a specialised or even personalised focus on the forefront of his field. Already in the previous centuries, artists had needed to stand out and claim as well as defend a place of their own in the musical market: profiling a specialty, e.g. as a traveling virtuoso, was helpful in being identified as an authority. But in the 20th century artists often spent whole careers focusing on a niche that they had personally created, whether it be the mobiles of Alexander Calder, Jackson Pollock's action painting technique or Harry's Partch's custom-made instruments. Such sharp profiles were part of a new definition of the artist who not only can act freely on his own insights, independently of institutions and traditions, but who can also make art that becomes an aesthetic value on its own instead of a means to an end.[1031] Even the techniques with which art is made can be justified as the artistic product. Anything can be art and anybody can be an artist: it may suffice to deny the generally accepted rules, fundaments and boundaries.

3.4.2 1900-1920's: The second wave

The first part of the 20th century saw a surge in the use of extended techniques comparable to the boom we have seen at the end of the 18th century. After the singular focus on the glissando in the 19th century, the period from roughly 1900 to 1939 contains basically all the extensions we have encountered since the early 18th century, plus newly invented types. For most of this period, it was not Europe that led the way, but rather the new continent across the Atlantic Ocean. Strictly chronological, though, the action really started in the old continent.

3.4.2.1 The glissando in the early 20th century

Between 1900 and 1930 the late-19th century trend of decreased interest and development of the glissando, as we demonstrated in the previous chapter, was stopped and countered by a surge in interest. (See table 3.1). In those 20 years we found 446 glissandos in 104 pieces by 35 composers. Almost a third of those glissandos (142) in a third of these pieces (32) were written by 8 French composers, mostly by Ravel (87 in 17 works) and Debussy (25 in 8 works).[1032] Other notable champions of the early 20th century glissando were Prokofief (38 in 11 works), Ornstein (34 in 8) and Godowsky (7 in 4 works). (Table 3.2. – for the legend to the data, see 3.3.2.1.)

[1031] Drijkoningen 1991, p.16.

[1032] See 3.3.2.1. for details on our counting method for this matter. The numbers here only apply to the period 1900-1920, earlier works by e.g. Debussy and Godowsky were included in the count of 19th century glissandos. Transcribers were counted as composers when they were not one and the same.

	Composer	Title of composition	Date	Number and types of glissandos	
1	M.Moszkowski	2 Pieces opus 80	1900	2	2*14n-U-R-1
2	Cl. Debussy	*Pour le Piano* , 1st movement	1901	5	2*23n-U-R-1; 2*25n-U-R-1; 1*30n-U-R-1
3	M. Ravel	*Jeux d'Eau*	1901	1	1*25n-D-R-1#
4	E. Elgar	*Allegro* opus 46	1901	2	1*13n-U-R-1
5	E. Grieg	*Norwegischer Tänze* opus 71, *Halling*	1901	1	1*27n-U-R-1
6	M. Moszkowski	*Valse de concert* opus 69	1902	1	1*24n-D-R-3
7	Fr. Busoni	Concerto, 1st movement	1904	4	1*(28n-U-R-1+28n-U-L-1); 1*(17n-U-R-6+17n-U-L-1)
8	B. Bartók	Rhapsody opus 1 for solo piano	1904	8	4*13n-U-R-1; 2*14n-U-R-1; 1*20n-U-R-1; 1*17n-U-R-1
9	B. Bartók	Rhapsody opus 1 for piano and orchestra	1904	6	5*14n-U-R-1; 1*17n-U-R-1
10	M. Ravel	*Une Barque sur l'ocean*	1905	2	1*12n-U-R-1#; 1*13n-D-R-1#
11	M. Ravel	*Alborado del Gracioso*	1905	7	1*14n-U-R-4; 1*14n-D-R-4; 1*14n-U-R-3; 1*14n-D-R-3 1*13n-U-R-3; 1*26n-D-R-3; 1*23n-U-R-3
12	M. Ravel	*Histoires Naturelles* , part I: *Le Paon*	1906	2	1(19n-D-R-1#+1*12n-U-L-1#)-X
13	M. Ravel	*Histoires Naturelles* , part V: *Le Pintade*	1906	1	1*14n-U-R-1
14	N. Medtner	Sonata in C	1907	1	1*21n-U-R-1
15	Fr. Busoni	Elegy IV	1907	1	1*14n-U-R-3
16	Fr. Busoni	Elegy VI	1907	1	1*25n-U-R-1
17	D'Indy	Sonata in E opus 63, mvmt. II	1907	1	1*12n-U-R-1
18	L. Godowsky	*Paraphrase 'Künstlerleben'*	1907	4	2*13n-U-R-1; 2*15n-D-R-1
19	L. Godowsky	*Paraphrase 'Die Fledermaus'*	1907	1	1*14n-U-R-1
20	X. Scharwenka	Concerto nr. 4 opus 82, 3rd movement	1908	2	1*24n-U-R-1; 1*18n-D-L-1
21	M. Ravel	*Gaspard de la Nuit,* 1st movement *Ondine*	1908	3	1*48n-U-R-1; 2*19n-U-R-1
22	M. Ravel	*Rapsodie Espagnole* , part IV: *Feria* (orchestra)	1908	5	3*22n-U-R-1; 1*(22n-U-R-1+22n-U-L-1)
23	M. Ravel	*Rapsodie Espagnole* , part IV: *Feria* (4-hand piano)	1908	3	2*21n-U-R-1; 1*15n-U-R-1
24	M. Ravel	*L'heure Espagnole*	1908	5	1*14n-U-R-1; 1*29n-D-R-1; 1*14n-U-R-1#; 1*25n-D-R-1# 1*29n-U-R-1
25	L. Godowsky	Renaissance III	1909	1	1*14n-U-R-1
26	S. Rachmaninoff	Concerto 3 opus 30, 3rd movement	1909	1	1*16n-U-R-1
27	F. H. Klickmann	*Knock-out Drops*	1910	1	1*21n-D-R-1
28	Cl. Debussy	*Trois Ballades de François Villon*	1910	1	1*34n-U-R-1
29	M. Ravel	*Daphnis et Chloé* (piano solo)	1910	2	1*13n-U-R-1#; 1*27n-U-R-1
30	A. Berg	*4 Lieder* opus 2, nr. 4	1910	2	1*(1*9n-U-R-1#; 1*13n-D-L-1)(X)
31	A. Glazunov	Concerto 1	1910-11	1	1*30n-U-R-1
32	M. Ravel	*Ma Mere l'Oye* , part III (four-hand piano)	1911	2	2*11n-U-R-1#
33	M. Ravel	*Ma Mere l'Oye* , part IV (four-hand piano)	1911	1	1*25n-U-R-1
34	M. Ravel	*Ma Mere l'Oye* , part V (four-hand piano)	1911	15	3*14n-D-R-1; 9*9n-U-R-1; 3*8n-U-R-1
35	M. Ravel	*Ma Mere l'Oye* , part V (orchestra)	1911	15	3*22n-D-R-1; 12*15n-U-R-1
36	L. Godowsky	Sonata	1911	1	1*13n-U-R-1
37	Cl. Debussy	*Images* nr. 3: *Rondes de printemps*	1912	1	1*24n-U-R-1
38	S. Prokofief	Concerto 1 opus 10	1912	6	2*17n-U-R-1; 4*13n-U-R-1
39	S. Prokofief	*Four Pieces* opus 4, nr. 4 *Suggestion Diabolique*	1912	2	1*29n-U-R-1; 1*28n-U-R-1
40	S. Prokofief	*Toccata* opus 11	1912	1	1*35n-U-R-1
41	S. Prokofief	Concerto 2 opus 16, movement I	1912-13	1	1*24n-U-R-1

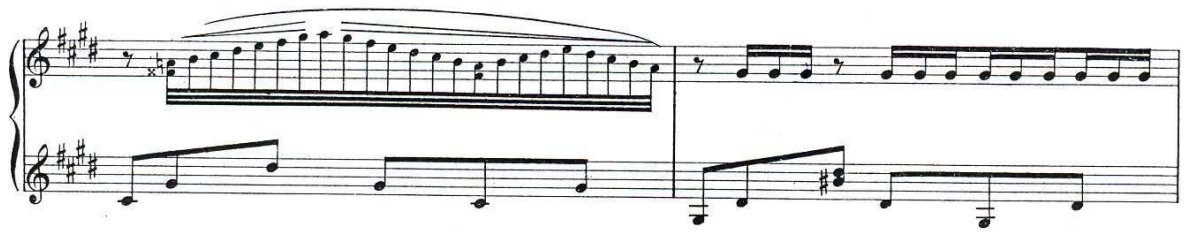
	Composer	Title of composition	Date	Number and types of glissandos	
42	S. Prokofief	Concerto 2 opus 16, movement III	1912-13	9	5*11n-D-R-1; 4*9n-D-R-1# 1*9n-D-R-1; 1*13n-D-R-1
43	S. Prokofief	Concerto 2 opus 16, movement IV	1912-13	2	1*27n-U-R-1; 1*24n-U-R-1
44	S. Prokofief	*Ten Pieces* opus 12, nr, 7	1913	8	8*14n-U-R-1
45	Cl. Debussy	*Feux d'Artifice*	1913	7	1*(37n-D-L-1+ 37n-D-R-1#)(1); 1*30n-D-R-1#; 2*15n-U-R-1; 2*11n-U-R-1#
46	Cl. Debussy	*La Boîte à Joujoux*	1913	1	1*16n-D-R-1
47	G. Pierné	*Variations en Ut mineur*	1913	3	2*27-U-R-1; 1*27n-D-L-1
48	I. Stravinsky	*Rite of Spring* (4-hand version)	1913	6	2*14n-U-R-1; 2*15n-U-R-1; 1*11n-U-R-1; 1*13n-U-R-1;
49	S. Prokofief	*Sarcasmes* opus 17, nr. 4	1912-14	1	1*22n-U-R-1
50	L. Ornstein	*Dwarf Suite* opus 11, nr. 4 *Serenade of the Dwarfs*	1913/14	1	1*25n-U-R-1
51	L. Ornstein	*Dwarf Suite* opus 11, nr. 6 *Marche Grotesque*	1913/14	8	4*(43n-U-R-1+43n-U-L-1)-11
52	E. Von Dohnanyi	Variations on a Nursery Tune	1914	4	1*20n-D-R-1#; 1*28n-U-R-1; 1*20n-U-R-6; 1*36n-U-R-1
53	M. Ravel	Trio, part II: Pantoum	1914	2	2*12n-U-R-1#
54	M. Ravel	Trio, part IV: Final	1914	1	1*22n-U-R-1#
55	Cl. Debussy	*Six Épigraphes antiques* (solo piano)	1914	2	1*16n-U-R-1; 1*14n-U-R-1
56	Cl. Debussy	*Six Épigraphes antiques* (4-hand piano)	1914	2	1*17n-U-R-1; 1*15n-U-R-1
57	L. Ornstein	*Three Moods* opus 22, nr. 3	c1914	2	1*(28n-D-R-1+20n-D-L-1#)
58	Cl. Debussy	*Etude pour les huit doigts*	1915	6	4*10n-D-L-1#; 1*9n-D-R-1; 1*16-D-R-1
59	M. De Falla	*Nights in the Gardens of Spain*, 1st movement	1915	7	3*12n-U-R-1#; 1*21n-D-L-1#; 1*19n-U-R-1#; 2*11n-D-L-1#
60	M. De Falla	*Nights in the Gardens of Spain*, 3d movement	1915	5	1*8n-U-R-10; 1*12n-D-L-1; 1*15n-U-R-1; 1*19n-D-L-1; 1*21n-U-R-1
61	K. Szymanowski	*Metopes* opus 29, nr 3: Nausicaa	1915	1	1*22n-U-R-1
62	Debussy/Charlot	*Première Rapsodie*	1915	1	1*13n-U-R-1
63	Holst	*Planets* nr VI	1914-16	1	1*34n-U-R-1
64	L. Ornstein	*A la chinoise op. 39*	1916	7	2*29n-D-R-1; 2*29n-U-R-1; 1*28n-D-R-1 1*(35n-D-R-1+1*25n-D-L-1#)
65	Respighi	*Fontane di Roma* (celesta and piano parts)	1916	21	4*22n-U-R-1; 1*16n-U-R-1; 1*20n-U-R-1; 2*28n-U-R-1 2*28n-D-R-1; 2*35n-U-R-1; 2*35n-D-R-1; 3*29n-U-R-1 1*29n-D-R-1; 1*29n-D-L-1; 2*29n-U-L-1;
66	Ch.T. Griffes	*Roman Sketches* nr 2	1912-17	1	1*20n-L-U-1#
67	A. Glazunov	Concerto 2	1917	2	1*28n-D-R-1; 1*30n-U-R-1
68	N. Medtner	Concerto 1	1914-18	3	1*16n-U-R-1; 2*25n-U-R-1
69	L. Ornstein	*The Corpse*	1918	12	4*27n-D-R-1; 8*13n-D-R-1
70	H. Villa-Lobos	*Simples Coletânea, Em um Berço Encantado*	1918	2	1*11n-D-L-1; 1*20n-D-L-1
71	H. Villa-Lobos	*Simples Coletânea, Rhodante*	1919	3	2*13n-U-R-1; 1*15n-U-R-1#
72	L. Ornstein	*Arabesque* opus 42, nr. 4	c1918	1	1*32n-U-R-1
73	L. Ornstein	*Arabesque* opus 42, nr. 9	c1918	2	1*27n-D-R-1; 1*33n-D-R-1
74	H. Villa-Lobos	*Suite Floral* opus 97, *Alegria na Horta*	1919	1	1*17n-U-R-1
75	O. Respighi	*Fontane di Roma* (4-hand transcription)	1919	2	1*15n-U-R-1; 1*19n-U-R-1
76	S. Prokofief	*The Love for 3 Oranges*	1919	1	1*14n-U-R-1
77	M. De Falla	*Fantasia Baetica*	1919	10	3*16n-U-R-1; 3*19n-D-L-1; 2*20n-U-R-1; 2*20n-D-L-1
78	V. D'Indy	*Pour les Enfants de tout Age*, nr. 24	1919	9	5*16n-U-R-1#; 4*15n-D-L-1

	Composer	Title of composition	Date	Number and types of glissandos	
79	Rachmaninov	cadenza to Liszt's Xth Hungarian Rhapsody	1919	2	1*27n-U-R-1; 1*26n-D-R-1
80	De Falla	*El Amor Brujo*	1915-1920	7	3*18n-L-D-1#; 2*24n-U-R-1; 1*15n-D-L-1#; 1*28n-U-R-1
81	A. Tcherepnin	*Feuilles Libres* , nr. 3	1920	11	3*c22n-D-R-1; 3*25n-D-R-1; 3*40n-U-R-1; 2*40n-D-R-1
82	M. Ravel	*La Valse* (two-pianos)	1920	20	1*(23n-D-L-1# +30n-D-L-1) 1*(23n-D-R-1# +31n-D-L-1) 3*21n-U-R-1; 2*21n-D-R-1; 1*22n-D-R-1 2*12n-U-R-1# 1*(13n-U-R-1# +18n-U-L-1) 1*(31n-D-R-1# +43n-D-L-1) 1*(20n-U-R-1# +28n-U-L-1) 1*(21n-D-R-1# +29n-D-L-1)
83	M. Ravel / L. Garban	*La Valse* (4-hand piano)	1920	14	2*30n-D-R-1; 1*13n-U-R-1; 2*15n-D-R-1 2*14n-R-R-1; 1*12n-U-R-1; 2*12n-D-R-1 1*25n-D-R-1; 1*14n-D-R-1; 1*22n-U-R-1; 1*37n-D-R-1
84	D. Milhaud	*5 Études*	1920	1	1*25n-D-R-chord
85	H. Villa-Lobos	*Suite Prôle do Bébé, Moreninha*	1921	1	1*10n-U-R-1
86	L. Ornstein	*Valse Buffon*	1921	7	2*11n-D-R-1; 2*11n-D-L-1; 1*23n-D-L-1; 1*18n-D-R-1# 1*20n-U-R-1
87	S. Prokofief	Concerto nr. 3, 1st movement	1921	4	3*15n-U-R-1; 1*12n-U-R-1
88	S. Prokofief	Concerto nr. 3, 3rd movement	1921	1	1*21n-U-R-1
89	I. Stravinsky	*Trois movements de Pétrouchka* , 1st movement	1921	1	1*16n-U-R-1;
90	I. Stravinsky	*Trois movements de Pétrouchka* , 3rd movement	1921	16	1*25n-U-R-1; 1*16n-U-R-1; 2*14n-U-L-1; 4*13n-U-L-1 2*13n-U-L-1/8; 2*21n-U-R-1; 1*26n-U-R-1 1*10-U-R-1; 1*10-D-R-1; 1*40n-D-R-1
91	P. Hindemith	*Suite "1922", Shimmy*	1922	2	1*21n-D-R-1; 1*14n-U-L-1#
92	I. Stravinsky	*Les Noces*	1923	48	2*10n-D-R-1; 1*13n-U-R-1; 1*15n-U-R-1; 2*16n-U-R-1; 4*18n-U-R-1; 20*19n-U-R-1; 1*20n-U-R-1; 4*21n-U-R-1; 7*23n-U-R-1; 2*25n-U-R-1; 2*26n-U-R-1; 2*43n-D-R-1
93	G. Gershwin	*Rhapsody in Blue*	1924	1	1*29n-U-R-1
94	O. Respighi	*I Pini di Roma*	1924	2	1*24n-D-R-1; 1*24n-D-L-1
95	G. Gershwin	Concerto in F, 1st movement	1925	1	1*13n-U-R-1
96	H. Villa-Lobos	*Rudepoema*	1926	3	1*19n-U-R-1; 1*21n-U-R-1; 1*20n-D-R-1
97	B. Bartók	*Sonata* , 1st movement	1926	1	1*23n-U-R-1
98	B. Bartók	Concerto nr. 1, 1st movement	1926	2	2*14n-U-R-1
99	B. Bartók	Concerto nr. 1, 2nd & 3rd movement	1926	8	1*44n-U-R-1; 1*17n-D-L-1; 1*21n-U-R-1 1*8n-U-R-1; 1*9n-U-R-1; 1*13n-U-R-1; 1*15n-U-R-1
100	A. Copland	Concerto	1926	1	1*27n-U-R-1
101	D. Shostakovich	Sonata nr. 1 opus 12	1926	7	1*15n-D-R-1; 3*7n-D-R-8; 1*7n-D-R-1; 1*8n-D-R-1; 1*7n-U-R-1
102	L. Ornstein	Five Songs, nr. 4	1927-28	1	1*18n-U-R-1
103	H. Villa-Lobos	*Mômo Précoce* for piano and orchestra	1929	1	1*16n-U-R-1
104	O. Messiaen	*Preludes, Les sons impalpables du rêve*	1929	1	1*27n-U-R-1
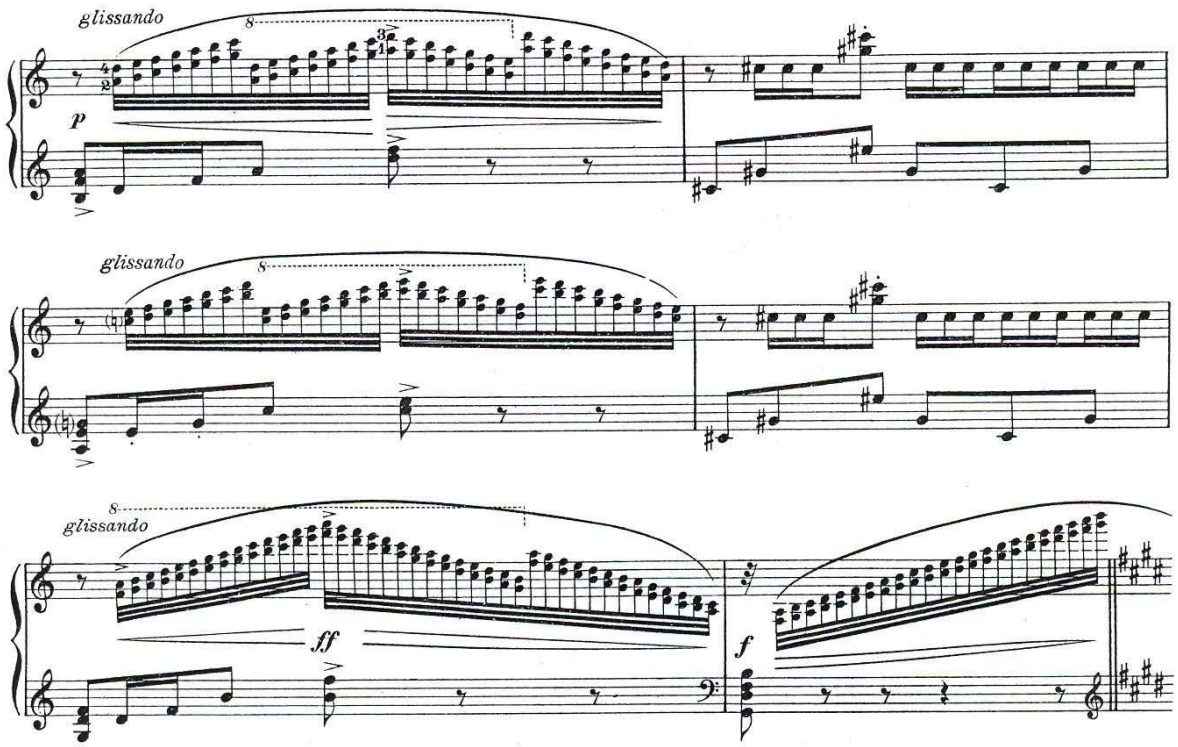
Some of the glissando's presence in this period shows to be a straight continuation of developments and achievements that took place in the 19th century. 23 of the 104 pieces (with 75 of 446 glissandos) are works for piano and orchestra, stressing the popular place that the glissando already had in concerto-style compositions. Almost all glissandos are now literally indicated as such, with the exception only of "glissato" (Moszkowski opus 80), "Glissé"/"glissez" (D'Indy), and the lack of any indication only once in von Dohnanyi. Other aspects of the glissando's advance in this period are also based on what was started before (though taken further). A number of entirely new ideas are experimented with as well.

3.4.2.1.1 Double- and triple-note glissandos

There are surprisingly less double-note glissandos in this 1900-1920 period. We counted only 2 in sixths, none in octaves, 7 in thirds and 2 in fourths. The latter and most of those in thirds are found in Maurice Ravel's 1905 *Alborado del gracioso,* where he diversifies the glissando types in an interesting build-up. The glissando passage (ex. 3.392)– a variant of an individually articulated single-note flourish (as in ex. 3. 391) – is organized along the sequence *b-a-g* at the beginning of each system, in the bass of the left hand chords that alternate with the C# major harmonies. (Ex. 3.392.) There is no obvious reason why the first glissando is in fourths and the next two in thirds. The initial glissando's first top note had to be a D because that way the glissando departs from and returns to the central C# (comparable to the individually articulated passage in ex. 3.358). Possibly, Ravel did not want to double the bass notes in the grip of the glissando, hence the lower glissando note would have to be an A instead of a B. To counter the downward movement of the bass line with an upward movement of the glissando's first note, he then needed to continue the sequence of glissandos with those in thirds.
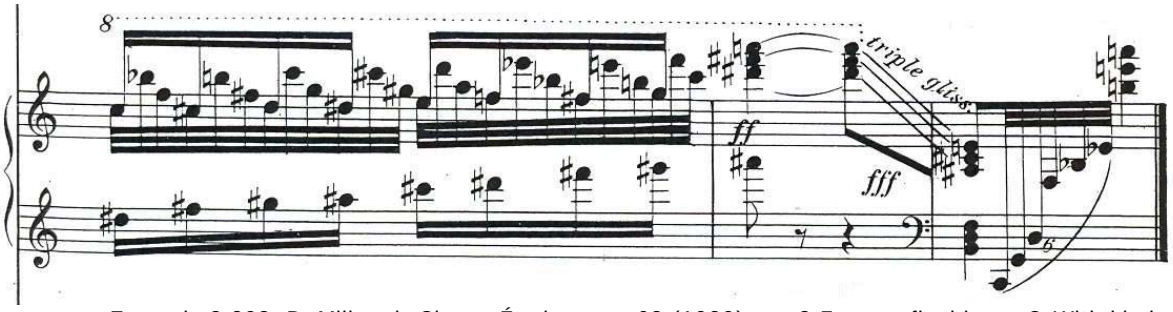


Example 3.391. M. Ravel: *Miroirs* (1905), nr. 4 *Alborado del gracioso*, bars 45-46. Editions A. Durand et Fils.



Example 3.392. M. Ravel: *Miroirs* (1905), nr. 4 *Alborado del gracioso*, bars 176-181. Editions A. Durand et Fils.

Most peculiar is the triple glissando in one of Milhaud's 5 etudes for piano and orchestra (1920). It is not clear whether it should exactly be a combination of one white-key and two black-key glissandos or just all on the white keys. (Ex. 3.393.) As written, the former is physically possible, though likely to be painful; if the left hand is put into play, more comfort is available. At any rate, it is doubtful that anyone would notice if, in the time span of only a quarter note, all three glissandos where diatonic.

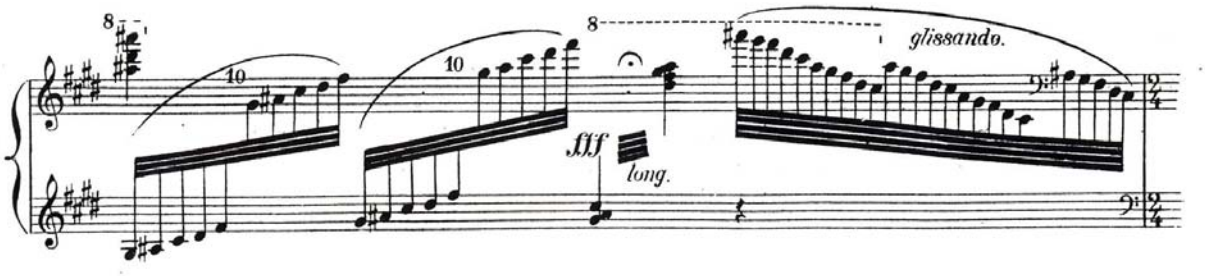


Example 3.393. D. Milhaud: *Cinque Études* opus 63 (1920), nr. 3 *Fugues*, final bars. © With kind permission by UNIVERSAL EDITION A.G., Wien.

3.4.2.1.2 The solo black-key glissando

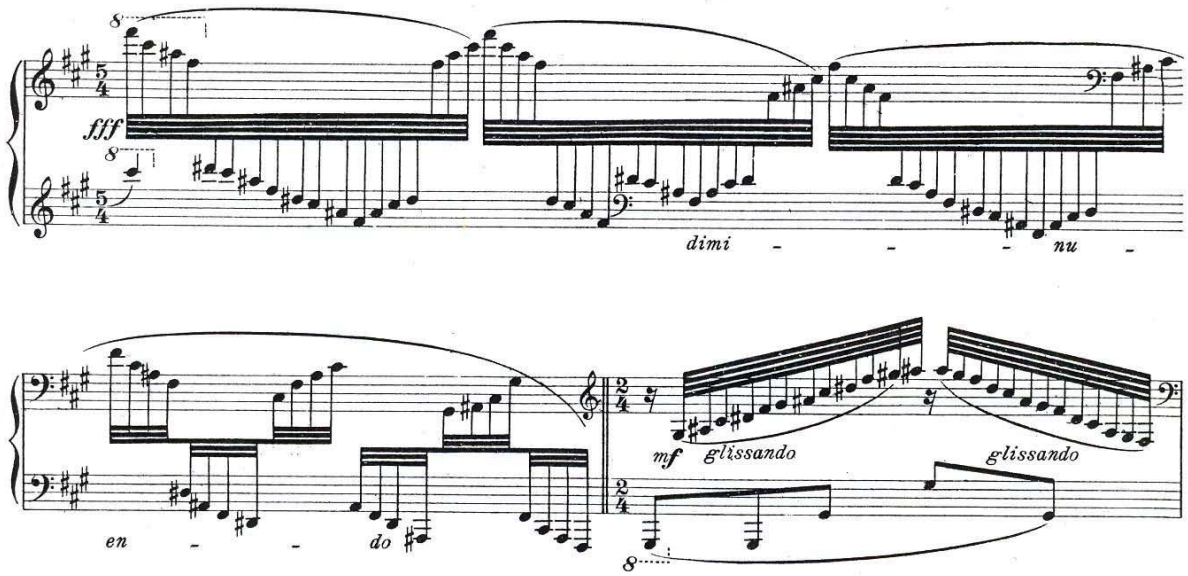
In sharp contrast to the few double-note glissandos in these first 20 years of the 20th century, the black-key glissando enjoyed a surprising popularity, with 40 of them in a total of 206 glissandos.

In the 1901 *Jeux d'Eau* – more than half a century years after the first black-key glissando in Liszt's *Grosse Konzertfantasie über spanische Weisen* (see ex. 3.236 in 3.3.2.3.2.2) – we find another solo pentatonic glissando. (Ex. 3.394.)



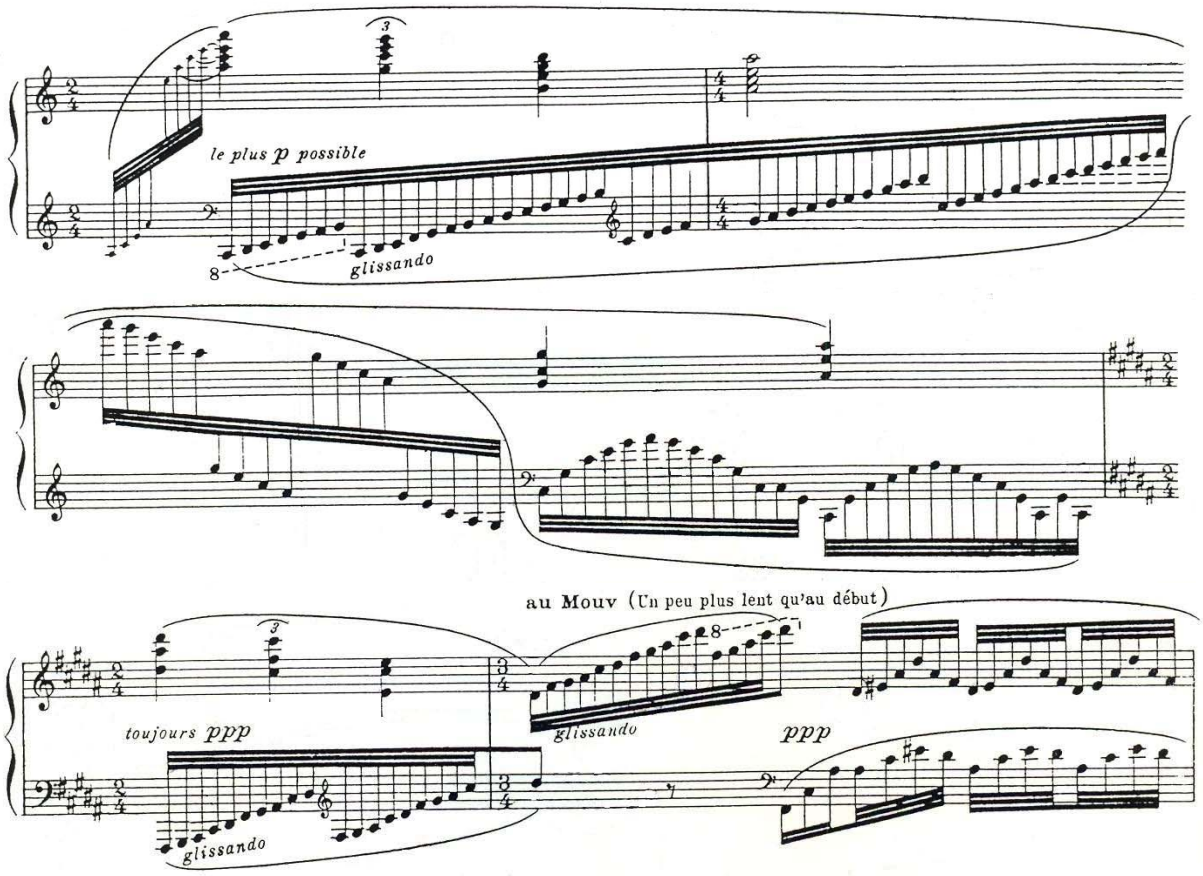
Example 3.394. M. Ravel: *Jeux d'Eau* (1901), bar 48. Editions A. Durand et Fils.

The pentatonic glissando appears again in the 1905 *Barque sur l'océan* from the cycle *Miroirs.* (Ex. 3.395.) As in *Jeux d'Eau*, the movement of the glissandos takes the opposite direction of the arpeggios that precede them.



Example 3.395. M. Ravel: *Miroirs* (1905), nr. 3 *Une barque sur l'océan*, bars 43-44. Editions A. Durand et Fils.

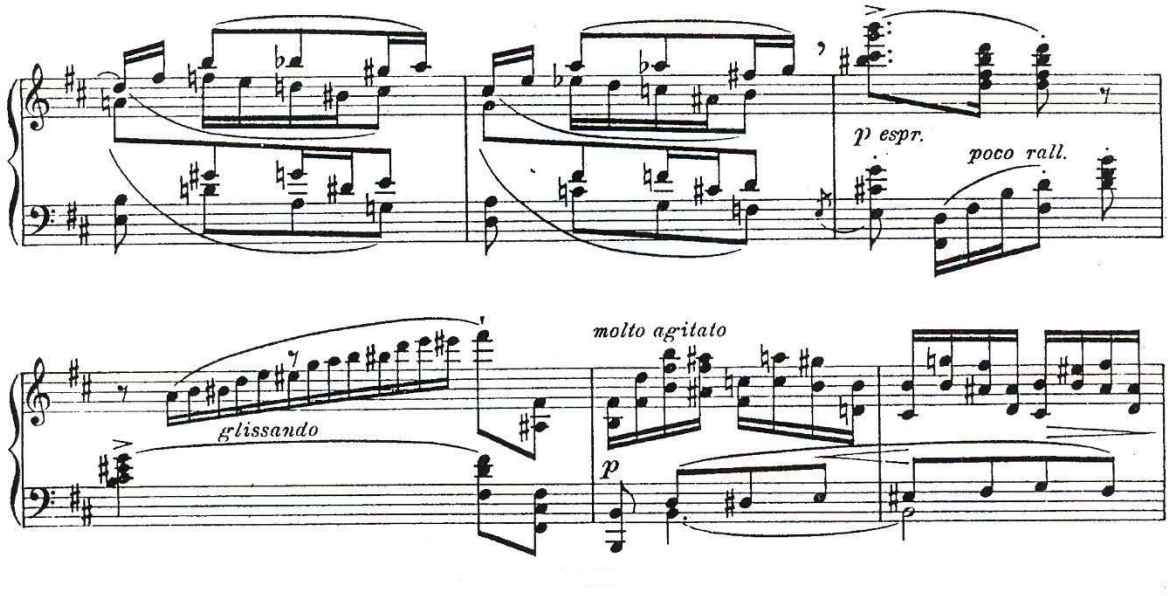
In both previous examples the black key glissandos easily integrate in the predominantly black key environment. In the 1908 *Gaspard de la nuit,* Ravel uses the black key glissandos to transpose a passage with a white key glissando. (Ex. 3.396.)



Example 3.396. M. Ravel: *Gaspard de la nuit* (1908), 1st movement *Ondine*, bars 73-76. Editions A. Durand et Fils.

3.4.2.1.3 The enharmonic glissando
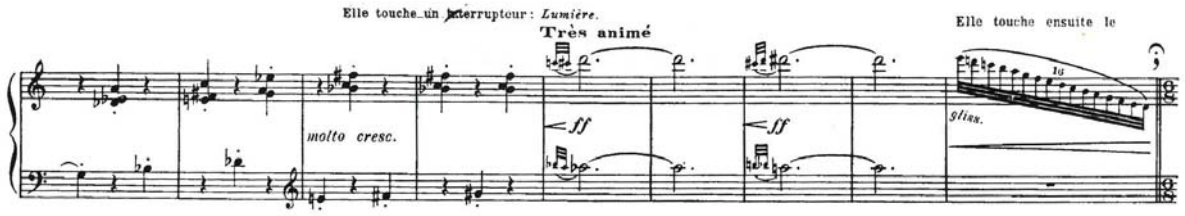
In an age where composers moved away from tonality to the point of abolishing it, discussing the glissando "away from C major" seems hardly as relevant as it had been in the 19th century. In the early 20th century there are still some examples of glissandos over clashing harmonies that were typical for the second half of the 19th century, e.g. in the third and sixth piece of Godowsky's *Renaissance* (1909) where he writes E major chords underneath white-key glissandos in an environment that is still clearly tonally defined, or in his paraphrase on Strauss' *Künstlerleben* (1907), with diatonic glissandos over A♭7+ and g minor harmonies. The only instance notable enough to be included here, however, is Godowsky's 1911 sonata, in which he perversely writes – in the midst of a highly saturated harmonies – what can only be called an 'enharmonic' glissando. (Ex. 3.397.)



Example 3.397. L. Godowsky: *Sonata* (1911), 3rd movement *Allegretto vivace e scherzando,* bars 135-140. Schlesinger edition.

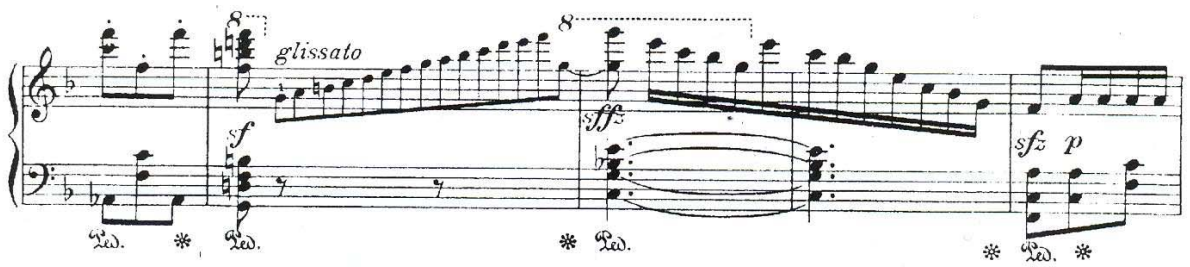
3.4.2.1.4 Beginnings and endings

It is striking how many glissandos in the first two decades of the 20th century are open: there are hardly any with a pivotal first note and an individually articulated ending note. The extreme consequence is seen in Debussy's *La Boîte à Joujoux* (ex. 3.398), where only the gliding part of a glissando remains, reminding us of the similar situation in the first unequivocal glissando piece *Appolon vient les exterminer* by Christophe Moyreau (<1753 – see 3.2.4.1.).
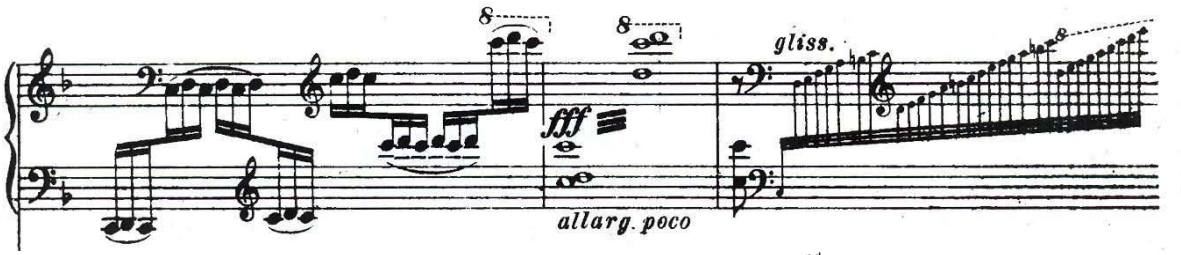


Example 3.398. Cl. Debussy: *La Boîte à Joujoux* (1913). Editions Durand et Cie.

Further experimentation with the beginning and ending of a glissando can lead to interesting subtleties. We have already seen how Moritz Moszkowski worked out the transition from gliding fingers to individual articulation at the end of a glissando in his opus 37 and 52 (see 3.3.2.4.4.2, ex. 3.314 and 3.315), an idea he merely repeated in his opus 80 at the turn of the century (ex. 3.399).



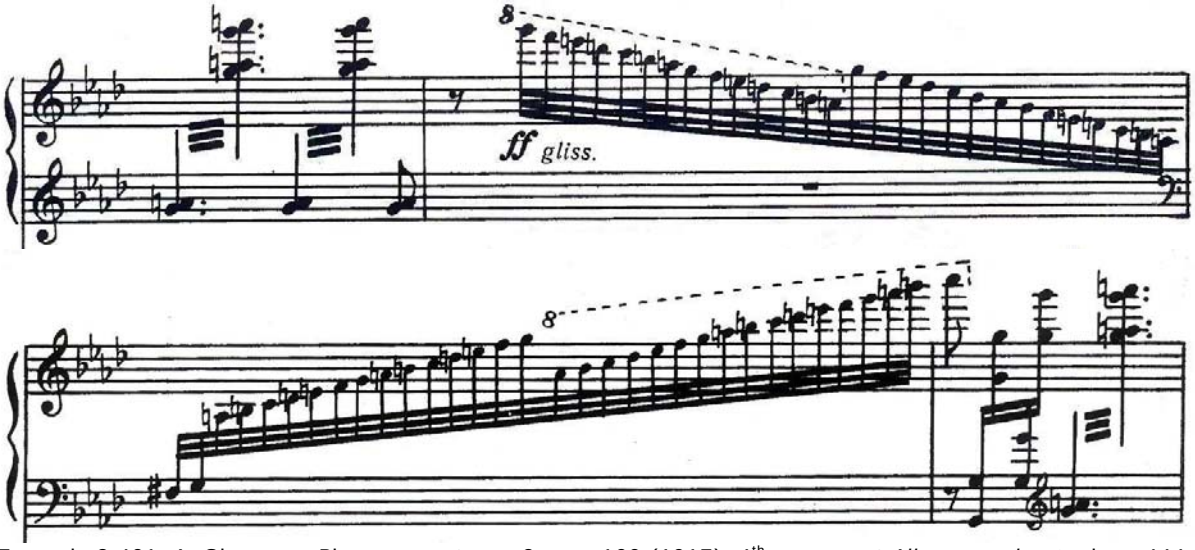
Example 3.399. M. Moszkowski: *Deux Morceaux* opus 80 (1900), nr. 2 *Mit Fächer und Mantilla*, bars 84-88. Bote & Bock edition.

Other composers also tinkered with the transition between proper and improper fingering (or vice versa). For instance, in his first concerto Alexander Glazunov avoided spending time during the pivotal action at the beginning of glissandos by using the other hand. (Ex. 3.400.)



Example 3.400. A. Glazunov: Piano concerto nr. 1 opus 92 (1910-11), 2nd movement *Allegro moderato*, variation IX, bars 82-84. Muzgiz edition.
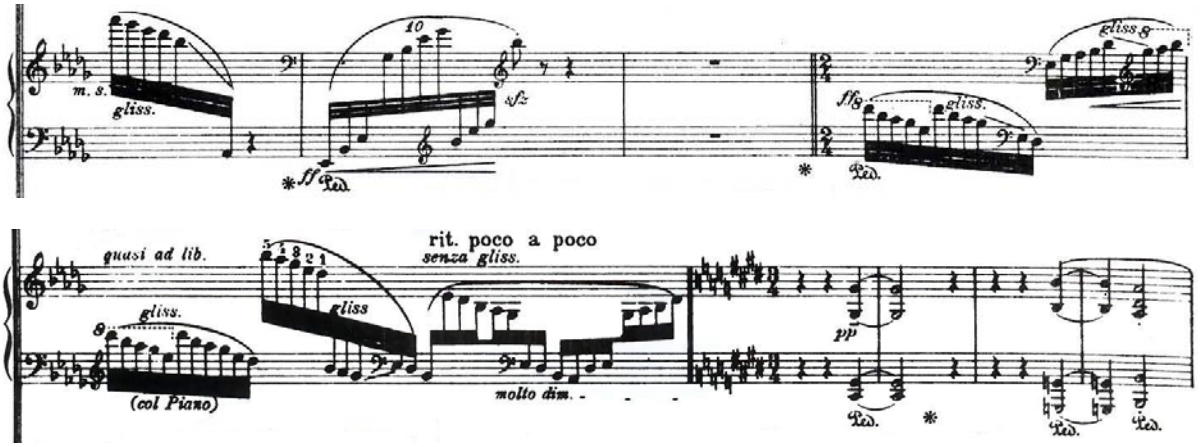
In his next concerto, he used the left hand to connect two right hand glissandos as smoothly as possible and without loss of any notes. (Ex. 3.401.)



Example 3.401. A. Glazunov: Piano concerto nr. 2 opus 100 (1917), 4th movement *Allegro moderato*, bars 444-447. Muzyka edition.

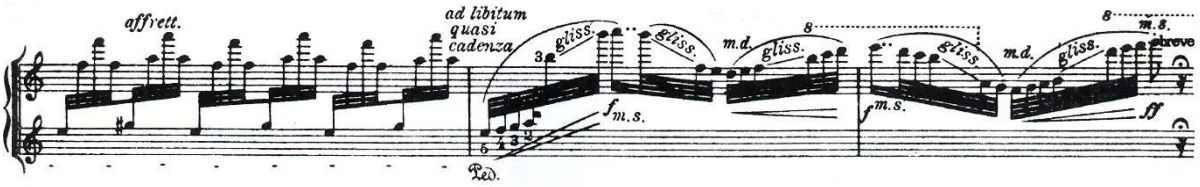
De Falla used the combination of two hands and individual articulation to balance the body in glissando passages. In some part of his *Nights in the Gardens of Spain* the left hand systematically glides downward and the right hand upward. (See bars 223-224, ex. 3.402.) When this back-and-forth movement is broken (second beat of bar 224), the

right hand uses proper fingering so that the performer's bodily position is not compromised when the second downwards run is started.



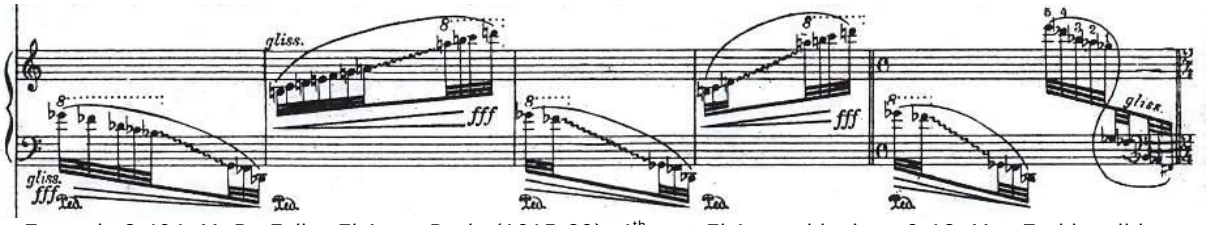
Example 3.402. M. De Falla: *Nights in the Gardens of Spain* (1915), 1st movement *En el Generalife*, bars 220-228. Max Eschig edition.

Later on in the same concerto, the flow of the music *and* the most comfortable bodily position are assured by starting the glissando passage with left hand individual articulation. (Ex. 3.403.)
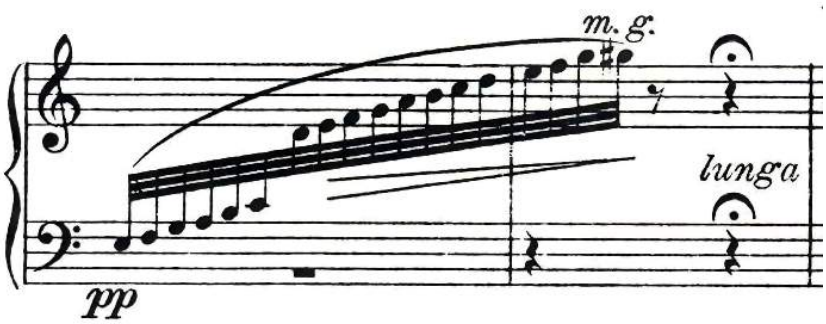


Example 3.403. M. De Falla: *Nights in the Gardens of Spain* (1915), 3rd movement *En los jardines de la Sierra de Córdoba*, bars 58-60. Max Eschig edition.

In between 1915 and 1920, De Falla also worked on *El Amor Brujo*, where he applies the same technique and starts a glissando in one hand with individually articulated notes in the other hand in order to keep the flow of left hand glissandos uninterrupted. (Compare the last bar of ex. 3.404 with the first of 3.402.)
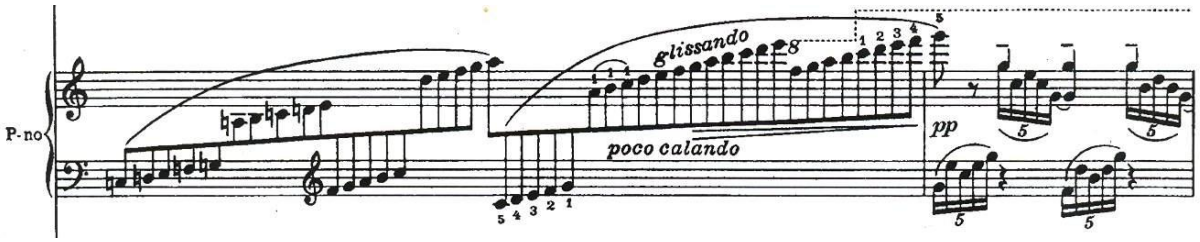


Example 3.404. M. De Falla: *El Amor Brujo* (1915-20), 4th part *El Aparecido*, bars 9-13. Max Eschig edition.

Bartók also took advantage of the subtlety of expression that a second hand can bring to a one-hand glissando by adding individual articulation, as in his rhapsody opus 1. (Ex. 3.405.)



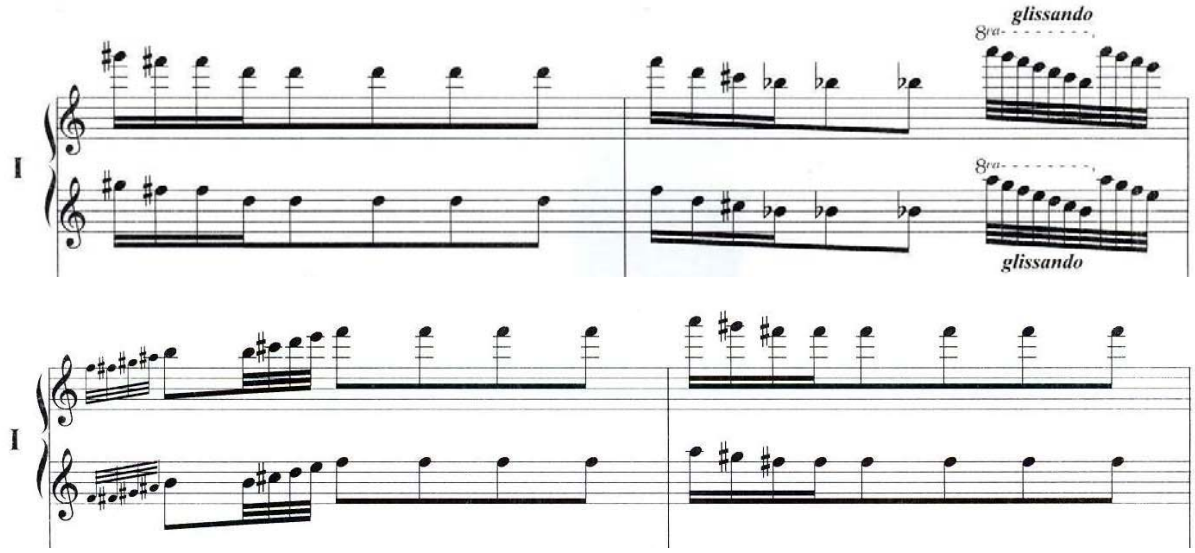
Example 3.405. B. Bartók: rhapsody opus 1 (1904), bar 76-77. Muzyka edition. P. Jurgenson Publishing House.

Medtner went much further in his first concerto and changed from individual articulation to glissando and back, allowing for perfect control and regularity in articulation during the calando. (Ex. 3.406.)



Example 3.406. N. Medtner: piano concerto nr. 1 opus 33 (1914-18), bars 104-105. Muzgiz edition / P. Jurgenson Publishing House.

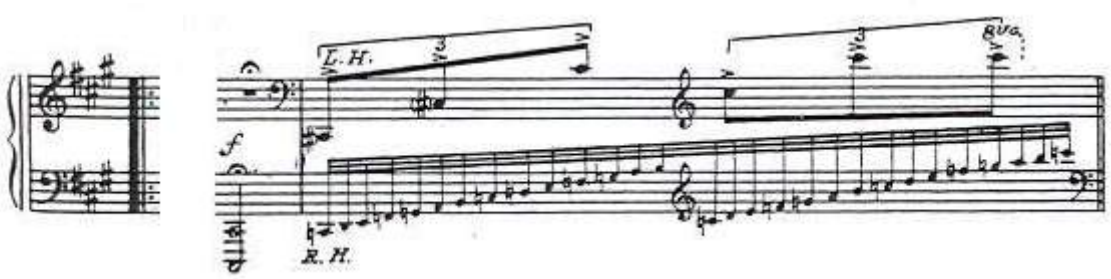
The transition from gliding to individual articulation is easy to accomplish when both hands are given the time and space to work it out (as in Glazunov, De Falla and Bartók), or when the movement slows down enough to change from improper to proper position without letting the sound suffer (e.g. in Medtner). In the four-hand piano piece *Valse Buffon* (1921) Leo Ornstein left it up to the performer to decide on the exact timing (in tempo *vivo*) to switch from gliding position to the individual articulation between the end of the glissando and the chromatic upbeat. (Ex. 3.407.)



Example 3.407. L. Ornstein: *Valse Buffon* (1921), first pianist's part, bars 118-121. Reproduced by kind permission of Poon Hill Press.

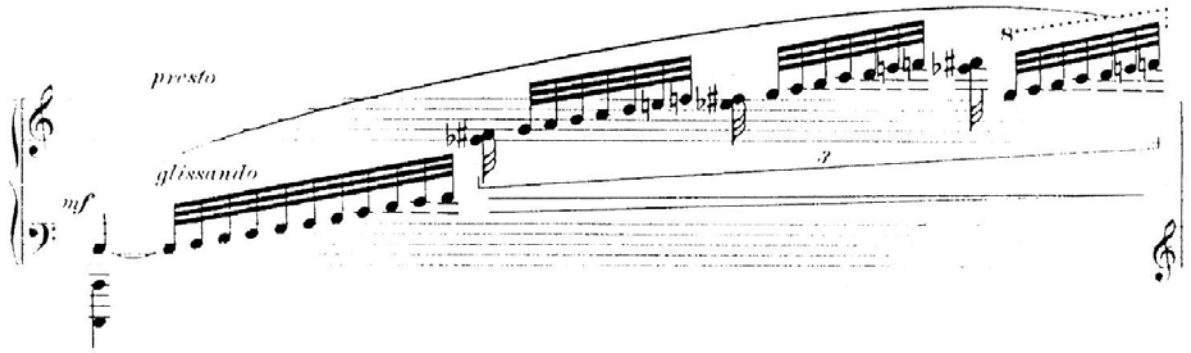
3.4.2.1.5 Calibrated glissandos

Some white-note glissandos are accompanied by the other hand playing rhythmical accents on the black keys. This is to keep track of or to restore the music's metrical flow when long glissandos take too much time to be an indicator themselves. (Ex. 3.408.) In theory such cases are related to the pseudo-chromatic glissando, but in fact they stem from the ergonomics that come into play when the pianist has one free hand that is easier to deploy on the black keys than on the (already occupied) white keys.



Example 3.408. G. Gershwin: *Rhapsody in Blue* (1924), cue H. © New World Music Corporation.

The superposed notes can be notated in between the sections of the glissando (ex. 3.409), as if to suggest that the movement twists and turns, gliding over black just as much as white keys. Nevertheless the basic technique remains the same: the right hand glides in one long sweep while the right hand plays a rhythm on top of the glissando.



Example 3.409. F. Busoni: *Klavierübung*, part V, *Zehn Variationen über ein Präludium von Chopin*, bar 210. Breitkopf & Härtel edition.

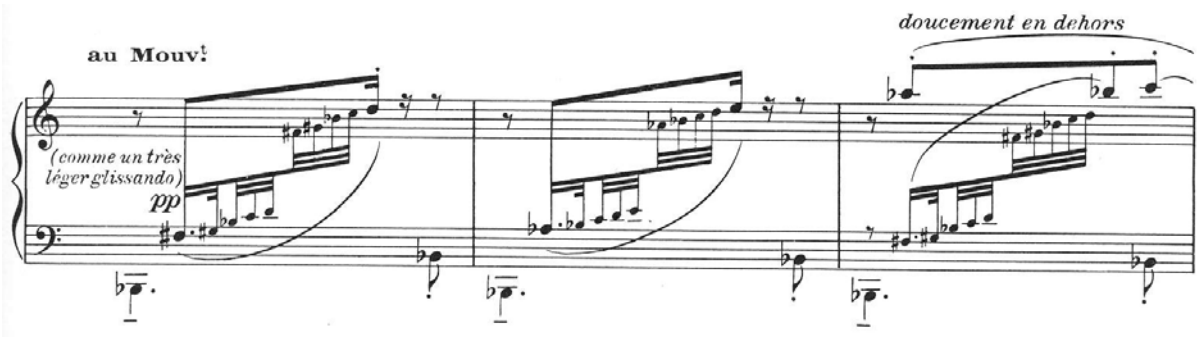
3.4.2.1.6 The *quasi* glissando

The *quasi glissando*, as started in the 1890's (see 3.3.2.4.4.3.), was used again by the apparent first composer to have written it (Felix Blumenfeld)[1033] and taken over by others.

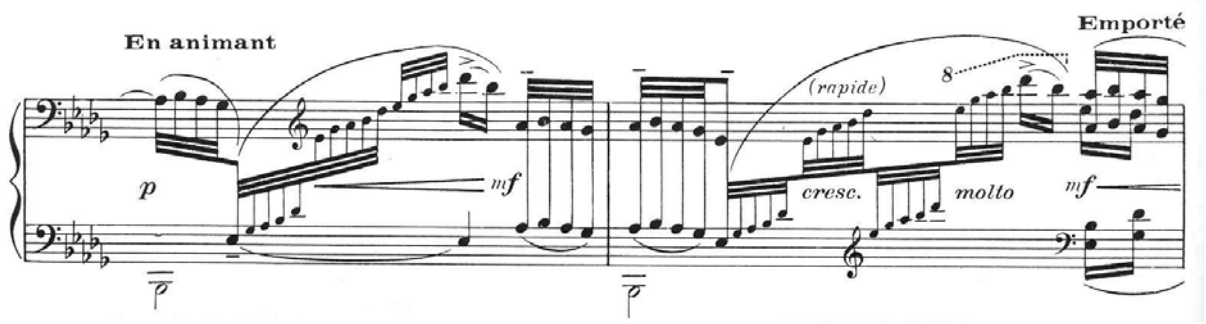
Claude Debussy used it as well in his prelude *Voiles*, though inexplicably distinguishing the mode of playing "like a very light glissando" (ex. 3.410) from apparently "regular" rapid runs. (Ex. 3.411.) The whole-tone runs may be required to *sound like* glissandos because they cannot be *played as* such. The runs in the second excerpt, however, *can* be

[1033] *La Fontaine*, nr. 6 from *Près de l'Eau, Six Morceaux détachés* opus 38 (1906).

performed as black-key glissandos. Debussy nevertheless decided that the latter should not sound like glissandos.
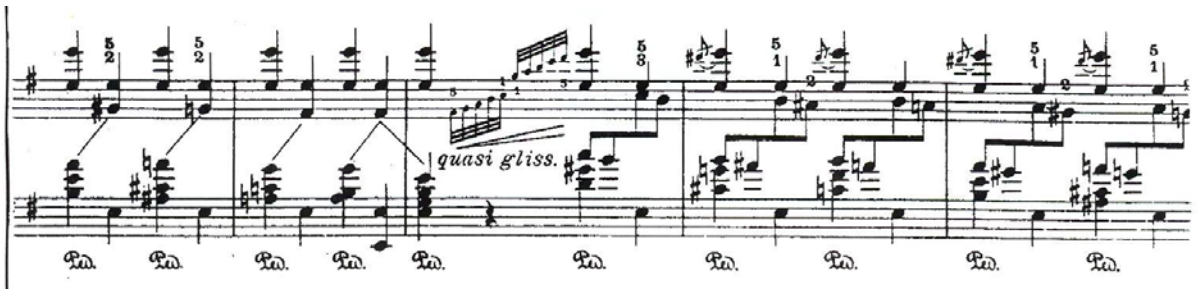


Example 3.410. Cl. Debussy: *Préludes*, first book (1909-10), *Voiles*, bars 48-50. Editions Durand et Cie.

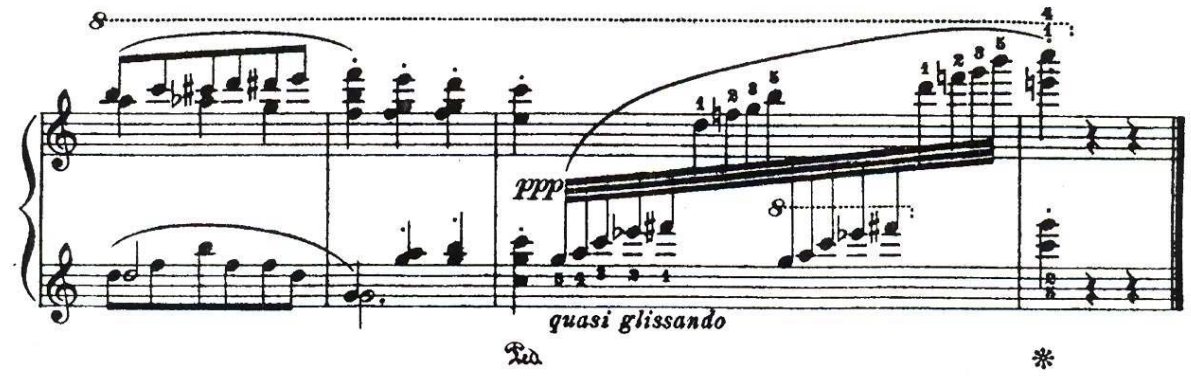


Example 3.411. Cl. Debussy: *Préludes*, first book (1909-10), *Voiles*, bars 42-43. Editions Durand et Cie.

In the early 20th century, *quasi glissandos* deviate more and more from the basic glissando characteristic of consecutive white or black keys, as e.g. in Leopold Godowsky's works, where "interrupted" sequences of seconds could only be played *as if* and not *as* glissandos. (Ex. 3.412 and 3.413.)

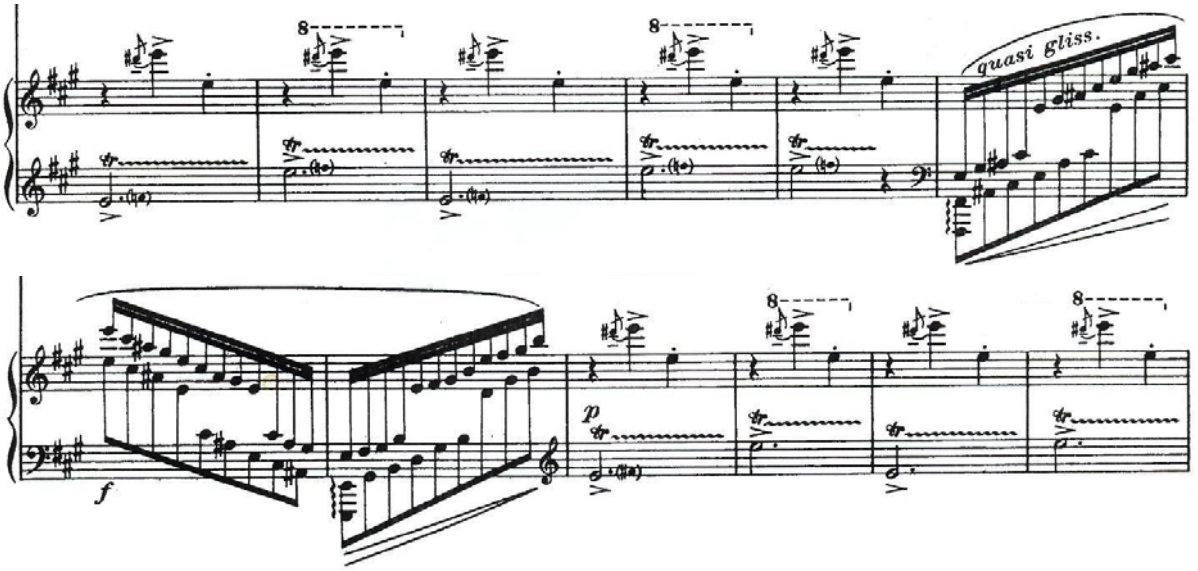


Example 3.412. L. Godowsky: *Renaissance* (1909), nr. 6 *Tambourin*, bars 51-55. Schlesinger edition.
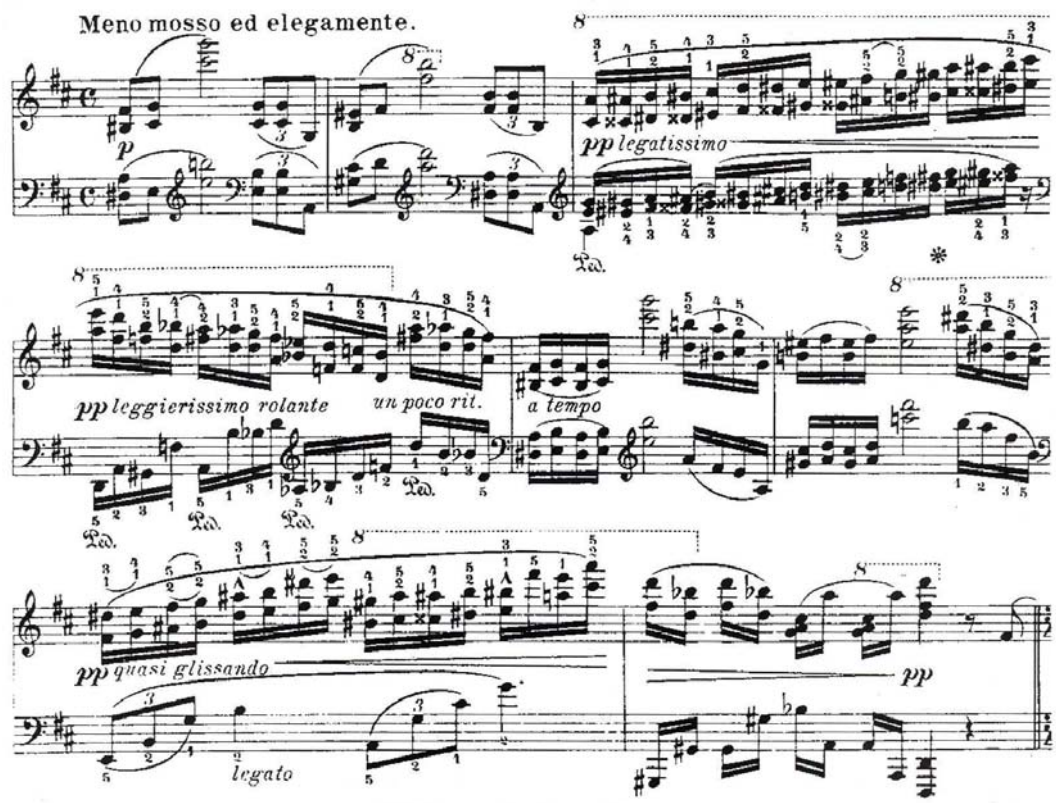


Example 3.413. L. Godowsky: *Triakontameron* (1919), nr. 23 *The Music Box*, final bars. G. Schirmer edition.

In Ravel's own transcription for two pianos of his orchestral *La Valse*, he wrote back-and-forth arpeggios as *quasi glissando* to imitate the harps. (Ex. 3.414.) Oddly, he did not add this indication to the arpeggios in the solo piano transcription he also made.



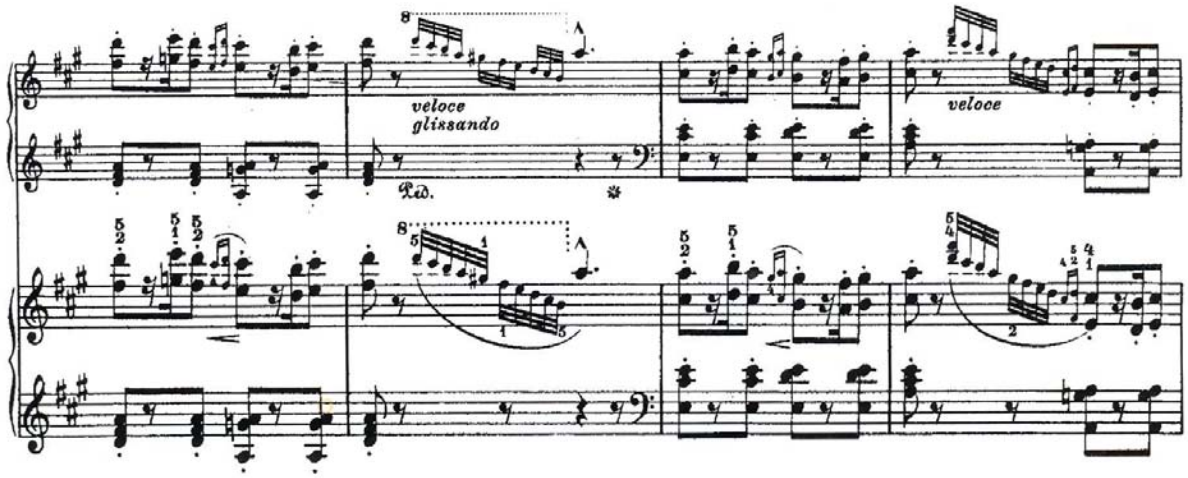
Example 3.414. M. Ravel: *La Valse* (1920), composer's transcription for two pianos, second piano part, bars 409-420. Editions Durand et Cie.

Moriz Rosenthal took the idea much further, apparently loosing any practical sense: the difference between *legatissimo*, *leggierissimo rolante* ("rolling") and *quasi glissando* for the three double-note sequences seems psychological at most (there are no more fingers gliding from black to white keys in the third passage as there are in the first). (Ex. 3.415.)

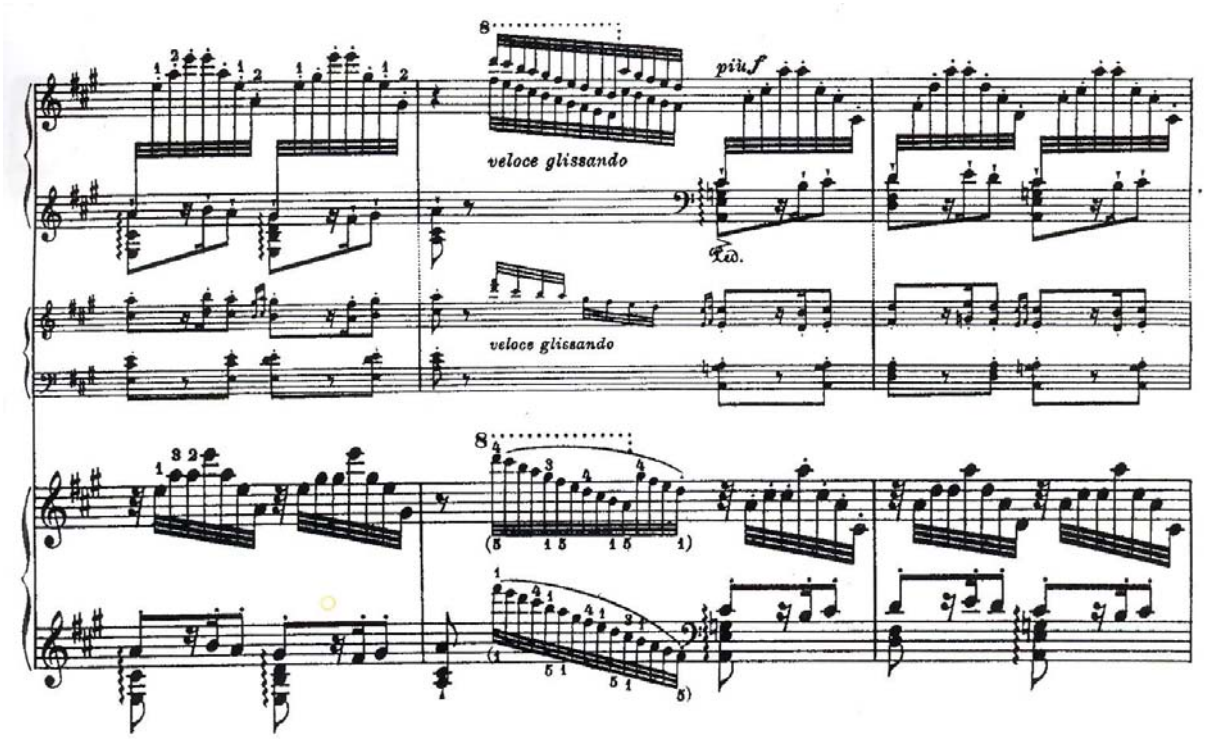


Example 3.415. M. Rosenthal: *Variationen über ein eigenes Thema* (1903), 10th variation *Finale con Intermezzi,* bars 25-32. Reproduced by permission of SCHOTT MUSIC GmbH & Co. KG, Mainz - Germany.

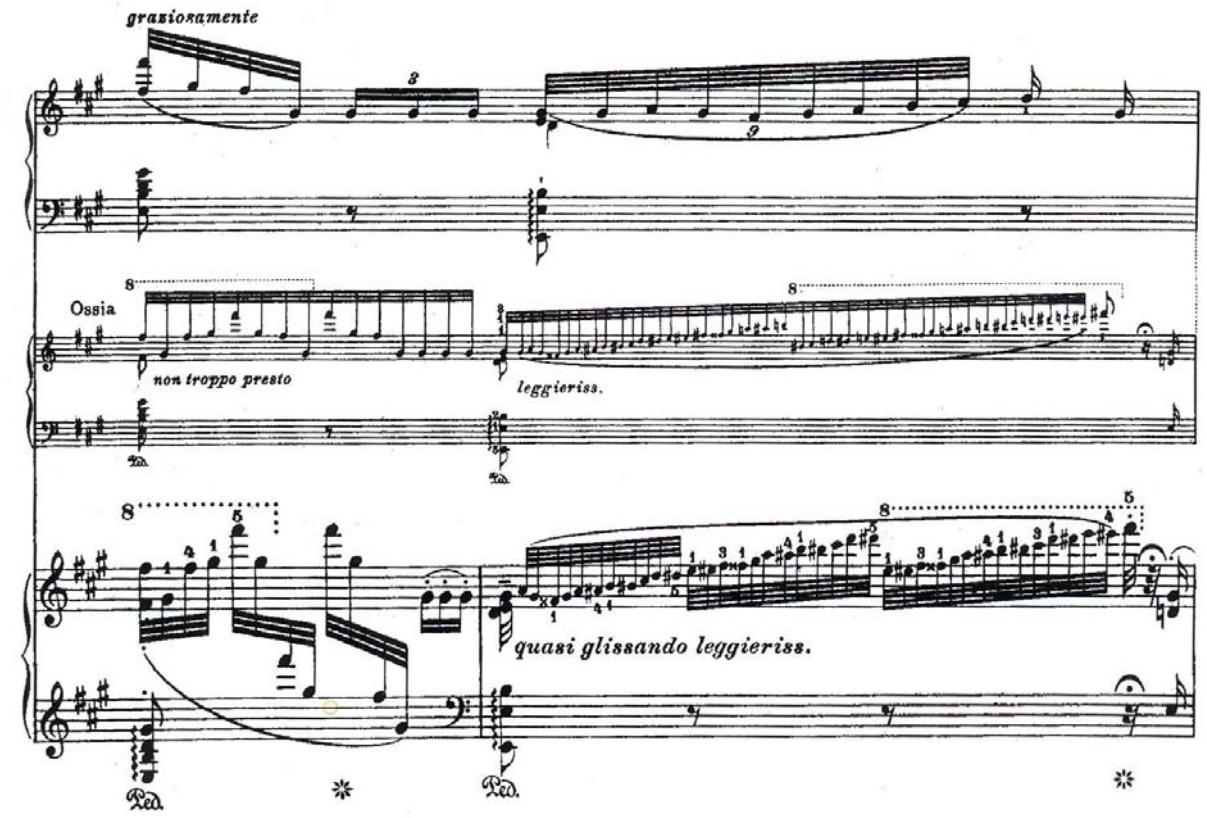
Busoni liked the quasi glissando also, infusing some of Liszt's works when he edited them "critically-instructive." He sometimes deleted the "veloce glissando" indications (ex. 3.416 and 3.417) but compensated with additions of a *quasi-glissando* interpretation elsewhere. (Ex. 3.418-3.419.)
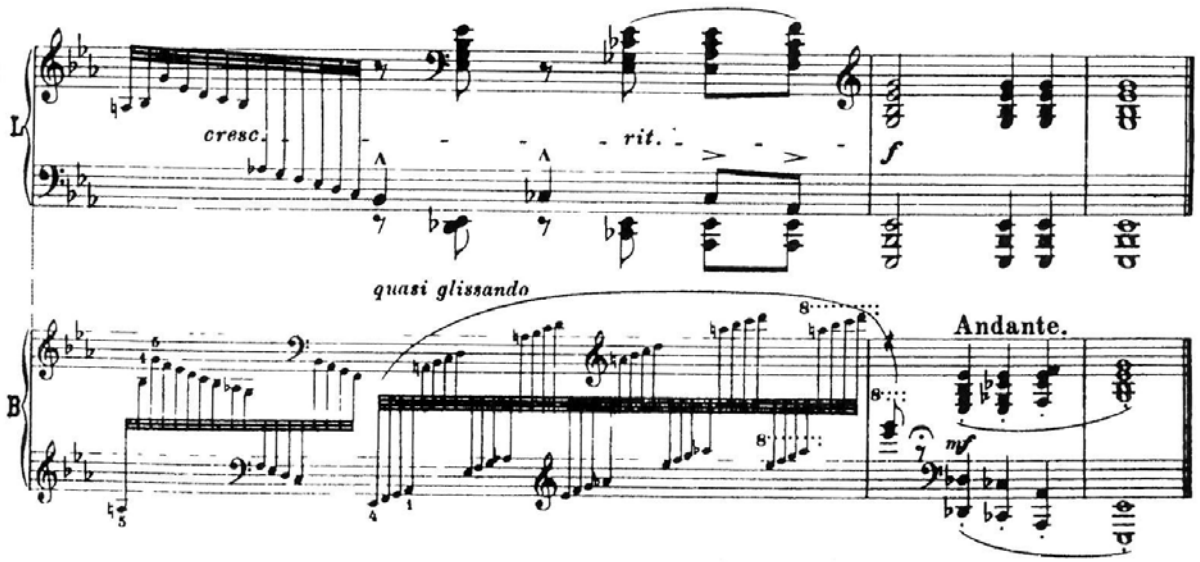


Example 3.416. Fr. Liszt: *Réminiscences de Don Juan. Große kritisch-instruktive Ausgabe von Ferruccio Busoni.* (Breitkopf & Härtel - 1917/18, plate number 28109), bars 133-136. Upper staff: Liszt original; lower staff: Busoni's version.



Example 3.417. Fr. Liszt: *Réminiscences de Don Juan. Große kritisch-instruktive Ausgabe von Ferruccio Busoni.* (Breitkopf & Härtel - 1917/18, plate number 28109), bars 233-235. Upper staff: Liszt original; middle staff: Liszt original ossia; lower staff: Busoni's version.

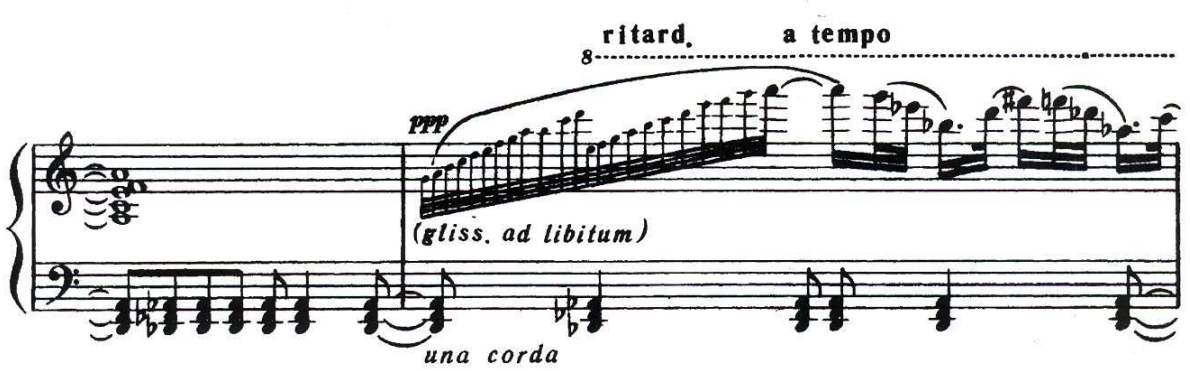


Example 3.418. Fr. Liszt: *Réminiscences de Don Juan. Große kritisch-instruktive Ausgabe von Ferruccio Busoni.* (Breitkopf & Härtel - 1917/18, plate number 28109), bars 107(-108). Upper staff: Liszt original; middle staff: Liszt original ossia; lower staff: Busoni's version.
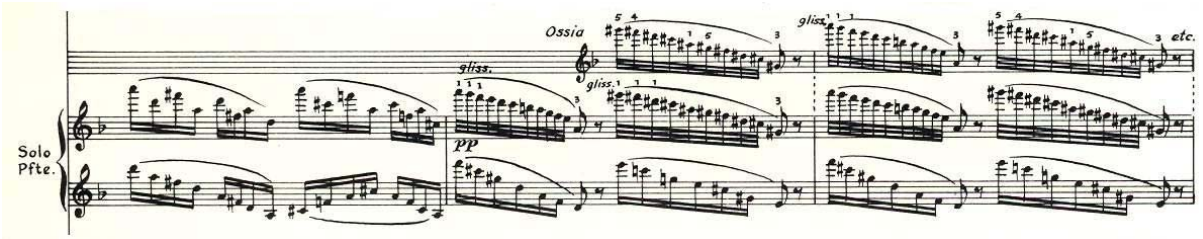


Example 3.419. Fr. Liszt: *Grandes Études de Paganini,* nr. 3, Busoni edition (Breitkopf & Härtel - 1910/11, plate number 27978), final bars. Upper staff: Liszt original; lower staff: Busoni's version.

On the other side of the spectrum of this matter, the difference between a glissando and an individually articulated run can be reduced to zero. Prokofief twice gave the performer the choice of either technique, at the same time demonstrating the subtle difference between both instances: in the fourth of the *Sarcasmes* it is an individually articulated run which *may* be performed as gliding; in the concerto the glissando technique is the first choice. (Ex. 3.420 & 3.421.)



Example 3.420. S. Prokofief: *Sarcasmes* opus 17 (1912-14), nr 4, bars 37-38. Muzgiz edition / P. Jurgenson Publishing House.
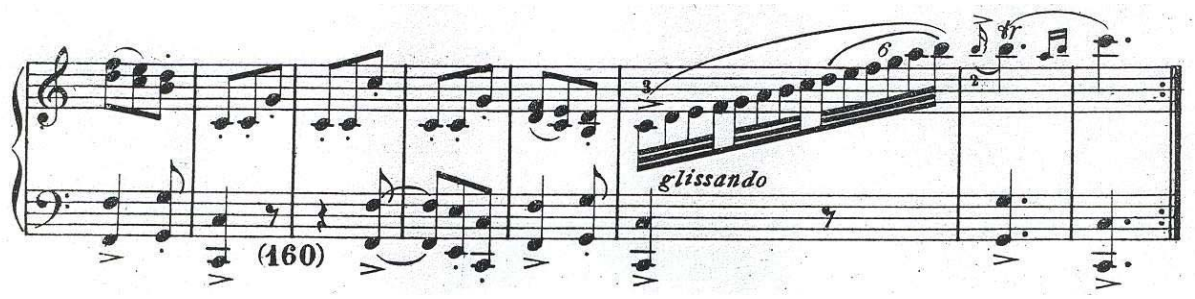


Example 3.421. S. Prokofief: piano concerto nr. 2 (1912-13), 3rd movement *Intermezzo,* from one bar before cue 71. Muzgiz edition / P. Jurgenson Publishing House.

3.4.2.1.7 Editing the glissando IV

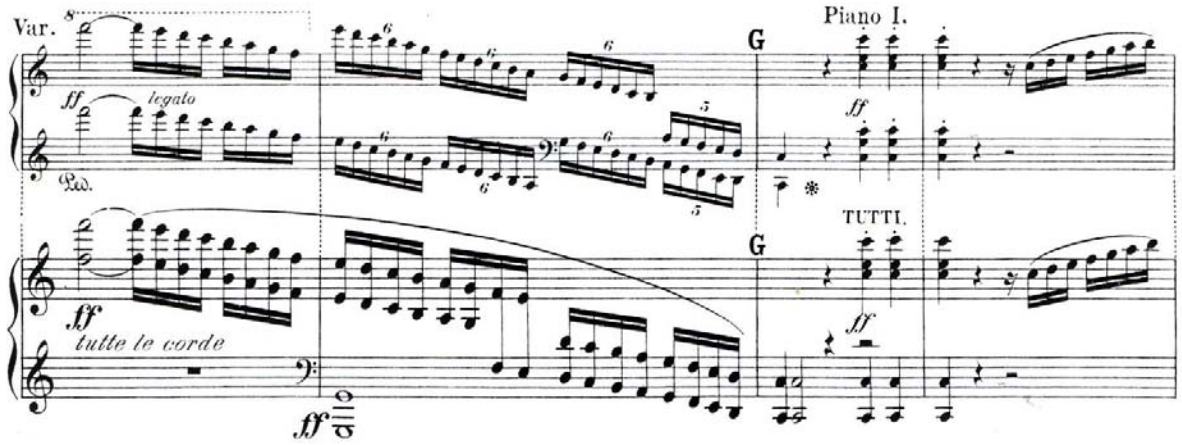
Early 20th century editions of older works that contained glissandos are characteristic in ways similar to what we saw in the second half of the 19th century. (Compare 3.3.2.3. and 3.3.2.4.)

In the 1906-1908 edition by G. Ricordi of sonatas by Domenico Scarlatti, editor Alessandro Longo (1864-1945) left out all 'con deto solo' prescriptions. (Compare 3.2.4.2.). On the other hand, he changed the notation of the run in the final bars of sonata K. 487: it now consists of three neatly arranged groups of 32nd-notes with the word glissando written underneath it. A stress mark over the first note suggests it to be the end of the previous melody, therefore individually articulated and thus distinguished from the rest of the run. (Compare ex. 3.422 with 3.44.)



Example 3.422. D. Scarlatti: sonata K. 487 (Longo edition L. 205), final bars. Reproduced by permission of G. Ricordi & C.

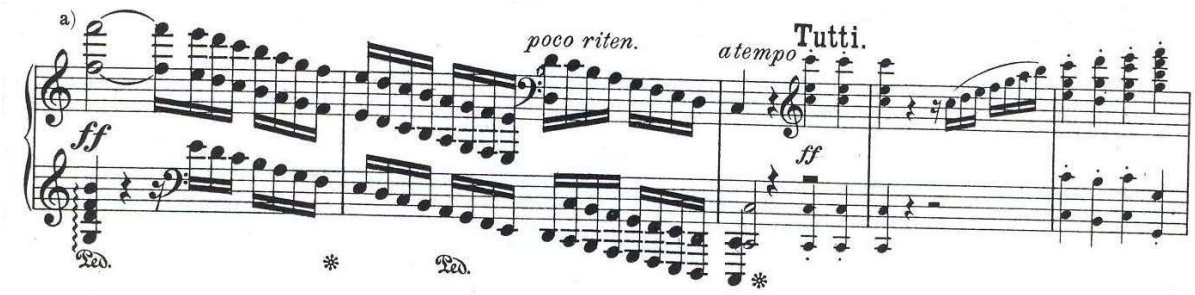
A 1901 edition of Beethoven's concerto opus 15 has parallel (left and right hand) fingered runs an octave higher than the original octave run[1034]. (Ex. 3.423.)



Example 3.423. L. van Beethoven: Concerto opus 15, 1st movement (Cotta edition – 1901), bars 344-347.

[1034] *L. v. Beethovens Klavier-Concerte für Klavier allein sowie mit Begleitung eines zweiten Pianofortes, eines Streichquintetts (oder des Orchesters) zum Gebrauche für das Studium und für den Concertsaal = L. v. Beethovens pianoforte-concertos with accompaniment of a second pianoforte, string-quintet or full orchestra = Concertos de piano par Ludwig van Beethoven arrangés pour piano seul et accompagnement d'un second piano, ou avec quintette d'instruments à cordes, ou avec orchestre complet et destinés aux études musicales et à l'exécution en public / unter Mitwirkung von Vincenz Lachner bearbeitet von Sigmund Lebert. – Stuttgart : J. G. Cotta'sche Buchhandlung Nachfolger G. m. b. H.* Copy used: G-BNba C 15/3. Dating according to G-BNba.

More extremely, the c1914 [1924][1035] "critically instructive" edition by Eugène d'Albert of this same concerto did not bother adding an ossia but rather inserted the editor's musical opinion straight into the main text with an extra left hand arpeggio and scale. (Ex. 3.424.)
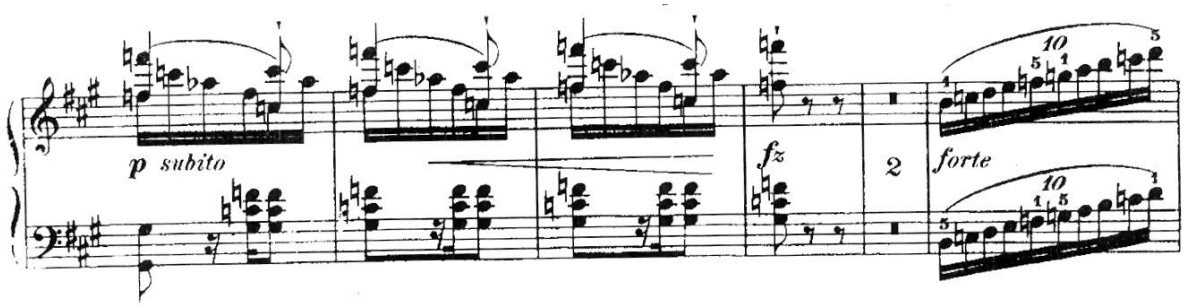


Example 3.424. L. van Beethoven: Concerto opus 15, 1st movement (d'Albert edition – c1914), bars 344-348.

In a footnote, the editor adds:

> A performer of this Concerto will scarcely prefer the facilitated rendering (division of the simple octaves between the two hands).[1036]

This remark tells us that d'Albert saw the original right hand octaves as separately articulated, possibly played with two hands. To avoid the latter, cheap alternative, he proposed an extra run so that the original difficulty would remain.

Virtuoso pianist-editors did not always act the way one would expect of them. In Busoni's version of Liszt's first *Mephisto-Walzer*, he left out the original 4+ octaves long two-hand parallel glissandos in favor of two rather short individually articulated runs, perhaps to promote the type of fingering we see often in his own works. (Ex. 3.425.)



Example 3.425. Fr. Liszt/F. Busoni: *Mephisto-Walzer* (1904), bars 196-202.

Much to the contrary of what Busoni liked, Emil Von Sauer edited Liszt's *Mephisto waltz* also (in 1917), but added a footnote explaining his personal preference for a version that is much more showy than the original 32-note two-hand glissandos, but also hardly enticing at the required *quasi presto* tempo:

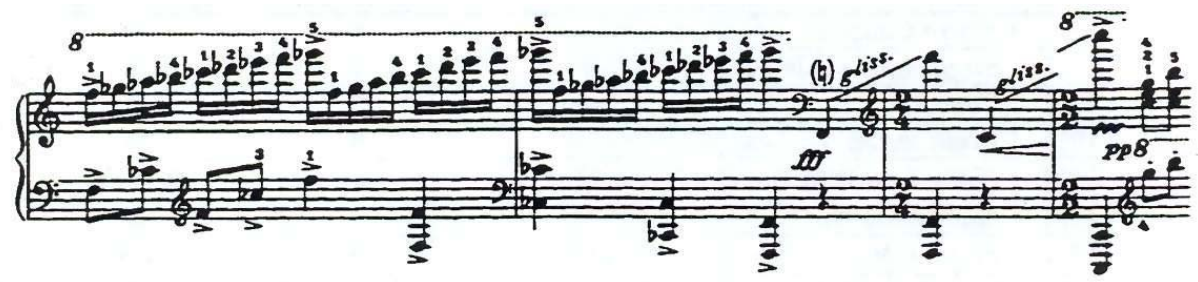
> A fine effect is produced by playing this run *glissando* with the right hand, the left hand executing it as a scale.[1037]

[1035] *Konzerte für Pianoforte und Orchester / L. van Beethoven. – Kritisch instruktive Ausgabe der Solostimme / von Eugen d'Albert, [Klavierauszug]. – Leipzig: Breitkopf & Härtel, c 1914 [1924]. – 192 S.; Hochformat. – (Edition Breitkopf; 4347).* Copy used: G-BNba C 242/2. Dating according to G-BNba: copyright is 1914, second date (1924) found in publisher's announcement.

[1036] English text as in the edition, next to the German version: "Ein Spieler dieses Konzerts wird die Erleichterung (Verteilung der einfachen Oktaven in beide Hände) nicht vorziehen."
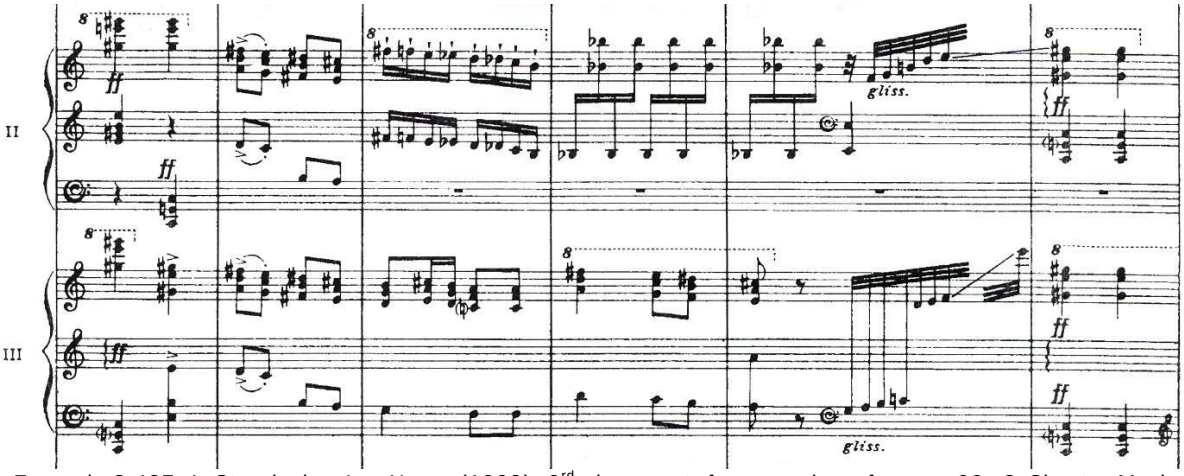
3.4.2.1.8 Glissando notation

In the first quarter of the 20th century composers devised a new way of notating the keyboard glissando. Instead of writing out all the individual notes, a line could be much more efficient. As early as 1912, Prokofiev started using such lines in his opus 4 (*Suggestion Diabolique* – ex. 3.426), opus 11 (*Toccata*) and opus 12 (*Ten Pieces*), as did Debussy in his *Feux d'Artifice*. Later on in this period De Falla (*Amor Brujo*, *Fantasia Baetica*, *Nights in the Spanish Gardens*), Bartók (*Tanz-Suite*, 1st concerto, Sonata), Stravinsky (*Pétrouchka*) and Hindemith (*Suite "1922"*) have used the graphic notation.



Example 3.426. S. Prokofief: Pieces opus 4, nr. 4 *Suggestion Diabolique* (1912), bars 107-110. Muzyka edition / P. Jurgenson Publishing House.
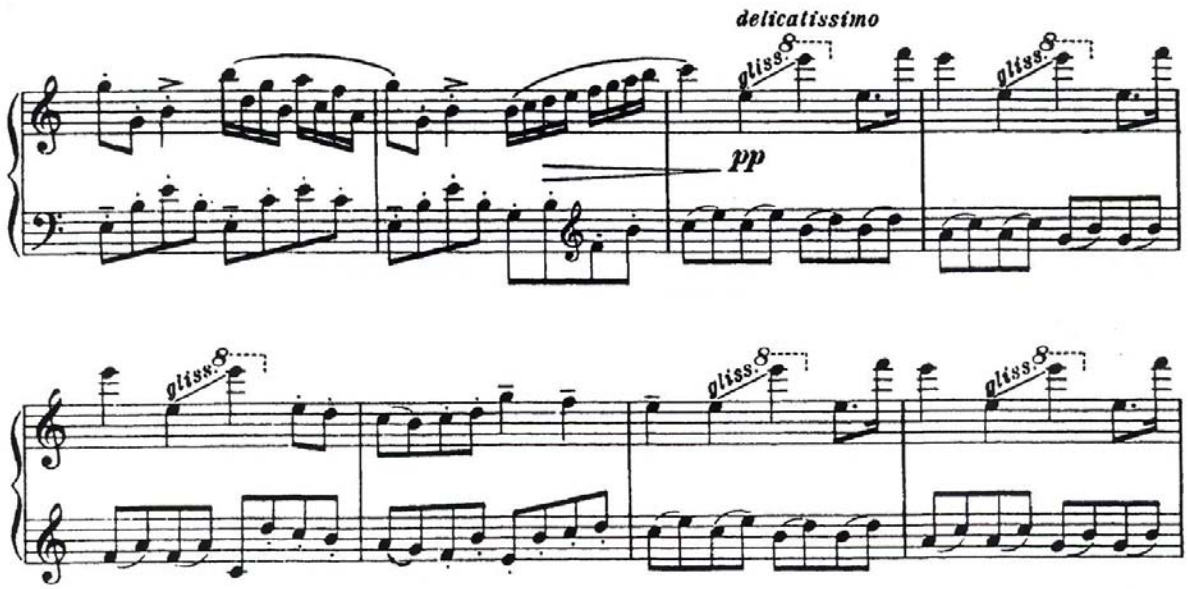
The line-notation was not perfect, however. When a white-key glissando ends on a black key, a line does not unequivocally indicate up to exactly which white key to glide. The problem is demonstrated clearly in Stravinsky's *Les Noces*, where the second pianist can only assume that he should go glide all the way up to *f* [3], the note nearest to the ending on *g#*[3]. (Ex. 3.427.) In the third pianist's part, Stravinsky shows the last note of the glissando's gliding by writing it out, but as he uses both these kinds of notations throughout the composition for such glissando-endings, we don't know whether he consciously intended them to mean different performance practices. Of course, if the glissando and endnotes are performed with one and the same hand (as in this Stravinsky example) the tempo is a deciding factor: at fast speeds the last notes of the gliding part will disappear in order for the hand to switch position in time for the next (individually articulated) note or chord.



Example 3.427. I. Stravinsky: *Les Noces* (1923), 3rd piano part, from one bar after cue 90. © Chester Music.
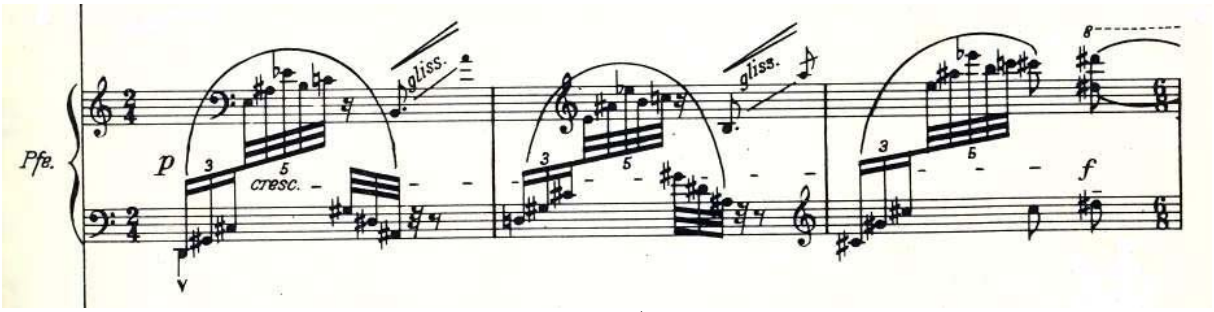
[1037] As quoted from the English text on the bottom of the relevant page in the Peters Edition nr. 3601a, plate number 9880.

Many composers only used the line to save space and ink when composing long glissandos, writing out the smaller ones and/or drawing the line only for the middle part to avoid confusion. Unfortunately, when a straight line represents a glissando and the last note is written out on a beat, that last note can give the impression to be accentuated, especially since it often is or needs to be. (Compare ex. 3.426 and 3.428.)
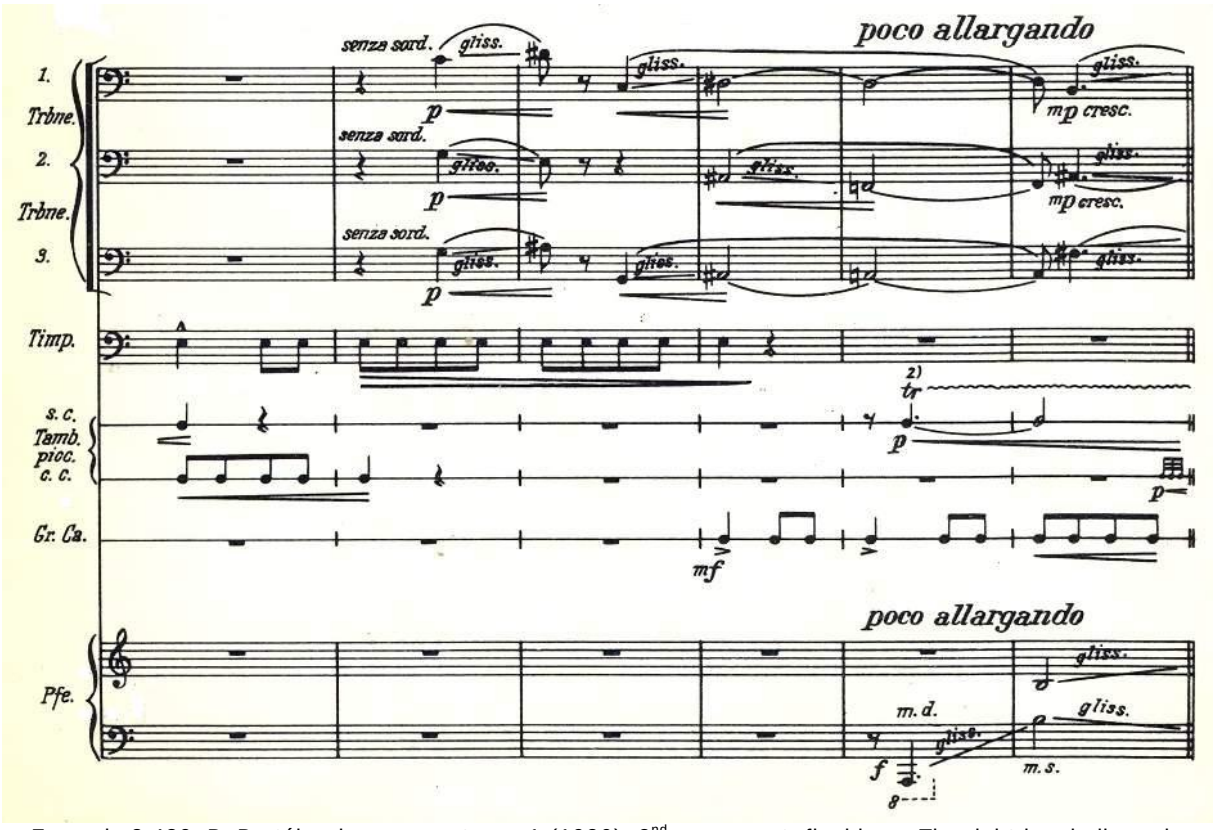


Example 3.428. S. Prokofief: *Ten Pieces* opus 12, nr. 7 (1912), bars 36-43. Muzyka edition / P. Jurgenson Publishing House.

Bartók once indicated the endings of some glissandos by way of a grace note. (Ex. 3.429.) As the other glissandos he wrote in this period (and in this same piece) all end on a pitch notated with a big head but *on* the beat, we cannot be sure to construe the grace note as an indication of an open ending (i.e. the last note *not* individually articulated).
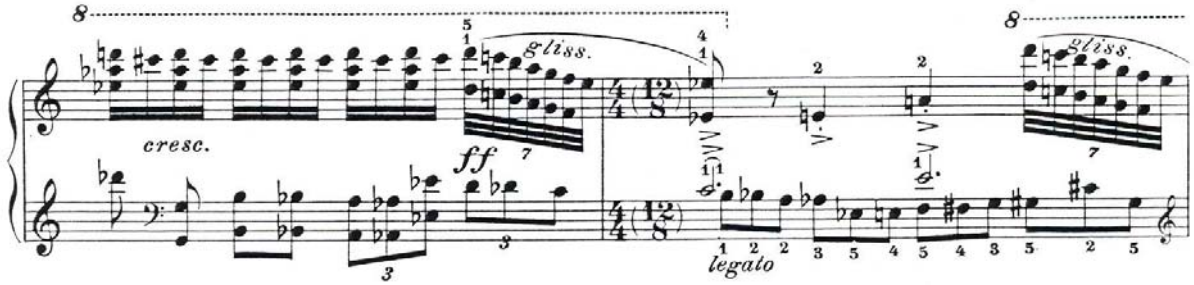


Example 3.429. B. Bartók: piano concerto nr. 1 (1926), 1st movement, from one bar after cue 21. © Boosey & Hawkes.

In this same concerto, Bartok left us another dubious bit of glissando notation. In the transition from the 2nd to the 3rd movement, he has a right hand glissando that splits into a contrary motion two-hand glissando. (Ex. 3.430.) The half note *b* may only be there to indicate where the left hand starts to glide, and *not* to be accentuated. On the other hand, the *b* may serve to calibrate the glissando in this *poco allargando* (see below, 3.4.2.1.9.).



Example 3.430. B. Bartók: piano concerto nr. 1 (1926), 2nd movement, final bars. The right hand glissando ends on e^3, the left hand on E^1. © Boosey & Hawkes.

One instance deserves special mention here to show how composers could be expertly concerned with the performance practice of their glissandos. Dmitry Shostakovich wrote some white-key octave glissandos of that needed to end on a black-key octave, so he dropped a note at the end of the gliding part to give the thumb time to move upwards to the black key. (Ex. 3.431.)

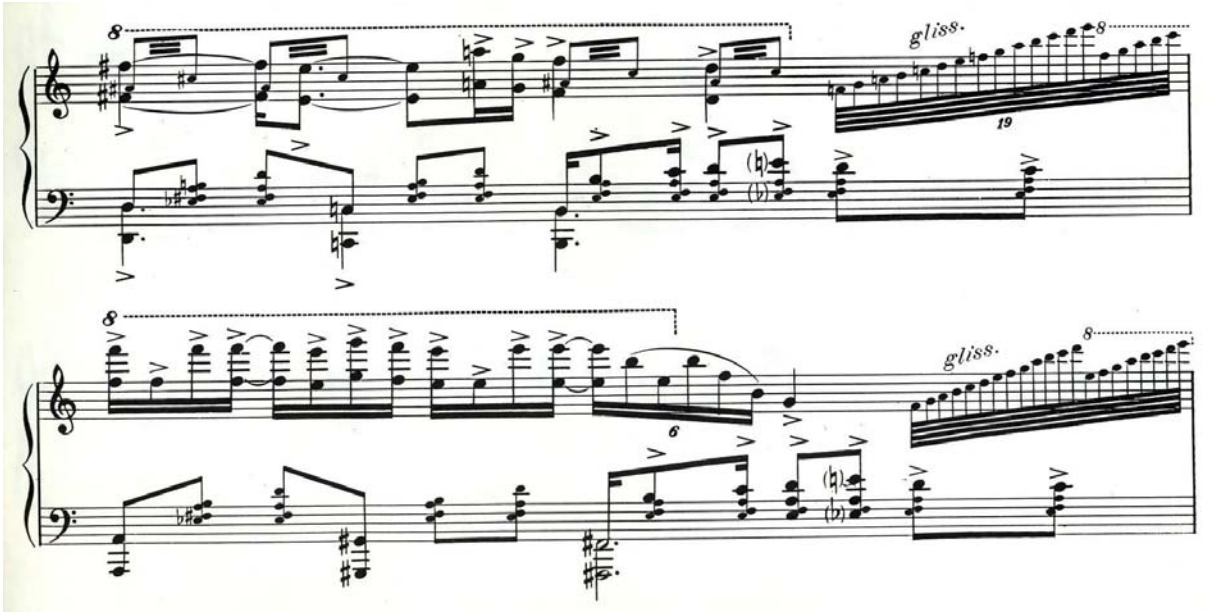


Example 3.431. D. Shostakovich: sonata 1 opus 12 (1926), bars 164-165. © MCA Music.

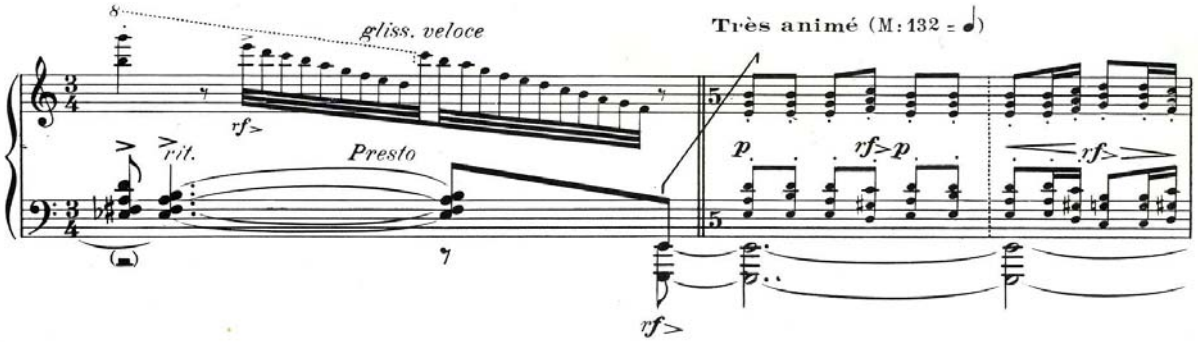
3.4.2.1.9 Speed

Glissandos cover a certain distance between fixed points. If they are written as part of a strict tempo environment, the time between those points is fixed and any extra suggestion of speed beyond the tempo indication is irrelevant. In cadenzas or other instances where the length of a glissando stretches beyond the available time to play all the notes, the performer has to choose how much he stretches the pulse or how flashy he wants the glissando's effect to be. In the early 20th century some glissandos were

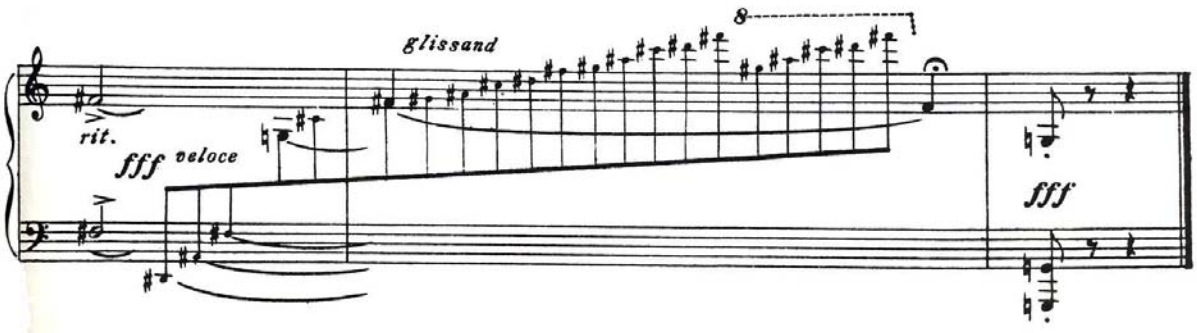
given such specific indications of speed, pointing at a particular *level* of speed – *veloce* ("fast") – to show either the composer's preference or lack thereof. Especially Heitor Villa-lobos (1887-1959) sensed the difference between glissandos that fitted the tempo (ex. 3.432) and those that needed extra specification. (Ex. 3.433, 3.434, 3.435.)



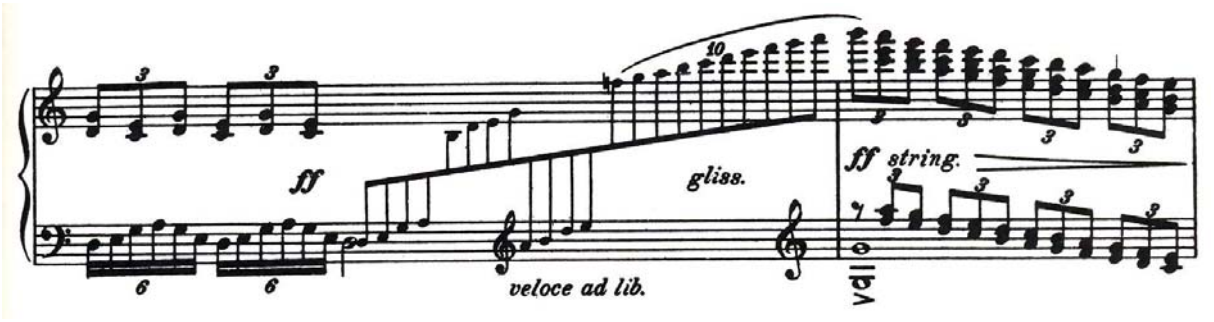
Example 3.432. H. Villa-Lobos: *Rudepoema* (1926), bars 443-444. © Max Eschig editions.



Example 3.433. H. Villa-Lobos: *Rudepoema* (1926), bar 446. © Max Eschig editions.



Example 3.434. H. Villa-Lobos: *Simples Coletânea*, nr. 3 *Rhodante* (1919), final bars. © Consolidated Music Publishers, Inc.



Example 3.435. H. Villa-Lobos: *Prolé Do Bébé*, Suite nr. 1, nr. 2 *Moreninha* (1918), bar 31. © Consolidated Music Publishers, Inc.

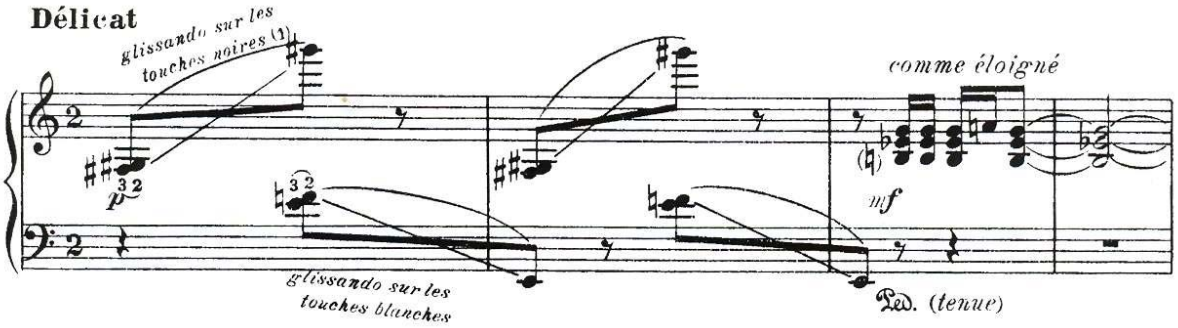
A few glissandos required a change of velocity *during* the gliding, as for instance in Bartók's 1st piano concerto (see above, ex. 3.430), Prokofiev's 4th *Sarcasme* (see above, ex. 3.420) or Medtner's concerto (see above, ex. 3.406). The Bartók instance deserves special attention. The pianist can perform the *poco allargando* by actually slowing down the notes within the glissando, calibrating the change in tempo by interrupting the glissando to place the *b*. But two other interpretations are possible also. In glissando playing the speed of the gliding is determined by the movement of the arm by the time it takes on the pivotal notes to change position of the hand. The individual notes in the gliding part do not necessarily have any bearing to the way the meter is divided for proper runs. Realizing this, the *poco allargando* can be seen as a directive to make the piano part *sound* as if slowing down, rather than physically slowing down the *playing* itself. Considering the passage as such, the *b* can be considered enough – together with the *allargando* in tempo in the other instruments – to make the tempo change audible without any change of speed for all the other notes in the glissando. The glissandos in each of the two bars would be steady in tempo but the second bar's tempo would be slower than the one in the first bar. A third interpretation could be to even consider the *b* as a notational by-product only: not to be played explicitly but rather to show the performer when to split the glissando into two directions. The complete glissando passage can then be played in one steady tempo while the distance covered in those two bars takes as long as necessary to match the *allargando* that is played only by the other instruments. The effect could be reinforced by leaving out any accent, interpreting the *forte* as a general dynamic and *not* playing the A^2 as a pivotal note. That way the slowing down in the piano part would be a virtual one, due to notational ambiguity as much as to the nature of glissando playing.

3.4.2.1.10 For children

After the many methods including the glissando in their pedagogical visions, it was only a matter of time before someone would write a piece with them for beginning piano enthusiasts. In 1919, Vincent d'Indy wrote a cycle of 24 study pieces "for children of all ages"; with graduated difficulty spread over three books. After simple pieces for the five fingers, compositions introducing the Gregorian modes, dance and other compositional forms, and individual composer's styles from Scarlatti to Debussy (including even one of his favorite 18th century composers: Wilhelm Friedrich Rust), d'Indy ends the publication with a piece demonstrating "Modern-Style." All the material is designed to provide enough contrast so as to overcome a limited attention span; the most recurrent material consists of black- and white-key glissandos. (Ex. 3.436.) Interestingly, d'Indy asks for the first notes of the glissandos to begin in a peculiar way, as explained in a footnote:

> One must *simultaneously* attack the two first notes of the *glissando* with the back of the first phalanx of the 2nd and 3rd finger of each hand.[1038]

D'Indy either wanted the glissandos to begin as if with a mistake (which would be in keeping with the suggestive, tongue-in-cheek, Satie-like commentary above some the musical notation[1039]) or he liked to include the dissonance of the interval as symbolic of modern music, although the soft dynamic level and delicacy of performance would mostly inhibit either perception of dissonance or mistake. At any rate, as much as this little technique resembles a well-known and effective way to start a trill, it here obscures what d'Indy intended the fingering to be exactly. Either the seconds are played with the hand in proper position – i.e. 3rd fingers on *g#* (right) and *e* (left) – or with the hand upside-down and ready to glide – i.e. the nail of the 3rd fingers on *f#* (right) and *f* (left). In both cases the performer still has the choice of either finger to do the actual gliding.
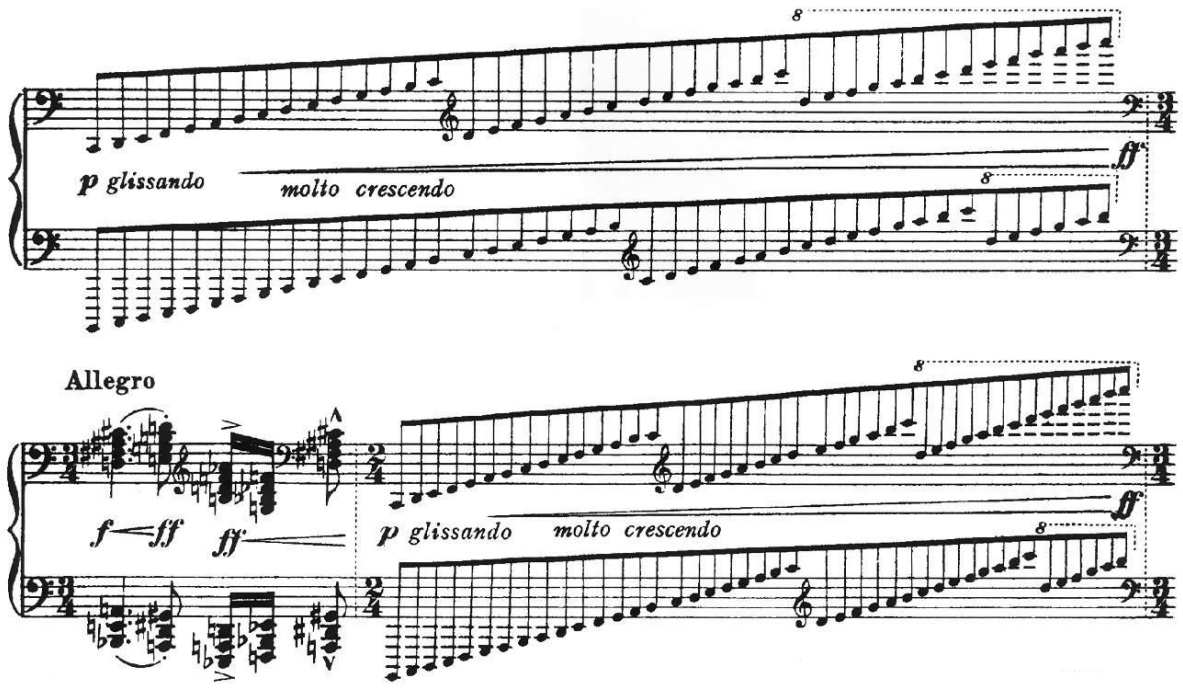


Example 3.436. V. d'Indy: *Pour les Enfants de tout âge* opus 74 (1919), nr. 24 *Modern-Style*, opening bars. Edition Rouart, Lerolle, et Cie.

3.4.2.1.11 Mixing and combining glissando types

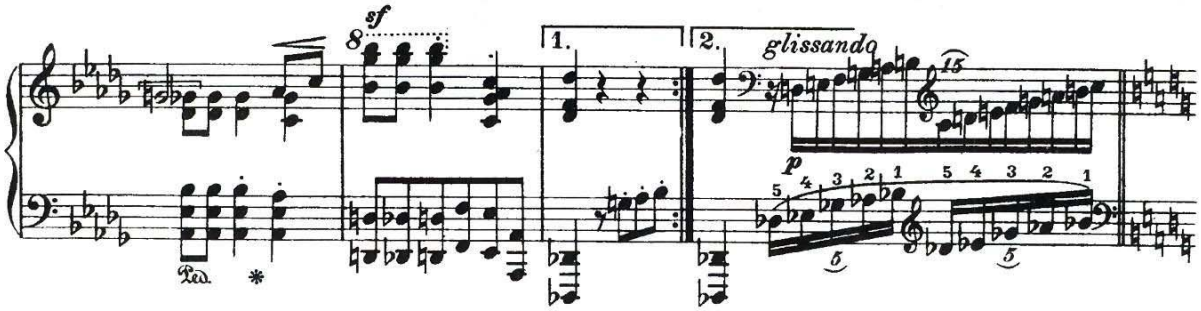
After thirds, fourths, sixths, octaves and the combinations thereof, it was only a matter of time before a composer would write glissandos a *dissonant* interval away from each other. It was the futurist Leo Ornstein who separated two white-key glissandos by the interval of a ninth (ex. 3.437) when he returned from Europe with music by – amongst others – Ravel and Debussy, which he promoted energetically.[1040]

[1038] "Il faut attaquer *simultanément* les 2 premières notes du *glissando* avec le revers des premières phalanges des doigts 2 et 3 de chaque main."
[1039] For instance: "profoundly annoyed" ("avec un profond ennui") over some dry, quiet and slow parallel fourths in bars 18-21.
[1040] See Broyles & Von Glahn 2007, p. 119-122. When back in the US, Ornstein started performing music by Schoenberg, Albéniz, Skryabin, Debussy, Ravel, d'Indy and other contemporary composers.

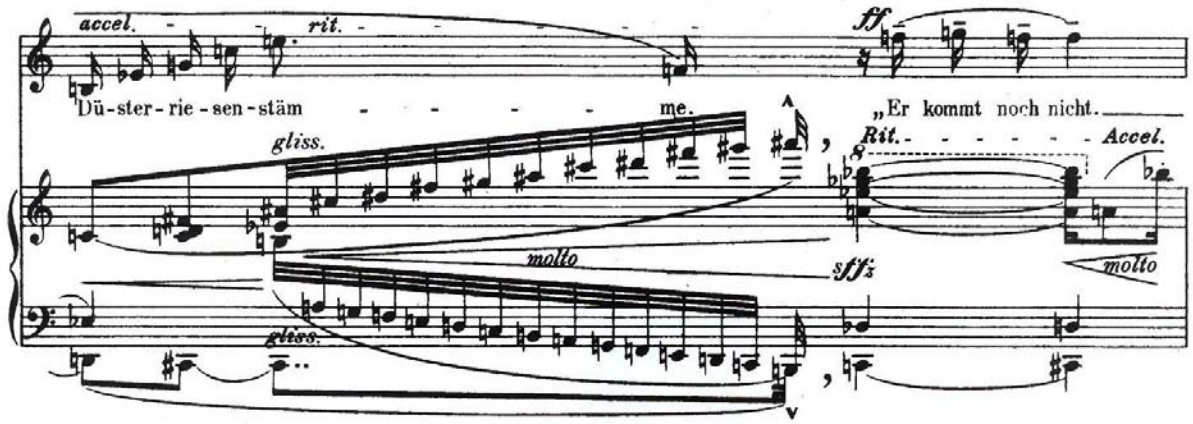


Example 3.437. L. Ornstein: *Dwarf Suite* opus 11 (1913-14), nr. 6 *Marche Grotesque*, bars 147-149. Reproduced by kind permission of Poon Hill Press.

Building on the technique behind Tausig's and Godowsky's pseudo-chromatic glissandos in the 19th century (see 3.3.2.4.4.5), the latter tried the same effect once again but now with only one hand gliding (ex. 3.438), while Alban Berg kept the double glissando but avoided any fake chromatics by putting the glissandos in opposite direction. (Ex. 3.439.)

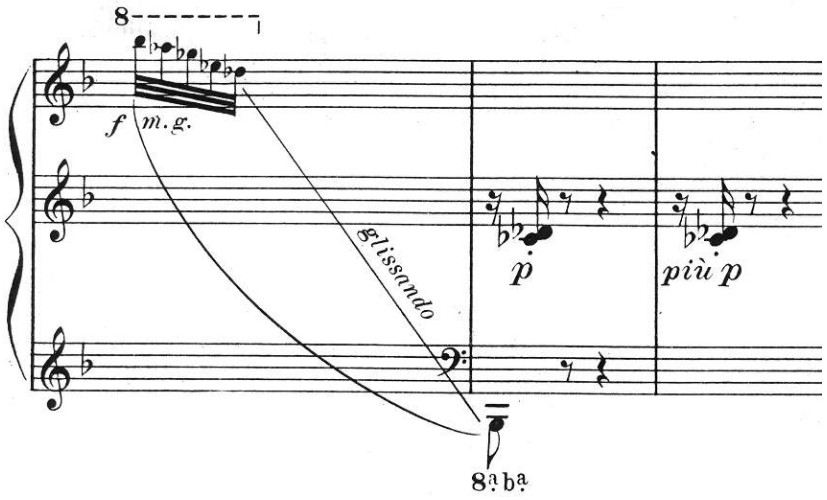


Example 3.438. L. Godowsky: *Symphonische Metamorphosen Johann Strauss'cher Themen* (1907), nr. 2 *Die Fledermaus*, bars 155-158. Cranz edition.

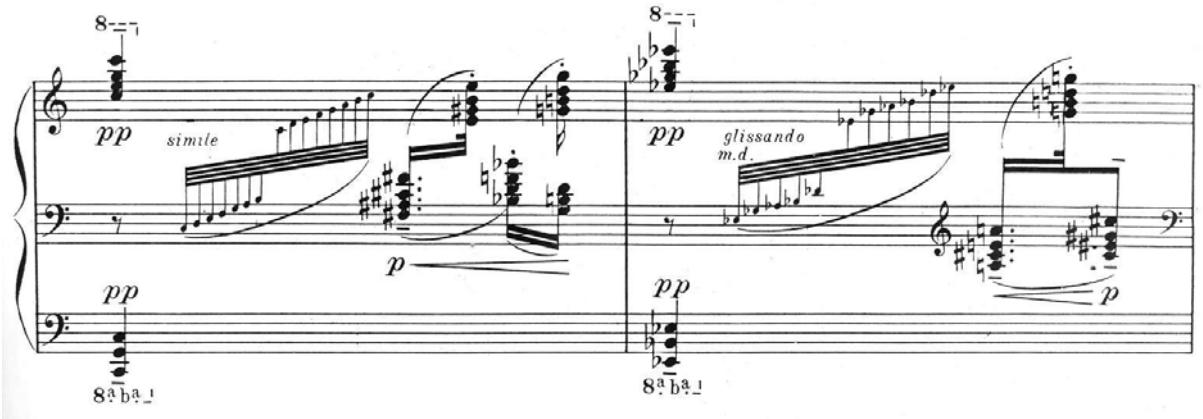


Example 3.439. A. Berg: 4 Lieder opus 2 (1910), nr. 4, bar 15. Schlesinger edition.

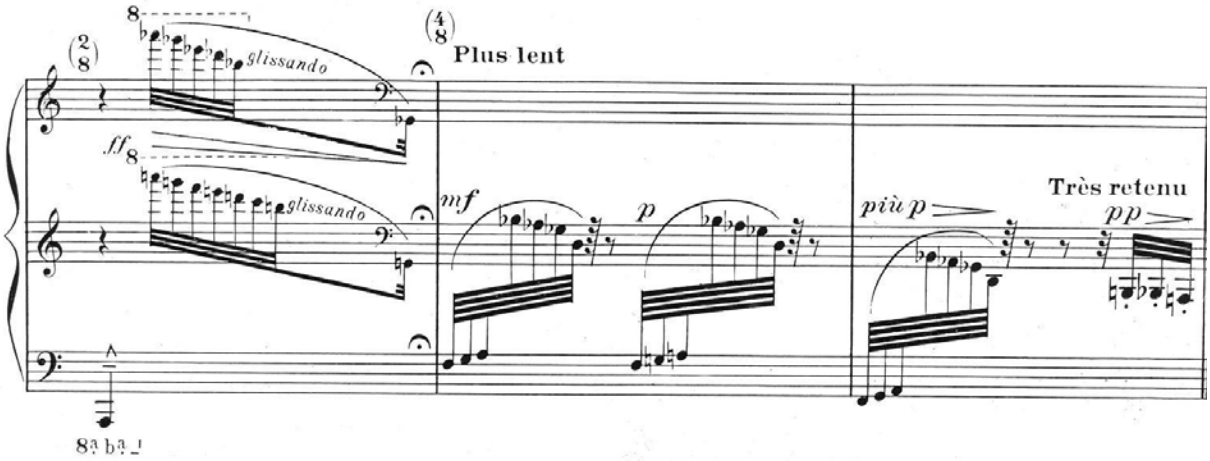
Debussy took a systematic approach: in *Feux d'artifice* he builds up from separate pentatonic and diatonic glissandos to the combination of both. (Ex. 3.440-3.442.)



Example 3.440. Debussy: *Préludes*, second book (1912-13), *Feux d'artifice,* bars 17-19. Editions Durand et Cie.
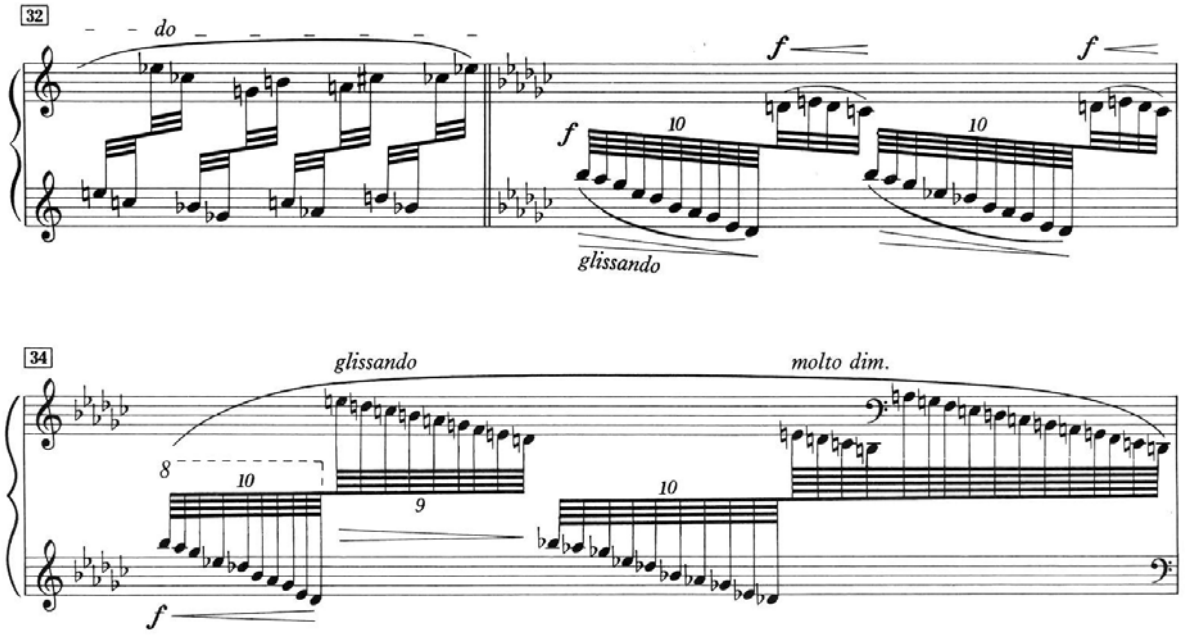


Example 3.441. Cl. Debussy: *Préludes*, second book (1912-13), *Feux d'artifice,* bars 62-63. Editions Durand et Cie.



Example 3.442. Cl. Debussy: *Préludes*, second book (1912-13), *Feux d'artifice,* bars 87-89. Editions Durand et Cie.

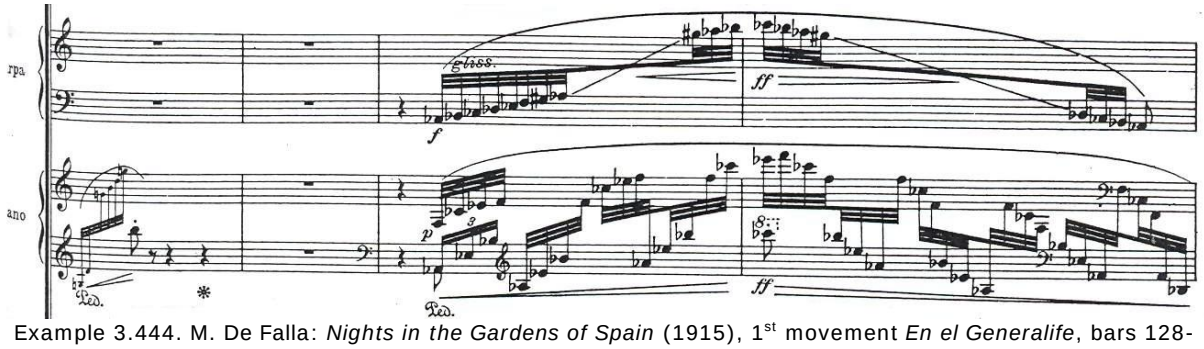
The ergonomics of the two-hand black- and white-key glissandos in *Feux d'artifice* is echoed in the three little two-hand black- and white-key flourishes in the bars that follow the glissandos. Debussy also played around with the morphology of the keyboard throughout his 1915 study for the eight fingers, culminating in black-key glissandos furiously alternating with white-key individually articulated motifs as well as glissandos. (Ex. 3.443.)
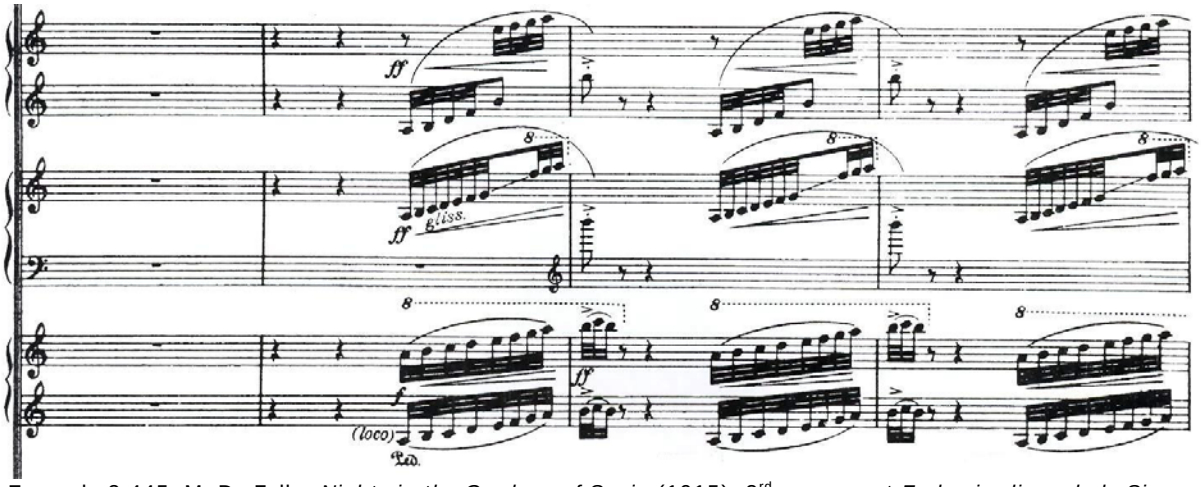


Example 3.443. Cl. Debussy: *Études*, first book (1915), nr. 6 *Pour les huit doigts*, bars 32-34. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

3.4.2.1.12 The glissando in orchestral setting

Apart from the concerto format, the 19th century composer was in the habit of writing glissandos for "brilliant" solo showpieces based on popular tunes. The early 20th century saw a marked rise in chamber music and "serious" forms: the few sets of variations and virtuoso paraphrases are contrasted with sonatas (not "brilliant" as the only sonata with a glissando was titled in the previous century[1041]), songs and other chamber musical settings, as well as orchestral settings requiring a piano or celesta. In orchestral settings, composers have the opportunity to compare the potential of several related instruments: the piano, the harp and the celesta.[1042] The piano did not always get to play the glissando, however, as evidenced in Manuel De Falla's *Noces en los Jardines de España* (ex. 3.444-3.445).



Example 3.444. M. De Falla: *Nights in the Gardens of Spain* (1915), 1st movement *En el Generalife*, bars 128-131. Top system: harp; bottom system: piano. Max Eschig edition.

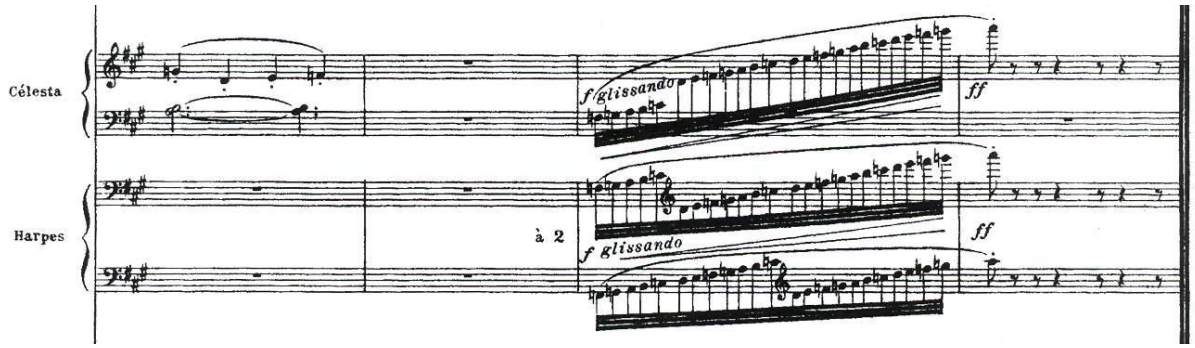


Example 3.445. M. De Falla: *Nights in the Gardens of Spain* (1915), 3rd movement *En los jardines de la Sierra de Córdoba*, bars 67-70. Top system: celesta; middle system: harp; bottom system: piano. Max Eschig edition.

The attraction of the celesta for composers' orchestral endeavors led them to write glissandos for this particularly heavy keyboard as well. (Ex. 3.446.) We will see particular consequences of this new factor when discussing more orchestral keyboard glissandos in the next item.

[1041] Kalkbrenner's opus 177 from 1845, see table 3.1.
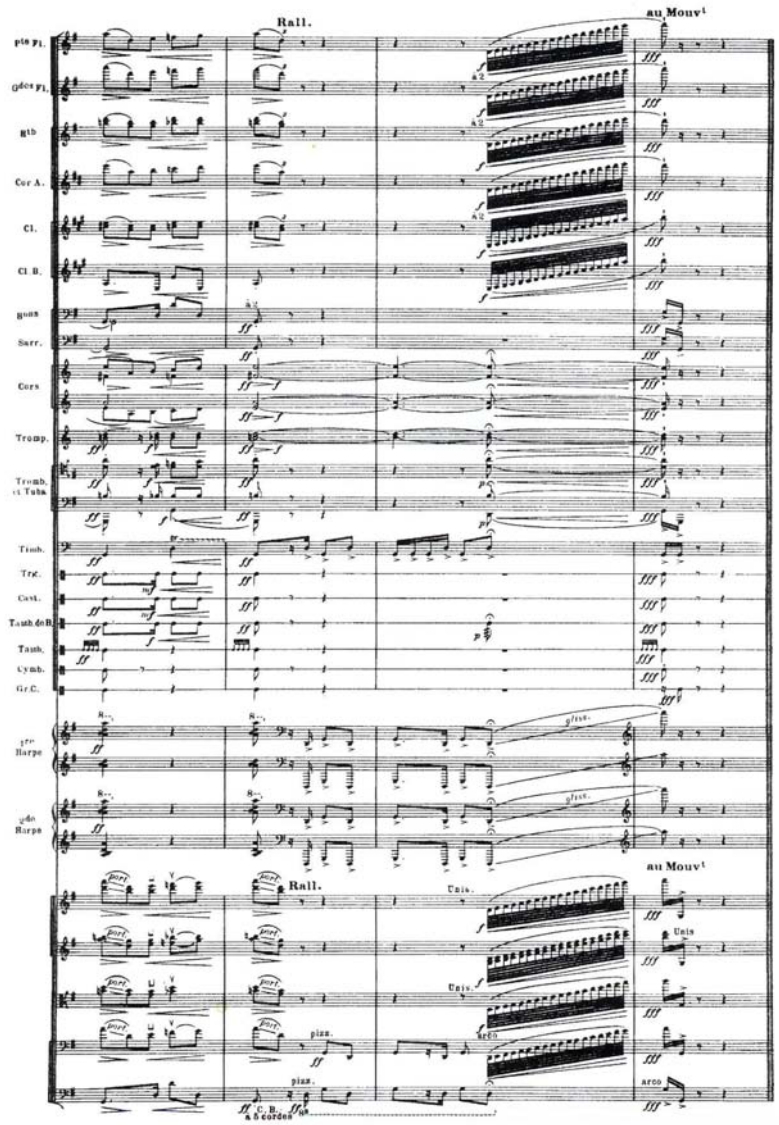
[1042] Potentially the organ should be added to this list, but we did not find any glissando instances that involve an organ part in an orchestral score.



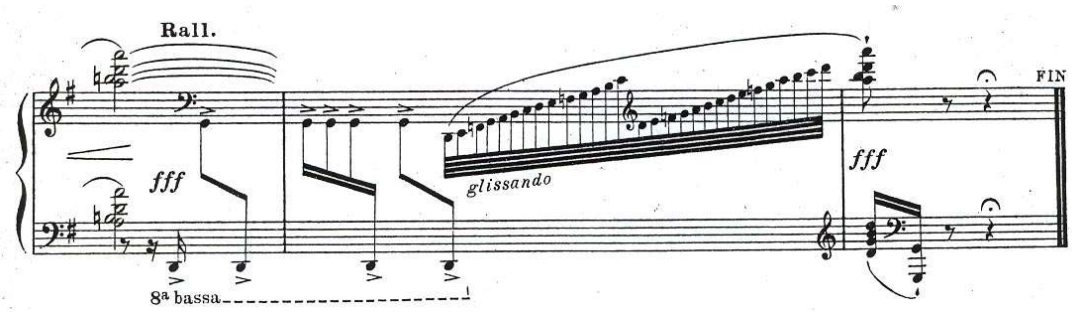
Example 3.446. Cl. Debussy: *Images* (1913), nr. 3 *Rondes de Printemps*, final bars. Editions Durand et Cie.

3.4.2.1.13 Glissando transcriptions

Transcriptions for piano and orchestra of original solo piano works – or vice versa – can show us how composers treated the glissando differently when switching setting. In Liszt's *Totentanz* we saw differences between the glissandos in the versions for solo and for concertante piano that had to do with practicalities, i.e. some glissandos had to be cut in order to insert some of the orchestral parts into the piano solo score. In the early 20th century composers similarly decided to adapt glissandos in piano parts, although the reasons were not always evident. When virtually the whole orchestra has a fast upwards run as an upbeat to the last note, as in e.g. Ravel's *l'Heure Espagnole* (ex. 3.447) then the transcription can pose no problems. (Ex.3.448.)

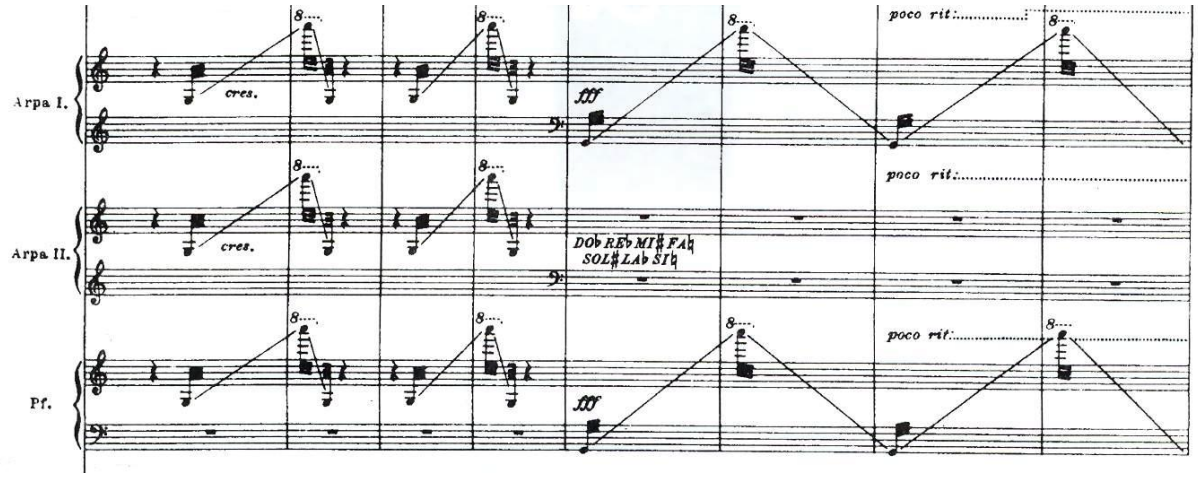


Example 3.447. M. Ravel: *l'Heure Espagnole* (1907-09), final bars. Editions Durand et Cie.
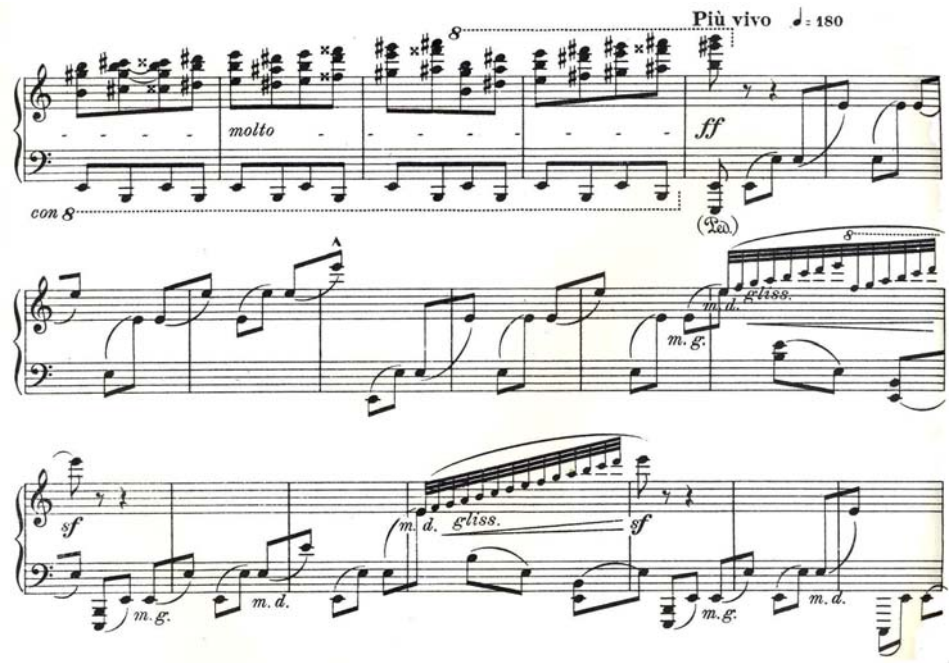


Example 3.448 M. Ravel: *l'Heure Espagnole* (1908), composer's vocal score, final bars. Editions Durand et Cie.

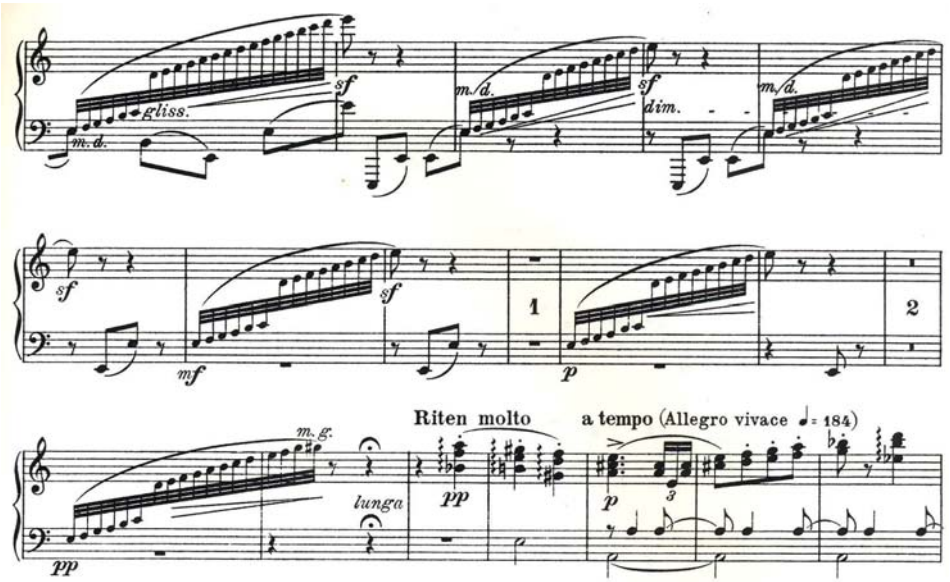
Matters are not always as simple, however. Ottorino Respighi's *Fontane di Roma* has 21 glissandos in the parts for piano and celesta alone (not counting those in the harp parts), with some passages infested with glissando playing for different instruments together. (Ex. 3.449.) And yet only two glissandos found their way into the four-hand version that the composer put together.



Example 3.449. O. Respighi: *Fontane di Roma* (1916), cue 8. G. Ricordi edition.
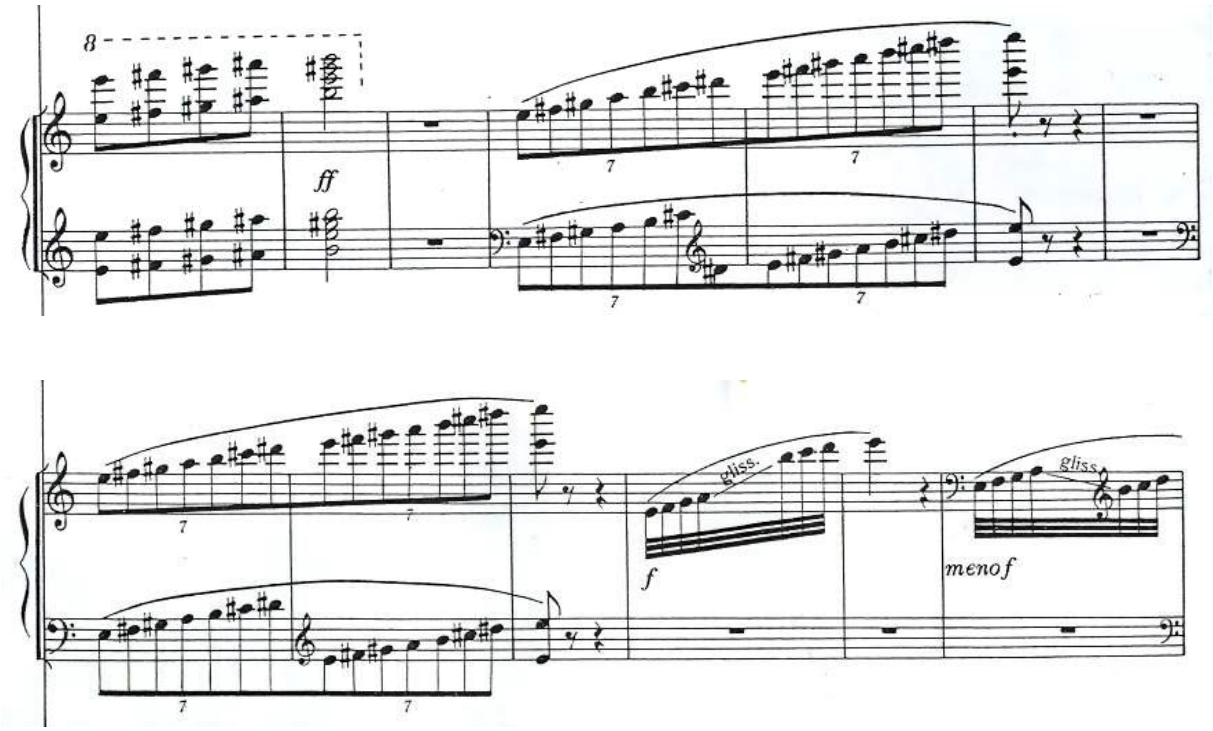
With Bartók's *Rhapsody* opus 1 (1904) we find an example of changed glissandos when transcribing for piano and orchestra a piece that was originally for solo piano. Arriving at a *più vivo* in the fast *frissu* dance part of this Lisztian rhapsody, Bartók takes his time to introduce a 30-bar long multiple glissando passage in the solo version of the piece. (Ex. 3.450.)





Example 3.450. B. Bartók: rhapsody opus 1 (1905), concerto version, bars 344-382. Reproduced by permission of Editio Musica Budapest.

The orchestral version of the same year (but made *after* the solo version[1043]) is 16 bars shorter and replaces part of the repeated E's in the solo version and three of the glissandos (amongst which the longest of the sequence) with two-hand septuplet runs. Only from bar 365 onwards in the solo version did Bartók use his original material for the concertante version. (Compare Ex. 3.450 and 3.451.) The new material – the septuplets – is more closely connected to the preceding music, but otherwise there is no detectable pianistic reason for the cuts in the number of bars and glissandos.
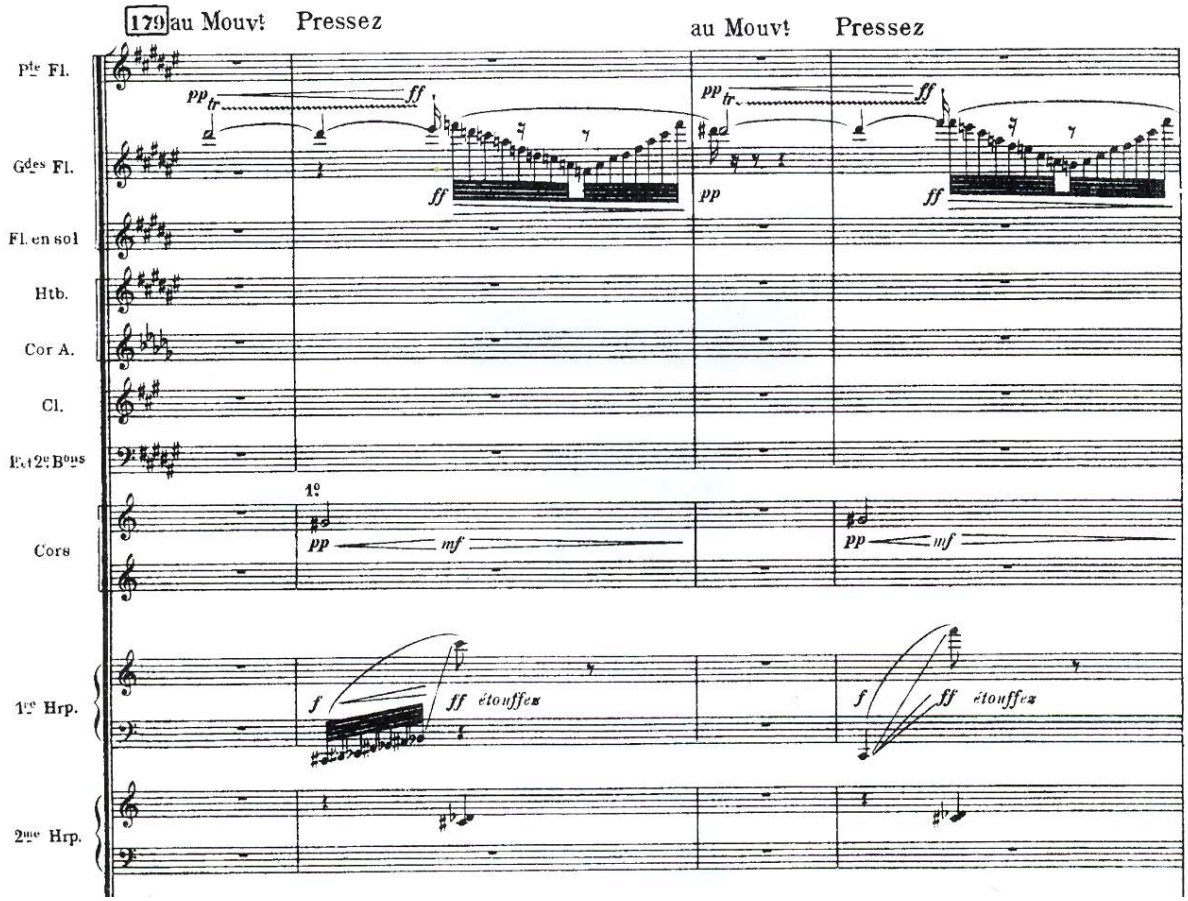


Example 3.451. B. Bartók: rhapsody opus 1 (1905), concerto version, from bar 12 after cue 21 onwards. The second bar in this excerpt equals bar 348 in the solo version (ex. 3.418). Reproduced by permission of Editio Musica Budapest.

[1043] Suchoff 1981, p. viii.

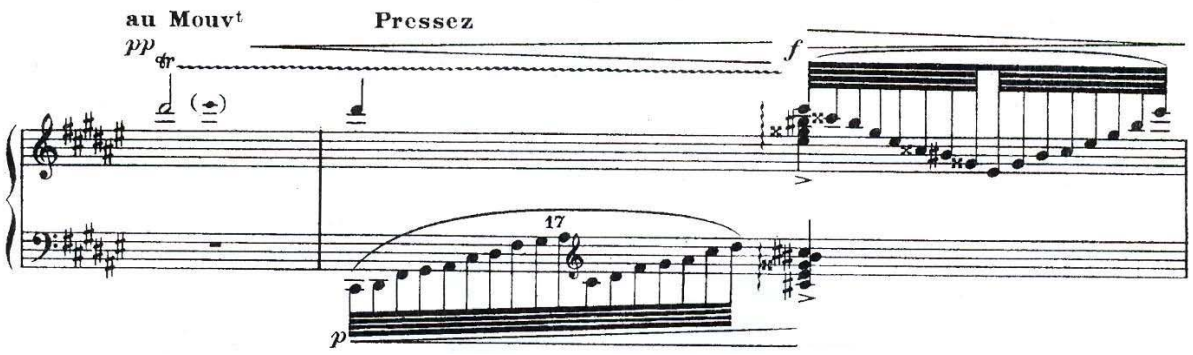
More importantly than the reasons for the changes between the two versions of Bartók's Rhapsody is the consequence of the changes for performance practice. In the solo version the repeated E's demand that the first notes of the first five glissandos are individually articulated. Bartók's indications for left and right hand usage do not change that musical requirement. How the last three glissandos should be played is not made explicit by the composer. The notation alone suggests they may be glided from their first note; musical consistency might demand otherwise.

As glissandos also entered the parts of orchestral instruments (see 3.4.2.1.12), the orchestra had another influence besides serving as a context for transcribing piano solo glissandos. In the 19th century, with for instance Liszt's many transcriptions for solo piano of all kinds of orchestral scores, we did not find any glissando in a piano score that was originally for e.g. the harp. Liszt's virtuoso double note glissandos in his transcription of Berlioz' *Symphonie Fantastique* (see 3.3.2.2.6.1) are in fact a pianistic version of material in the orchestral string parts. In the early 20th century such transcription practice changed remarkably. In the fourth part, *Feria*, of Ravel's *Rhapsodie Espagnole* (1907-08), there are glissandos for the xylophone, the celesta and the harp. That the composer only transcribed the harp glissandos for the four-hand piano version is easy to understand: the harp glissandos are *ff* (*p* in the xylophone part and *pp* to *f* for the celesta) and the only ones that are audible as melodic gestures instead of the mere instrumental coloration that the others aim to be.

Ravel's *Daphnis et Chloë* (1909-12) demonstrates how he could differentiate with considerable subtlety when he wrote glissandos for the orchestra and then transcribed the music for piano. In terms of glissandos for the harps, the orchestral version represents a veritable embarrassment of riches: there are literally hundreds of them. In the piano reduction, which Ravel finished first (1909-10), only a few instances can be found where orchestral glissandos were deemed worthwhile to be transcribed as keyboard glissandos. Two of them are on the black keys: the upbeat to cue 26 in the score and the passage from cue 179 (compare the latter in ex. 3.452 and 3.453).
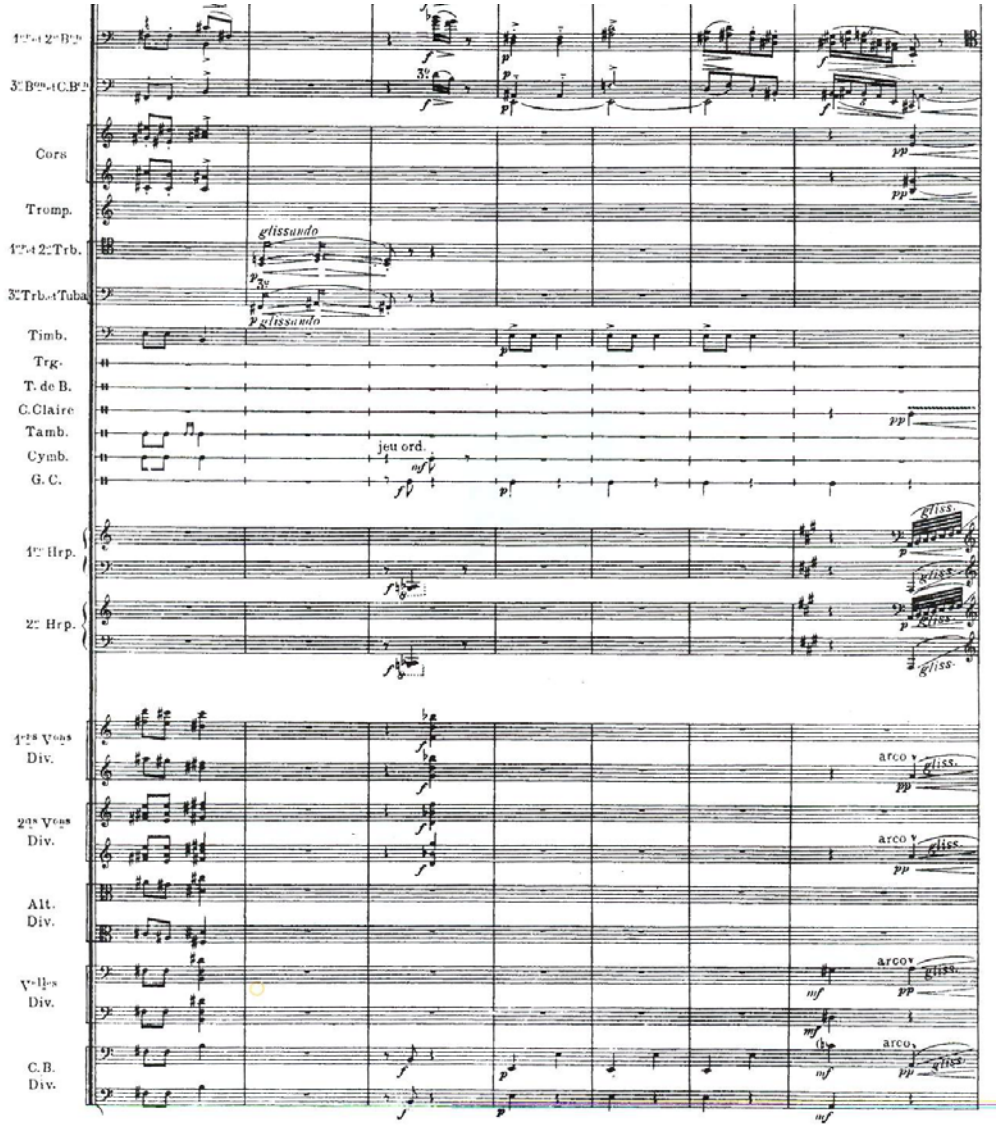


Example 3.452. M. Ravel: *Daphnis et Chloë* (1909-12), from cue 179. Editions Durand et Cie.

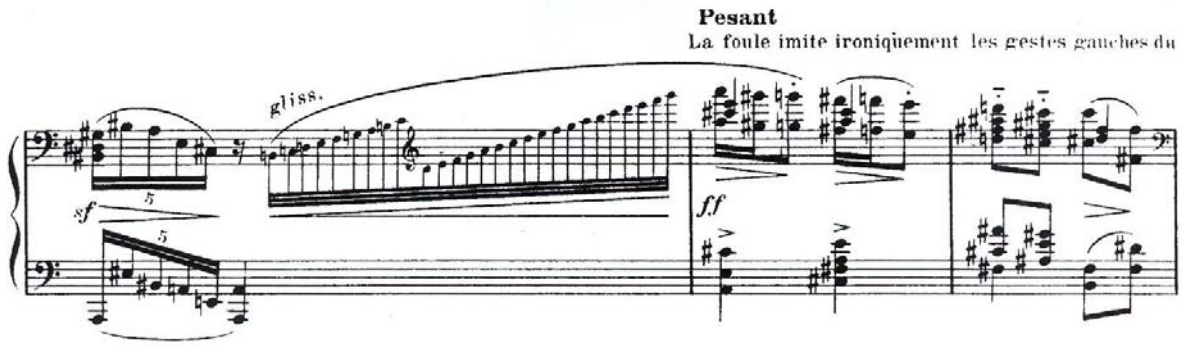


Example 3.453. M. Ravel: *Daphnis et Chloë*, piano reduction (1909-10), from cue 179. Editions Durand et Cie.

The eight harp and string glissandos that we find earlier in the score seem to be transcribed with a meaningful difference. In the orchestra the glissandos depart clearly *on* the A, which serves as the actual upbeat to the next bar. (Ex. 3.454.) In the piano transcription (Ex. 3.455.) the glissando starts after a 16th note rest, so that the A octave is the end of the previous phrase, and the upbeat starts with the gliding part of the glissando. From a performance practical standpoint this is a major difference, musically speaking. It is with the 16th note rest that Ravel shows us he intended the A to be the end and not the beginning of a phrase. In the orchestra he did not need to use such a subtle indication because the different instruments can easily make the distinction between the end and the beginning of a phrase by the way they can play different dynamics and colors on one and the same beat.
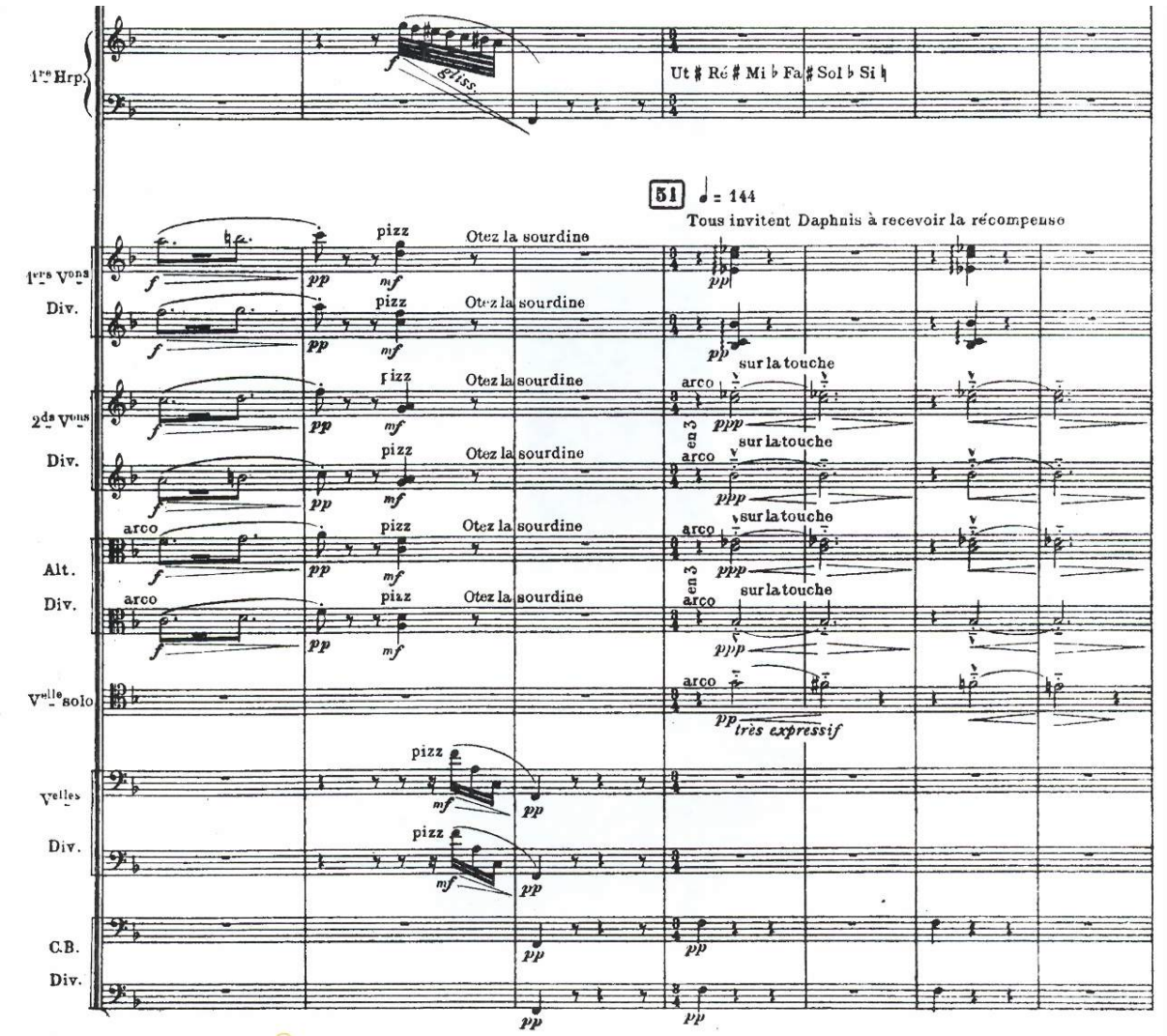


Example 3.454. M. Ravel: *Daphnis et Chloë* (1909-12), from seven bars before cue 40. Editions Durand et Cie.



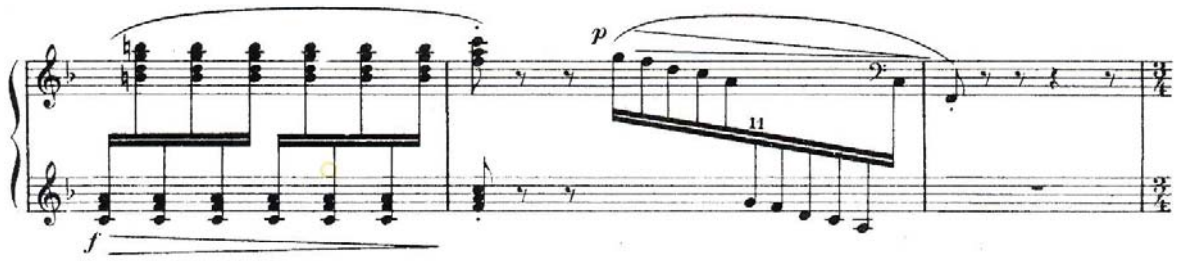
Example 3.455. M. Ravel: *Daphnis et Chloë*, piano reduction (1909-10), from one bar before cue 40. Editions Durand et Cie.

Ravel did not only write glissandos to emphasize upbeats. Sometimes the glissando was more a means to coloration, which was worked out differently in the piano reduction. At one point the orchestral version four pizzicato notes in the cellos are combined with a

glissando in the harp. (Ex. 3.456.) In the piano solo version (ex. 3.457.), only an arpeggio is left, indicating how the original glissando was not the *main* musical idea but rather served to color an F major chord.



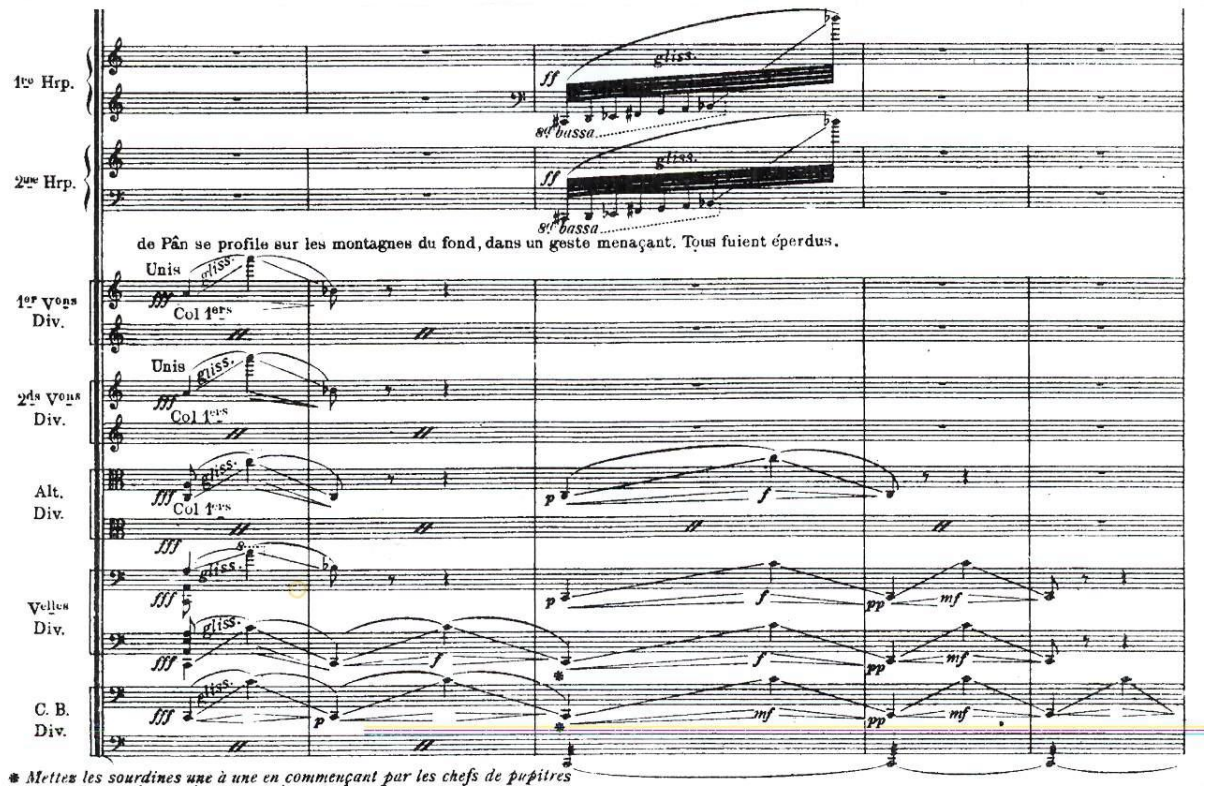
Example 3.456. M. Ravel: *Daphnis et Chloë* (1909-12), from three bars before cue 51. Editions Durand et Cie.



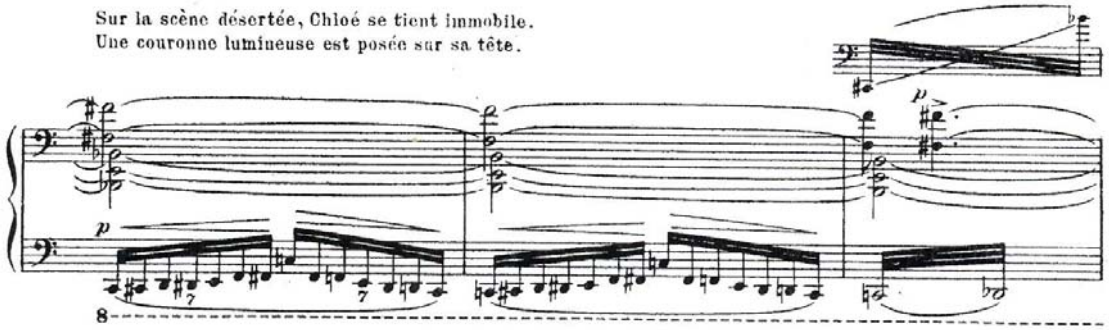
Example 3.457. M. Ravel: *Daphnis et Chloë*, piano reduction (1909-10), three bars before cue 51. Editions Durand et Cie.

Most interesting is how, much further down the score, Ravel rewrote more than 60 glissandos (mostly two octaves long) in strings and harps as little chromatic runs for the piano. (Compare ex. 3.458 and 3.459.) In the piano part the glissando technique would

not have been adequate to represent the quiet and muted glissandos in the strings. The loud interventions by the harp glissandos are merely indicated in the piano reduction for informational purposes.



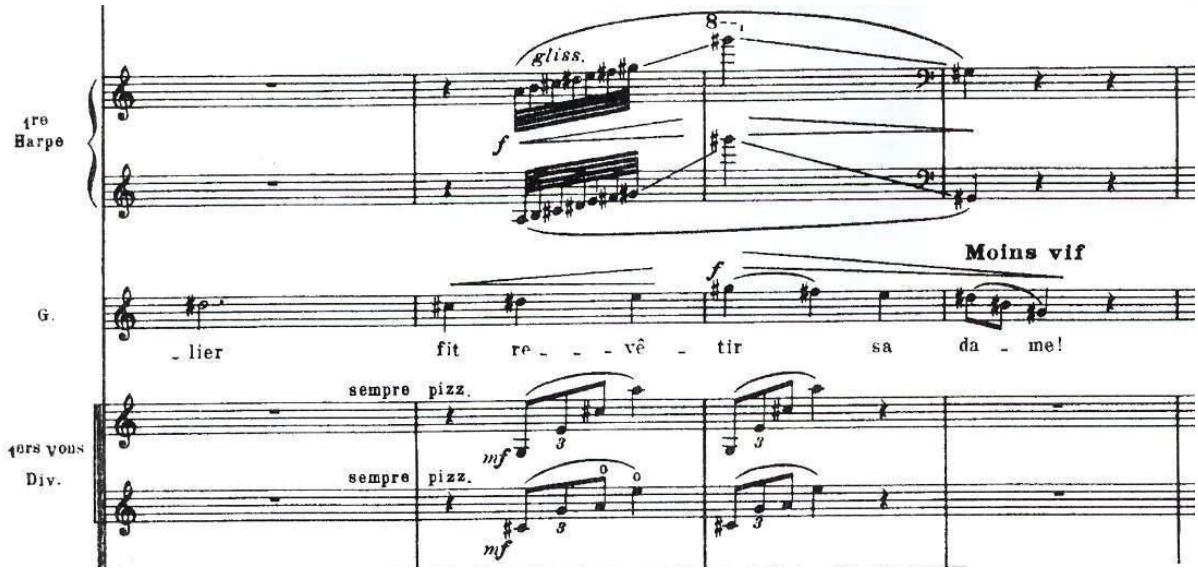
Example 3.458. M. Ravel: *Daphnis et Chloë* (1909-12), from eight bars before cue 153. Editions Durand et Cie.
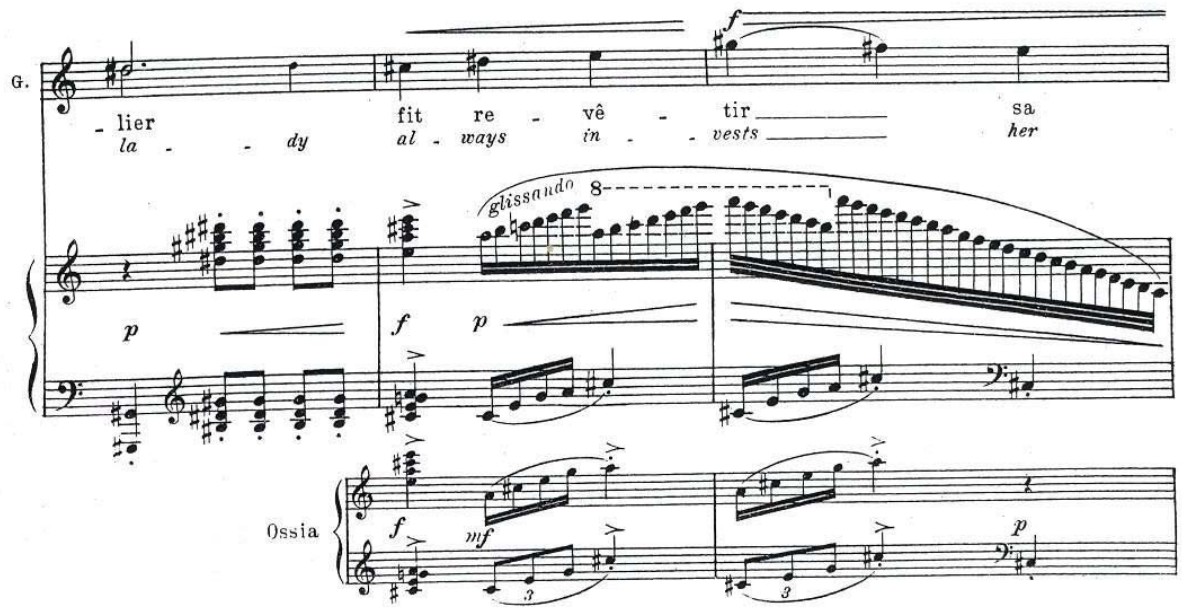


Example 3.459. M. Ravel: *Daphnis et Chloë*, piano reduction (1909-10), from eight bars before cue 153. Editions Durand et Cie.

Following this passage is an extended orchestral part with dozens of up-and down glissandos in the harp, combined with arpeggio-like passagework in the woodwinds. In the piano reduction Ravel only uses the woodwind material. Obviously, he did not consider the keyboard glissando to be always the best or foremost choice for transcribing orchestral glissando effects onto the keyboard.

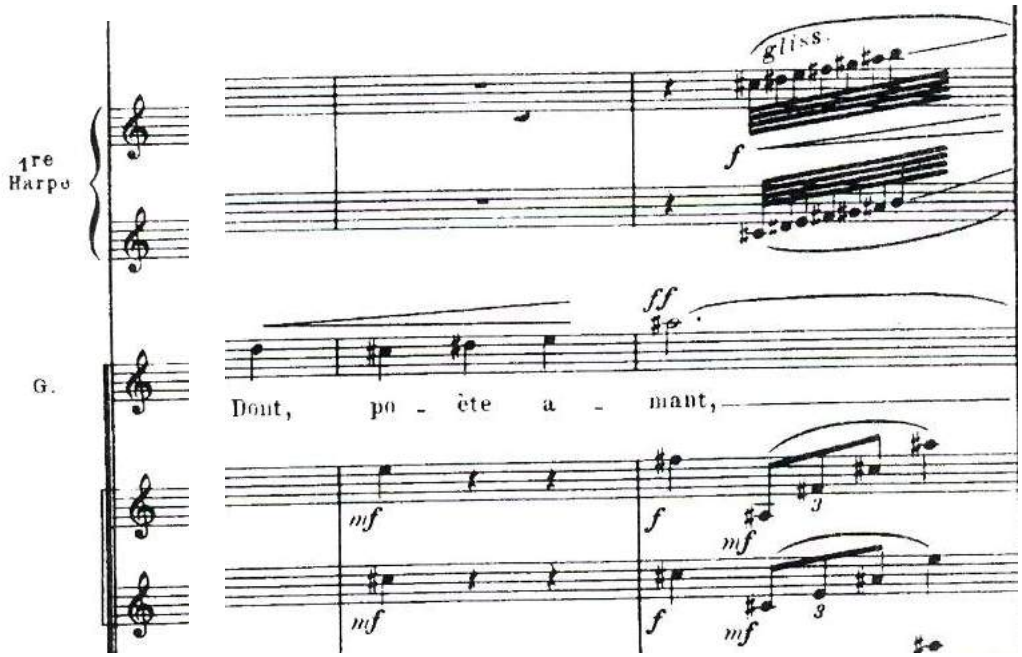
At one point in Ravel's *l'Heure Espagnole* the harp plays a set of glissandos fitted to the voice's melody and to the A7+ environment in the rest of the orchestra. (Ex. 3.460) In Ravel's own transcription for the vocal score, he transcribes this instance with a white-key glissando. (Ex. 3.461.) A little later in the orchestral score the passage is repeated but on the basis of an F#7+ harmony (ex. 3.462), which the composer transcribes as a black-key glissando. (Ex. 3.463.) The piano's keyboard does not allow the same versatility in glissando playing as the harp, on which instrument the combinations of the pitches for a glissando are virtually endless. Obviously Ravel started out fitting the black-key glissando to the F#+ chord, then applying the one remaining option to the A7+ passage.



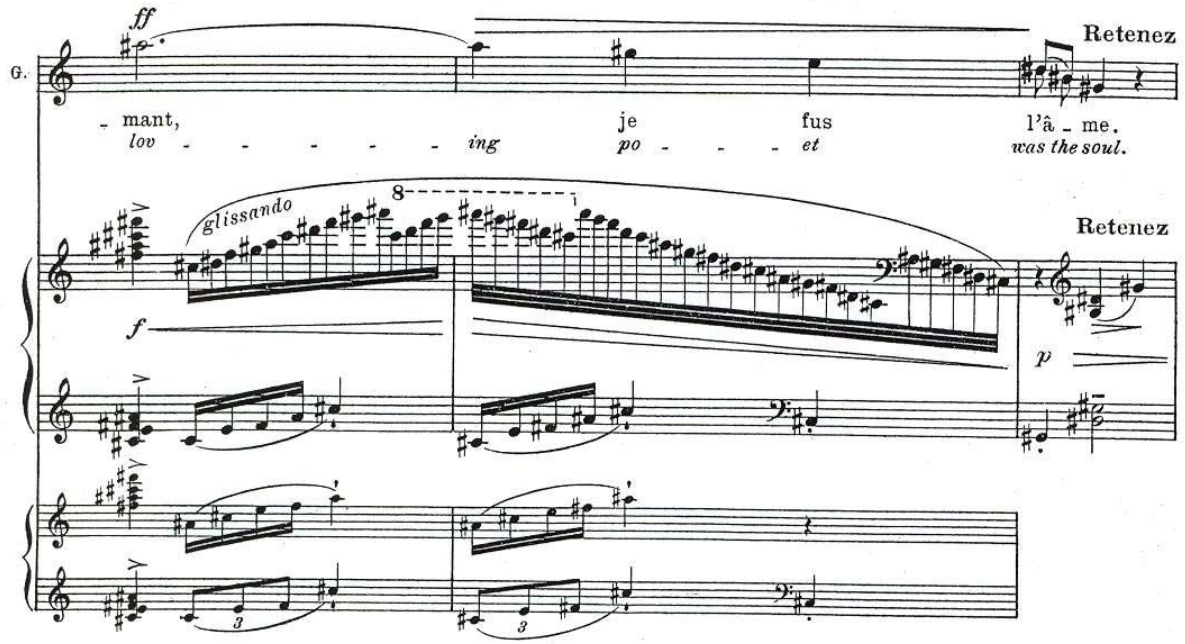
Example 3.460. M. Ravel: *l'Heure Espagnole* (1907-09), cue 102. Editions Durand et Cie.



Example 3.461. M. Ravel: *l'Heure Espagnole* (1907-09), composer's vocal score, cue 102. Editions Durand et Cie.
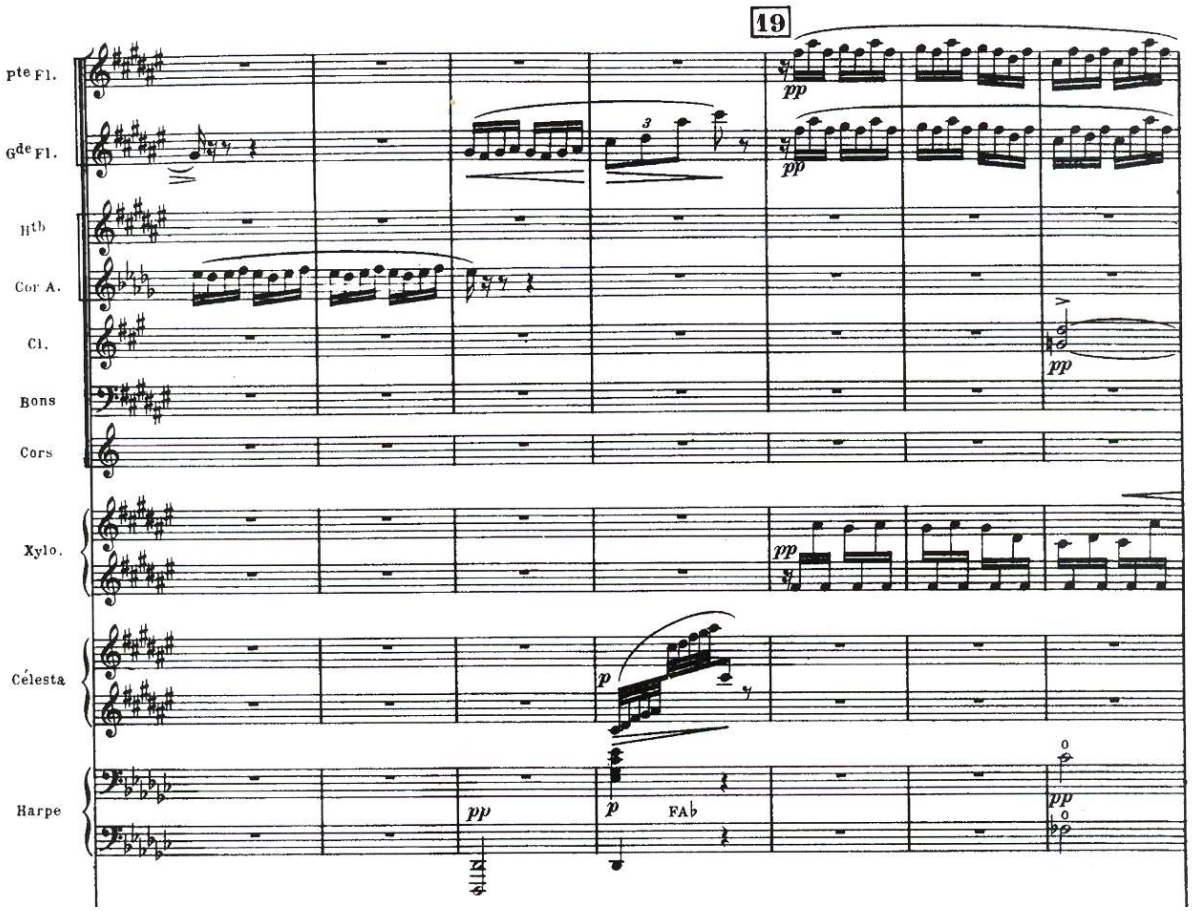


Example 3.462. M. Ravel: *l'Heure Espagnole* (1907-09), cue 103. Editions Durand et Cie.

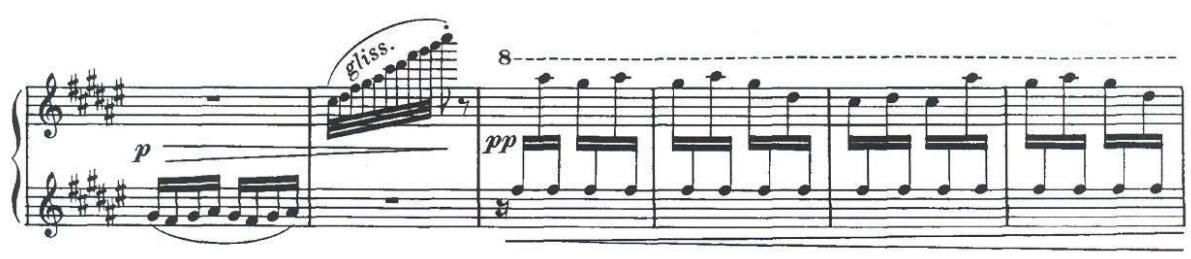


Example 3.463. M. Ravel: *l'Heure Espagnole* (1907-09), composer's vocal score, two bars after cue 103. Editions Durand et Cie.

From an ergonomical point of view, the glissando is most natural way to play the harp. As much so, it is one of the most difficult techniques to play the celesta. This keyboard instruments action is so heavy that glissandos can be most painful, especially on black keys. Ravel's *Ma Mère l'Oye* (1911) is excellent in demonstrating this. In one passage the celesta plays the black key flourish with individual articulation while the performer in the four-hand version could just as well have had to play the exact same fingering, only Ravel opted for the glissando (compare ex. 3.464 and 3.465.)

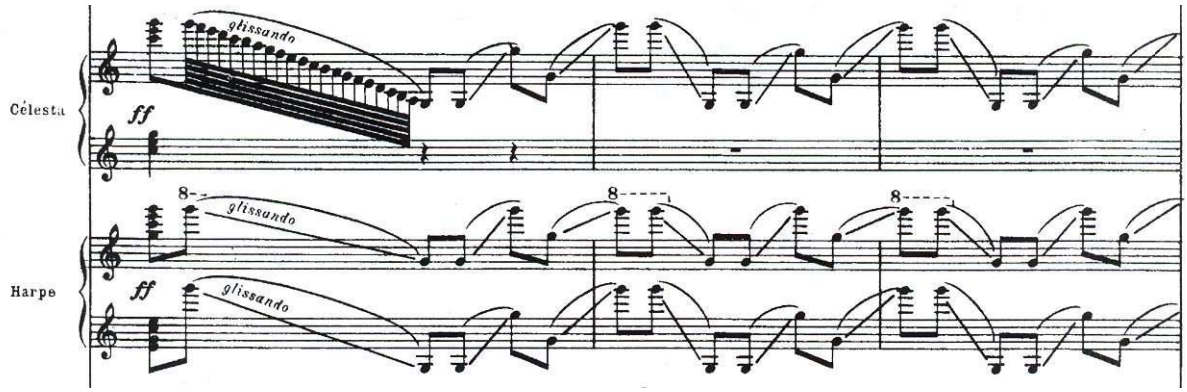


Example 3.464. M. Ravel: *Ma Mère l'Oye*, orchestra (1910-11), part III *Laideronette*, from four bars before cue 19. Editions Durand et Cie.

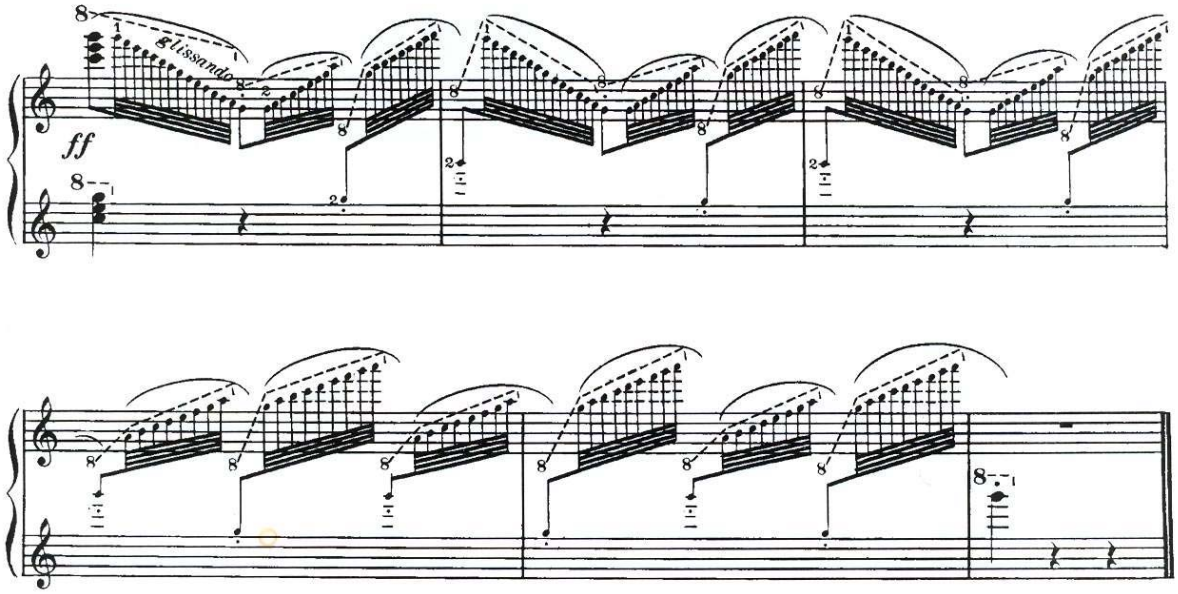


Example 3.465. M. Ravel: *Ma Mère l'Oye,* four-hand piano (1910), part III *Laideronette*, from two bars before cue 19. Editions Durand et Cie.

Besides the mere choice between glissando and individual articulation, Ravel also adapts aspects of glissando playing when turning from harp and celesta to the piano. At the very end of *Ma Mère l'Oye*, the two- to three-octave glissandos in celesta and harp are too big to fit in the treble part of the four-hand version (the second player's part would be in the way), so the composer cuts them down but compensates by lengthening the upwards glissandos with just two notes, whereby each upward glissando ends just above the first note of the next glissando. This is easy on a 20th century piano, but would be very difficult on the celesta due to the fact that its action hardly encourages repeated notes. (Compare ex. 3.466 and 3.467.)



Example 3.466. M. Ravel: *Ma Mère l'Oye* (1910-11), part V *Le jardin féerique,* from cue 5. Editions Durand et Cie.
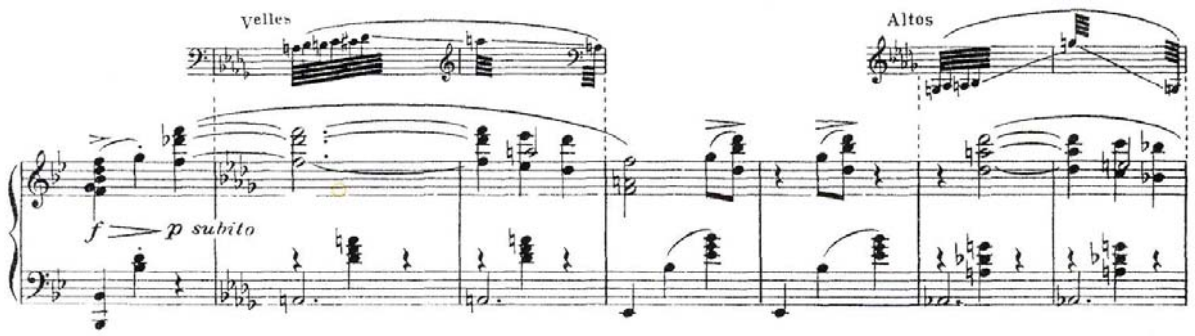


Example 3.467. M. Ravel: *Ma Mère l'Oye* (1910-11), part V *Le jardin féerique*, first player's part from cue 5. Editions Durand et Cie.

With his transcriptions Ravel shows to be creative with the glissando where others merely follow standard practice: the solo transcription of *Ma Mère l'Oye* by Jacques Charlot (written in the same year as Ravel's) has regular glissandos in this passage. Yet more examples of Ravel's subtle use of the glissando are provided by *La Valse*. This piece exists in three versions by the composer himself: for piano solo (1920), for 2 pianos (1920) and for orchestra (1921). To complete an interesting picture of comparison, we will add the version for four-hand piano by Lucien Garban (1920). Like *Ma Mère l'Oye* and *Daphnis et Chloë* the piano versions of *La Valse* were published before the orchestral score, but it is safe to assume that Ravel always had orchestral colors in mind. As in those other pieces for orchestra, the harp glissandos are abundantly present in *La Valse*. Of interest to us here, however, is the prominent place of the glissandos in the strings, for it is these that are mostly transcribed into the keyboard versions.

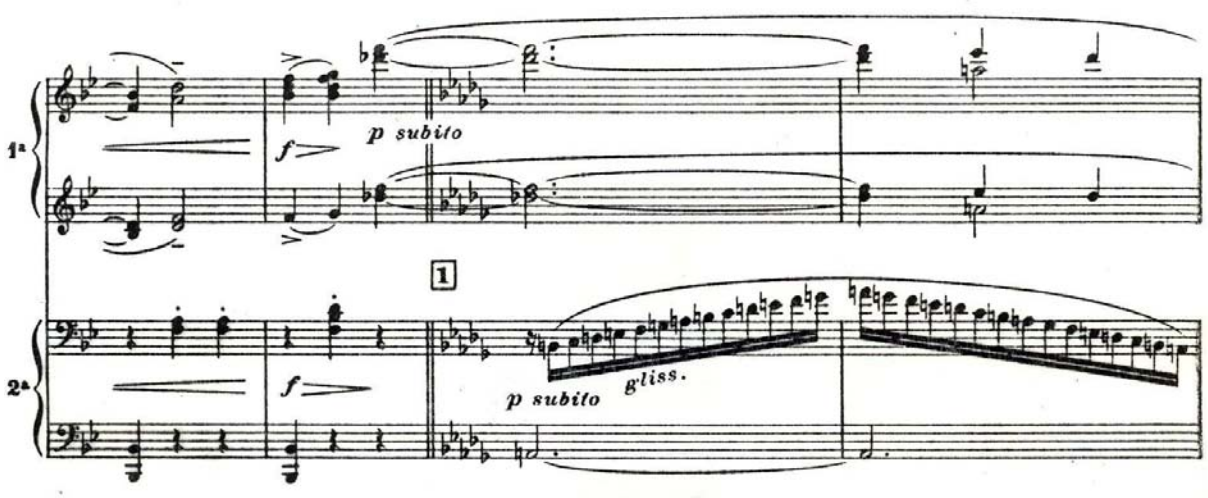
The main difference between the different versions for piano(s) lies in the fact that there is least space in the solo piano score for large glissandos when the two hands are occupied playing the main melodic material. Two players on one piano have some more while two complete keyboards have of course the best opportunities. We do not know whether this is only or main reason why Ravel chose to transcribe the piece for two pianos, but the glissandos were obviously important to him: even when it is impossible to

combine them with what else needs to be played in the solo version, he still indicates them on an extra staff. (Ex. 3.468.)

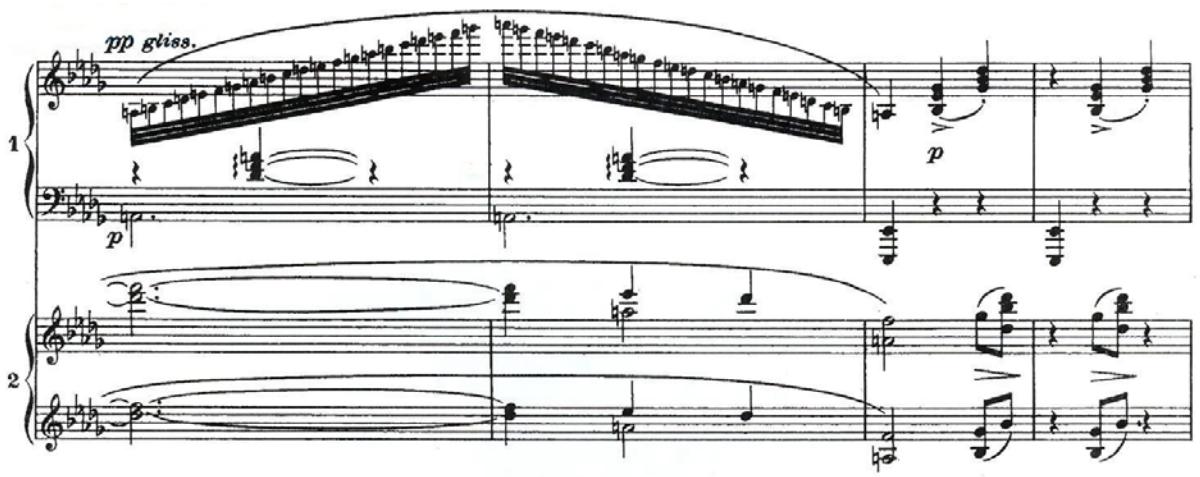


Example 3.468. M. Ravel: *La Valse*, piano solo version (1920), bars 386-392. Editions Durand et Cie.

In both two-pianist versions, the string glissandos of this particular excerpt are transcribed as white key glissandos, with the second player of the four-hand version being allocated a shortened version compared to the first player of the two-piano version, where the length of the glissando is exactly as in the orchestral score. (Compare ex. 3.469 and 3.470.)
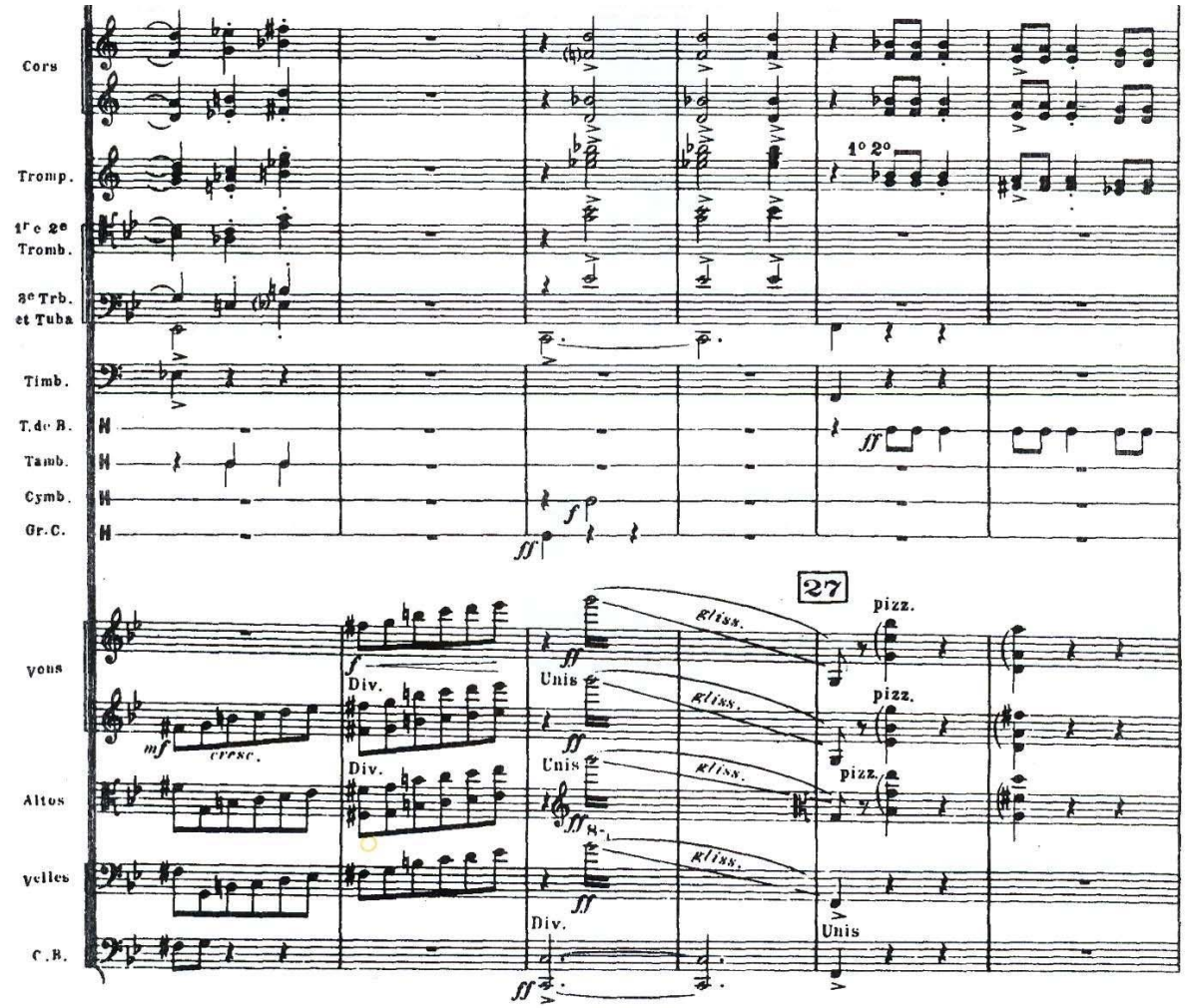


Example 3.469. M. Ravel: *La Valse*, four-hand piano version (1920), bars 385-388. Editions Durand et Cie.
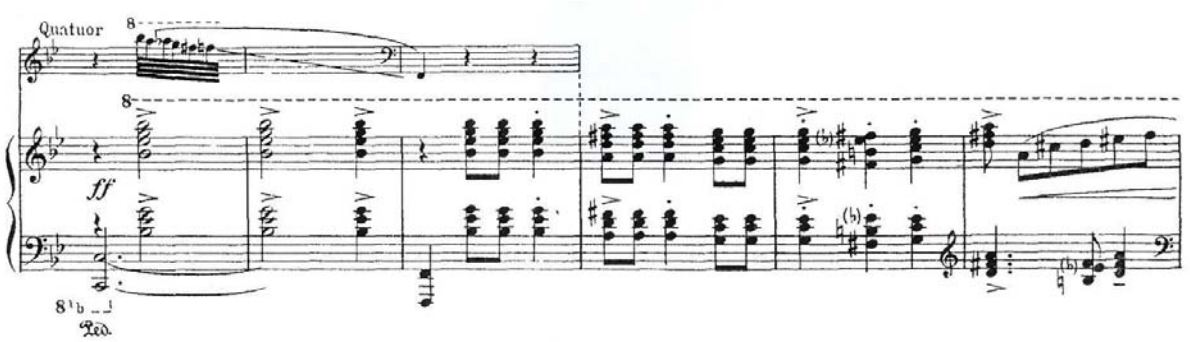


Example 3.470. M. Ravel: *La Valse*, two-piano version (1920), bars 387-390. Editions Durand et Cie.

More revealing of Ravel's ways of transcribing glissandos for the keyboard is seen at one of the earliest highpoints in the structure of the piece, when 4-octave glissandos in violins, altos and cellos underline the syncopations in the brass and woodwinds. (Ex. 3.471.)



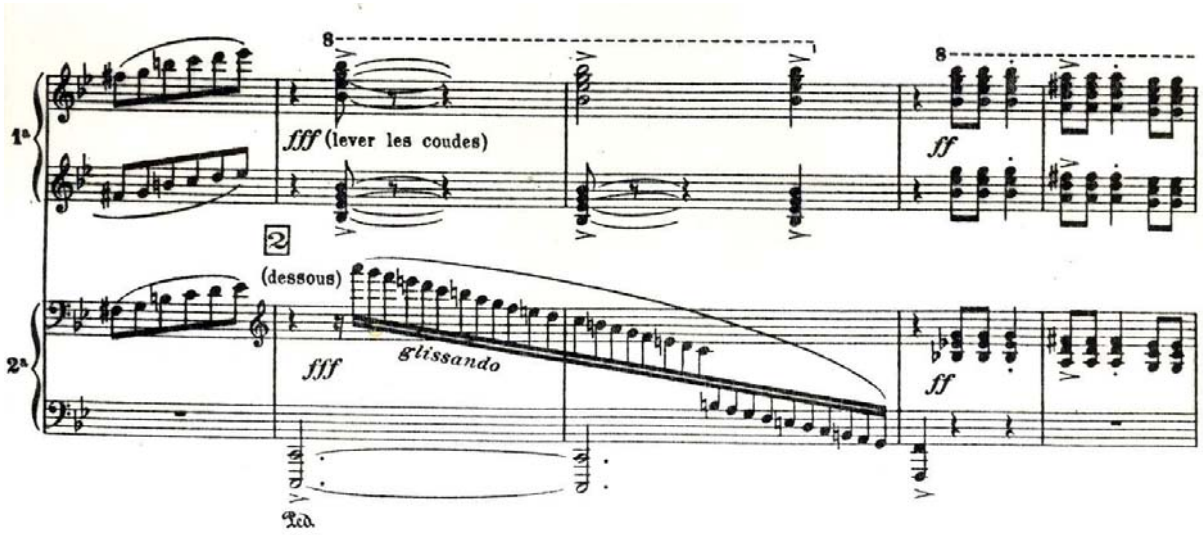
Example 3.471. M. Ravel: *La Valse*, orchestral version (1921), from four bars before cue 27 (bars 215-220). Editions Durand et Cie.

Ravel did not find place in his score for piano solo to fit such glissandos *and* keep the required massiveness of the syncopated chords, so he just informs the performer of what happens in the orchestra. (Ex. 3.472.)



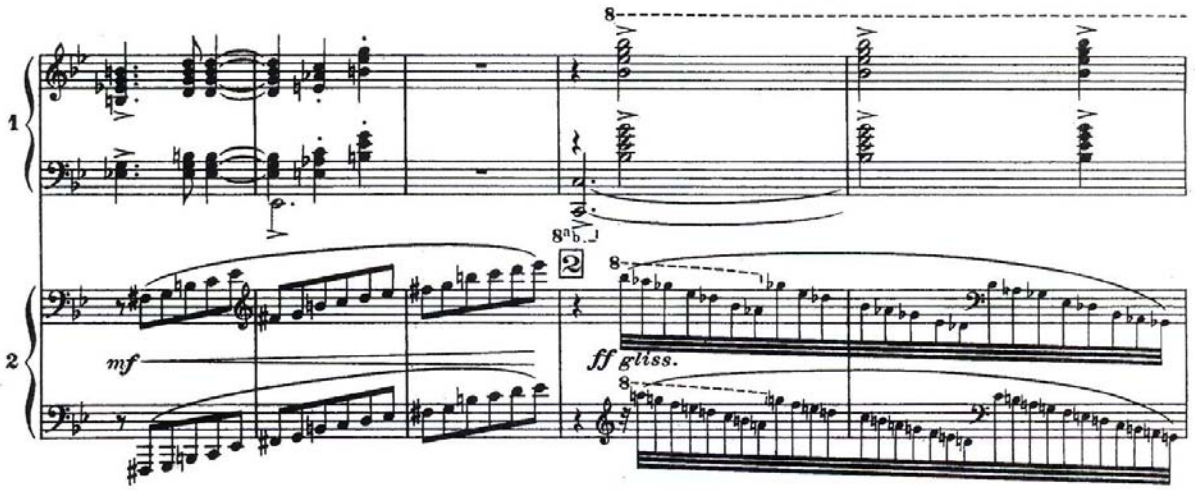
Example 3.472. M. Ravel: *La Valse*, piano solo version (1920), bars 217-223. Editions Durand et Cie.

In the Garban transcription for four-hand piano, the glissando is written out in the score, with the performance practical advice for the treble player to lift his elbows so that the second player can start high enough with his glissando. (Ex. 3.473.)
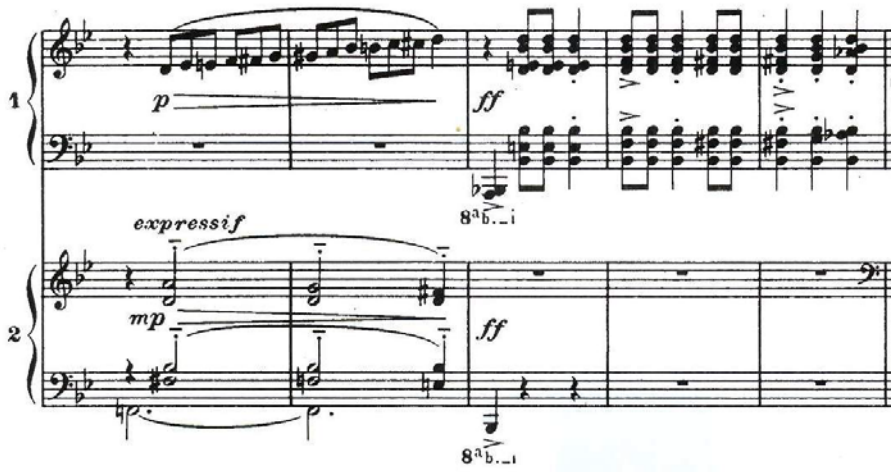


Example 3.473. M. Ravel: *La Valse*, four-hand piano version (1920), bars 216-220. Editions Durand et Cie.

Finally, in Ravel's version for two pianos, he allows us a glimpse of his daring and shows what he really wanted to transcribe the string glissandos as when given the space: a large two-hand pseudo-chromatic glissando in the second piano. (Ex. 3.474.) Of note is the way the composer made sure that the glissando starts on a B♭, by letting the left hand white-key glissando start later so that the entrance of the harmonies in the first piano is not compromised.



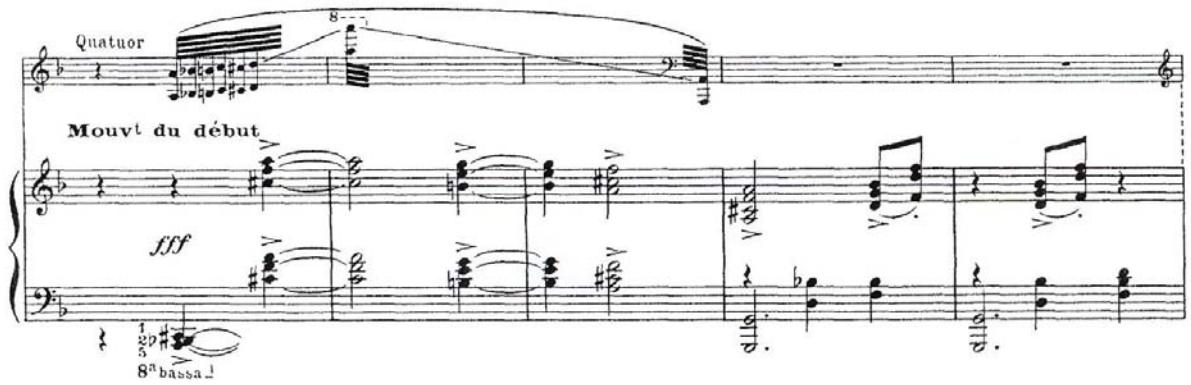
Example 3.474. M. Ravel: *La Valse*, two-piano version (1920), bars 214-218. Editions Durand et Cie.

In the orchestral version this large glissando instance is repeated twice, once *piano diminuendo* and once *fortissimo*. In the versions for two pianists, Ravel and Garban only transcribed the loud ones and used individually articulated chromatic runs to allow for more subdued colors of the upwards cello glissando. (E.g. ex. 3.475.)

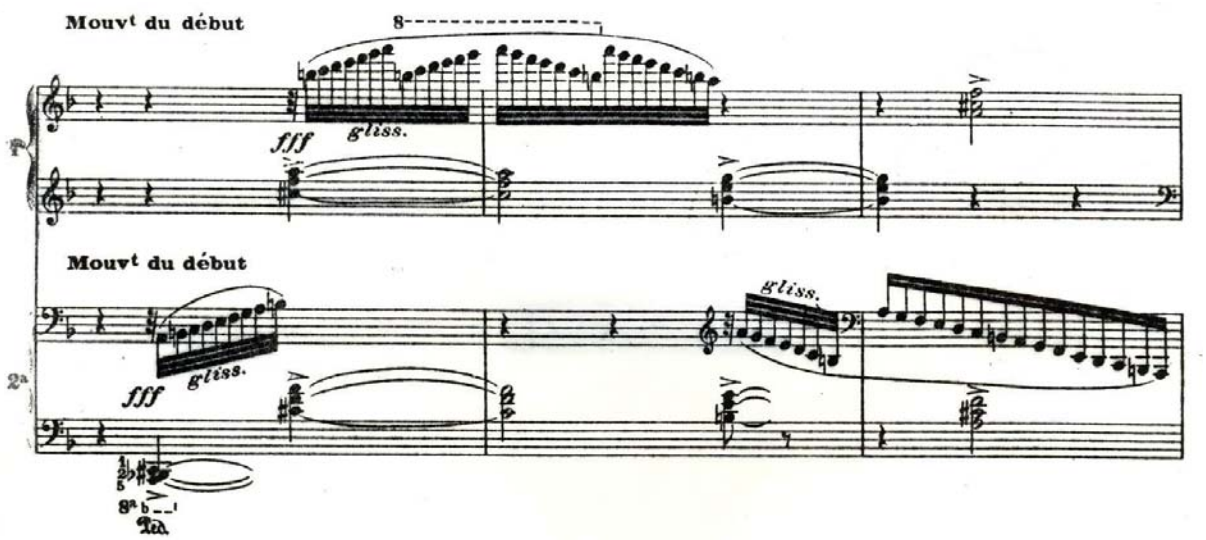


Example 3.475. M. Ravel: *La Valse*, two-piano version (1920), bars 225-229. Editions Durand et Cie.

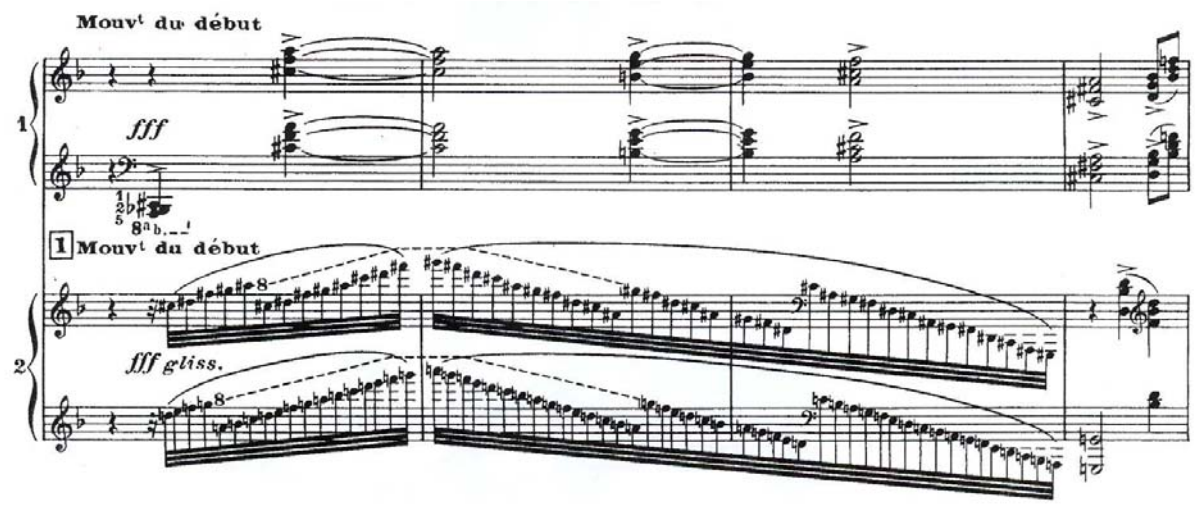
Near the end of the composition, large up- and downward glissandos appear to accompany the syncopated opening of the waltz theme. Again, the solo pianist can only dream of them (ex. 3.476.) while in the four-hand version *both* pianist combine forces to spread the glissandos of the keyboard (ex. 3.477.) and in the two-piano transcription, Ravel reverts to the pseudo-chromatic two-hand glissando. (Ex. 3.478.)



Example 3.476. M. Ravel: *La Valse*, piano solo version (1920), bars 645-649. Editions Durand et Cie.



Example 3.477. M. Ravel: *La Valse*, four-hand piano version (1920), bars 645-647. Editions Durand et Cie.
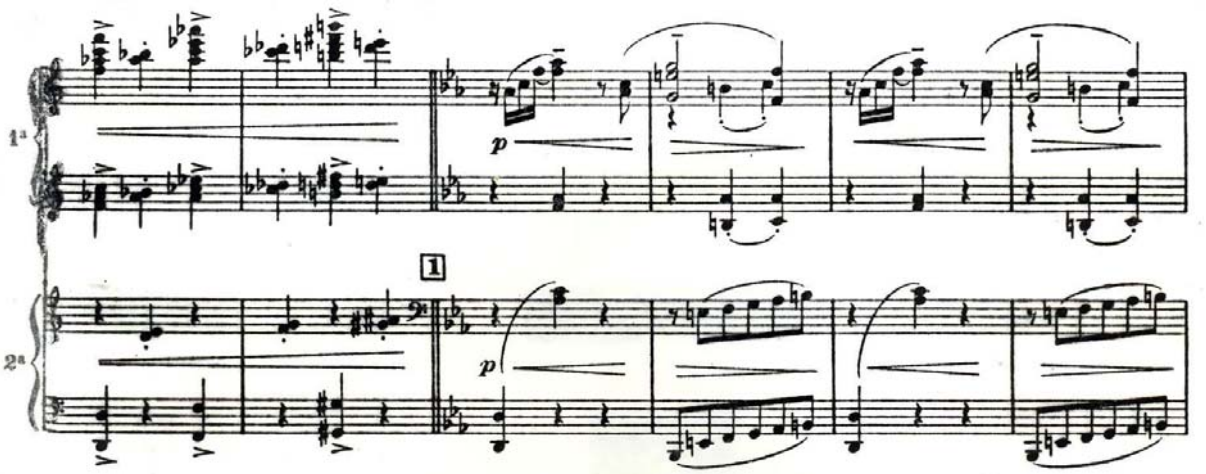


Example 3.478. M. Ravel: *La Valse*, two-piano version (1920), bars 645-648. Editions Durand et Cie.

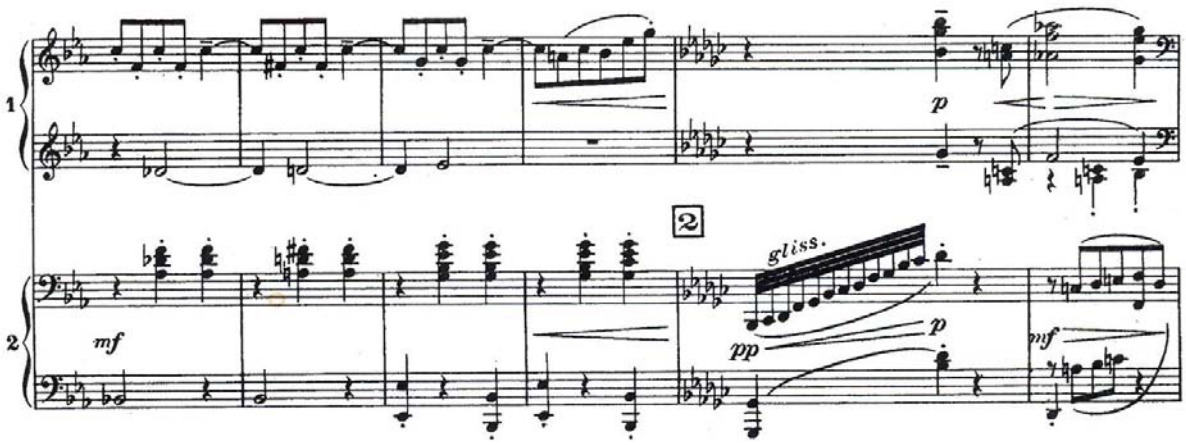
On a side note, it is surprising to see how all three versions use a *125* fingering for the near-cluster that is to imitate the bass drum and tam-tam at the onset of this particular

glissando moment. Perhaps Garban worked with Ravel or consulted him when writing the four-hand version, or maybe the publisher decided to print one and the same fingering in all three scores. That real clusters do not seem to go together with glissando playing only confirms what we have remarked when regarding the repertoire of the 18th and 19th century.

Ravel also transcribed some of the dozen of harp glissandos. In the solo piano version, he either again added an unplayable extra staff or he wrote individually articulated runs or arpeggios. In the two-piano version he wrote one *quasi glissando* (see above, 3.4.2.1.6) to indicate that the original was a glissando. At another point he transcribes harp glissandos first as 16th-note arpeggios (ex. 3.479) and, when the material is repeated a few steps up, as pentatonic glissandos (in the two-piano version only). (Ex. 3.480.)

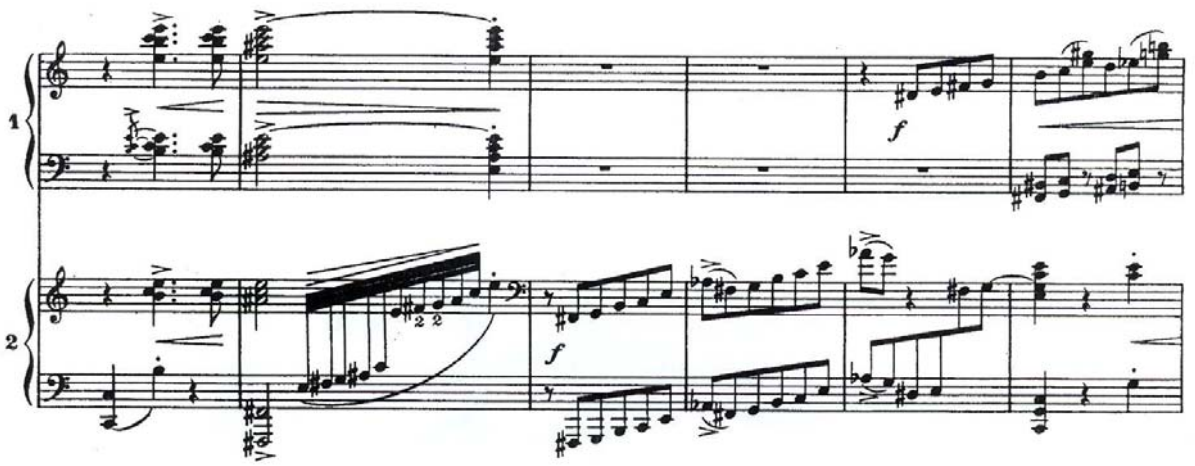


Example 3.479. M. Ravel: *La Valse*, four-hand piano version (1920), bars 519-524. Editions Durand et Cie.



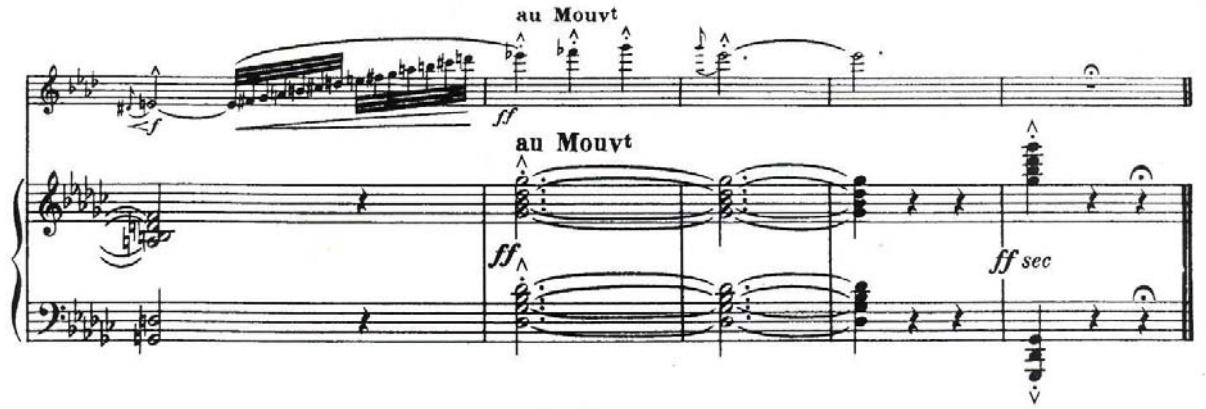
Example 3.480. M. Ravel: *La Valse*, two-piano version (1920), bars 527-532. Editions Durand et Cie.

Again on a side note: at one place Ravel uses a two-note glissando when five fingers are just not enough to play a fast flourish with only two positions of the hand. (Ex. 3.481.)

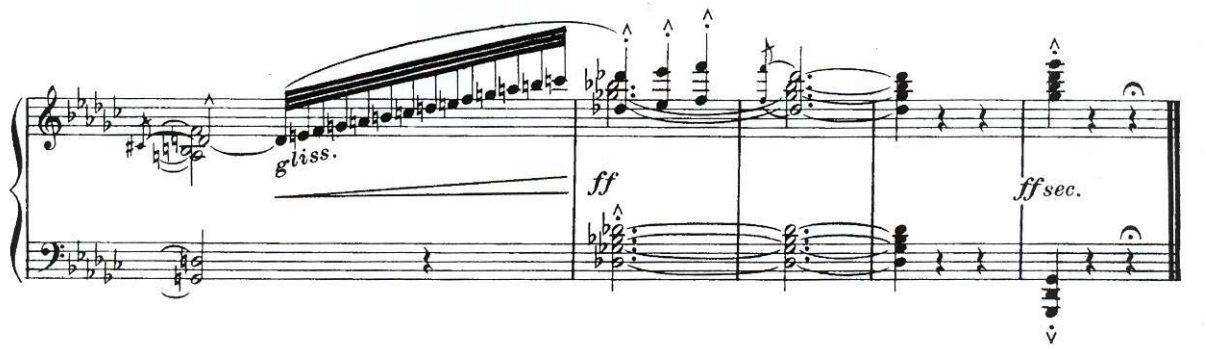


Example 3.481. M. Ravel: *La Valse*, two-piano version (1920), bars 676-681. Editions Durand et Cie.

Besides Ravel and Garban, one more composer is worthwhile mentioning here for his transcription. Jacques Charlot wrote a version for piano solo of Debussy's first rhapsody for clarinet and orchestra. At the end of it, he decided to transcribe the solo clarinet's individually articulated D minor run as a dorian run, allowing for a glissando that makes the whole final gesture very easy and effective. (Ex. 3.482 and 3.483.)



Example 3.482. Cl. Debussy: *Première Rapsodie* (1909-10), final bars. Editions Durand et Cie.



Example 3.483. Cl. Debussy / J. Charlot: *Première Rapsodie* (1912), final bars. Editions Durand et Cie.

3.4.2.2 1908- The cluster revisited
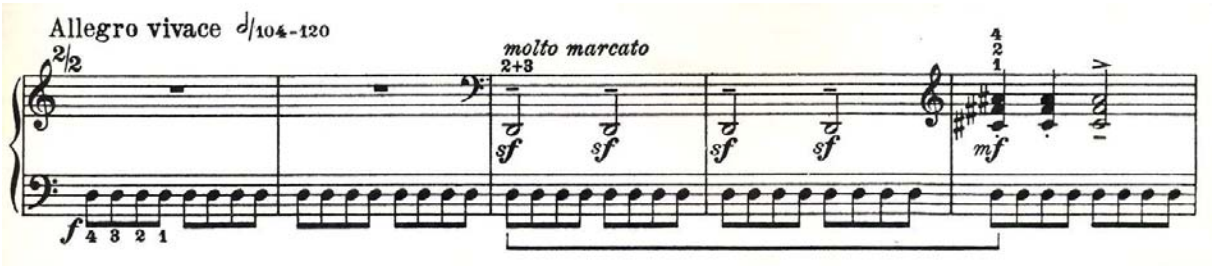
In the 18th and 19th century we saw how cluster playing was used to either imitate the sound of a canon or that of thunder. In the second decade of the 20th century the cluster was used for the first time as a technique to produce a sound that only had abstract musical meaning. It is in the 1913-14 music of Vladimir Rebikov that we find the earliest evidence of this new step in the cluster's evolution. In the rest of this period, however, there are several instances of techniques that are related to cluster playing. In some pieces the lack of specific performance practical cluster *indication* would not stand in the way of playing the chords in question with the palm of the hand. In other pieces the peripheral techniques of micro-cluster playing (see 2.5.2.3.4) are picked up again.

3.4.2.2.1 1908- Micro-clusters
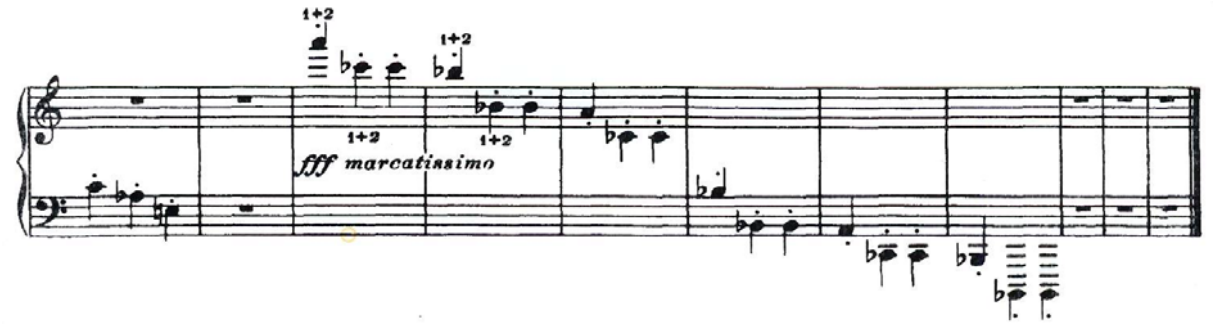
3.4.2.2.1.1 More than one finger on one note

In the first quarter of the 20th century, the technique of playing one note with two fingers returns from its initial 19th century introduction into piano scores (see 3.3.3.2.3.1).

Going no further than what Czerny already advised in his 1839 method opus 500, Bartók still applies two fingers to a right hand bass note in the last of his *10 easy pieces* (1908 – ex. 3.484). In his 1916 *Suite* opus 14, he uses the technique like Gottschalk did in the 1860's (*1+2* fingering) but now on most of the keyboard range. (Ex. 3.485.)



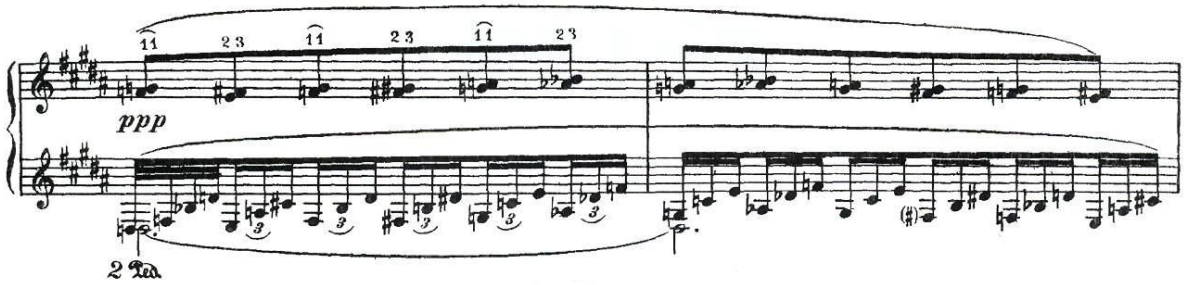
Example 3.484. B. Bartók: *10 easy pieces* (1908), nr. 10 *Bear Dance*, opening bars. Muzyka edition / P. Jurgenson Publishing House.



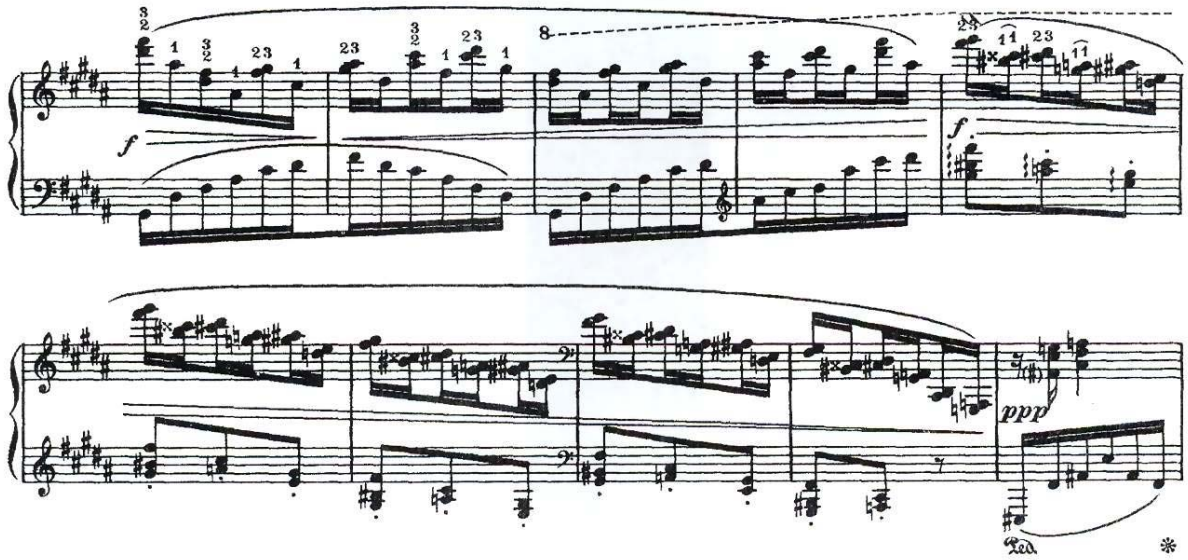
Example 3.485. B. Bartók: *Suite* opus 14 (1916), 2nd movement *Scherzo*, final bars. © With kind permission by UNIVERSAL EDITION A.G., Wien.

3.4.2.2.1.2 More than one note with one finger

Ravel also took the 19th century as an example when he implemented the 1-finger-2-notes techniques in his 1908 *Scarbo*. Like Raff's tremolo's and Alkan's spread chords, Ravel uses the technique to allow for fast chord playing, but builds up from slow melodic movement. (Ex. 3.486 and 3.487.)
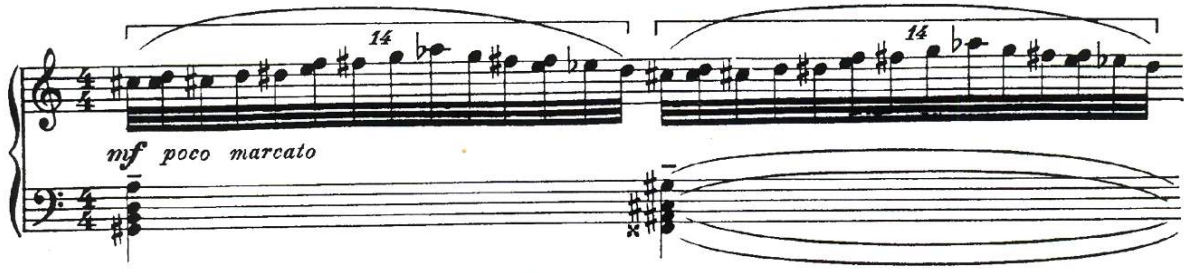


Example 3.486. M. Ravel: *Gaspard de la Nuit* (1908), 3rd movement *Scarbo*, bars 449-450. Editions Durand et Cie.

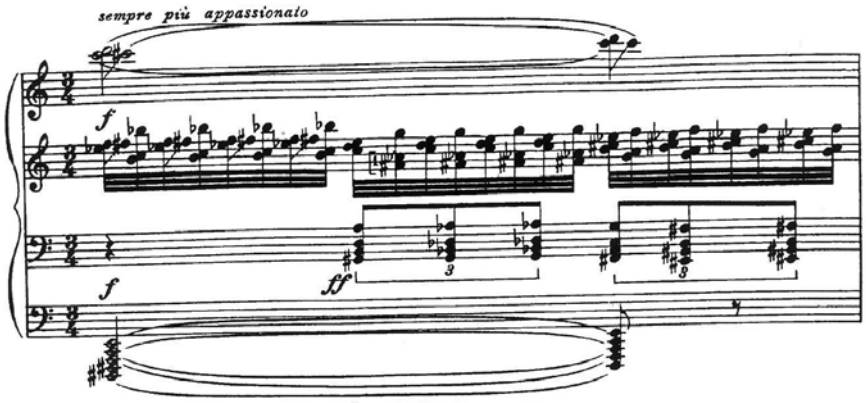


Example 3.487. M. Ravel: *Gaspard de la Nuit* (1908), 3rd movement *Scarbo*, bars 465-474. Editions Durand et Cie.
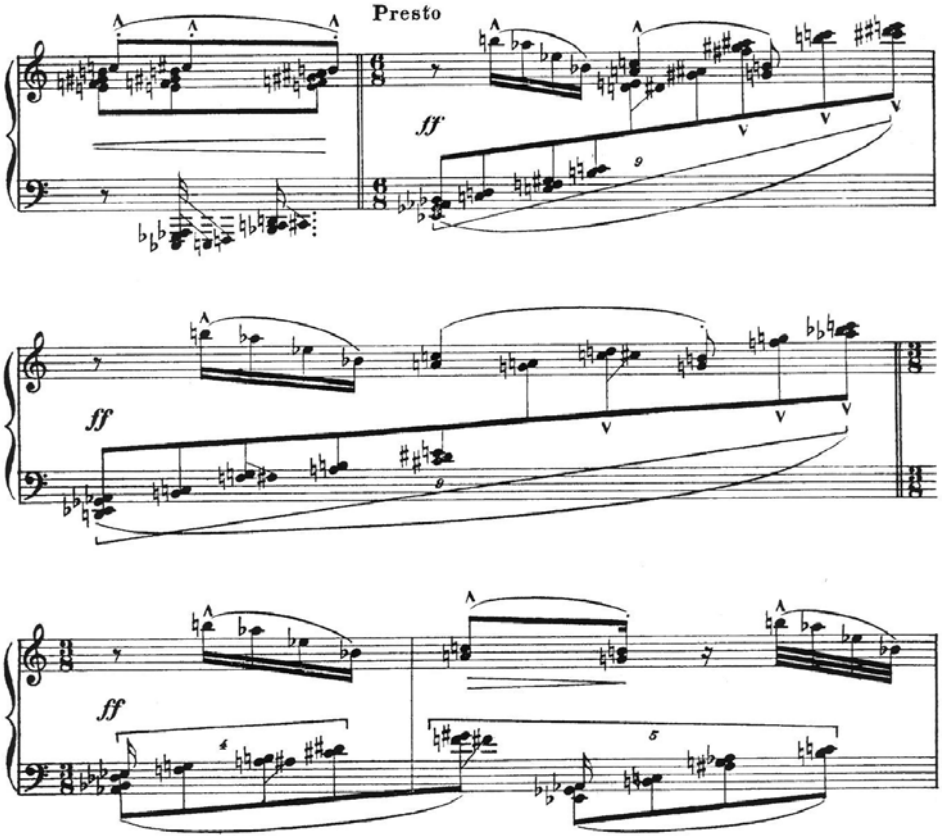
Such ergonomical writing is further developed in the ways Ornstein uses the thumb to play two (ex. 3.488-3.490) or three (ex. 3.491) notes in different kinds of chordal passagework that resembles or extends the examples of Alkan and Ravel.
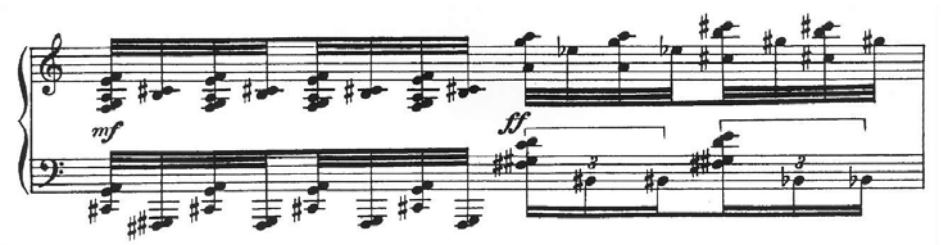


Example 3.488. L. Ornstein: *Poems of 1917*, nr. II, bar 23. Sharps and flats only apply to the note before which they are notated. The second 32nd in the right hand consists of a $c^{\sharp 2}$ and $d^{\sharp 2}$. Reproduced with kind permission of Poon Hill Press.



Example 3.489. L. Ornstein: *Poems of 1917*, nr. VIII, bar 32. Reproduced with kind permission of Poon Hill Press.
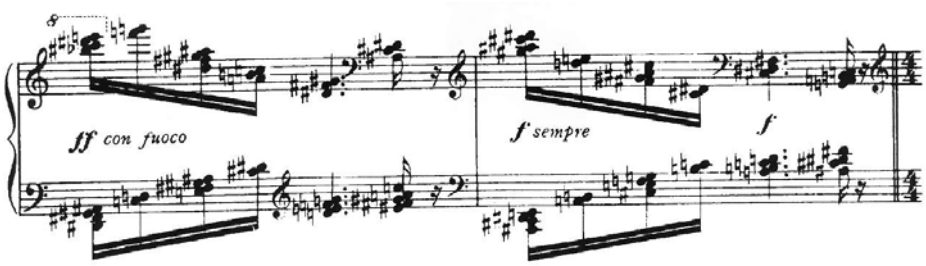


Example 3.490. L. Ornstein: *Wild Men's Dance* ca1913, bars 148-152. Reproduced with kind permission of Poon Hill Press.



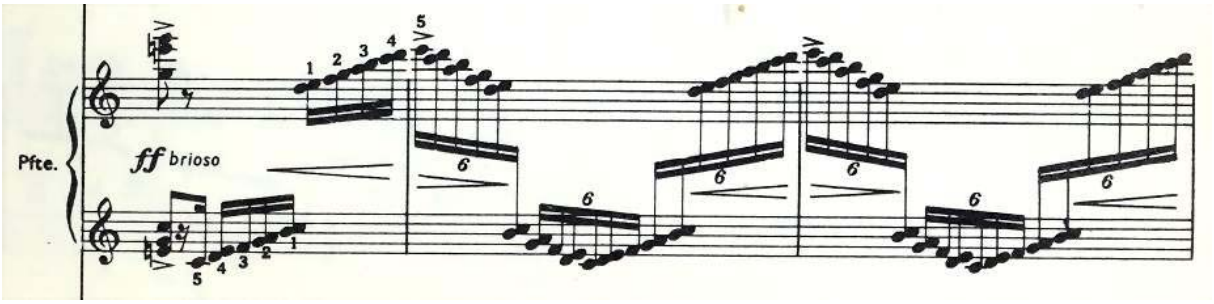
Example 3.491. L. Ornstein: *Poems of 1917*, nr. VIII, bar 3. Reproduced with kind permission of Poon Hill Press.

Ornstein takes the idea to its limit, as in example 3.492, where the ergonomics imply that the thumb takes on three notes (as in ex. 3.491) in a sequence with that same thumb as a pivot amongst all-black as well as differently built chords. There is a clear general tendency to avoid repetition, or even a system, in the way the two hands use black or white key positions. Nearly every combination of the hand's position is different from what the other hand is asked to do, and different from what comes before and after, e.g. the first left hand position with the 2nd to 5th finger on black keys with thumb on two white keys, is followed by a "mixed position" chromatic chord with the thumb on two black keys, while the right hand shifts from mixed and thumb-on-white to all black and thumb-on-white. It is - again – almost as if Ornstein searches for idiomatically efficient piano writing while at the same time avoiding that it would turn out easy to play.
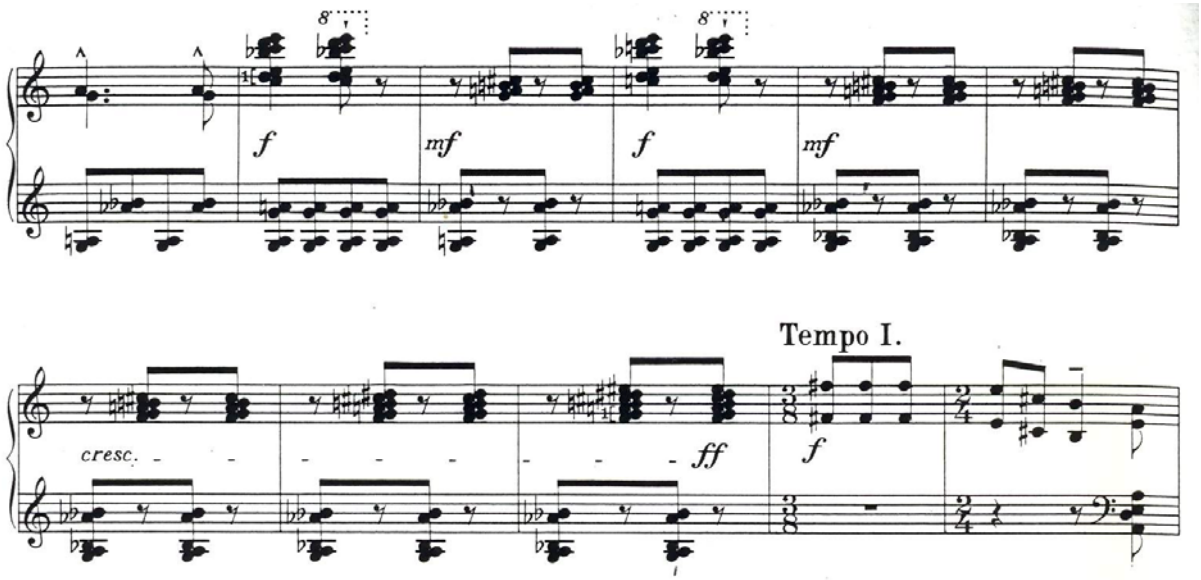


Example 3.492. L. Ornstein: *Impressions of Notre Dame* (1914), bars 81-82. Reproduced with kind permission of Poon Hill Press.

It is Prokofiev, however, who comes with the most virtuoso use of the technique to use one finger one more than one key. In the finale of his 3rd piano concerto in C (1917-21), not only the thumb but also the 2nd, 3rd and 4th finger are deployed to this purpose, and this at a higher speed even than in Ravel's *Scarbo*. (Ex. 3.493.)
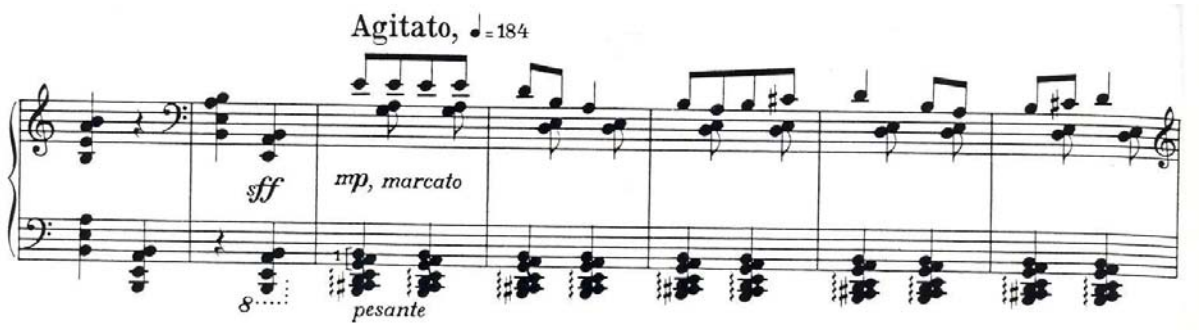


Example 3.493. S. Prokofiev: Piano concerto nr. 3 (1917-21), 3d movement, cue 137. © Boosey & Hawkes.

Later on in the second of the 20th century decade Bartok, like Ornstein, writes chordal spreads taking advantage of both hands' thumb on three keys. (Ex. 3.494, 3.495.)



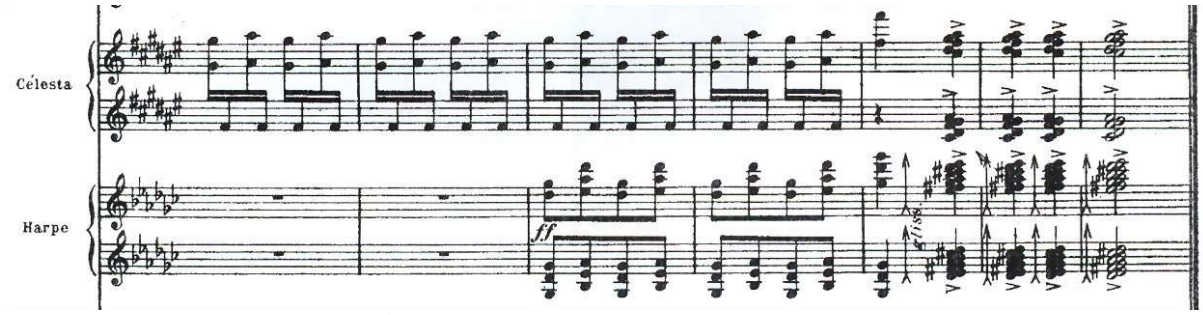
Example 3.494. B. Bartók: *Sonata* (1926), 3rd movement, bars 83-93. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.495. B. Bartók: *Sonata* (1926), 3rd movement, bars 225-231. © With kind permission by UNIVERSAL EDITION A.G., Wien.
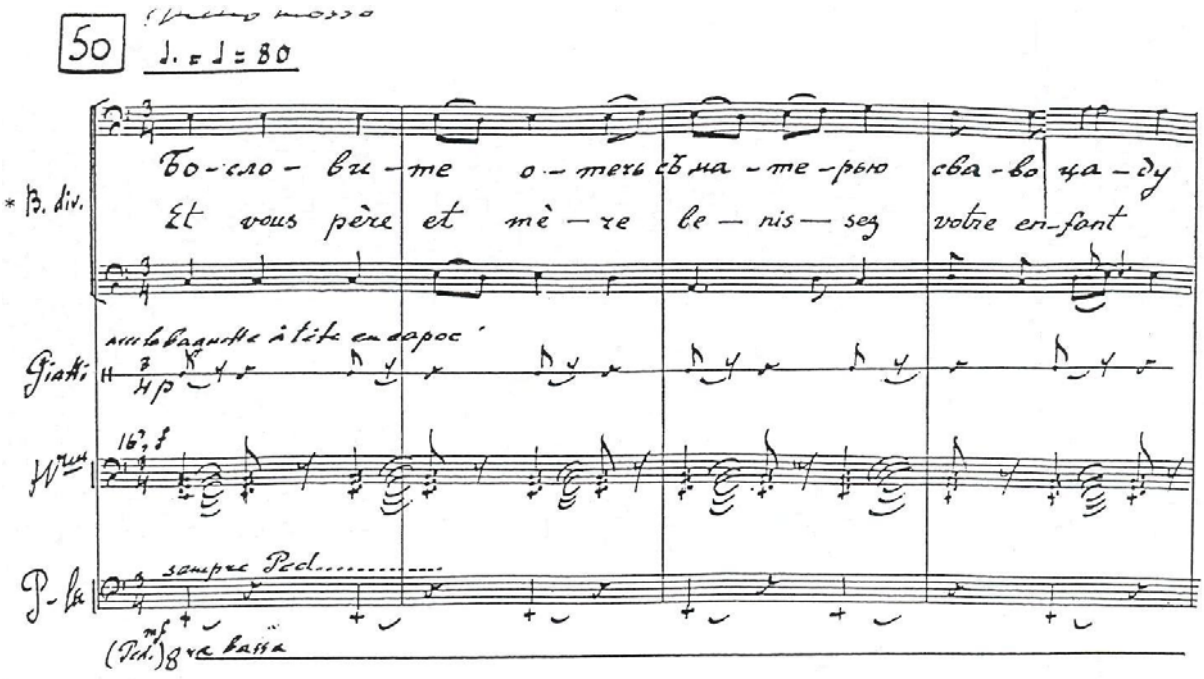
3.4.2.2.2 With the palm or not?

At the end of one of Ravel's orchestral *Mother Goose* pieces, there are five-note black-key chords for each hand of the celesta player. (Ex. 3.323.) There is nothing in them that necessitates cluster playing except that, on the heavy action of a celesta, this would be the more efficiently and less painful way to achieve the required *fortissimo* volume. It is especially tempting to see the celesta chords as clusters when considering how the very fast glissandos in the harp are just as much arpeggiated clusters – a rare example of how closely related the glissando and the cluster essentially are.



Example 3.496. M. Ravel: *Ma Mère l'Oye* (1911), part III *Laideronette*, final bars. Editions Durand et Cie.

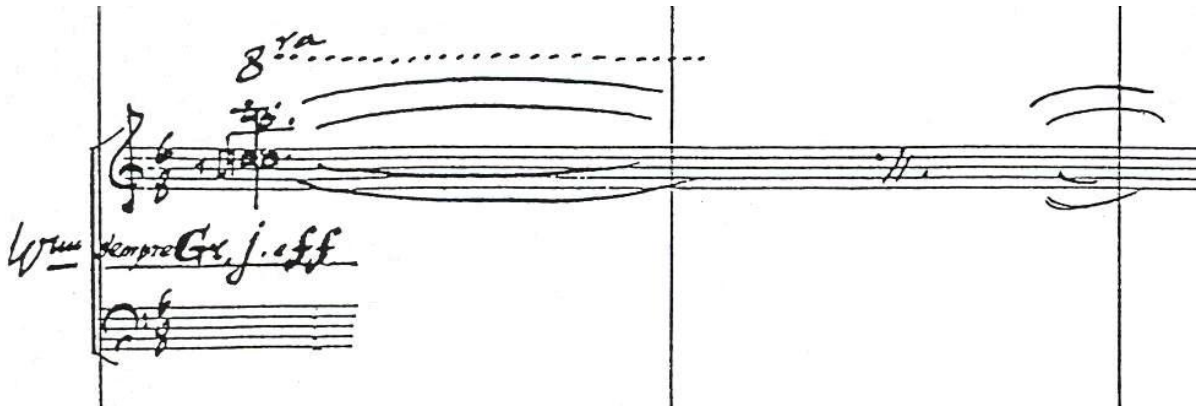
One of Stravinsky's early versions (1919) of *Les Noces* was scored for soprano, percussion, Pianola[1044], harmonium and two cimbaloms. In the harmonium part of that score, we find a repeated chord that is suspiciously dense for the one stave – and thus one hand – it is written on. (Ex. 3.497.) It is probably meant to be played with two hands and notated on one stave for convenience's sake only, of course, but that it is one note too wide for five fingers and that it nicely fits the width of the palm of an average hand is – again – tempting to anyone looking for evidence of early 20th century use of cluster technique.



Example 3.497. I. Stravinsky: *Les Noces Villageioses* (1919), first part, second *Tableau*, cue 50. Bottom staves: harmonium and Pianola. © Chester Music.

[1044] A Pianola is a brand name (from the Aeolian Company in New York) which became the generic name for all types of player pianos and piano players. A "player piano" is a special piano with all the roll mechanisms built into the interior; a "piano player" (in this "pianola"-context) is a "push-up" device which contains the roll mechanism and which sits in front of a normal piano, and plays it with a set of small felt covered wooden fingers. Apart from these two semi-automatic "Pianola" types, which are operated live by a performer and which play rolls that are cut mechanically, there is also the fully automated reproduction player piano, which uses music rolls that are recorded by a performer in real time with suction generated by an electric pump. For Stravinsky's *Les Noces* the Pianola part was certainly meant for the controlable semi-automatic type Pianola because of the ensemble playing. Whether a player piano or piano player was intended must have depended on what was available, keeping in mind that a piano player offered the advantage that it could be used with any chosen acoustic piano (e.g. concert grand). Apart from the advantage in sound it could thus offer, the piano player was also easier to transport because it is smaller and less heavy compared to a player piano.

The chord continues its path in perfect rhythmic unison with the Pianola's bass for 21 bars until it is replaced by another chord, again with a conspicuous ergonomical property: both bottom notes are to be played with the thumb, indicating that this chord – written on one stave also – is intended for one hand. (Example 3.498.)
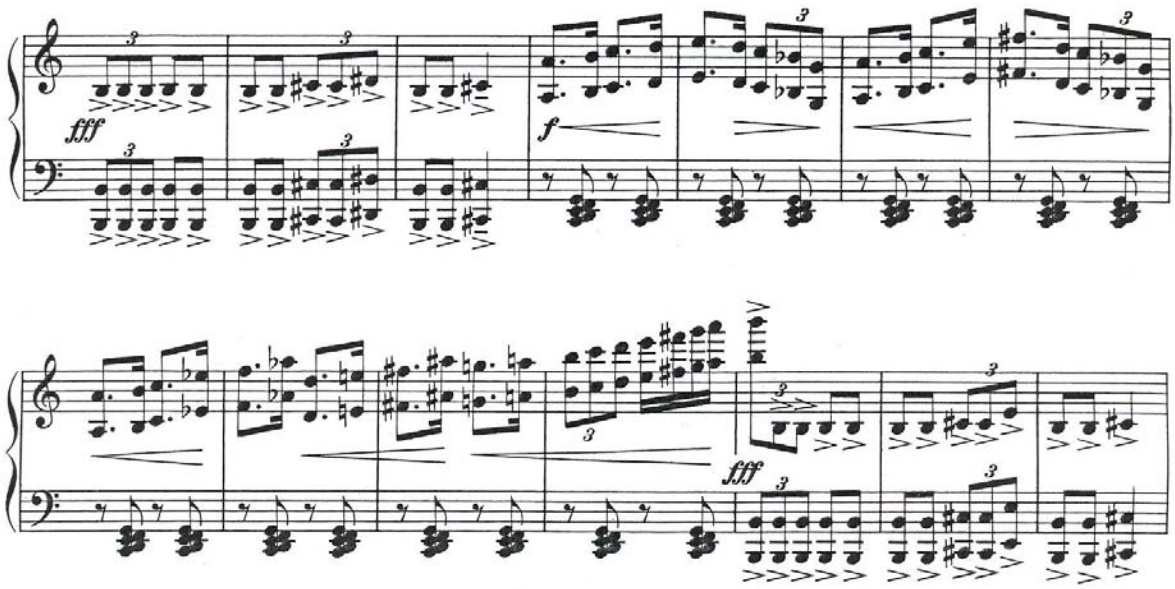


Example 3.498. I. Stravinsky: *Les Noces Villageioses* (1919), first part, second *Tableau*, harmonium part, cue 51. © Chester Music.

The subsequent known versions of *Les Noces* leave this passage for the voices *a capella*, just as it had been in the previous 1917 version for large ensemble. We see no more of the cluster-like keyboard chord in Stravinsky's works.

The percussive and ergonomical aspects of the cluster-like chords may be indicators of how cluster *technique* might have been in the composer's thoughts. However, besides such associative conclusions, there is no exact proof of any kind. The six-note chord in the harmonium part can easily be played with both hands; or with the left hand alone, grabbing the top two notes with the thumb.

Like *Les Noces,* Hindemith's 1919-20 *Tanzstücke* opus 19 contain many dissonances and much percussive playing, like in the *Ragtime* he wrote in 1922 (as part of his Suite 1922), and for which he indicated "consider here the piano as an interesting kind of percussion and treat it likewise."[1045] Nevertheless, as with the celesta chords discussed just above, there is no proof that the five-note chords in the third (*Pantomime – sehr lebhaft*) of Hindemith's primitivist set of dance pieces opus 19 are meant to be played improperly (ex. 3.499).

[1045] As in the "Direction for Use!!" above the music of *Ragtime*: "Betrachte hier das Klavier als eine ineressante Art Schlagzeug u. handle dementsprechend."



Example 3.499. P. Hindemith: *Tanzstücke für Klavier* opus 19 (1919-20), nr. 3 *Pantomime*, bars 7-20. SCHOTT MUSIC GmbH & Co. KG, Mainz - Germany.

3.4.2.2.3 1911/13 With palm, fist and forearm

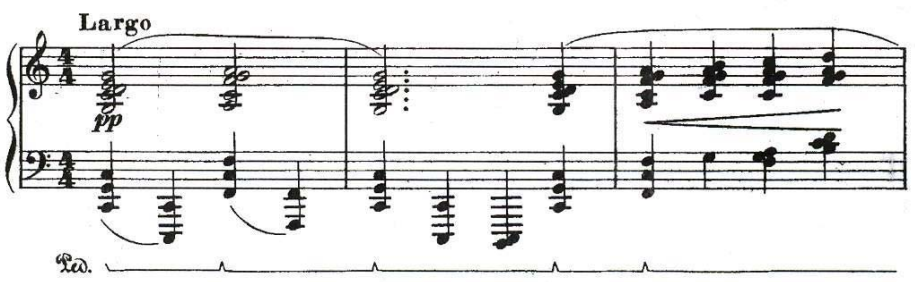
In the second decade of the 20th century, several composers demonstrated an interest in the cluster that went beyond the incidental. They showed an evolution from different starting points towards using hands, fists and/or arms to play clusters, or their work shows diversity in approach that makes it worthwhile paying attention to. One composer – Henry Cowell – developed such a lasting love for the cluster that we will discuss his achievements later on, in a separate overview of his accomplishments in the whole area of the extended piano.

3.4.2.2.3.1 1911- J.H. Anger/Vl. Rebikov: through white-key harmonies to clusters

A teacher, composer, organist, conductor and head of the theory department at the Toronto Conservatory of Music, Canadian composer (Joseph) Humphrey Anger (1862-1913) may have intended *Tintamarre*, a "Morceau de Salon" (1911), to refer as much to its translation "The Clangor of Bells" as to "the Acadian event known as "tintamarre" where celebrants bring spoons, whistles and other musical instruments to make as much noise as possible.[1046]
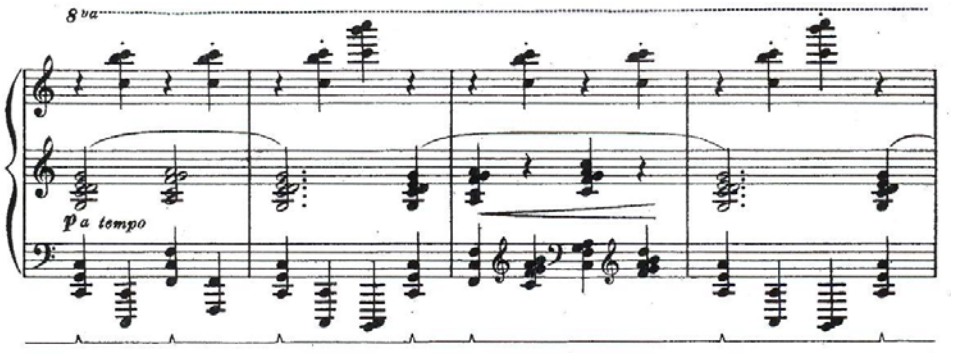
The theme is characterized by diatonic additions in the otherwise simple chords. (Ex. 3.500.)

[1046] Keillor 2004. The Acadians are a people who originated in France and settled the East Coast of what is now Canada beginning in the 17th century when it was still a French colony, and who were later called "Cajuns" after being expelled and eventually settling in Louisiana during the later part of the 18th century. Every August 15 Acadians from all over the country gather for an annual celebration called the *Tintamarre* (Hullabaloo). At exactly 17:55 the emotions of the *Tintamarre* reach a powerful crescendo, for that time signifies the date 1755, when the British redcoats and American militiamen drove them from their homes in Atlantic Canada.
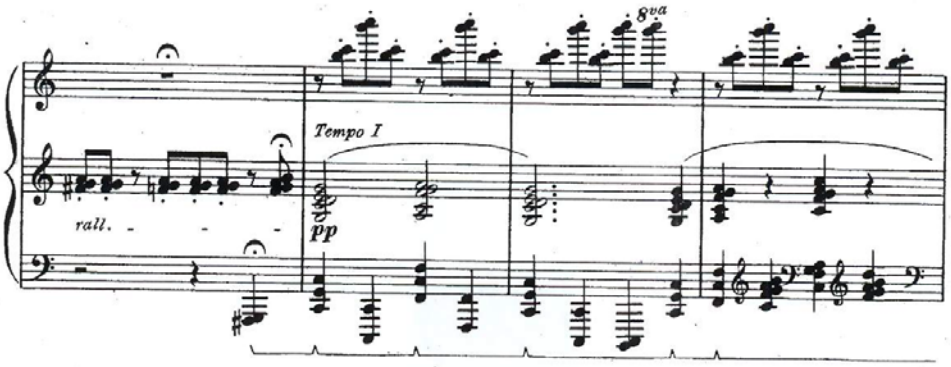


Example 3.500. J. H. Anger: *Tintamarre* (1911), bars 1-3.

In this straightforwardly tonal vein, the minor second B-C in the deep base can still be seen as transitional towards the F chord that follows in the harmonic sequence. Soon afterwards, the intention of the added second becomes clear in the accompaniment of the reoccurring theme, translating the harmonically enriched bell tones onto the piano. (Ex. 3.501-502.)

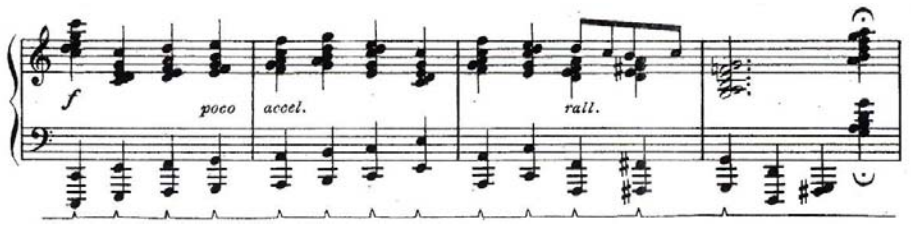


Example 3.501. J. H. Anger: *Tintamarre* (1911), bars 12-15.
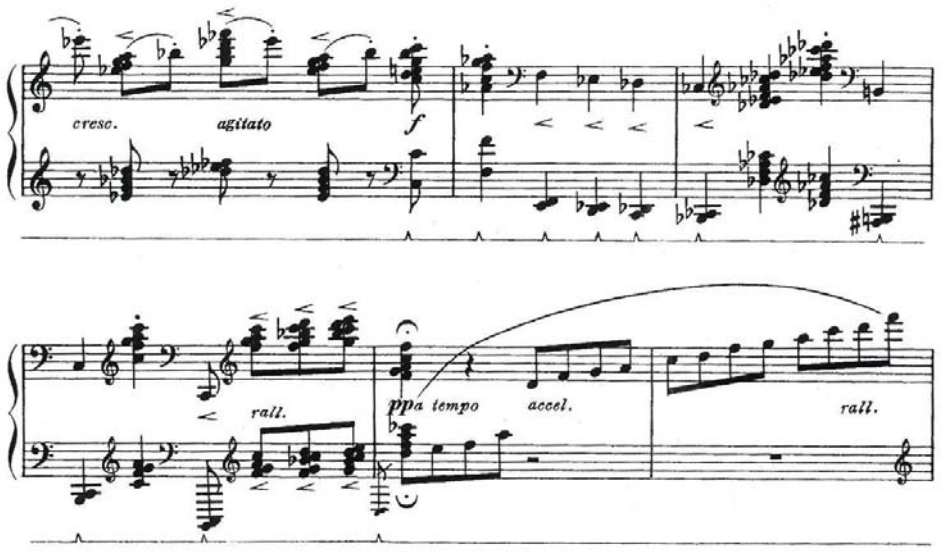


Example 3.502. J. H. Anger: *Tintamarre* (1911), bars 47-50.

Besides minor seconds and occasional filling up of tonal chords, there is a tendency to work with parallel mixture sonorities (ex. 3.503) reminding us of Debussy, as had already the accompaniment of the main theme. (See ex. 3.501.)



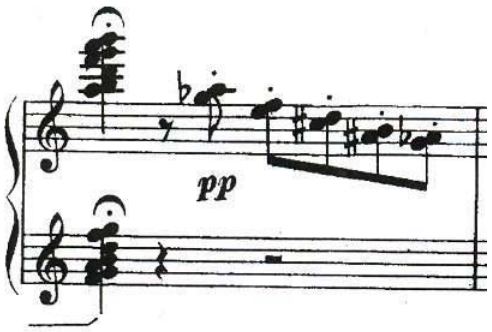
Example 3.503. J. H. Anger: *Tintamarre* (1911), bars 8-11.

Both tools – minor seconds added to the harmonic fundaments and coloration of chords – are further worked out as the piece moves on. (Ex. 3.504.)
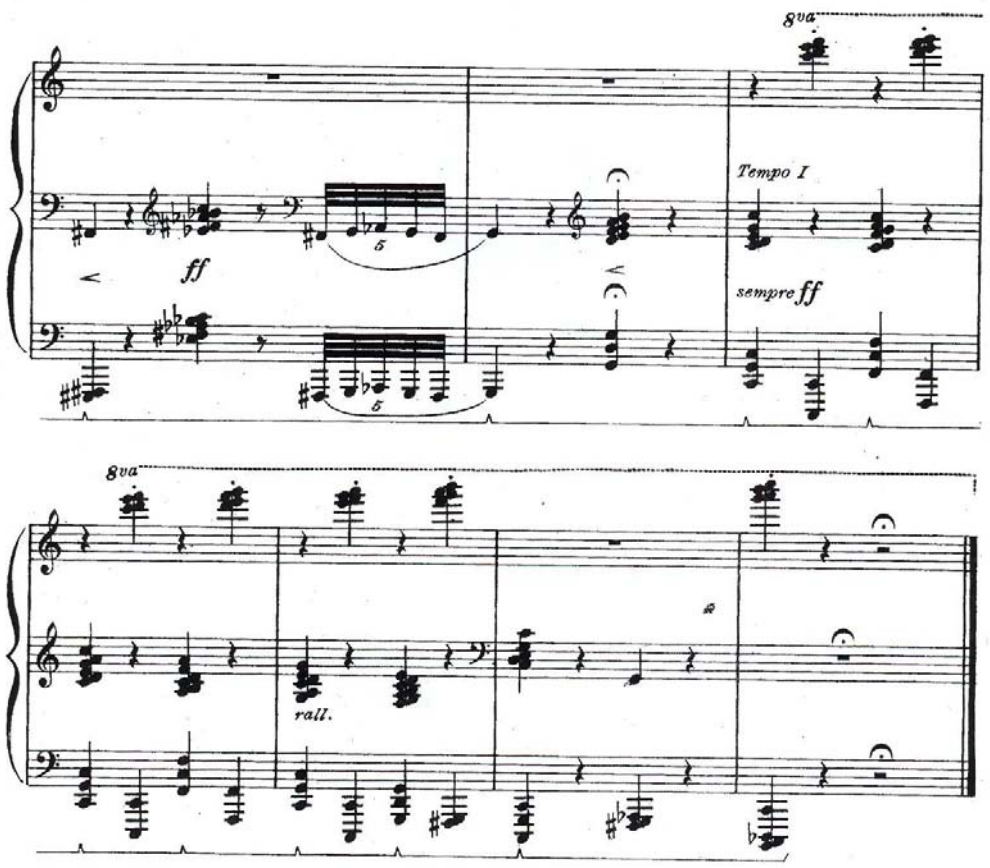


Example 3.504. J. H. Anger: *Tintamarre* (1911), bars 28-33.

As Anger develops these techniques, he is forced to further cross the line of proper playing into the realm of cluster techniques. Ex. 3.333 shows chords that not only require the thumb on two keys but the fifth finger as well.



Example 3.505. J. H. Anger: *Tintamarre* (1911), bar 44.

At the end of this large build-up, the chords grow into fully diatonic clusters, though they are still playable with minimal cluster technique, i.e. at the most the thumb and fifth fingers each play two keys at once. (Ex. 3.506.)



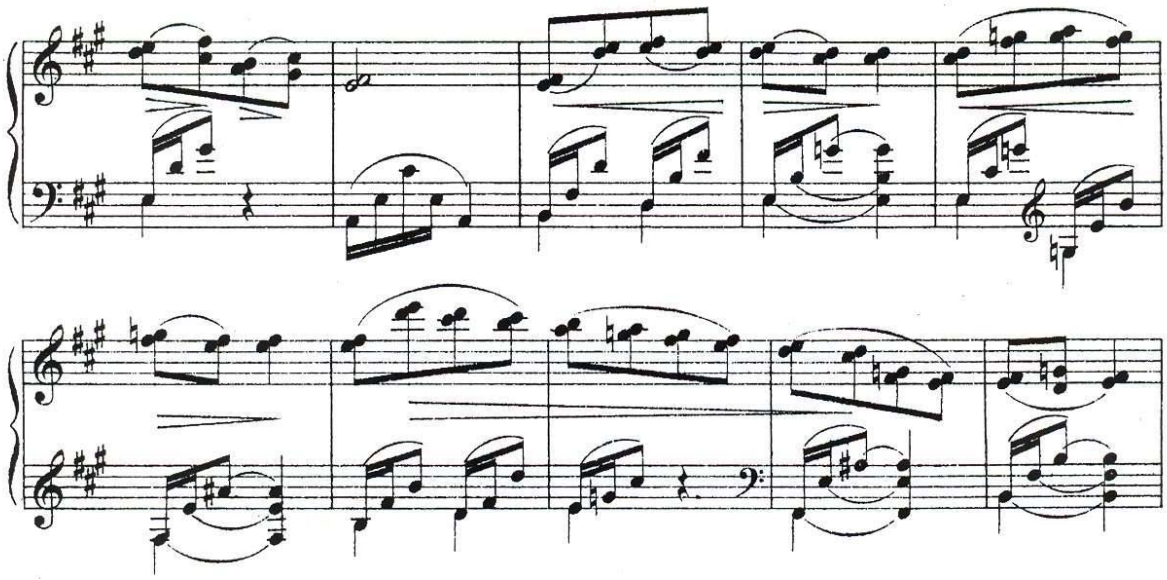
Example 3.506. J. H. Anger: *Tintamarre* (1911), final bars.

Even if the last two line of this piece do not necessarily require the flat of the hand to be played, the limits of tonal harmony have been crossed for programmatic reason as much and as naturally as the borders of proper playing have.

In much the same way as in Anger's *Tintamarre*, though spread over more than one composition and far away from Canada, Vladimir Rebikov developed clusters by coloring in white-key chords.

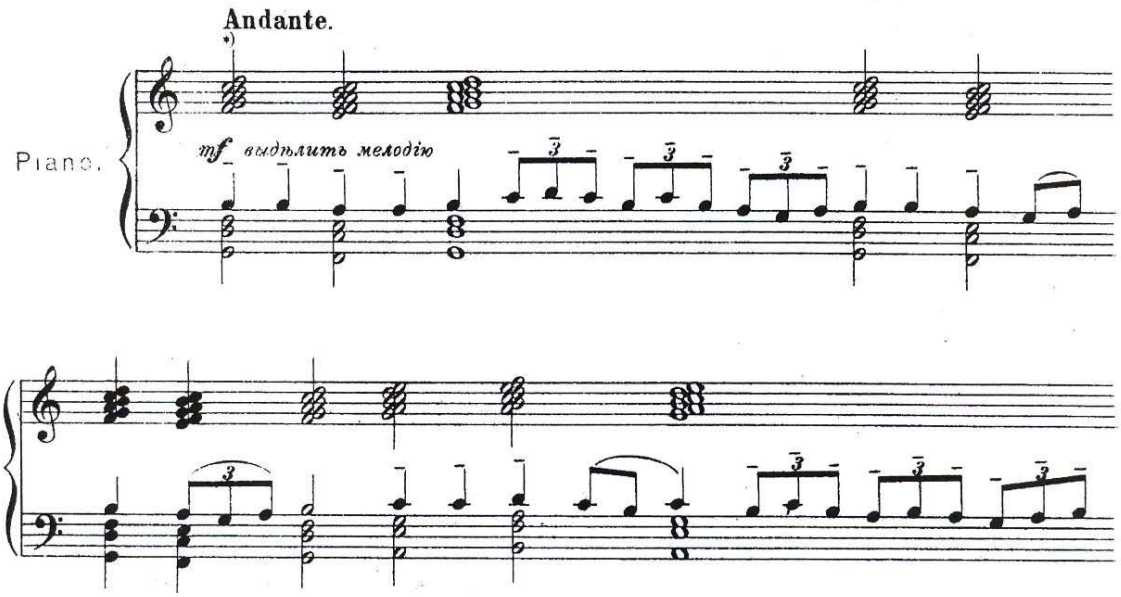
From 1901 to 1909 Vladimir Ivanovich Rebikov (1866-1920) achieved success as a pianist in concert tours around Russia as well as in Vienna, Berlin, Paris, Leipzig and Florence. From 1909 onwards he lived in Yalta.[1047] As a composer, he then starts a number of experiments that are of interest here. In works such as *Une Fête* opus 38 (<1912), *Les Démons s'amusent* (c1917) and *Dans la forêt* opus 43[1048], he worked with the whole-tone scale for both melody and harmony; in other works, he tries to limit his material to only a particular part of the keyboard: the first part of *Jeux des sons* (ca 1913[1049]) has almost exclusively white keys until the end, and the *Chansons Blanches* opus 48 (1913[1050]) has no black keys at all. The latter is furthermore built from quartal harmonies. In another piece – *Pages d'un manuscript oublié* (no date) – secundal harmonies are integrated via the melody. (Ex. 3.507.)

[1047] Levaya 2002.
[1048] This opus number appears on the printed score. Sitsky's listing "opus 46" (Sitsky 1994, p.23) is probably a mistake. We found no date for this piece.
[1049] Dated according to Henck 2004, p. 5
[1050] Sitsky 1994, p. 23 lists 1915.



Example 3.507. Vladimir Rebikov: *Pages d'un manuscript oublié*, bars 15-24. Edition P. Jurgenson.

Bitonality is not far away from Rebikov's works in this period, but in the second of the *Trois Idylles* opus 50 (1913[1051]) – *Dans un vaste éspace* [sic] – the bilateral relation is plotted onto the keyboard: right hand plays on white keys only while the left hand accompanies with chords in all keys but C major. Finally, in the first and last of this set of idylls, both for white keys only, clusters appear. In *Hymne au soleil* they are placed mostly above harmonies in C major, enriching those seventh chords and together encasing the tenor melody. (Ex. 3.508.)

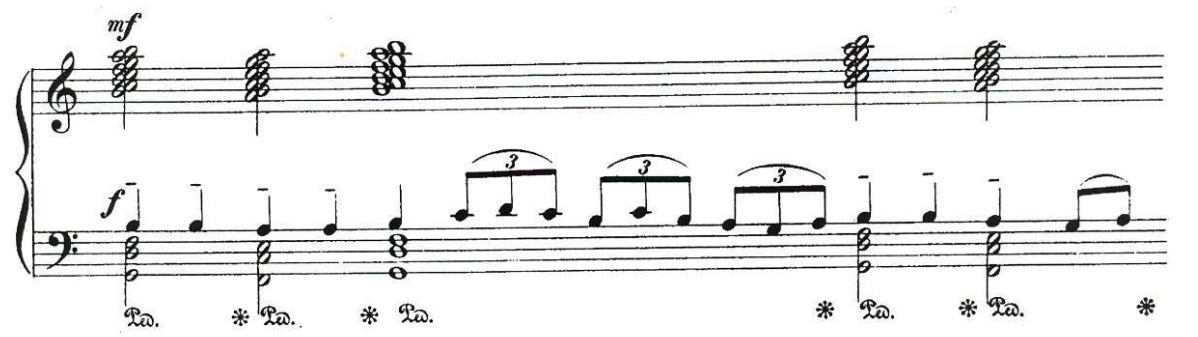


Example 3.508. Vladimir Rebikov: *Hymne au soleil*, part I of *Trois Idylles* opus 50 (1913), opening. Edition P. Jurgenson.

These clusters could still be played properly, but an asterisk leads to a footnote stating how "the chords of the right hand are to be performed with the side of the palm."[1052]

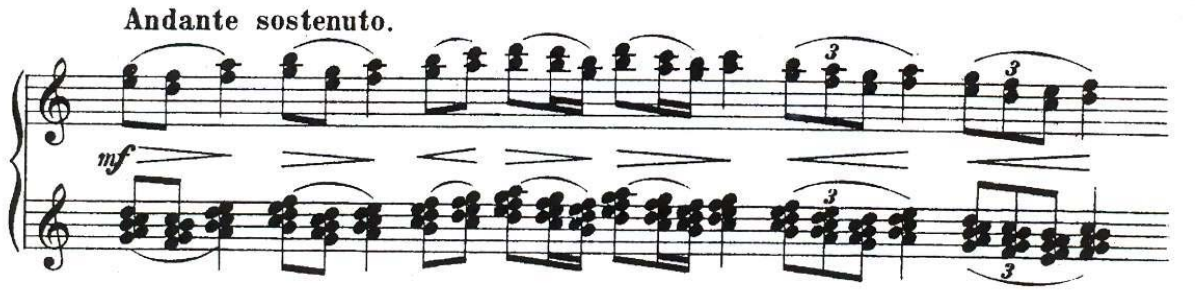
[1051] Henck 2004, p. 5: composed in 1913 at the latest, published in 1914.
[1052] "Les accords de la main droite doivent être executés avec le bord de la paume."

When the melody returns, the clusters have grown to a size that would need a large hand for them to fit the side of the palm. (Ex. 3.509.)
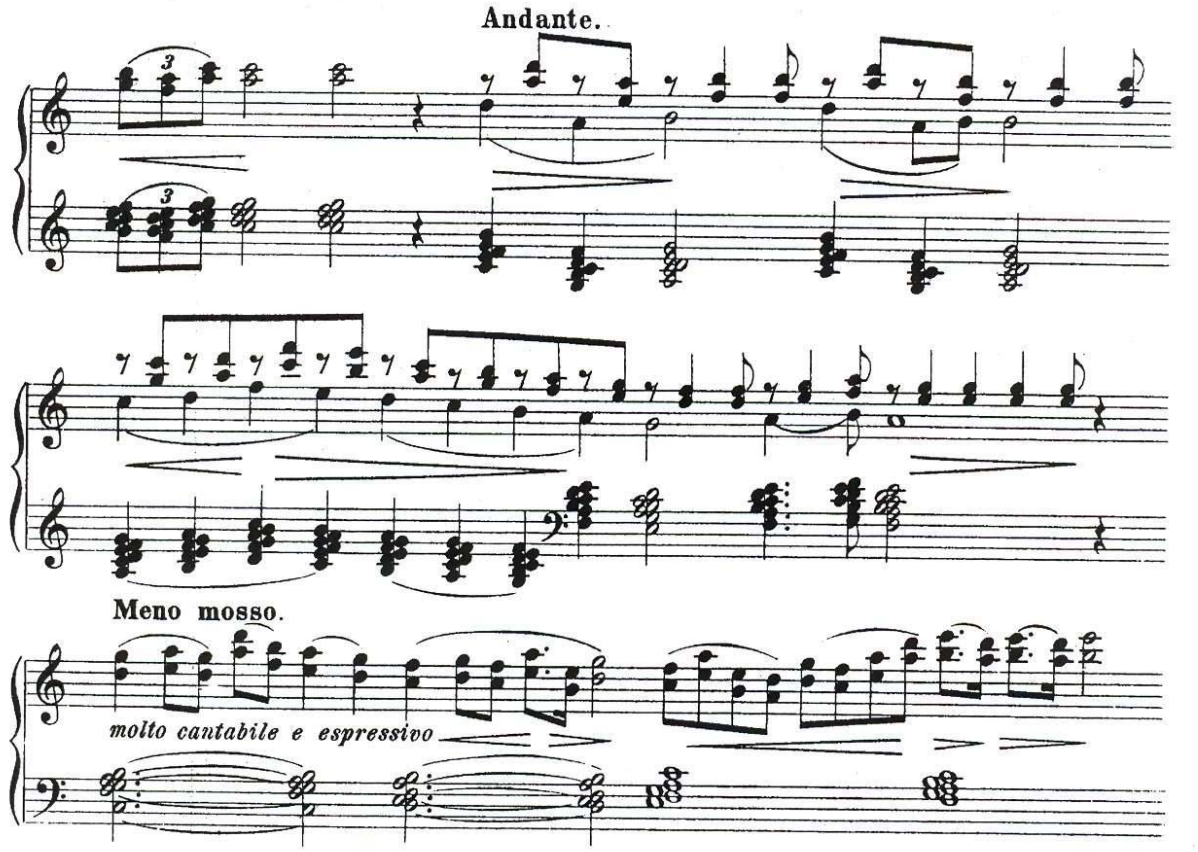


Example 3.509. Vladimir Rebikov: *Hymne au soleil*, part I of *Trois Idylles* opus 50 (1913), top of second page. Edition P. Jurgenson.

In the third part of the set – *Parmi les fleurs* – the clusters are more modestly sized and mostly hanging underneath the (smaller) tonal chords. (Ex. 3.510.)
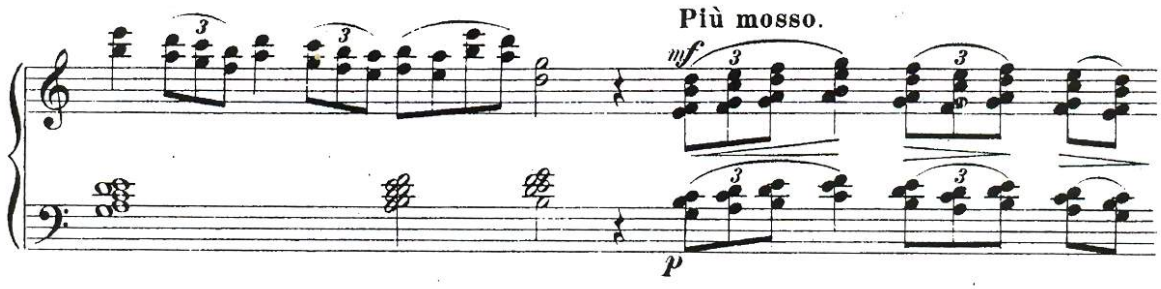


Example 3.510. Vladimir Rebikov: *Parmi les fleurs*, part II of *Trois Idylles* opus 50 (1913), opening. Edition P. Jurgenson.

In this piece, Rebikov diversifies the relationship between cluster and chord: after the five-note clusters, inversed seventh-chords are introduced as accompaniment, soon clustered up. The *Meno mosso* is characterized by an ascending C major scale in the bass, harmonized with differently clustered chords, all tending to occupy tonal functions. (Ex. 3.511.)



Example 3.511. Vladimir Rebikov: *Parmi les fleurs*, part II of *Trois Idylles* opus 50 (1913), 3rd to 5th system. Edition P. Jurgenson.

The *Più mosso* has a melody similar to the beginning of the piece, now in parallel inversions of a clustered chord. (Ex. 3.512.)



Example 3.512. Vladimir Rebikov: *Parmi les fleurs*, part II of *Trois Idylles* opus 50 (1913), 6th system. Edition P. Jurgenson.

To end the composition, this section is repeated with the constellation from the beginning: thirds in the right hand and palm size clusters in the left hand.

In the next opus number Rebikov summarizes some of what he had accomplished: *Les Dances* opus 51 (1914[1053]) contains quartal harmony in the first three pieces, the fourth has the right hand on white keys and the left on black, and the last piece is again based on the whole tone scale. But the clusters did not reappear after the *Idylles* opus 50.

[1053] At the end of the published score, the last bar contains the printed indication "Yalta 1914."

All these experiments show how Rebikov was searching for ways to personalize his style without deciding on developing his ideas much further. In opus 51, Rebikov added a *nota bene* to assure the reader that he had already used the chords in fourths in several works since 1895, and until the end of his life he was known to be bitter about Debussy having "stolen" his idea of composing with the whole-tone scale. He clearly didn't realize that it would be the technique with which to play some of his chords that could assure him of a place in history.
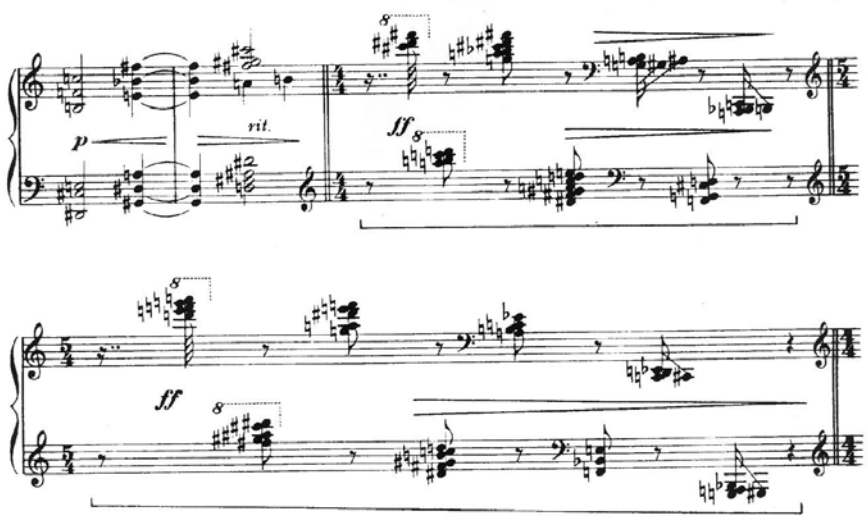
3.4.2.2.3.2 1913- Leo Ornstein: through ergonomics to the cluster

Born in 1894 (to a life that would end 108 years later in 2002), Ornstein immigrated from Russian St. Petersburg to New York in 1906.[1054] After graduating from the Institute of Musical Art in 1910, he was taken on a short trip to Europe where he "encountered modern music for the first time in the shape of the César Franck *Sonata* for violin and piano."[1055] While this trip must certainly have been an eye-opener for Ornstein in terms of his musical development, it was not to revolutionise his personal musical aesthetics, rather reinforce the traditional basis along the lines of which he had been educated. Returning to New York, he embarked on the typical career of a virtuoso pianist playing anything from Bach to MacDowell. Besides the expected classics and the established warhorses, Ornstein began to play his own works as well, but these were mostly melodic character pieces.

Somewhere in 1913, Ornstein changed from being perceived as the Russian pianist to the ultra-modernist composer. His new works would incorporate the most dissonant harmonies and the most pounding rhythms, rivaling anything by Stravinsky and Bartok. In the summer of that year, he set out on his second trip to Europe, lasting through April 1914. Accounts of how, where and when exactly the transition took place do not agree to the detail. Most, including Ornstein himself (sixty and more years after the facts) [1056], seem to converge on the point that a new, "futurist" sound occurred in his oeuvre already before he set out for Europe in 1913, only to blossom somewhere on the old continent later that year[1057]. Whether, as he stated, he "began to hear these things" without ever having seen any music by Schoenberg or Stravinsky, or whether he had in fact been influenced by what he could have heard in Paris in 1913, Ornstein's transition from "well-behaved" compositions to the "savage" pieces he started to profile himself with is characterized by a transition from chords to clusters.
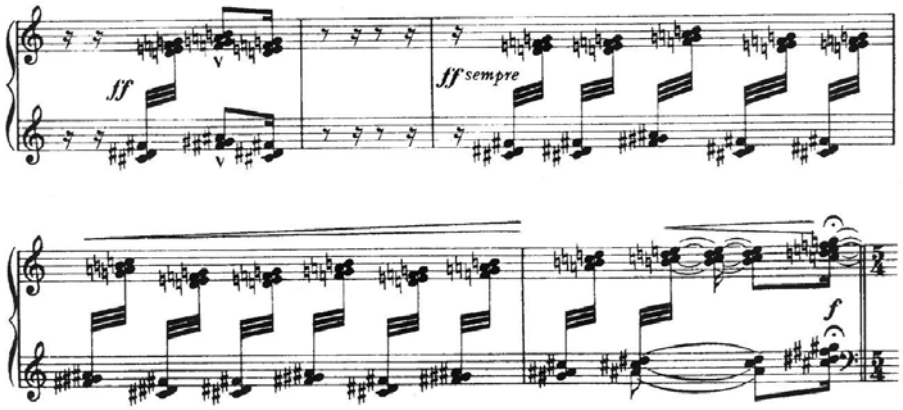
In general, Ornstein had a predilection for either widespread or compact, dense chromatic chords. The logic behind the formation of his chords is not tonal, nor is it a clearly defined harmonic system. (Ex. 3.513.)

[1054] Leo Ornstein was born in Kremenchuk in Ukraine. While he was studying at the St. Petersburg conservatory, the family, living in Kremenchuk and suffering from the 1905-06 pogroms, decided to collect Leo and leave the native country.
[1055] Martens 1918, p. 16.
[1056] Some sources give 1895. See Broyles & Von Glahn for the story on the matter of Ornstein's year of birth.
[1057] See Broyles & Von Glahn 2007, p. 59-69.
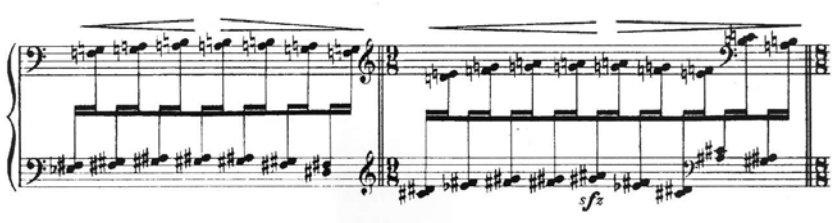


Example 3.513. L. Ornstein: *Impressions of Notre Dame* opus 16 (1914), nr. 2 *Andante – Presto*, bars 23-26. Reproduced with kind permission of Poon Hill Press.

At times, Ornstein resorts to simple black- and white-key differentiation (ex. 3.514), with chords that are defined only by the layout of the keyboard and a preset number of notes.
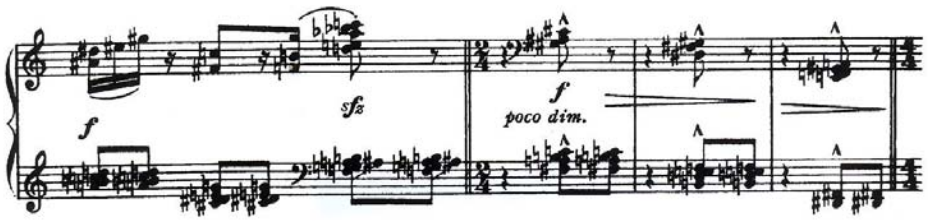


Example 3.514. L. Ornstein: *Impressions of Notre Dame* opus 16 (1914), nr. 1 *Moderato Sostenuto - Agitato*, bars 54-58. Reproduced with kind permission of Poon Hill Press.

Even in such simple and easy combinations of latitudinal movement with fixed hand positions, he sometimes tries to differentiate at least the notation to suggest a sense of harmonic reasoning, e.g. the choice of D♯ or E♭ in consecutive black key chords. (Ex. 3.515.)
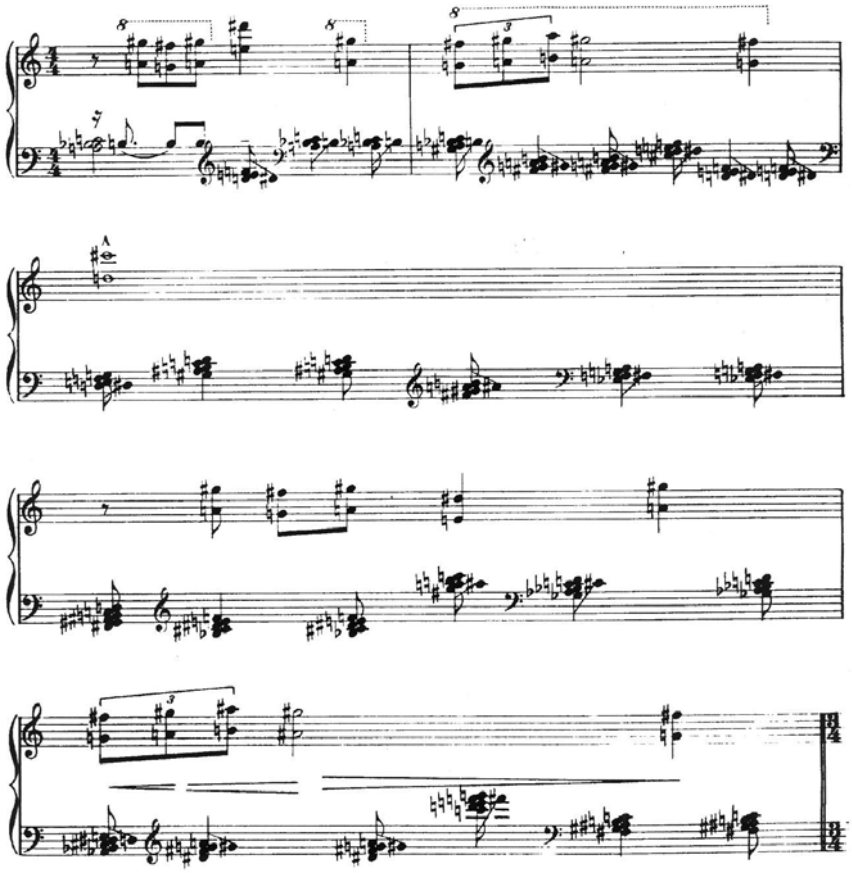


Example 3.515. L. Ornstein: *Impressions of Notre Dame* opus 16 (1914), nr. 2 *Andante – Presto*, bars 41-42. Reproduced with kind permission of Poon Hill Press.

Most often, Ornstein uses a combination of both the complex chromatic chords and the simple black and white grips, either in clear and consistent juxtapositions (ex. 3.516) or in ways that are less easily explained (ex. 3.517).

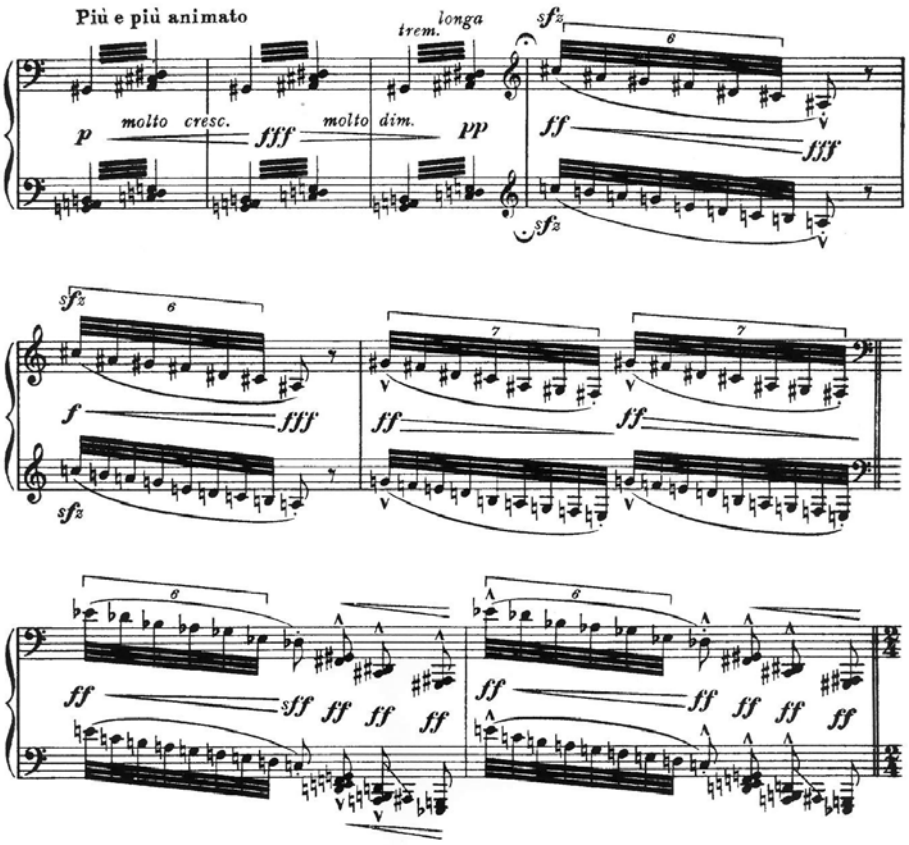


Example 3.516. L. Ornstein: *Dwarf Suite* opus 11 (1913/14), nr. 5 *Dwarfs at work,* bars 18-21. Reproduced with kind permission of Poon Hill Press.
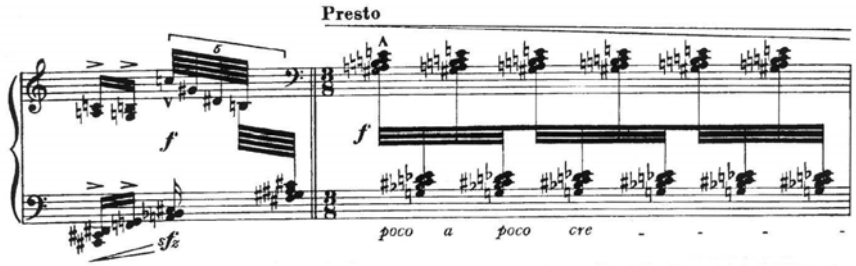


Example 3.517. L. Ornstein: *Impressions of Notre Dame* opus 16 *(*1914), nr. 1 *Moderato Sostenuto,* bars 28-32. Reproduced with kind permission of Poon Hill Press.

Sometimes it seems that there was an urgent need or a reflex to add a chromatic aggregate to an otherwise simple construction, as in ex. 3.518, where the whole passage is based on the division of the right hand playing the black keys and the left hand the white keys, only to change at the end with chords that do not fit the black/white system. (Ex. 3.518.)



Example 3.518. L. Ornstein: *Impressions of the Thames* opus 13 nr. 1 (1920), bars 76-83. Reproduced with kind permission of Poon Hill Press.

More than one example shows how Ornstein deliberately searched for high-level chromatic nuance resulting in performance practical difficulty, when the effect might have been achieved almost or just as effectively with the simpler means of black and white key chords, which he so often used. The chordal trill in ex. 3.519 is very hard to execute due to the lack of space for the specifically required position of the fingers and hands to move in any comfort.
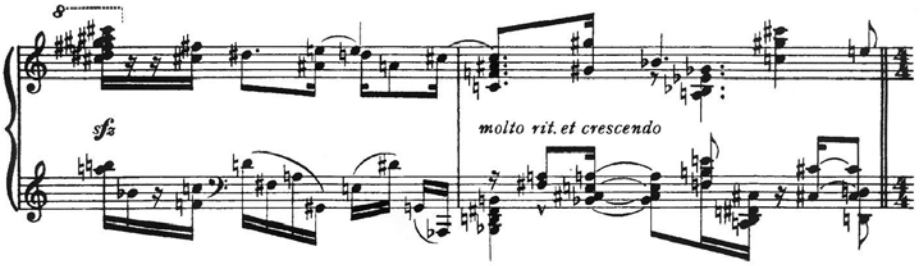


Example 3.519. L. Ornstein: *Wildman's Dance* opus 13 nr. 2 (ca 1913), bars 84-85. Reproduced with kind permission of Poon Hill Press.

Nevertheless, Ornstein's chord building is often inspired by physical considerations of performance practice, with chromatic intricacies coming into play as coloration rather than on a clear theoretical basis. The idea of such an approach can be linked to the knowledge that he was an accomplished improviser, mastering "a skill that not only enabled but likely reinforced his championing an intuitive approach to composition."[1058]

[1058] See Broyles & Von Glahn 2007, p. 91.
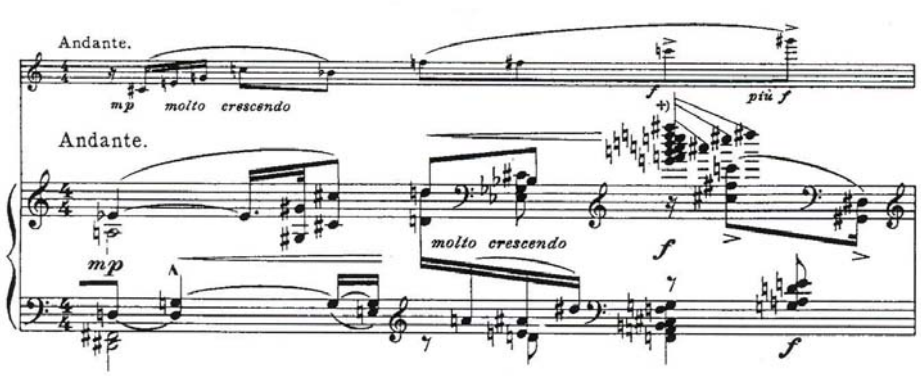
Some of the pieces he performed were never written down[1059], and when he did put his pieces to paper, he is known to not ever change a note. This routine, coupled to the facts that he never took a course in composition and that he disdained formal constraints[1060], further confirms his writing of (at least) harmonies based on practical and intuitive keyboard knowledge rather than on intricate theoretical foundations.

There are few clusters in Ornstein's works. Yet, the highly idiomatic cluster technique would have fitted well with the many passages where chords are so dense that they ask for all the notes in between their outer limits. But it is almost as if his reflex to maintain a traditional level of difficulty in piano writing denied him the context for something as simple as playing a chord with the palm of the hand. Ex. 3.520 is ergonomically written throughout in that it all lays rather well in the hand and on the keyboard, yet the first right hand aggregate would invite the hand to play it rather than the five fingers.



Example 3.520. L. Ornstein: *Three Preludes* (1914), nr. 2 *Moderato,* bars 12-13. Reproduced with kind permission of Poon Hill Press.

Ornstein did indicate the cluster technique, but only very rarely, and then only when nothing else would allow the high density of a chord to be realised. (Ex. 3.521.)



Example 3.521. L. Ornstein: *Sonata* for violin and piano opus 31 (1915), 1st movement, bar 14. Reproduced with kind permission of Poon Hill Press.
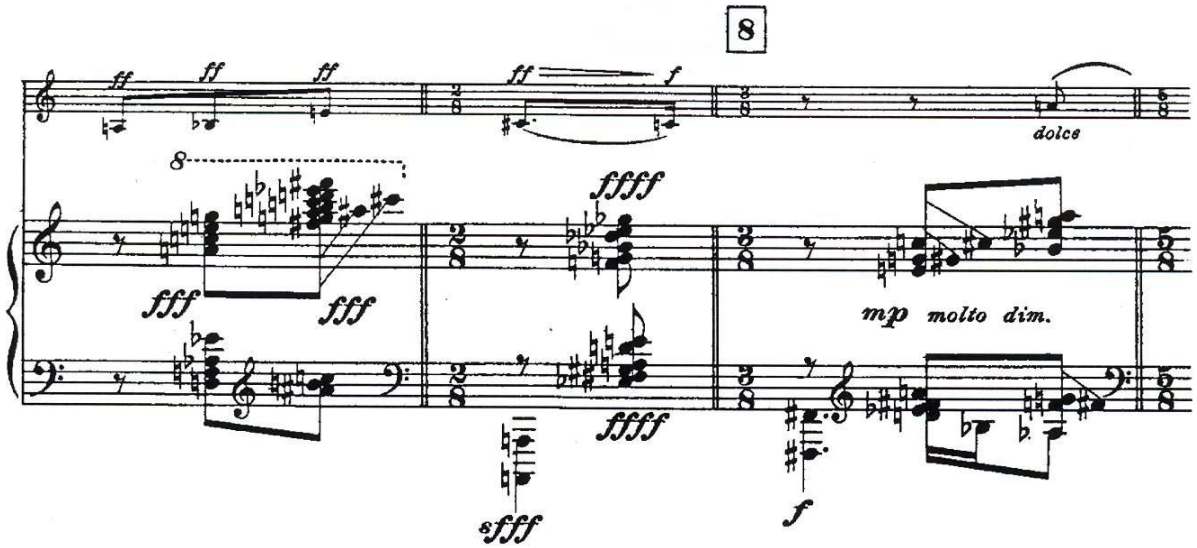
Even when he seems to specifically write a cluster, it is not the most regular one of all. The footnote to this chord (the asterisk in ex. 521) explains how the different parts of the hands are needed to play this 11-note cluster. (Ex. 3.522.)

[1059] See Broyles & Von Glahn 2007, p. 356, footnote 62 on p. 356 and footnote 12 on p. 363.
[1060] Broyles & Von Glahn 2007, p. 279 and 290.



Example 3.522. L. Ornstein: *Sonata* for violin and piano opus 31 (1915), 1st movement, footnote regarding bar 14. Reproduced with kind permission of Poon Hill Press.
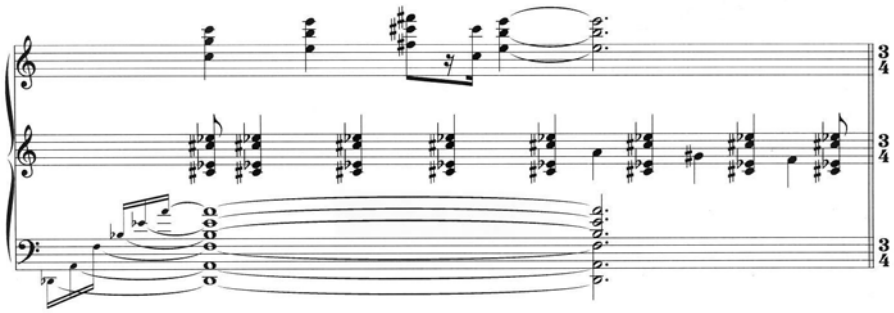
The irregularity of the cluster in fact demonstrates how it was conceived "from the keyboard up." It is a natural position of a relaxed hand on a specific place on the keyboard that is translated into a compound of the notes it actually covers. Similarly, a little further in this piece, the basic grip of an F♯ major chord with the added sixth (or simply a black key cluster played with the fingers) is filled out using the flat of the hand dropped onto the white keys underneath. All that ends up being touched is what constitutes the chord. (Ex. 3.523.) Ergonomics now tend to regulate the composition of harmonic texture.



Example 3.523. L. Ornstein: *Sonata* for violin and piano opus 31 (1915), 1st movement, bars 38-40. Reproduced with kind permission of Poon Hill Press.

Although these steps, as we have summed them up, do not represent a completely straightforward chronological evolution in the short period of ca1913-ca1915, Ornstein confessed that his violin sonata opus 31 "had led him to the edge of chaos" and seemed a "dead end."[1061] The next period in Ornstein's compositional career sees him return to more simple textures and levels of techniques, though he never looses that sense of ergonomical writing. (Ex. 3.524.)

[1061] Broyles & Von Glahn 2007, p. 278-279.



Example 3.524. L. Ornstein: *Nocturne* #2 (1922), bar 101. Reproduced with kind permission of Poon Hill Press.

Ornstein's next stylistic change came quickly. After his opus 31, the relentless pounding of the keyboard and the chromatically dense harmonies gradually made way for more lyrical material. His "ultramodern" reputation as both a pianist and composer remained of interest to audiences and Ornstein kept playing his futurist pieces, but now more and more as encores (such as the much requested *Wild Men's Dance*) to programs that consisted of a balanced mix between the radical and the traditional. His touring schedule reached a peak in the 1919-1920 season, after which his appearances dropped markedly during the early 1920's. After about 1933, he stopped performing altogether.

3.4.2.2.3.3 Charles E. Ives: In between drum chords and fist smashing

In January of 1921, Ives shipped his second sonata to hundreds of critics, libraries, music lovers and musicians. One of them – a certain Walter Goldstein – wrote to Ives to say that "to me the sonata seems to be expressed in the Schoenberg-Scriabin-Ornstein idiom, the musicality of which is not yet comprehensible to me." Ives apparently sketched a reply which he did not actually mail: "Dear Goldy, Ain't never heard nor seen any of the music – not even a god damn note – of Schoenberg-Scriabin – or Ornstein – Just because I swear & use cuss-words, aint no sign my name is Murphy."[1062] As Ives had lived in New York for most of the time when writing the second sonata, it is hard to believe that he would never have heard or seen any music by Ornstein. The latter was at the pinnacle of his career as an ultra-modernist pianist and composer in that very period in that very city as much as in the rest of musical America. By 1917 Ornstein was "the most discussed figure on the concert stage today"[1063]; in the 1919-1920 season he constantly performed before packed halls with more than two thousand people in it. It may be that Ives felt attacked by Goldstein's suggestion that the sonata was perhaps not wholly original, and that he wanted to distance himself of the said modernist composers as much as possible for the sake of Goldstein's argument. Goldstein was not the only one to think of Ornstein when contemplating Ives' second sonata. In the first journalistic piece on Ives' music – for a New Orleans arts magazine in October 1921 – Henry Bellamann writes about the "Ornstein-like fury" of *Hawthorne*, refining his observation by adding that it is "used to finer purpose."[1064]

Regardless of whether or not Ives new Ornstein's music well enough to be influenced by its clusters, the question of chronology is clouded by the problems of dating Ives' works. It is rarely possible to make sense of the different dates that can be deduced directly or indirectly from Ives' own indications on sketches, drafts, patches, emendations, final

[1062] As cited in Swafford 1996, p 318-319.
[1063] As quoted in Broyles & Von Glahn 2007, p. 140, from an article in the *Baltimore Evening Sun*, February 10, 1917, reprinted in the *Musical Courier* 74, no. 11 (March 15, 1917), p. 7. See Broyles & Von Glahn 2007, p. 127-146 for more on Ornstein's fame in the period from 1915-1920.
[1064] Quoted in Swafford 1996, p. 320-321.

scores and proof sheets as well as in other sources. These often conflict with each other, at times even with the manufacturing dates of the paper on which they were written. Many works were recomposed from earlier material that could have been reworked at different times into different works, manuscripts can be layered with stages of reworking, all further compromising a clear view of any compositional evolution.[1065] In many cases, the date of publication is the earliest certain and reliable terminus. But some works were not published or were printed long after the earliest known manuscripts. So it is that *Hawthorne* was annotated on a set of sketches and patches to have been started in April of 1911, ended in October 1912 and scored in 1915-16 as the second movement of the 4th symphony. The whole sonata was revised around 1919 (for the first edition in 1920) while different work lists compiled by Ives cite the piece to be from 1911-15, 1910-15 or 1909-15. It has furthermore been deduced that "Ives did not produce a complete work similar to what became known as the first edition until several years after 1915" and that "much of this work was done in 1919."[1066] The material of which *Hawthorne* consists was based on pieces that are now lost, but which in turn could date back to 1909.[1067] Such material can therefore not be identified, and so it is impossible to assess the time at which Ives thought of the clusters in *Hawthorne* any more precisely than by the bracket 1909-1920. We will therefore be concerned less with the chronology in Ives' treatment of the cluster than with its diversity. If Ornstein only developed his performance idiom up and till the cluster technique, not pursuing the matter any further, Ives not only wrote many more clusters, he also used them in more and different ways.

The relation between Charles Ives and cluster technique can be divided into four categories: his "drum chords"; those occurrences of indicated cluster technique; passages where only cluster technique is possible; doubtful instances where the use of cluster technique is possible but not necessary and not indicated.

3.4.2.2.3.3.1 Ives' drum chords

In his 1932 memos, Charles E. Ives (1874-1954) tells us how he came to use the fist or the flat of the hand in his piano writing:[1068]
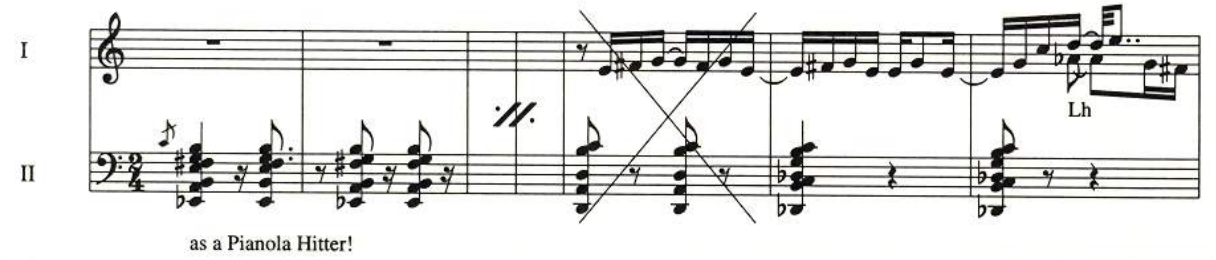
> When I was a boy, I played in my father's brass band, usually one of the drums. Except when counting rests, the practising was done on a rubber-top cheese box or on the piano. The snare and bass drum parts were written on the same staff, and there were plenty of dittos. In practising the drum parts on the piano [...], I remember getting tired of using the tonic and dominant and subdominant triads, and Doh and Soh etc. in the bass. So [I] got to trying out sets of notes to go with or take-off the drums – for the snare drum, tight hand notes usually closer together – and for the bass drum, wider chords. They had little to do with the harmony of the piece, and were used only as sound-combinations as such. For the explosive notes or heavy accents in either drum, the fist or flat of the hand was sometimes used, usually longer groups in the right hand than left hand.
>
> Father didn't object to all of this, if it was done with some musical sense – that is, if I would make some effort to find out what was going on, with some reason. For instance, I found that often I kept a different set of notes going in each hand, and that the right hand chords would move up and down more, and change more, than those of the left hand. And then for accents the hands would go usually in opposite directions, the right hand up, the left hand down–also that triads and chords without bites were quite out of place, or any combinations that

[1065] Sinclair 1999, p. xi-xii. See also Solomon 1987.
[1066] Block 1996, p. 30.
[1067] Sinclair 1999, p. 193-194.
[1068] Kirkpatrick 1973, p.42-43

> suggested fixed tonalities. And sometimes, when practising with others of in the school orchestra, I would play drum parts on the piano, and I noticed that it didn't seem to bother the other players–*if* I would keep away from triads etc., that suggested a key. A popular chord in the right hand was Doh#-Me-Soh-Doh, sometimes a Ray# on top [i.e. C#-D#-E-G-C], or Doh-Me-Soh-Ti, and one with two white notes with thumb, having the little finger run into a 7th or octave-and-semitone over the lower thumb note. The left hand often would take two black notes on top with thumb, and run down the rest on white or mixed.

George E. Ives died in 1894, so the recollections recounted here by his son would provide us with an ante quem of that year at the latest for cluster playing in Ives' musical youth. We did not find any sketch or score from such an early date in which these kinds of drum chords were incorporated, though. That he used the fist or flat of the hand "for the explosive notes or heavy accents in either drum" cannot be deduced from the earliest of his manuscripts either.

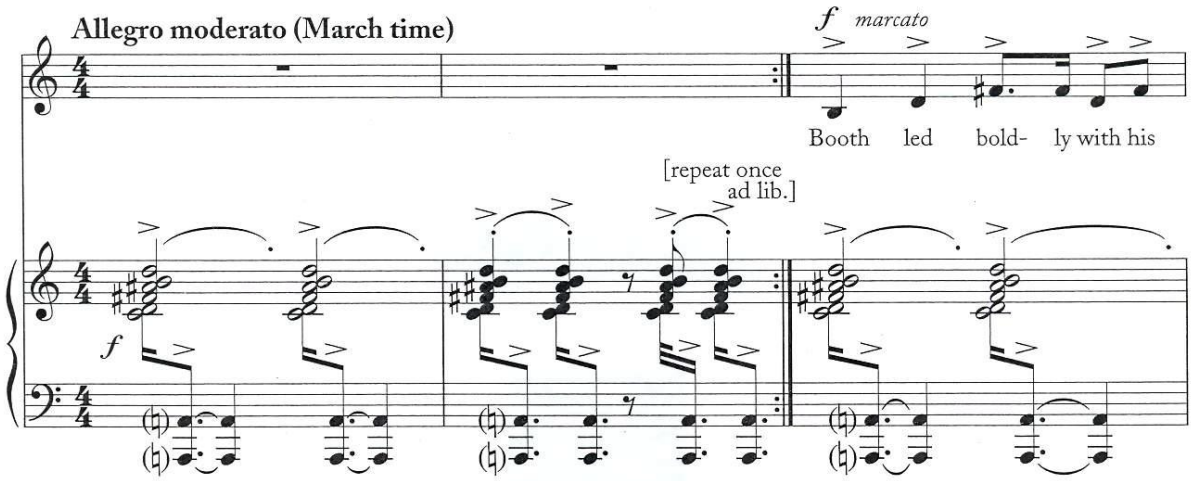
The earliest example of drum chords would be demonstrated in the bass part of the four-hand *Drum Corps or Scuffle*, presumably from or before 1902. (Ex. 3.525.)



Example 3.525. Ch. E. Ives: *Drum Corps or Scuffle* for piano four-hands, transcription of manuscript.[1069]
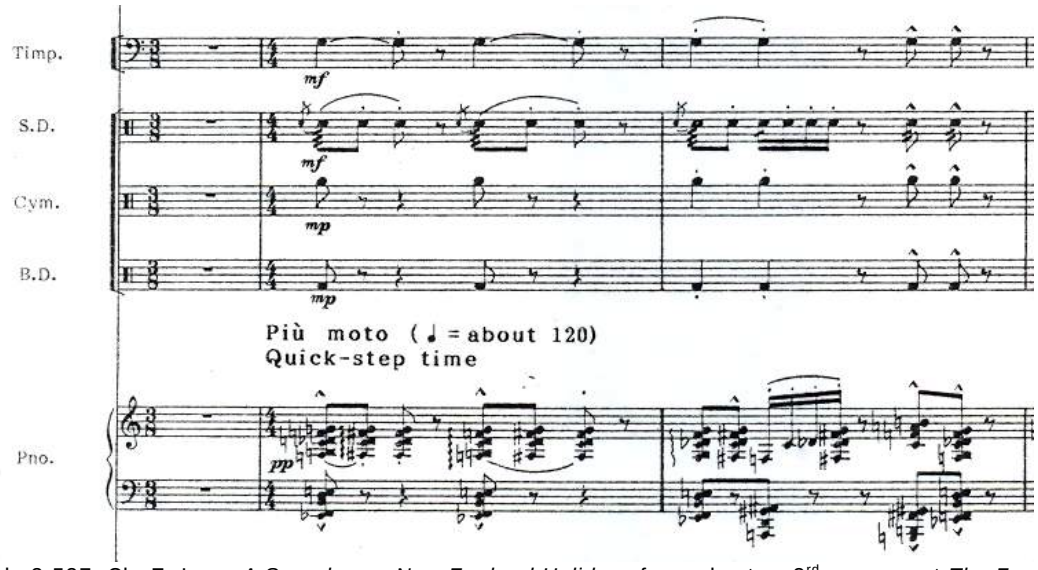
Ives' drum chords represent particular types of codified rhythmic motifs that were at the disposal of the "drum corps" (i.e. its rhythm section) of a marching band to move musicians in step, to signal players to raise their instruments and play, etc. A common such rhythm in Ives' keyboard transcription of this repertoire of musical signals is offered in *General William Booth Enters into Heaven*, where the "street beat" piano accompaniment lets us hear the big bass drum that – as the song tells us – Booth uses to lead his troops.[1070] Ex. 3.526.

[1069] As printed in Sinclair 1999, p. 234. Reproduced by permission.
[1070] See Burkholder 1995, p. 470, fn. 75:



Example 3.526. Ch. E. Ives: *General William Booth Enters Into Heaven* for voice and piano, opening bars. © Theodore Presser Co.

The association of drum chords with percussion is not limited to imitation, of course: in orchestral writing they often appear synchronized with the actual drums. (Ex. 3.527.)
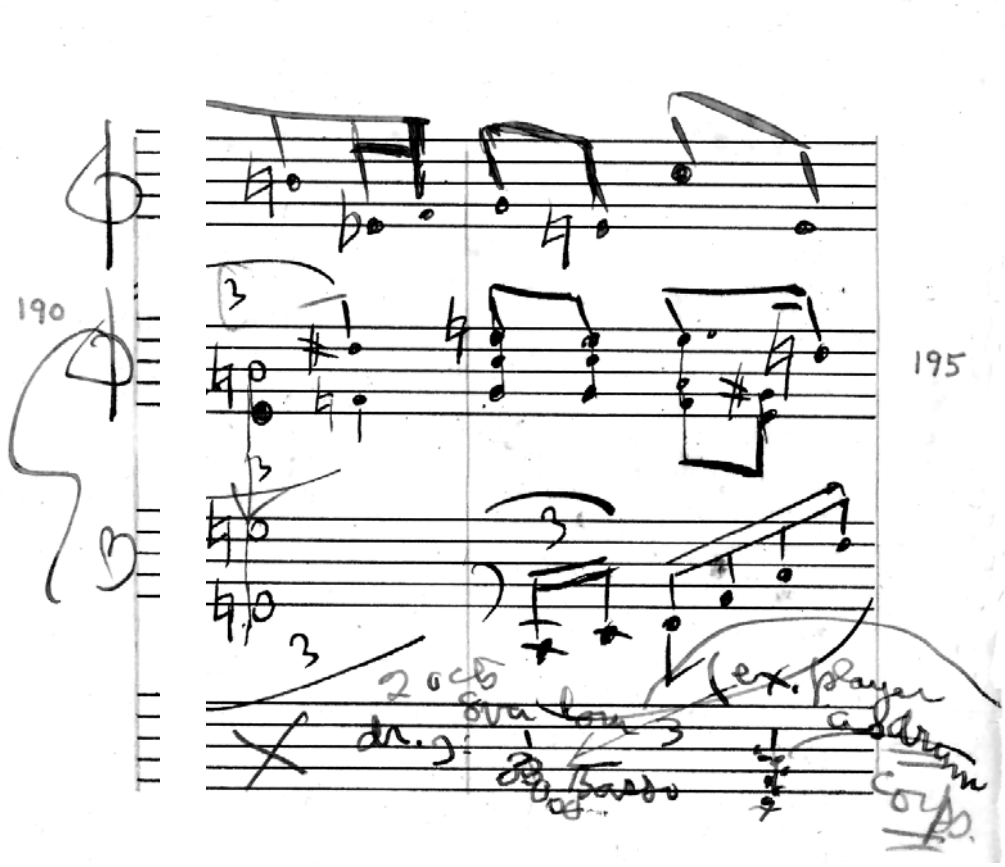


Example 3.527. Ch. E. Ives: *A Symphony: New England Holidays* for orchestra, 3rd movement *The Fourth of July,* cue "L". © Associated Music Publishers, Inc.
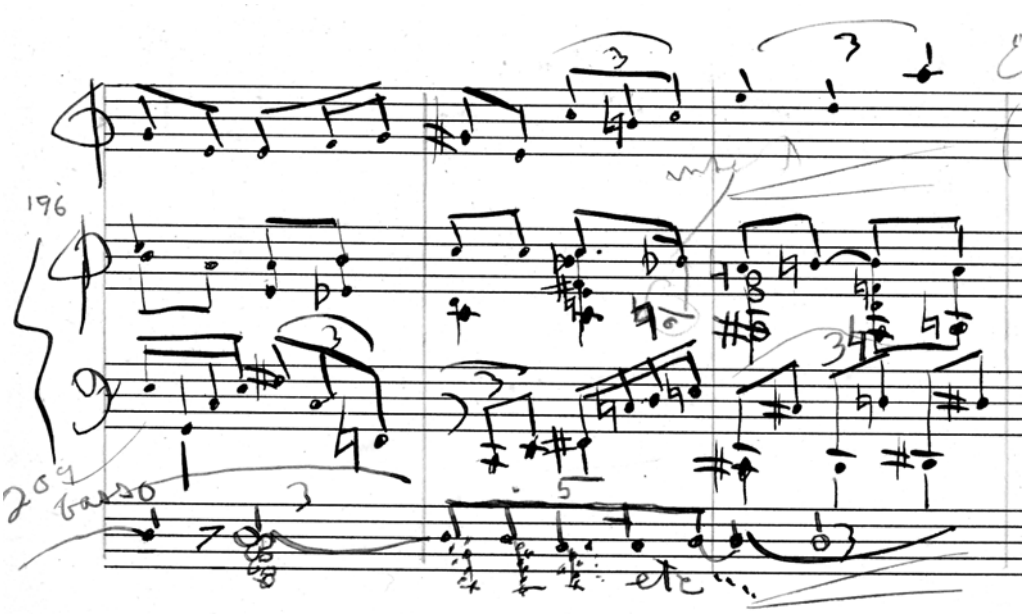
The use of thumb clusters is a typical part of Ivesian drum chord building. In some of these chords the fifth-finger is also required to depress two keys at once, sometimes the thumb needs to play three keys. But none of these particular chords are built or indicated so that they would require any improper use of the hand or fist, even if, in some instances, the association with the drum corps comes close to such techniques. In an emendation Ives made to one of the manuscripts of his second sonata for violin and piano[1071] he added an optional part for an extra player on the last 2 pages (bars 195-229).[1072] Most of the aggregates he added to the deep bass are diatonic cluster chords ranging from E up to D. The seven notes could be played with mostly proper fingering if the thumb as well as the fifth finger each take two notes. That second player may of course decide to use two hands, and if it is the page turner, he would only need the

[1071] # 61 in Sinclair 1999 (p. 149-151).
[1072] The source is the second ink copy (f3465-66). See Sinclair 1999, p. 150.
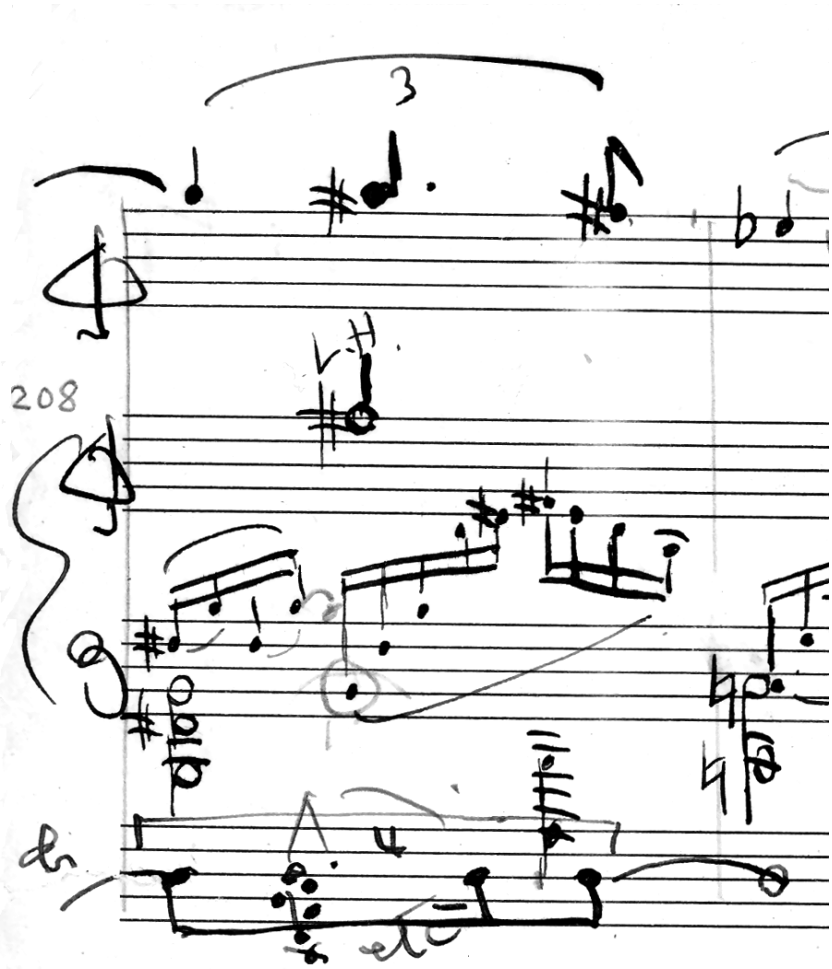
publisher to provide him with an efficient lay-out that prevents page turns at this moment. However, as much as we lack direct proof, it is very possible that we are here looking at palm-clusters. (Ex. 3.528-530.)



Example 3.528. Ch. E. Ives: 2nd violin sonata, 3rd movement *In the barn*, manuscript, bar 195. "Dr[um] / 2 oct[ave]s / 8va basso / low [?] / ex[tra] player as drum corps." Reproduced with kind permission of the Charles Ives Papers, Irving S. Gilmore Music Library, Yale University.

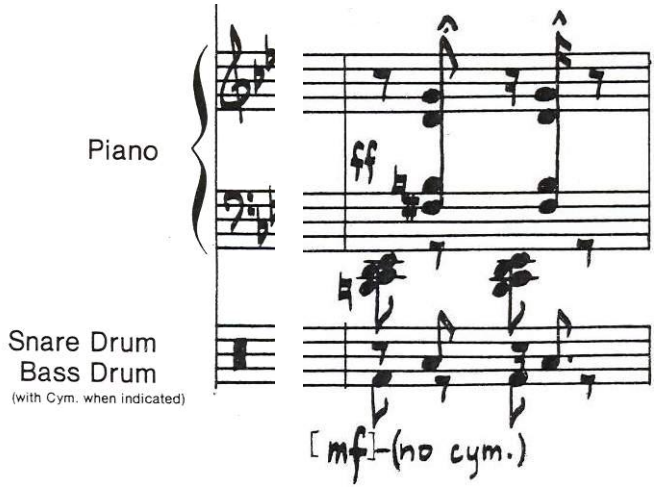


Example 3.529. Charles E. Ives: 2nd violin sonata, 3rd movement *In the barn*, manuscript, bars 196-198. Reproduced with kind permission of the Charles Ives Papers, Irving S. Gilmore Music Library, Yale University.



Example 3.530. Ch. E. Ives: 2nd violin sonata, 3rd movement *In the barn*, manuscript, bar 208. Reproduced with kind permission of the Charles Ives Papers, Irving S. Gilmore Music Library, Yale University.

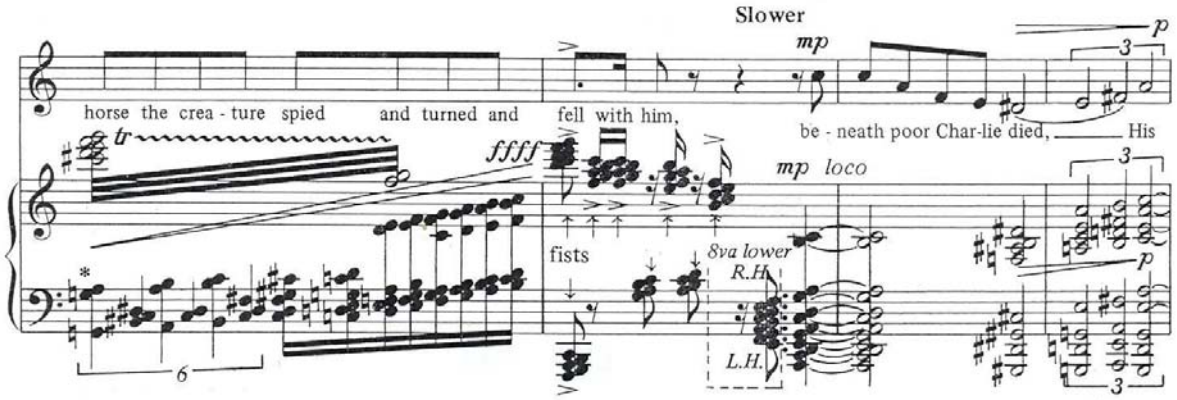
Another such instance equally lacks any indication of cluster technique, though it is most reminiscent of what Ives referred to in the memo. The four-note cluster chords in the left hand of the *Country Band March* may well be intended for the fist. (Ex. 3.531.)



Example 3.531. Ch. E. Ives: *Country Band March* for Theater Orchestra, bar 126. © Theodore Presser Co.

3.4.2.2.3.3.2 Cluster indications

Ives did sometimes express his requirement to use the hand to play cluster chords. In two songs he indicate the fist in the piano part. In *Charlie Rutlage*[1073] alternate fists (preceded by a row of thumb clusters) come crashing down upon five-note diatonic cluster-chords like the protagonist's horse in the story that is being sung. (Ex. 3.532.)

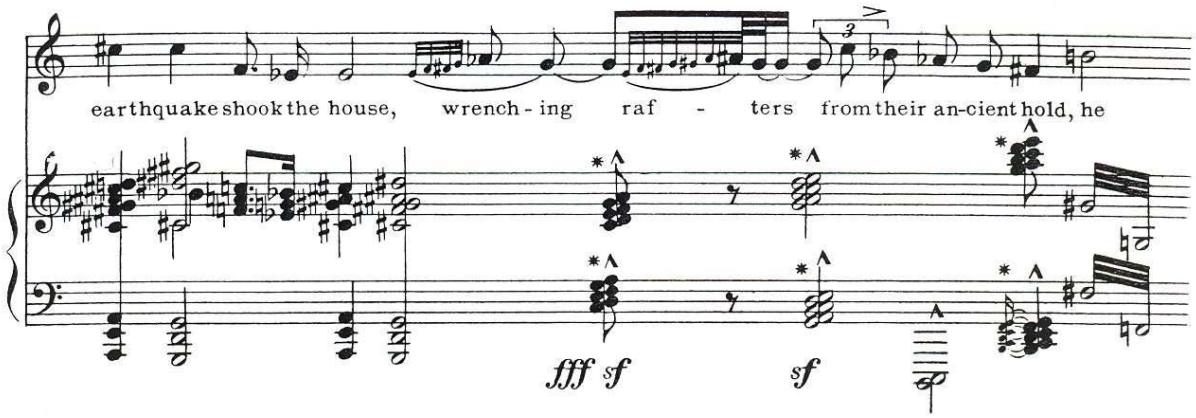


Example 3.532. Ch. E. Ives: *Charlie Rutlage* for voice and piano (from the 1922 edition *114 Songs*), bars 38-41. © Associated Music Publishers, Inc.

The asterisks in bars 38 and 39 refer to a footnote: "In these measures, the notes are indicated only approximately; the time of course, is the main point." In Ives' copy of this edition, containing corrections in his hand, the word "time" is crossed out and replaced by "action," demonstrating the priority of the cluster technique.[1074] The approximation thus allows the performer to give priority to tempo over exact size as well as to take into consideration the size of his or her hands to fit the four- and five-note chords.[1075] The arrows are used to indicate which hand is needed. It remains to be explained why the arrows at the last cluster seem to indicate that the right hand should be placed beneath the left hand.
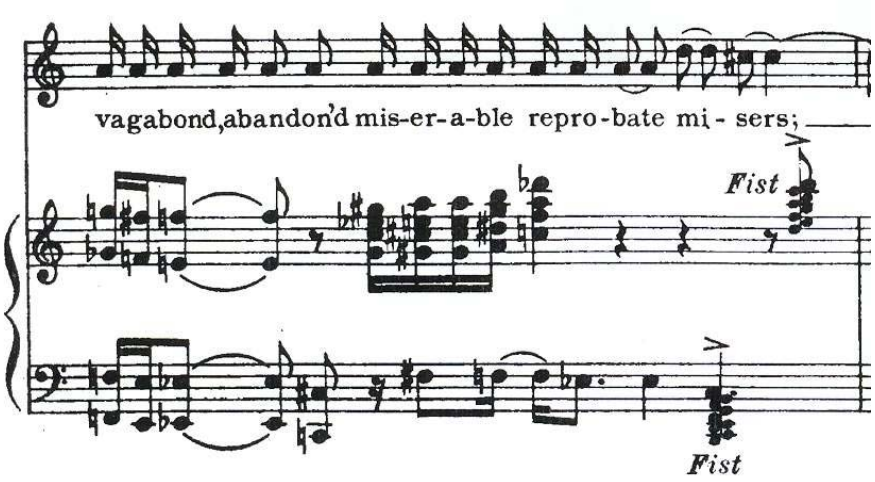
The song *Lincoln, The Great Commoner* also has asterisks, with a footnote explaining the six chords to be played with the fist. This time these chords are 6-notes wide, rather large for a fist (Ex. 3.533.) These fist clusters are a rare example of unequivocally identifiable programmatic use of the cluster in Ives' work, appearing as the text recounts how an earthquake tears down the structure of the roof.

[1073] #226 in Sinclair 1999 (p. 354-355).
[1074] See f6165.
[1075] Unfortunately, the critical edition sanctioned by the Charles Ives Society (*129 Songs*, edited by H. Wiley Hitchcock) left out the asterisk in bar 39, as well as the arrows below and above the penultimate chord in that bar.



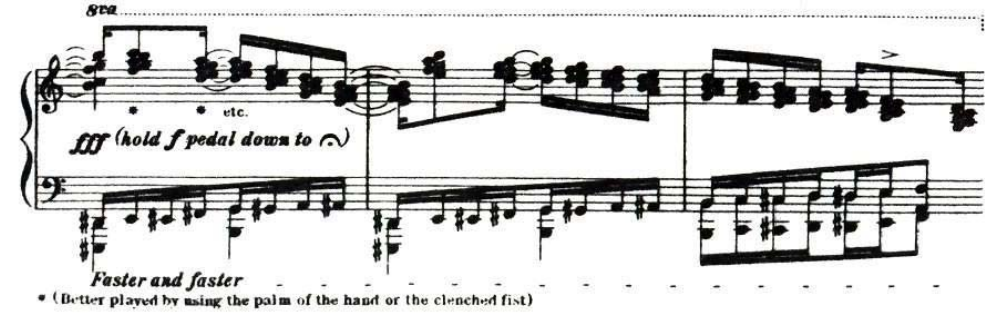
Example 3.533. Ch. E. Ives: from *Lincoln, The Great Commoner* for voice and piano. © Peer International Corporation.

In the song *December* the fist is required to play a whole octave full of white keys (ex. 3.534), possible only really by bending the wrist and putting the fist parallel to the keyboard instead of perpendicularly to it.

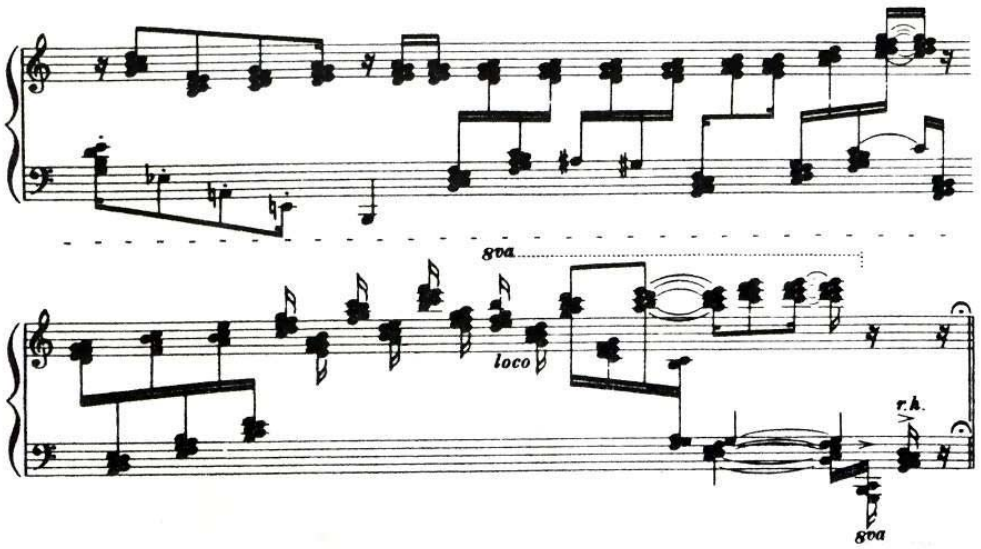


Example 3.534. Ch. E. Ives: *December* for voice and piano, second to last bar. © Theodore Presser Co.

In the second movement *Hawthorne* of the second solo piano sonata *Concord, Mass., 1840-60*[1076], Ives is less decisive about exactly what kind of cluster technique he thinks best: "palm of the hand or the clenched fist." (Ex. 3.535.)



[1076] #88 in Sinclair (p. 191-197).



Example 3.535. Ch. E. Ives : 2nd piano sonata *Concord, Mass., 1840-60*, 2nd movement *Hawthorne*, first edition, from 40/5 to 41/2. © Edwin F. Kalmus & Co.

Of note is the fact that Ives advises the *clenched* fist to play five-note cluster chords. Most pianists' fists are too small to fit these chords if the fist hits the keys perpendicularly. Ives may have had a large hand (to be deduced from many of the chords in his piano works), but it is still likely that he meant the fist to lay across the keys, i.e. in a 90° angle with the forearm.

In the same movement of this sonata, Ives writes large clusters that are to be silently depressed (see below, 3.4.2.3.3). It is interesting to note how, in a performance note printed at the bottom of the relevant page in the first edition (1920)[1077], he implies that it was John Kirkpatrick who came with the idea of using a specifically designed accessory to depress the cluster chords:

> Mr. Kirkpatrick devised and used a framework the weight of which held the keys down effectively. John Kirkpatrick put a strip of felt under the bat to keep it from falling on the home plate too often.[1078]

It is possible that Ives had had arm-clusters in mind, initially, and that Kirkpatrick introduced the board to achieve a more precise effect. The boxed notation is easily associated with the board, but that could have been thought of after the board was decided upon.[1079]

In both cluster instances of the second piano sonata, the initial way Ives expressed himself about the specifics of the cluster technique comes across as a little self-

[1077] The second sonata was published twice: first printed privately by G. Schirmer in 1920 (delivered 1921), then by Arrow Music Press in 1947. The first edition was reproduced in study score format without alteration by Edwin F. Kalmus & co; the second edition was issued again (also as an unaltered print) by Associated Music Publishers when they acquired Arrow Music Press. A third edition by Kirkpatrick ("largely based on the 1st edition, in pursuit of the earliest state of the sonata") would be available from Associated Music Publishers according to Sinclair 1999 (p. 194) but we have been unable to obtain such edition from Schirmer/AMP.

[1078] Clark 1971, p. 203. The quotation at the end ("Played without striking […] too often") is from I, a note printed at the bottom of the page.

[1079] In a later note referring to the second edition from 1947, Ives states "on page 25, published score, there are groups of notes which originally were intended to be played by a second piano off the stage or in another room. These were played by pushing down very lightly with a strip of board 14 ¾ inches long with felt on one edge." As quoted in Clark 1971, p. 204.

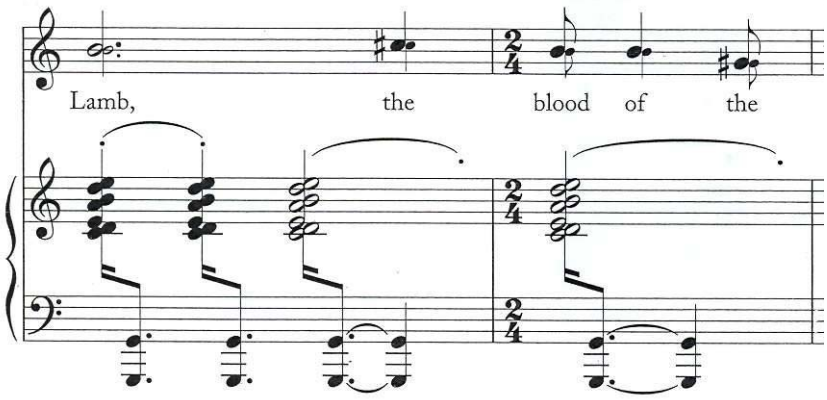
conscious. The brackets in the footnote and the reference to Kirkpatrick for devising the board may show that either the composer was insecure about (indicating) these performance techniques, or that he considered them so common that they needed little overt elaboration.

At the end of a sketch that is related to *Study #23*, Ives wrote a huge chromatic cluster spanning all notes between *C* and b^2, marked *ffffff*, and with an added performance practical clue "a Knock Out Chord play with BASE Ball BAT[…]."[1080] As the four-octave stretch is smaller than the length of an average baseball bat, Herbert Henck has suggested that Ives might have forgotten an octave sign to make the cluster five octaves wide.[1081] However, if Ives had really intended this cluster to be hit with a bat, four octaves may have been about the part that would crash down on the keyboard when swung from where Ives had been sitting at the piano, depending on how he held the bat with his hands. It seems unlikely that he would have held the bat parallel to the keyboard to press it down on the keys lengthwise. At any rate, it remains unlikely that Ives had actually been serious about what he had written here. As much as baseball references permeated his works, often connected to specifically developed compositional material[1082], smashing a bat onto the keyboard would inflict severe damage to any piano.

3.4.2.2.3.3.3 No indication but no doubt

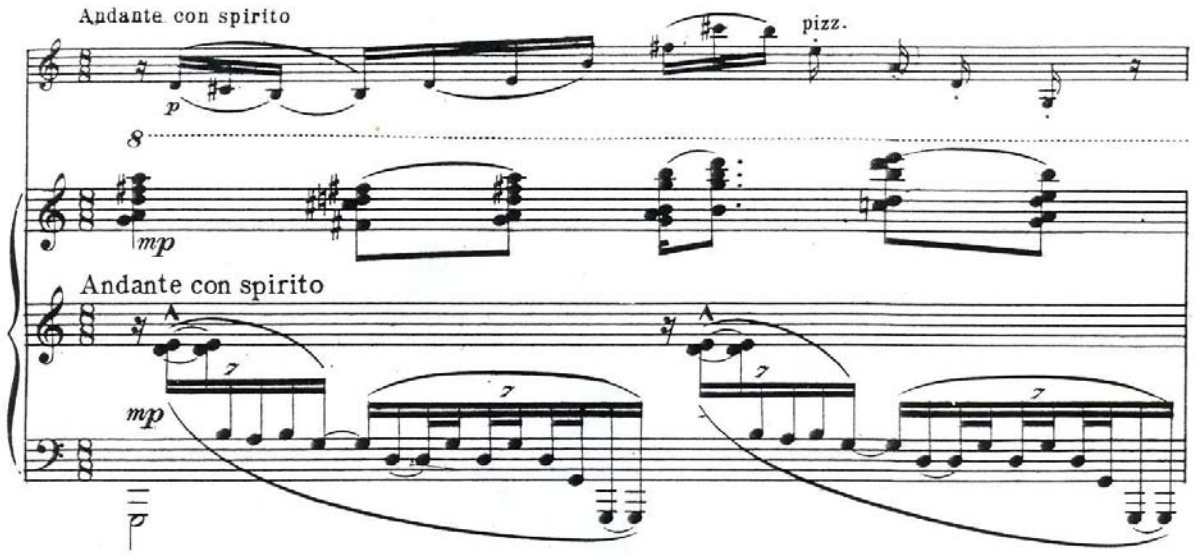
Some types of clusters need no indication and the use of such types in Ives' works shows that he was not averse to the technique, however timid the may have been about putting it into words.

There are several instances of finger-clusters, with the thumb covering three keys. (Ex. 3.536-3.539.)

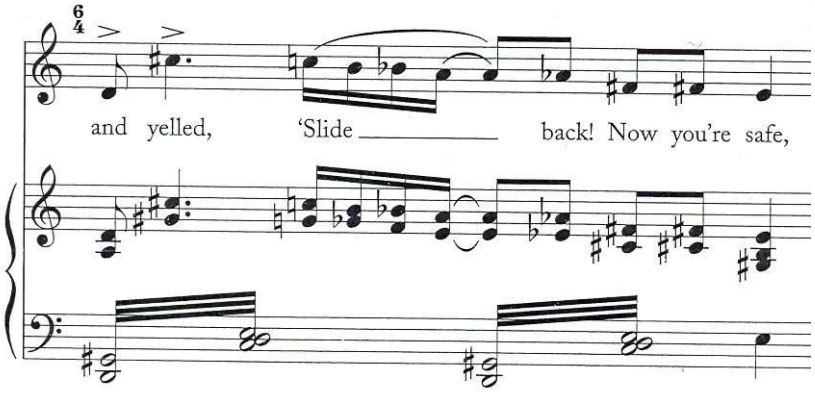


Example 3.536. Ch. E. Ives: *General William Booth Enters Into Heaven* for voice and piano, bar 17-18. © Theodore Presser Co.
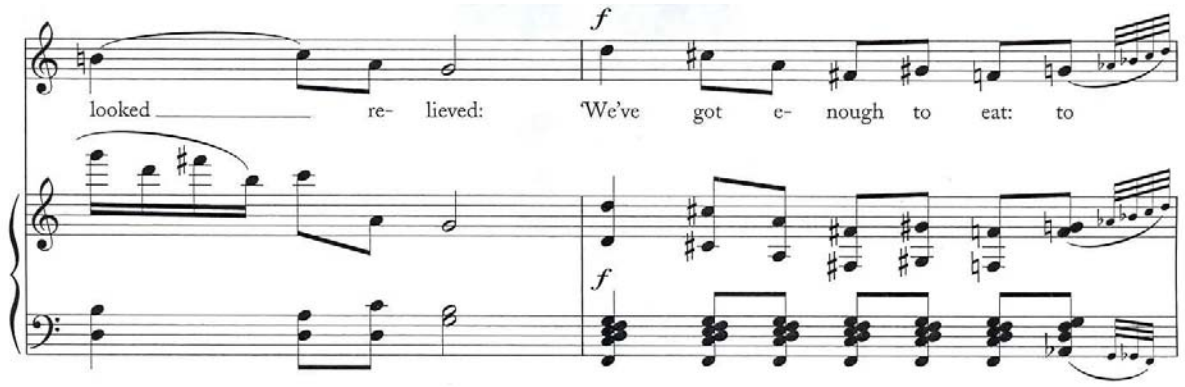
[1080] See Johnson 2004 (p. 60), Henck 2004 (p. 125-126) and Sinclair 1999, p. 107. The sketch is number f4822 in the Ives Collection at Yale University. Unfortunately, the manuscript instance is so illegible that reproduction is useless.
[1081] Henck 2004, p. 126.
[1082] See Johnson 2004.



Example 3.537. Ch. E. Ives: 4th violin sonata, Arrow Music Press edition 13/1/1.
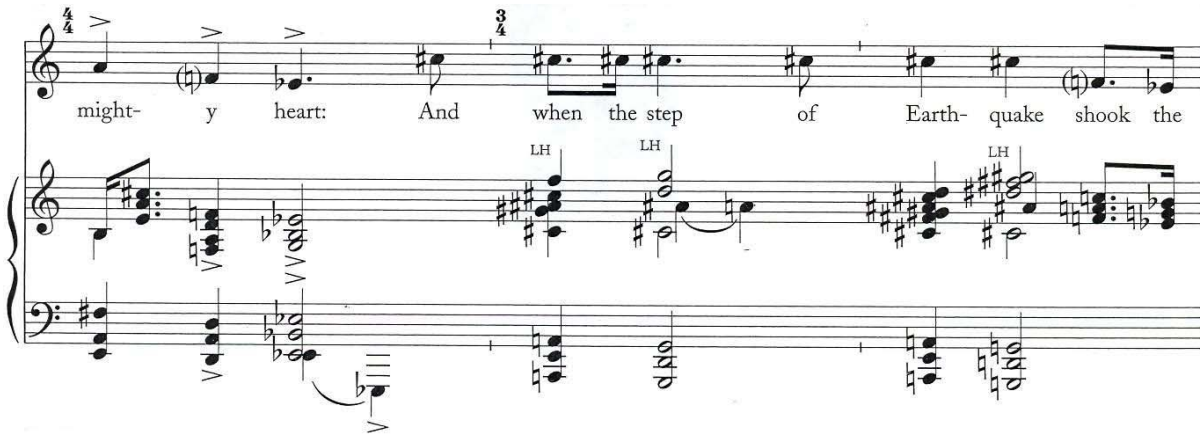


Example 3.538. Ch. E. Ives: *November 2nd* for voice and piano, bar 29. © Theodore Presser Co.



Example 3.539. Ch. E. Ives: *November 2nd* for voice and piano, bar 34. © Theodore Presser Co.
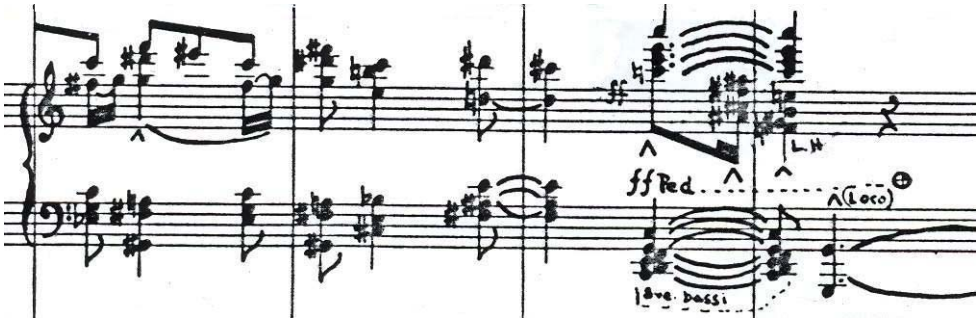
Other fingers sometimes function in the same way, as for instance at the 8th beat of example 3.540, where the right hand chord requires the 2nd finger to play the *f#1* and *g#1* at the same time (or else the 3rd finger has to play the *g#1* and *a#1*) if the performer does not want to carry the left hand over the right one to play one or more of the top

notes. Or the fifth finger in the right hand chord tremolo in bar 38 of *Charlie Rutlage*[1083] (see above, ex. 3.532.)



Example 3.540. Ch. E. Ives: from *Lincoln, The Great Commoner* for voice and piano. © Peer International Corporation.

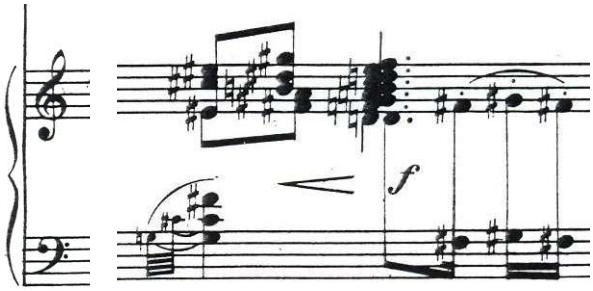
To play the fortissimo low left hand chord in the orchestral piano part of *The See'er*, there is a choice of the 2nd, 3rd, 4th or 5th finger playing two notes at the same time. (Ex. 3.541.)
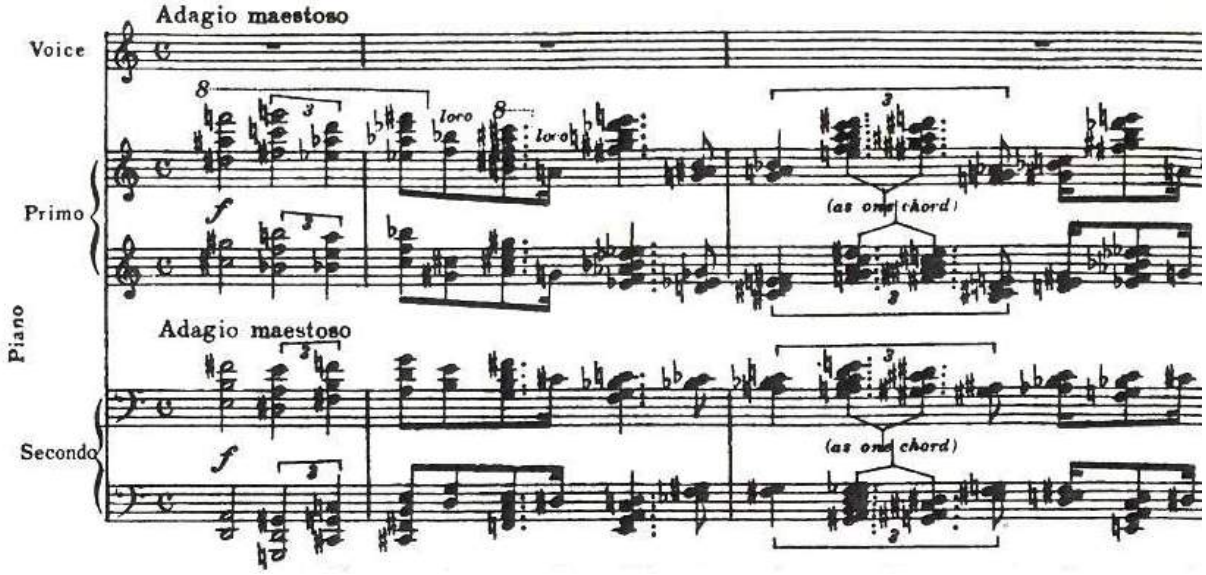


Example 3.541. Ch. E. Ives: *Set No. 9 of Three Pieces* for ensemble, 2nd movement *The See'r,* 4/2/1-4. © G. Schirmer, Inc.

It is easy to detect moments in Ives scores where the palm of the hand offers the only way to play a very dense chord, as demonstrated in examples 3.542-3.544.
On the Antipodes, for voice and four-hands piano, contains the only chromatic clusters that we found in Ives' work. In ex. 3.3543 they come at the tip of a huge, quasi palindrome wedge[1084] and need all four hands to be played. At the end of this composition half a wedge contains an even larger cluster, from *b* to *c#*[2], for which the pianist needs palms big enough to cover more than an octave.

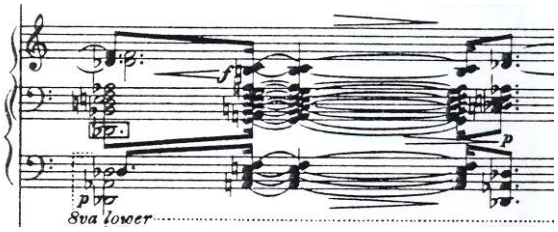
[1083] It is incomprehensible that the esteemed editor of the critical edition of 129 of the Ives songs (published in 2004 by A-R Editions, approved by the Charles Ives Society) edited out the f^3 from the main text, explaining only in the apparatus how the chord would otherwise be unplayable.
[1084] # 319 in Sinclair 1999 (p. 460- 462). This piece was included by Ives as no. 16 in his "List: Music and Democracy," as had been "Majority"/"The Masses." For the last stanza Ives envisioned that "it is better if there be an organ pedal and also in these measures, if a string orchestra may help sustain the piano part." (From a printed note on the last page of "Eighteen [recte 19] songs," as quoted in Sinclair 1999, p. 462.)



Example 3.542. Ch. E. Ives: 4th violin sonata, 2nd movement *Largo*, end of 2nd system. © Arrow Music Press.

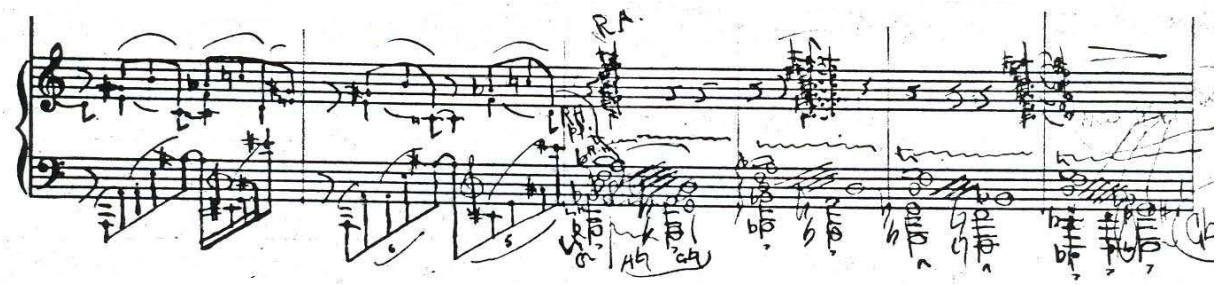


Example 3.543. Charles E. Ives: *On the Antipodes* for voice and piano four-hands, opening bars. © Theodore Presser Co.

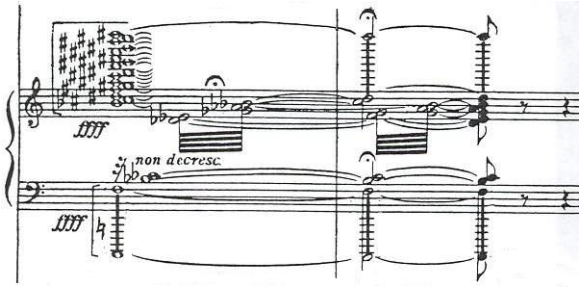


Example 3.544. Charles E. Ives: *Set for Theatre Orchestra,* 3rd movement *In the Night*, bar 9. © Edwin F. Kalmus & Co.

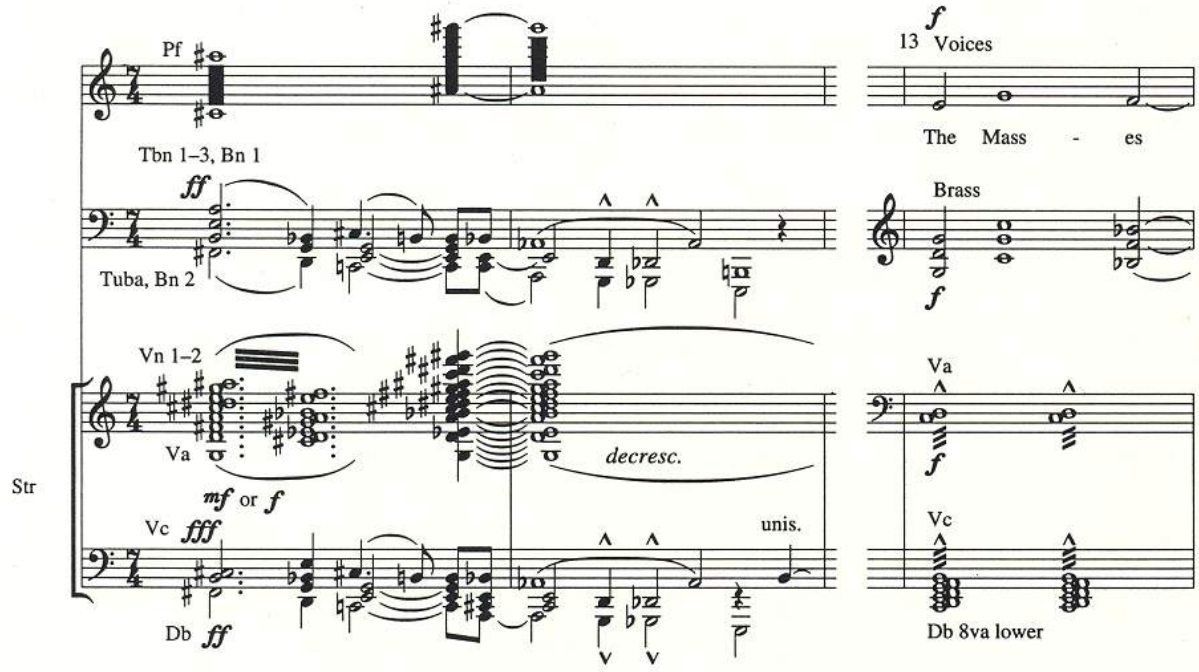
Equally easy to find are clusters for which the whole arm is required, as shown in examples 3.545-3.547.



Example 3.545. Ch. E. Ives: *Decoration Day* for violin and piano, bars 48-53. Reproduced with kind permission of the Charles Ives Papers, Irving S. Gilmore Music Library, Yale University.



Example 3.546. Ch. E. Ives: *Three Places in New England,* 3rd movement *The Housatonic at Stockbridge*, cue J (3rd and 2nd to last bars). © Theodore Presser Co.

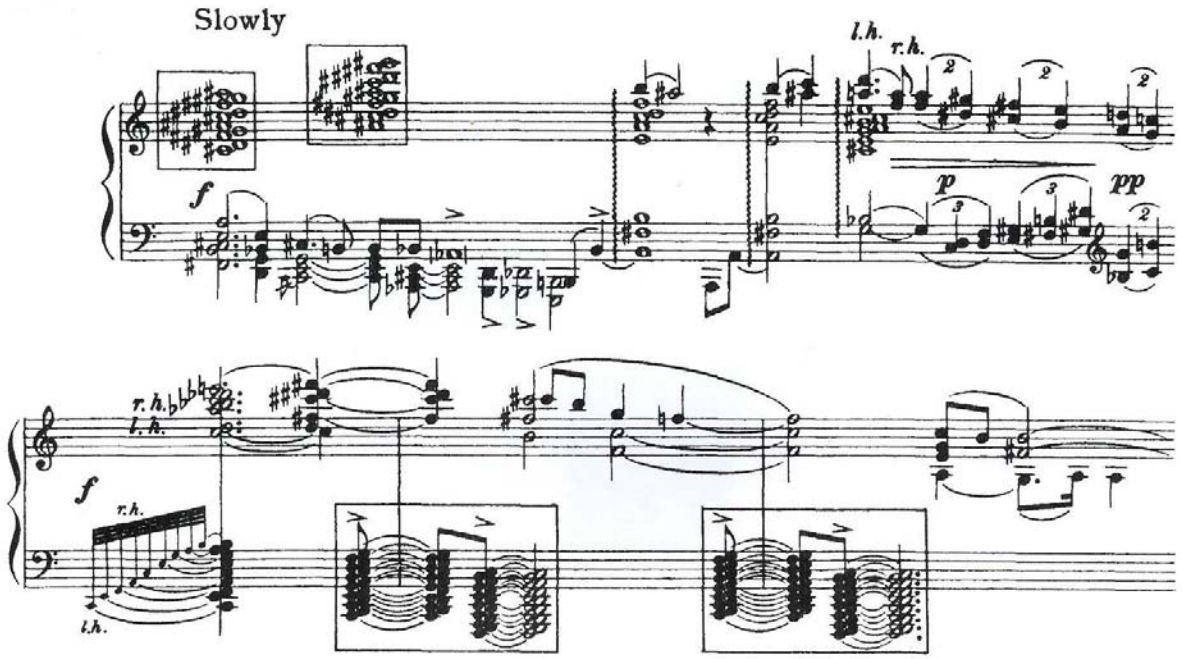


Example 3.547. Charles E. Ives: *The Masses* for unison chorus and orchestra, bars 1-2 and 8.[1085]

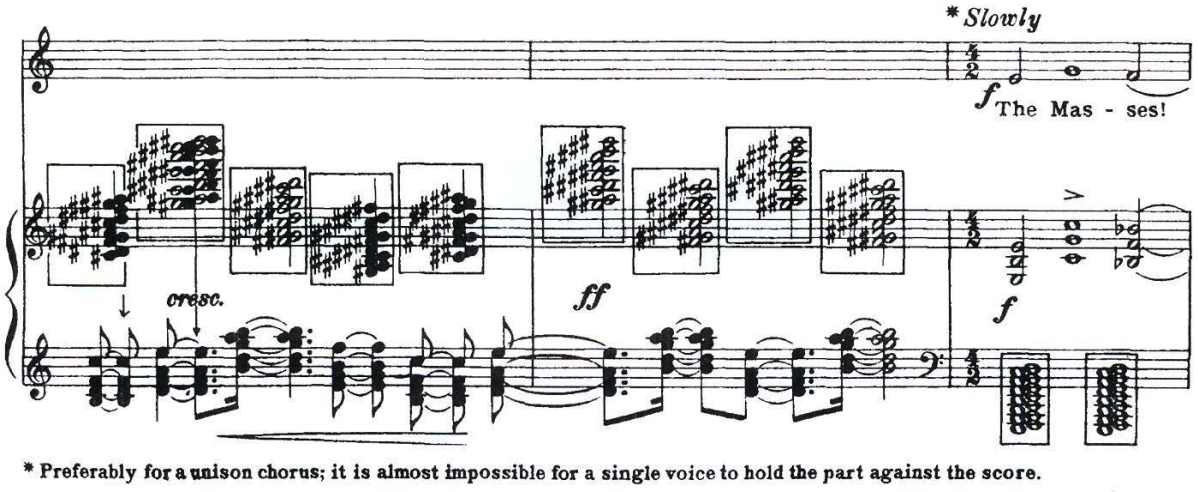
The piano clusters as well as those for the other orchestral forces in *The Masses* found their way into the 1921 arrangement of this piece that Ives made for voice or unison chorus and piano, named *Majority*[1086]. (Examples 3.548-3.549.) The clusters are shown

[1085] Setting from Sinclair 1999, p. 308. Reproduced by permission.
[1086] #294 in Sinclair 1999 (p. 429-431).

in boxed notation like in the first edition of the second piano sonata the year before. Comparing the song to the orchestral version, we can at least deduce that the piano clusters in the song are not meant to be depressed silently. But this time there is no indication of any board to play them. (See below, 3.4.2.3.2.) The clusters' length in the song is different from those in the second sonata, but in both works the white-key and black-key clusters are consistent in length. On the keyboard, a board of 31.5cm (12.4inch) would be long enough to cover every cluster in this song and short enough to not hit too many notes in any of the instances. It is therefore very possible that the boxed notation is symbolic for the use of the accessory that Ives had had in min for his second piano sonata.
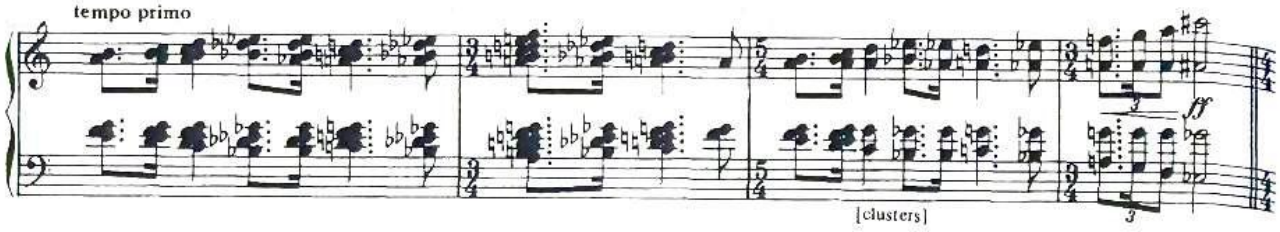


Example 3.548. Ch. E. Ives: *Majority* for voice and piano, opening bars. © Theodore Presser Co.



Example 3.549. Ch. E. Ives: *Majority* for voice and piano, bars 8-10. © Theodore Presser Co.

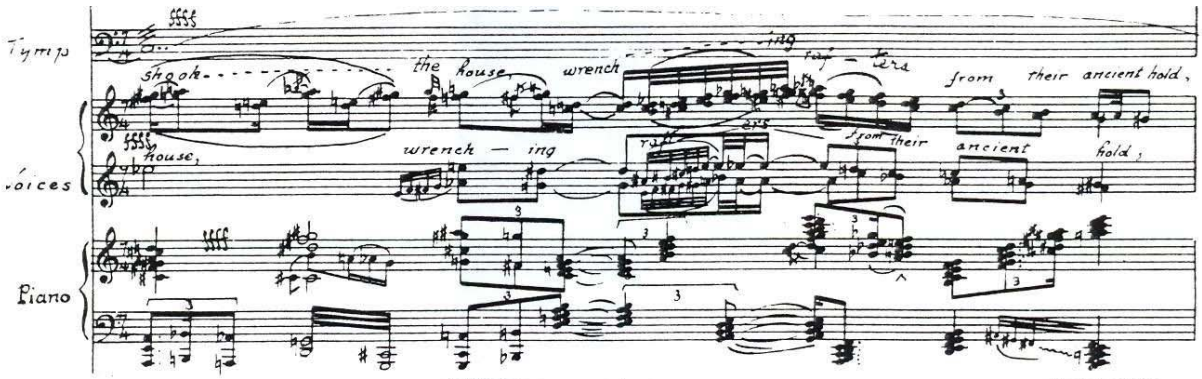
The use of clusters in *Majority* is diverse, with some serving to rhythmically articulate a melody (bars 1-5 and 8-10), others to add colour to chords and aggregates much like the bell sounds from the second piano sonata (bars 6-7 and 34-37).

The cluster usage in *Study 20* is commanded by the symmetrically outward spreading of the harmonies (ex. 3.550), a wedge structure like in *On the Antipodes* (see above, ex. 3.543) and *Soliloquy.* The study, however, contains no chromatic clusters. Strictly speaking, the published edition (posthumous in 1981) does not make this perfectly clear, but the surviving manuscripts are unequivocal about it: in one sketch the chords are not written out but replaced by (alternating) capital letters "B[lack]" and "W[hite]." The word "cluster" in square brackets in ex. 3.550 is not Ives' either, so there is no proof that the composer wanted *all* the cluster stacks in this excerpt to be played with cluster technique. In principle, only the last three chords of bar 24 need the palm of the hand: the earlier chords can be played with individual finger technique and combinations of (two or three note) thumb- and fifth-finger-cluster technique. Nevertheless, like *On the Antipodes*, the 20th study shows Ives combining purely compositional concepts ("wedges" and black- versus white-key writing) with purely ergonomical keyboard writing.[1087]



Example 3.550. Ch. E. Ives: *Study 20* for piano, bars 21-24. © Theodore Presser Co.

One last way to be sure that Ives wanted cluster playing, is to compare a non-specified instance with a different version of the same piece. It goes without saying that the 6-note stacks in the piano part of the orchestral version of *Lincoln, The Great Commoner* are mean for the fist also, even if there is no specification like in the song (compare ex. 3.551 to ex. 3.533). There is a footnote in the orchestral version, but it regards the double basses and cellos, stating, "play divisi; beginning with bottom note each take semitone above, as far as there [are] players."

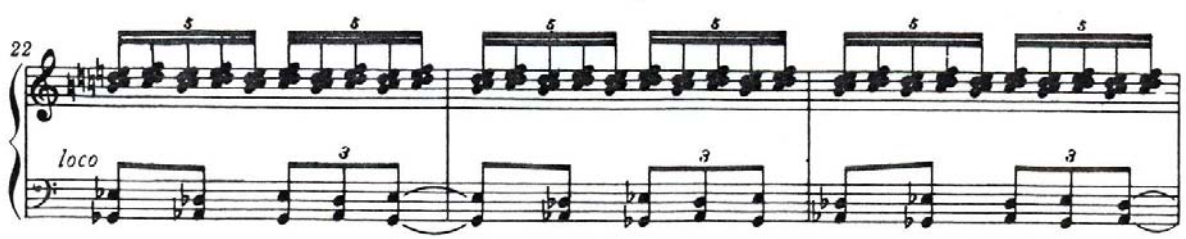


Example 3.551. Ch. E. Ives: from *Lincoln, The Great Commoner* for voices and orchestra. © Edwin F. Kalmus & Co.
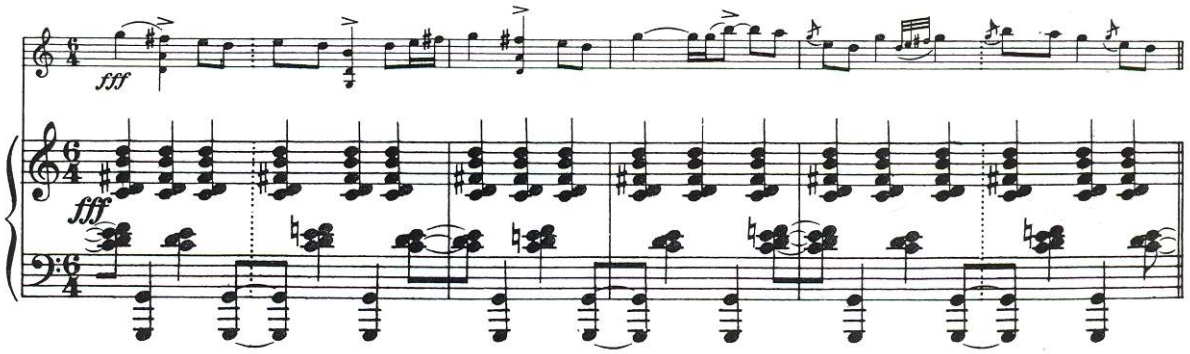
[1087] Soliloquy has a chromatic stack of 9 notes at the thin end of a wedge, but both hands are available to play it and there is no further indication that cluster technique might be intended.

3.4.2.2.3.3.4 Properly played or not?

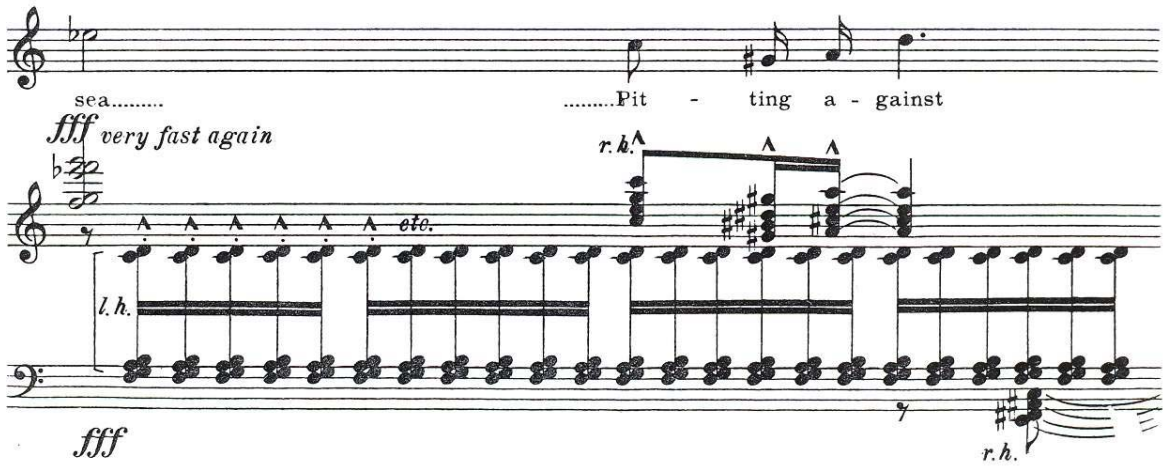
It is obvious, from the preceding instances, that Ives did not care much about indicating cluster technique. Only in a few passages did he expressly offer advice to use (clenched) fists, palm or board for playing cluster chords. As those instances always involve mostly black or white key clusters in otherwise mostly very chromatic environments, other passages with diatonic or pentatonic cluster chords easily arouse suspicion. (Ex. 3.552-3.556.) Some passages are especially prone to being associated with the one in *Hawthorne*, where the performance practical indication in between brackets in the footnote advises to do better than the proper fingering suggested in the score (see above, ex. 3.535).



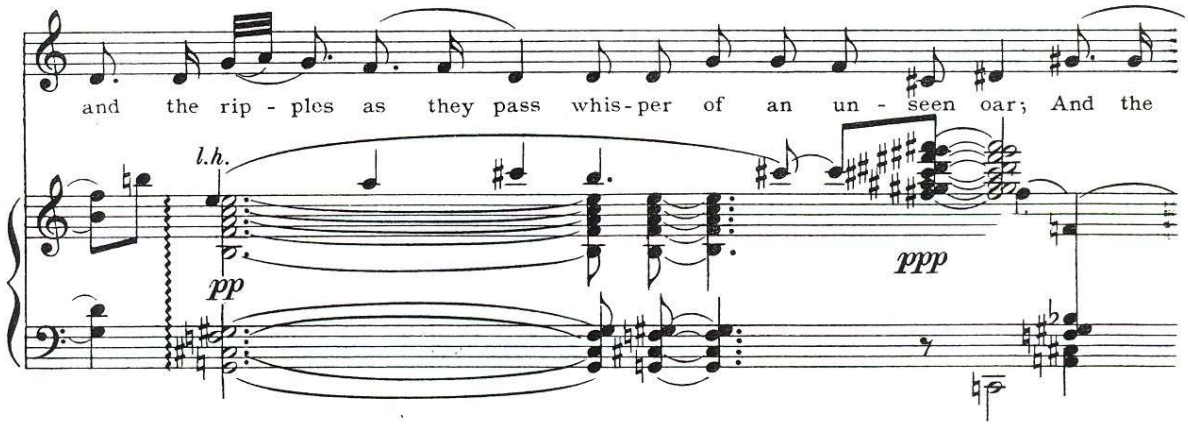
Example 3.552. Ch . E. Ives: Sonata 1 for piano, movement IVa, bars 22-24. © Peer International Corporation.



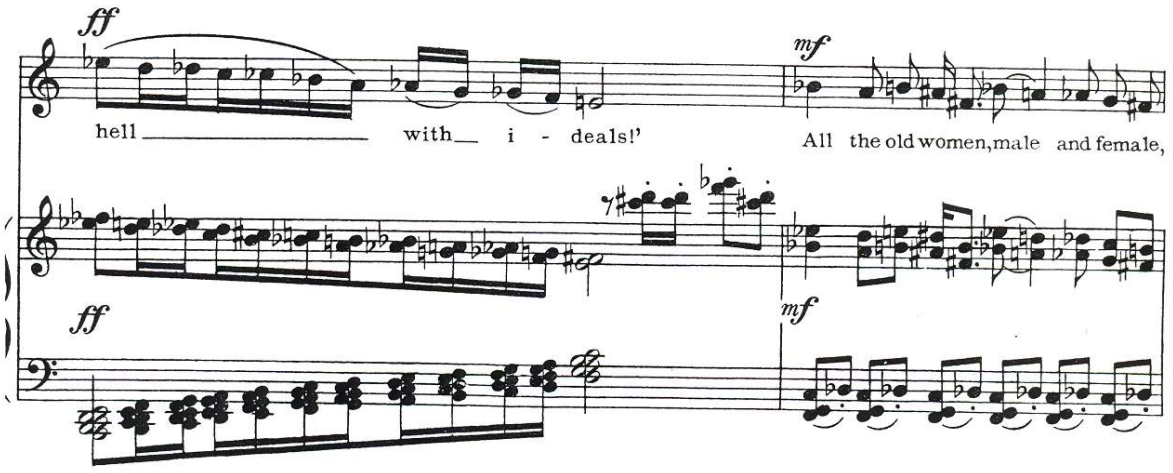
Example 3.553. Ch. E. Ives: Sonata 2 for violin and piano, 3rd movement *The Revival*, second to last system. © G. Schirmer, Inc.



Example 3.554. Ch. E. Ives: from *Swimmers* for voice and piano. © Theodore Presser Co.



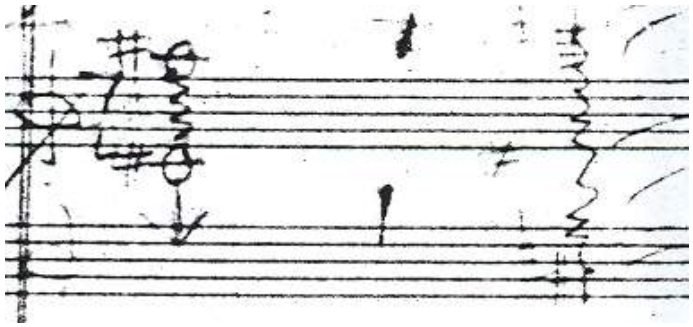
Example 3.555. Ch. E. Ives: from *Premonitions* for voice and piano. © Theodore Presser Co.



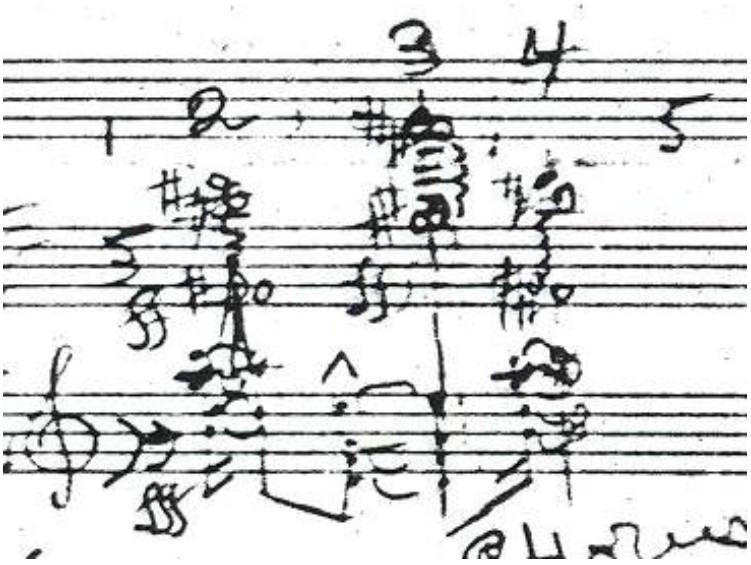
Example 3.556. Ch. E. Ives: from *Nov. 2, 1920 (An Election)* for voice and piano. © Theodore Presser Co.

3.4.2.2.3.3.5 Notation of Ives clusters

As far as dating the Ives repertoire is reliable or even possible, Ives mainly notated his clusters note per note until the early 1920's, as awkward as it makes the large ones appear. (E.g. many examples above.) In some cases, he used a shorthand notation consisting of a vertical waving line taking the place of the normal straight line from top note to bottom note, as in a manuscript for *Masses* (ca 1915). (Ex. 3.557.) Sometimes – e.g. in that same piece – Ives indicated the type of cluster by writing out *two* notes at the top and at the bottom, showing the type of density (most often pentatonic). (Ex. 3.558.)

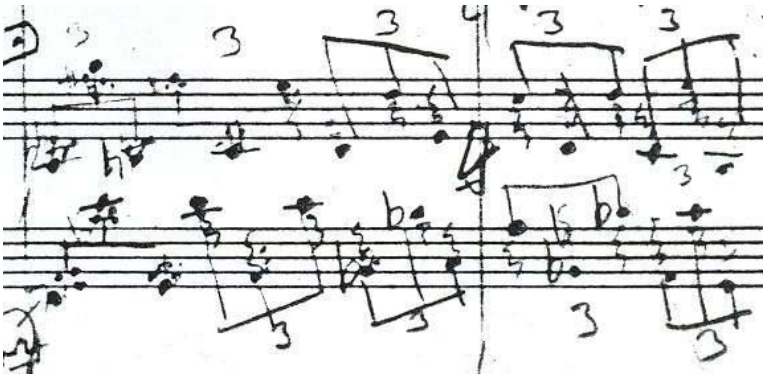


Example 3.557. Ch. E. Ives: *The Masses* for unison chorus and orchestra, manuscript f5758, opening bar. Reproduced with kind permission of the Charles Ives Papers, Irving S. Gilmore Music Library, Yale University.



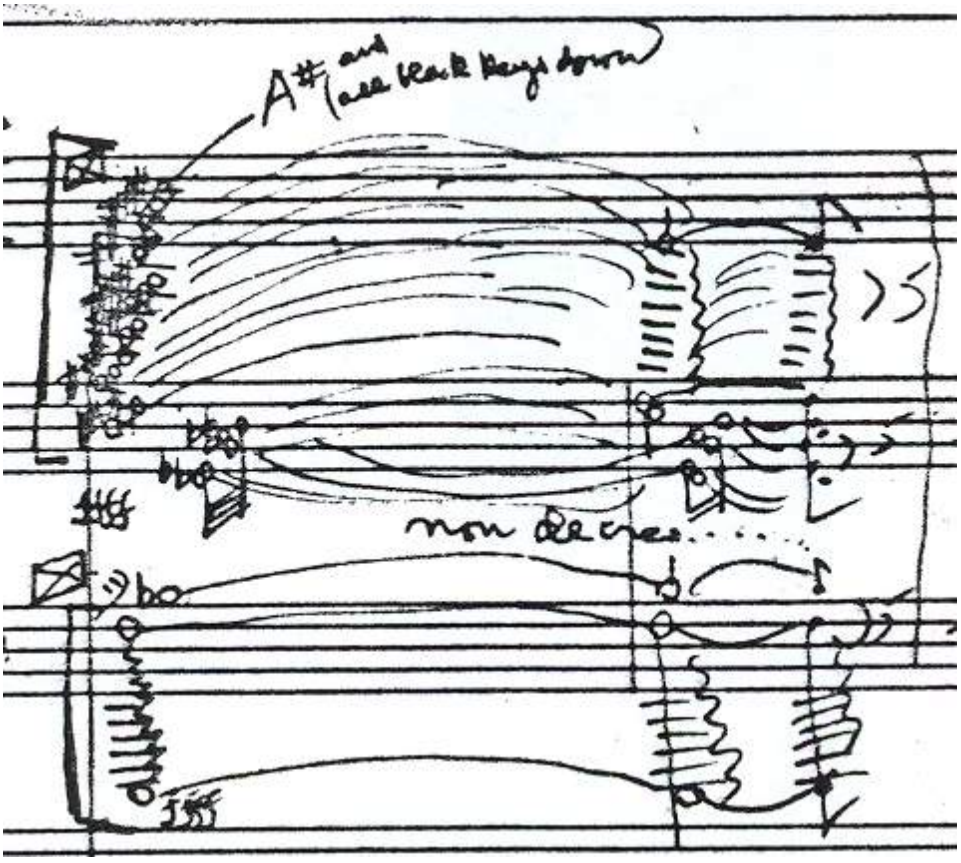
Example 3.558. Ch. E. Ives: *The Masses* for unison chorus and orchestra, manuscript f5762, first bar. Reproduced with kind permission of the Charles Ives Papers, Irving S. Gilmore Music Library, Yale University.

In *An Election* (ca1924), the first of a melodic sequence of clusters shows the length and density by stacks of individually notated notes while the rest of the clusters is indicated merely by the melodic note and the zig-zagging line. (Ex. 3.559.)



Example 3.559. Ch. E. Ives: *An election* for voice and piano, manuscript f5801, last bars. Reproduced with kind permission of the Charles Ives Papers, Irving S. Gilmore Music Library, Yale University.

The 2nd version of the orchestral *Housatonic* has the all-notes notation mixed with an arpeggio-type line that replaces the stem line as well as such a waving line positioned on the right of the stem, even adding a bracket on the left of the cluster. (Ex. 3.560.) Here the arpeggio-type line only has one top and one bottom note and therefore does not specify the density of the cluster.



Example 3.560. Ch. E. Ives: *Three Places in New England,* 3rd movement *The Housatonic at Stockbridge*, patch for the end of the piano part. Reproduced with kind permission of the Charles Ives Papers, Irving S. Gilmore Music Library, Yale University.

Later yet, in 1935 Ives used yet another type of notation: branching the stem into two clusters, one for the white keys and one for the black keys (see above, ex. 3.543.)

Ives clearly devised different systems to notate his clusters, all of his own invention and suggesting (un)intended independence from other composers such as Cowell and
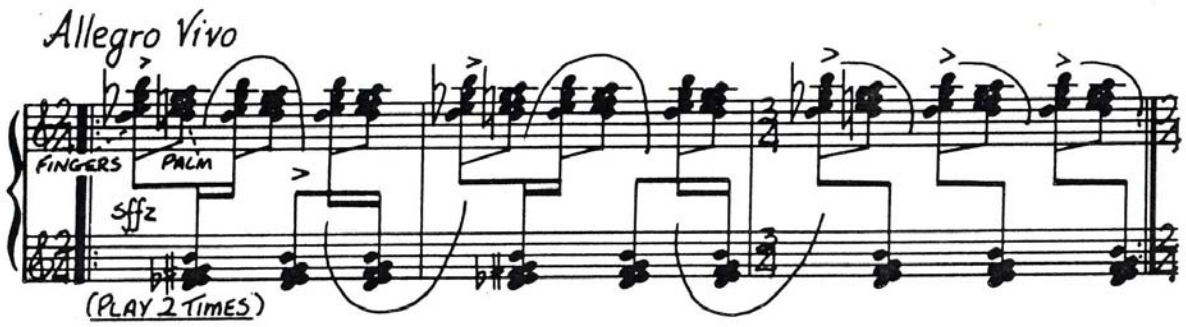
Ornstein. While his method of specifying the extremity of the cluster to indicate the density is clever, it is only used for arm-clusters that do not pose any problems of identification. The arpeggio-line is found with smaller clusters but does not serve to identify the cluster-technique, since he used it for whole-tone chords as well (e.g. in *Psalm 25*, witnessed from manuscript f5998).

3.4.2.2.3.4 George Antheil: a new type of cluster technique

Like Ornstein and Cowell, Antheil enjoyed a rather scandalous reputation as a keyboard-banging virtuoso in Europe. Ornstein had made his debut in London in 1914 and had given up concertizing in 1922. His manager sought a replacement and engaged Antheil to conquer the European market for American "ultramodern" virtuosos.[1088] Cowell started his European adventure in Berlin in 1923, when Antheil moved to Paris. Contrary to the other two, Antheil did not just tour but actually settled in the old continent for about the decade between 1922 and 1932, at first persistently cultivating his reputation as a "bad boy of music" and his affinities with the machine age.[1089] Judging his piano scores from the 1920's as well as the way his critics and audiences received his compositions, Antheil's piano playing was flashily mechanistic and percussive. Among the sharp dissonances, the many glissandos and the obsessively repetitive chord passages, clusters would have been an easy fit. It is therefore very surprising that Antheil only prescribed cluster techniques in some of his sonatas for piano solo and for violin and piano between 1922 and 1924) – perhaps he was enticed by the name that Cowell was making for his own clusters when touring Europe in 1923. But even more astonishing is the fact that Antheil's clusters were not the cheap banging that contemporary descriptions of his concerts would lead one to believe to be. In fact a unique perspective on the technique allowed him to write chromatic clusters that are lacking one or more notes in between the extremities of their range. The result is an irregular density that is normally possible only with pentatonic clusters.
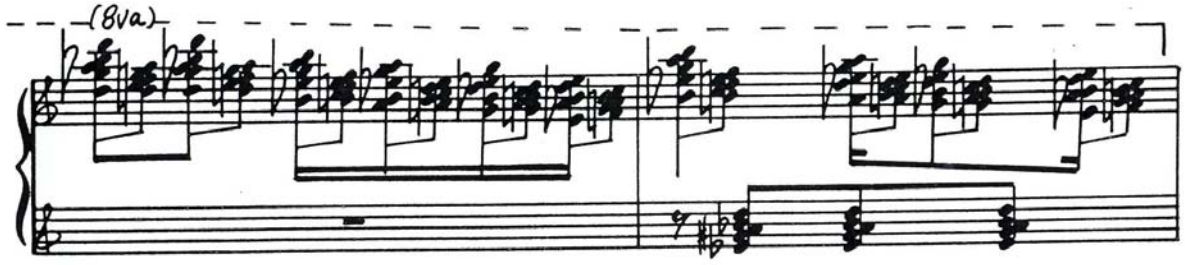
While living in Berlin in 1922-23, Antheil wrote some of his most well known solo piano pieces: the *Airplane Sonata*, *Death of Machines, Jazz Sonata, Mechanisms* and the *Sonata Sauvage.* The opening of the *Sonata Sauvage* (composed in 1922, premiered on New Year's day 1923[1090]), a 7-bar long repetitive rhythmical sequence, shows clusters of which black keys that are played with individual finger articulation and white keys with the palm of the hand. (In practice, it is the heel rather than the flat of the hand that depresses the keys.) (Ex. 3.561.) Only four black keys are required – the fourth finger is inactive. If this cluster-with-a-hole-in-it is what Antheil wanted, it could only be played with this particular technique of differentiated cluster articulation. The difference with what we could call "undifferentiated" chromatic clusters is that the latter indicate only the range of the cluster and leave the position of the hand and the fingers up to the discretion of the pianist. He may put his hand obliquely over the keyboard and choose the most comfortable way of spreading the fingers over the keys; he may put the fingers and the flat of his hand perpendicularly over the keys, in which case both the black and the white keys are played with both parts of the hand. Musically, these positions have a musical consequence: none of the notes can be articulated enough to be voiced. Antheil's indication leaves no choice of position but offers the pianist timbral control over the cluster. He may choose to emphasize the top note, or to emphasize all black or all white keys, or to balance the touch so that all keys sound equally loud.

[1088] Antheil 1945, p. 9-10.
[1089] See Antheil 1945 for the somewhat hyperbolic accounts of his career.
[1090] Whitesitt 1981, p. 620.



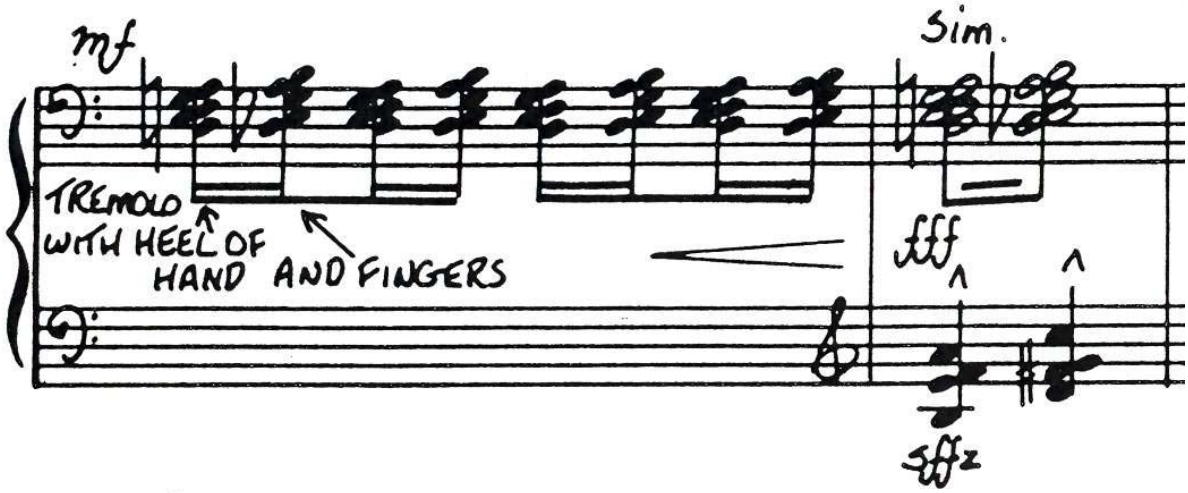
Example 3.561. G. Antheil: *Sonata Sauvage* (1922), 1st movement *Allegro Vivo,* opening bars. © G. Schirmer, Inc.

It is not clear from his score what Antheil would have preferred himself – the accents serve to stress the (change of) meter rather than to voice a cluster – and it is equally unknown whether he in fact made use of the potential of such control of the color of clusters. The *Allegro Vivo* indication allows for interpretation and whether or not the top notes of the downward clusters soon after the opening are accentuated depends on the technical mastery of the pianist and his take on the tempo. Here the range is larger – a spread of an octave – and now several notes are filtered out. The number of notes missing and which position they take in the vertical structure depends on the place of the cluster on the keyboard (the first cluster of ex. 3.562 lacks $e\flat^3$, b^3 and c^4, the first cluster on the second beat lacks c^3, $d\flat^3$, g^3 and a^3, etc.). Due to the position of the hand and fingers, such fast changing structures are more difficult than mere octave playing.
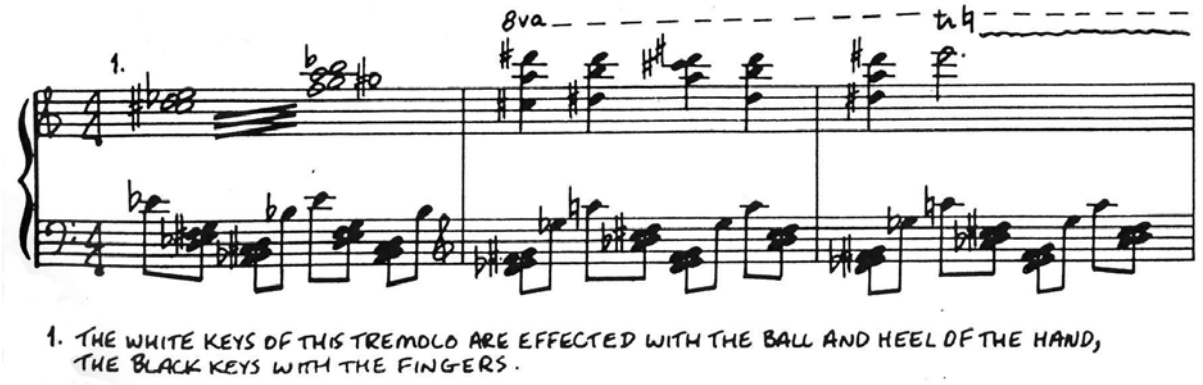


Example 3.562. G. Antheil: *Sonata Sauvage* (1922), 1st movement *Allegro Vivo,* bars 44-45. © G. Schirmer, Inc.

A variant of this technique is finger-heel tremolos that we find later on in this sonata. (Ex. 3.563.) Because of the structure of the hand this tremolo is harder to execute than it may at first seem. The opposable thumb is connected directly to the heel of the hand, make it easier to alternate between the four fingers (2nd to 5th) on one side and the heel and thumb together on the other side of the action than to alternate between the set of five fingers as one whole and the heel. In the latter case the physical connection between thumb and heel makes the technique tiring and difficult to apply at great speeds.



Example 3.563. G. Antheil: *Sonata Sauvage* (1922), 1st movement *Allegro Vivo,* bars 110-111. © G. Schirmer, Inc.

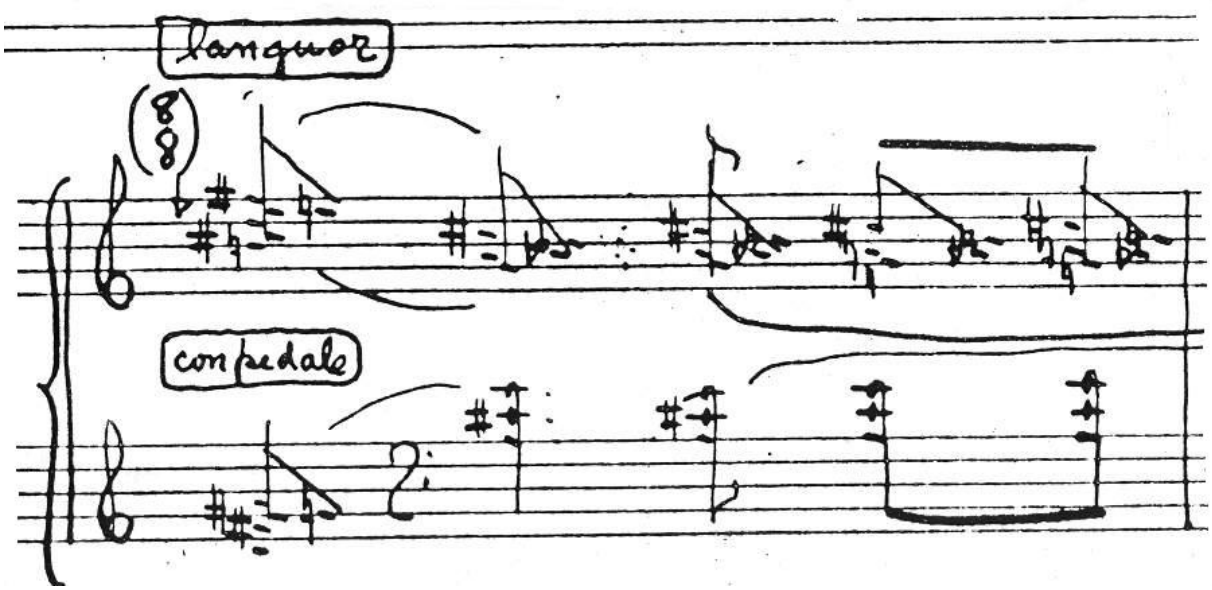
One such finger-heel tremolos – double as fast as in the previous example – is explained much better in the footnote in the score than Antheil succeeded in notating it on the staff. (Ex. 3.564.)



Example 3.564. G. Antheil: *Sonata Sauvage* (1922), 3rd movement *Moderato,* bars 9-11. © G. Schirmer, Inc.

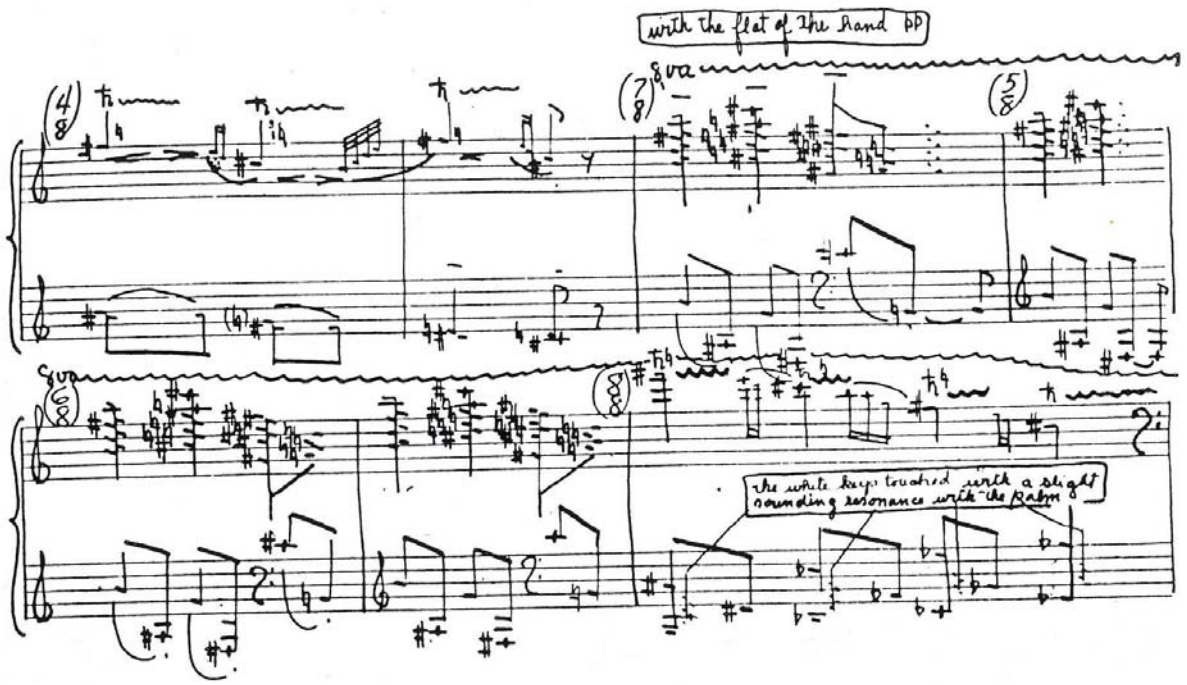
It is often only because Antheil puts written explanations in his scores that we know when he thought of cluster technique. The first aggregate in the piano solo sonata *"Woman"* (1923)[1091] looks to be another chromatic cluster with a few of the inside notes missing (c^2, f^2). This time there is no cluster-technical solution to play the structure. The b^1 in the right hand must be taken by the thumb of the left hand, together with the a^1. (Ex. 3.565.)

[1091] This work is published as such by Schirmer. Whitesitt 1981 does not mention a second sonata with the subtitle "Woman" anywhere.



Example 3.565. G. Antheil: *Sonata II "Woman"* (1923), opening bar. © G. Schirmer, Inc.

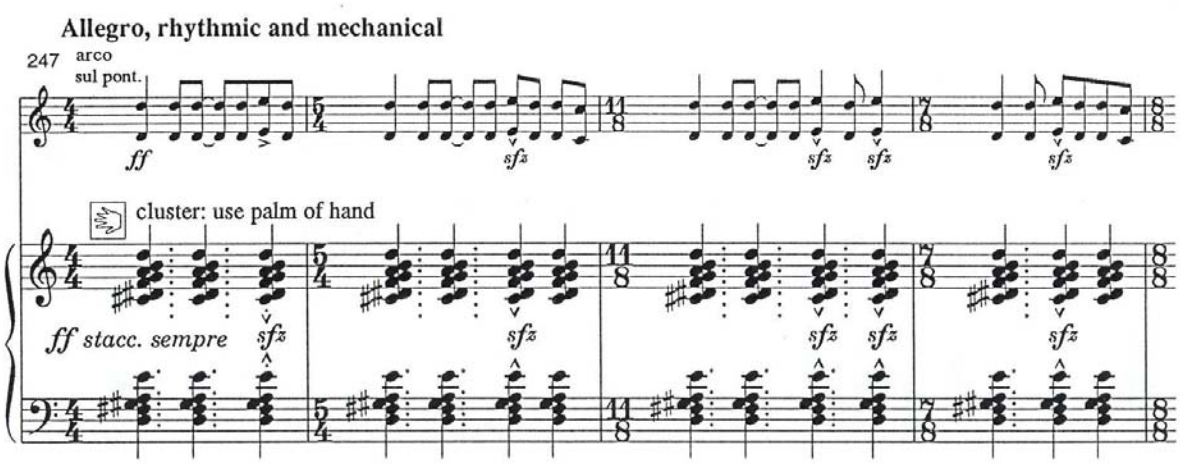
Later in this sonata, Antheil writes another series of such clusters with irregular density. (Ex. 3.566.) The indication "with the flat of the hand" here means that both the palm (or parts of it) and the fingers must be used in different types of combinations. Immediately following we find proof that Antheil differentiated between hand-parts for playing clusters with a musical purposes in mind. The requirement "The white keys touched with a slight sounding resonance with the palm" serves to add a haze of timbre to the individually articulated wide intervals in the same left hand.



Example 3.566. G. Antheil: *Sonata II "Woman"* (1923), bars 12-18. © G. Schirmer, Inc.
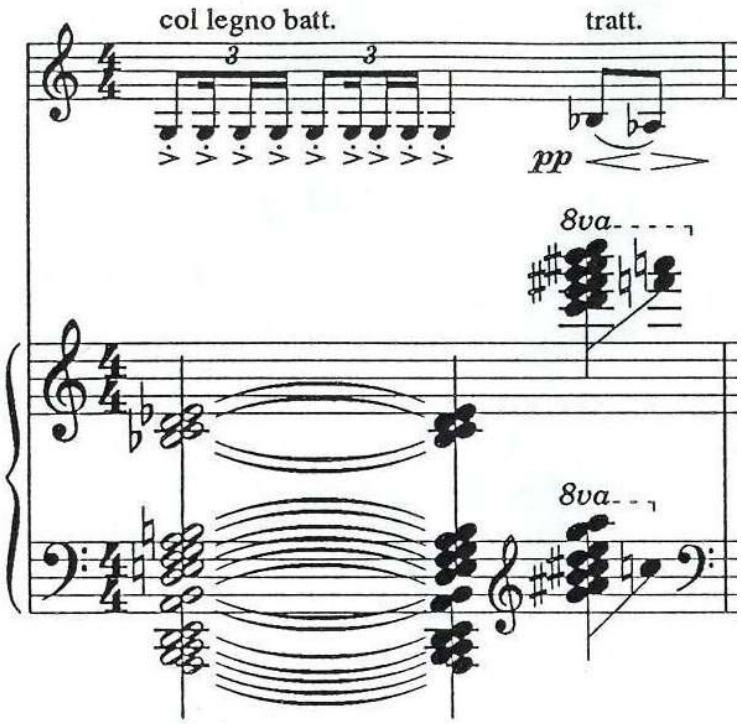
That Antheil liked the potential of such colouring is once more evidenced in his 1st violin sonata of the same year 1923. The aggregates could easily be played with mere finger

articulation if the tenor notes were switched, i.e. the right hand $c\#^1$-$d\#^1$ played by the left hand and the e^1 by the right hand. (Ex. 3.567.) That he wrote it differently and indicated to use the palm of the hand shows that he wanted the dissonance of the intervals $c\#^1$-d^2 in the right hand and d-e^1 in the left hand accentuated.



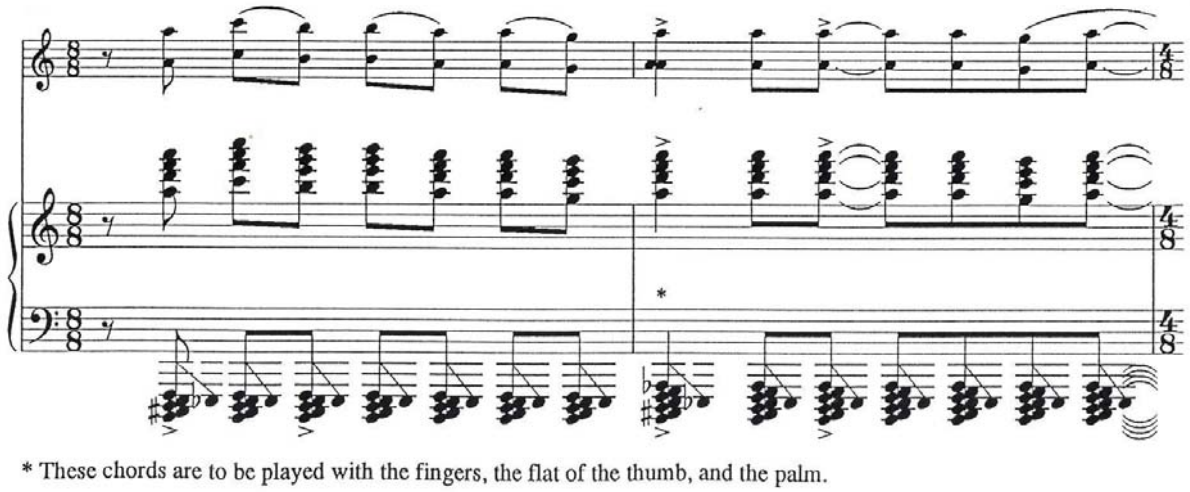
Example 3.567. G. Antheil: 1st sonata for violin and piano (1923), 1st movement *Allegro moderato,* bar 247-250. © G. Schirmer, Inc.

At times, Antheil took the technique to a virtuoso level, where the combinations of fingers and parts of the palms can be complex, as for instance in ex. 3.568, where four aggregates (none having enough notes to be played with "proper" cluster technique) require four different and sometimes acrobatic positions of the hand and fingers.



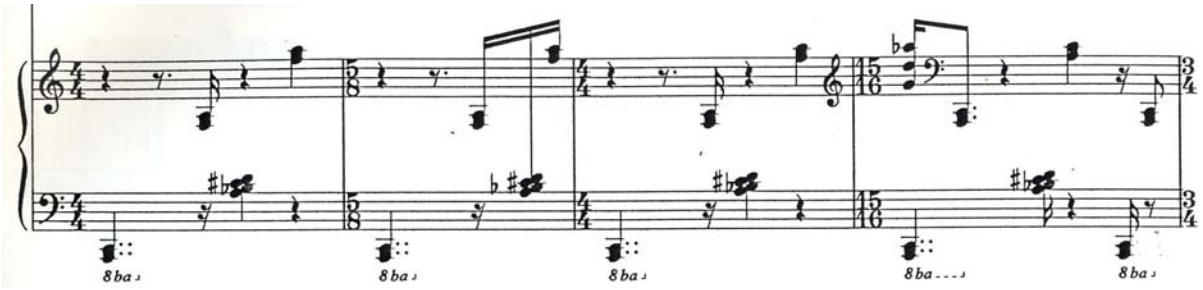
Example 3.568. G. Antheil: 1st sonata for violin and piano (1923), 3rd movement *Funebre – Lento expressivo*, bar 43. © G. Schirmer, Inc.

In another instance in this work, a sequence of such aggregates requires a basic palm-finger position that is elaborated as notes are added. (Ex. 3.569.)



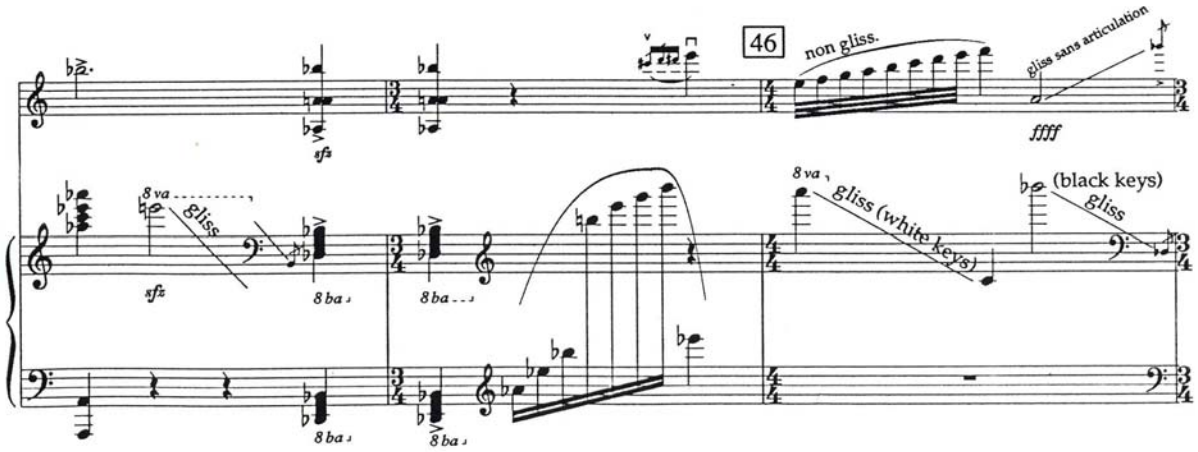
Example 3.569. G. Antheil: 1st sonata for violin and piano (1923), 4th movement *Presto,* bar 140-141. © G. Schirmer, Inc.

Besides and in between such instances of intricate hand techniques, Antheil often wrote small chromatic accumulations of four adjacent keys. He never indicated them to be played with a cluster technique, as much as the violent and repetitive nature of the writing (and the publishers decision of deleting Antheil's traditional notation in favour of cluster notation) might make the performer unjustly presuppose the use of for instance the fist. Such an association with percussive playing would furthermore come naturally given the fact that the pianist has to exchange his instrument for a bass and tenor drum at the end of the sonata. (E.g. ex. 3.570.)
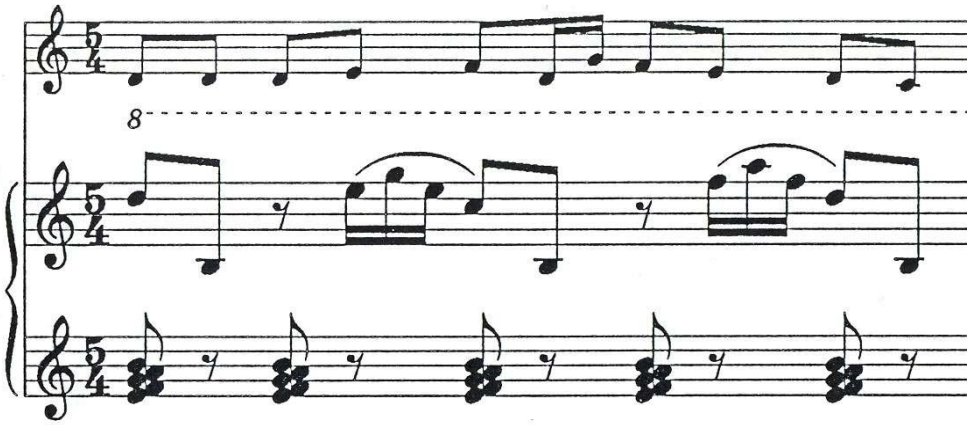


Example 3.570. G. Antheil: 2nd sonata for violin and piano (1923), between cues 50 and 51. © G. Schirmer, Inc.

It turns out that Antheil rarely wrote straightforward, fully filled-up clusters, like in ex. 3.571.



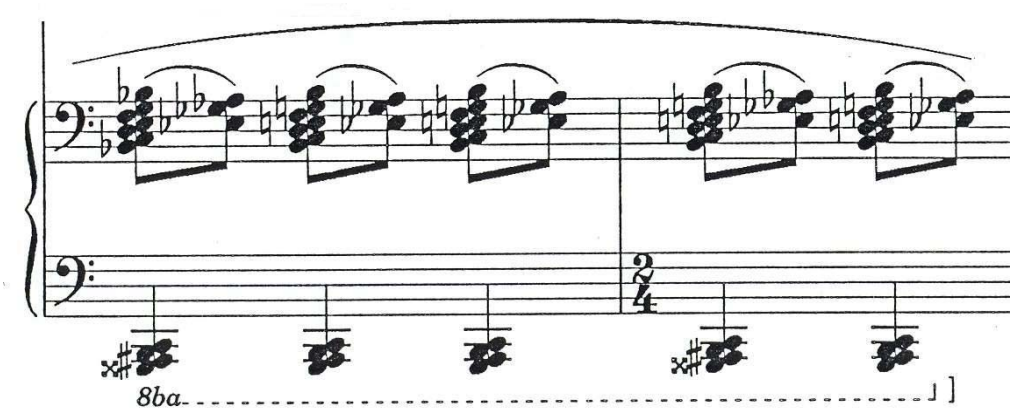
Example 3.571. G. Antheil: 2nd sonata for violin and piano (1923), around cue 46. © G. Schirmer, Inc.

Again, the cluster notation is the publisher's: in the manuscript each note is written out but without any indication of the technique. As these clusters cannot be played with individual finger technique, we can deduct that Antheil only indicated cluster technique when both techniques are possible. If Antheil wrote few fully chromatic clusters, and his "imperfect" clusters are combinations of diatonic and incomplete pentatonic clusters, he did not seem to be interested in purely pentatonic or diatonic clusters. Either the cluster technique was obviously impossible to play with proper finger technique alone, or he indicated the use of improper hand parts. Therefore, accumulations of adjacent notes that can be played properly (e.g. ex. 3.572) are intended for the fingers only.

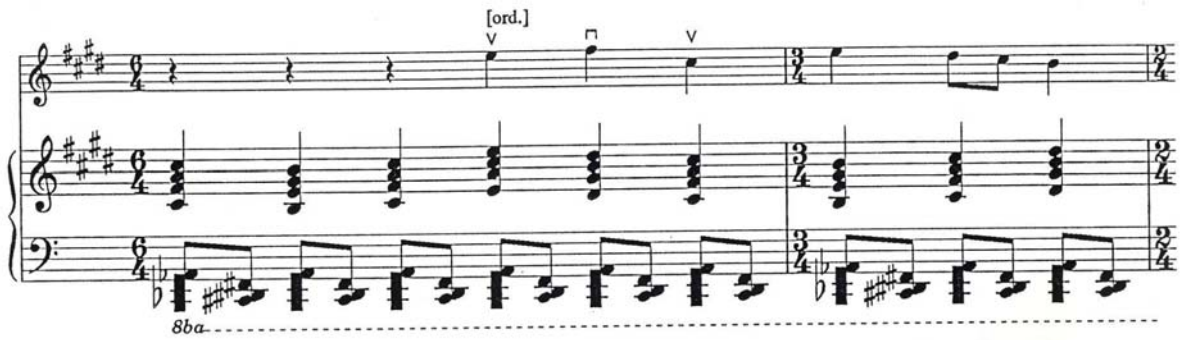


Example 3.572. G. Antheil: 3rd sonata for violin and piano (1924), bar 335. © G. Schirmer, Inc.

The unfortunate practice of editors adding cluster notation when transcribing manuscripts for publication is found in Antheil's third sonata, where the palm-and-finger clusters, such as we can see in the right hand of ex. 3.573, are mistakenly notated as pentatonic clusters (ex. 3.574).



Example 3.573. G. Antheil: 3rd sonata for violin and piano (1924), bars 152-153. © G. Schirmer, Inc.



Example 3.574. G. Antheil: 3rd sonata for violin and piano (1924), bars 17-18. © G. Schirmer, Inc.
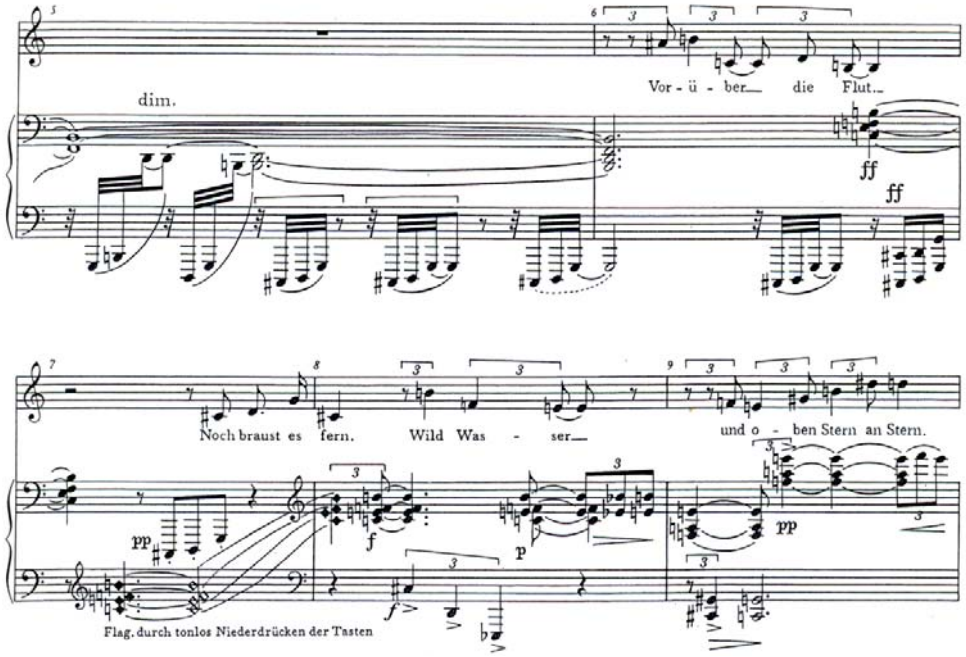
In this period of 1922-24, when he moved from Berlin to live in Paris and all these clusters were written, Antheil also started working on his *Ballet Mécanique*, which "crystallized all of his creative expressions in the early 1920's."[1092] In 1925, when this statement was finished and his love for Beethoven provided him with a new aesthetic impulse to write neoclassical music, the cluster technique vanished from his works.

[1092] Whitesitt 1981, p. 160.

3.4.2.3 1909- Silently depressed keys
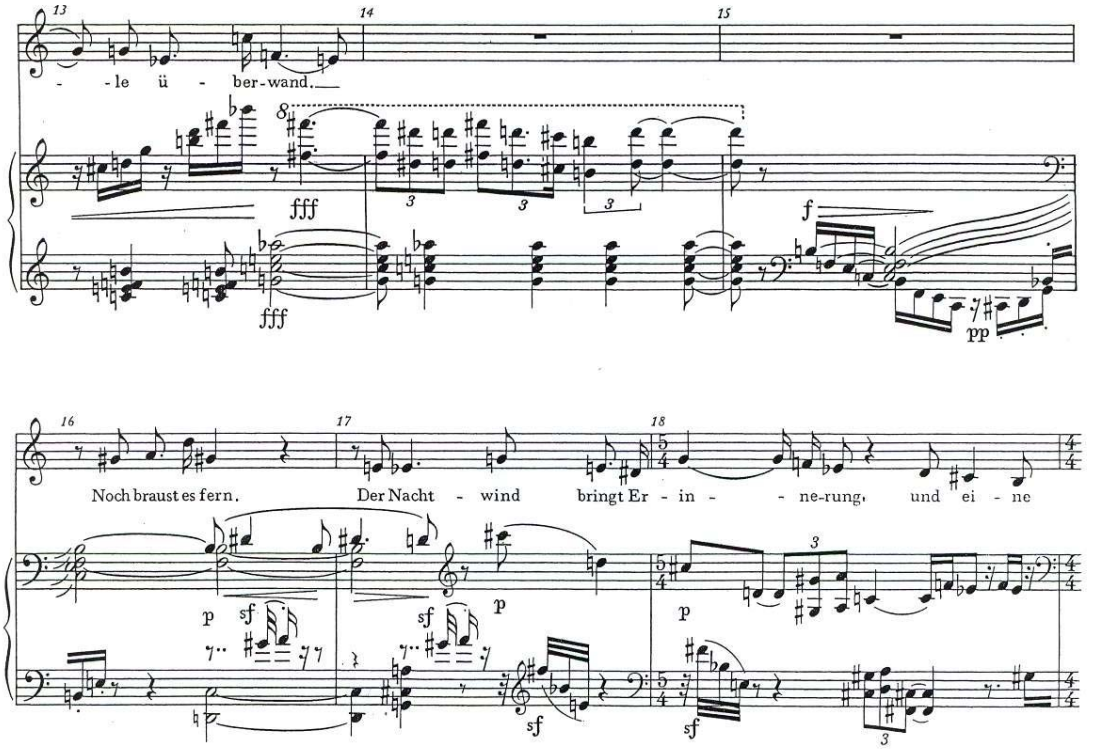
3.4.2.3.1 Arnold Schoenberg and his "Klavierflageolett"

On February 2, 1909, Arnold Schoenberg finished the third and last song *Am Strande* from his opus 14. Right after the initial bit of Rilke's text "In front of us the tide," the composer anticipates the following entrance of the voice "in the distance it still foams" with open strings resonating sympathetically with the previous fortissimo chord. (Ex. 3.575.)
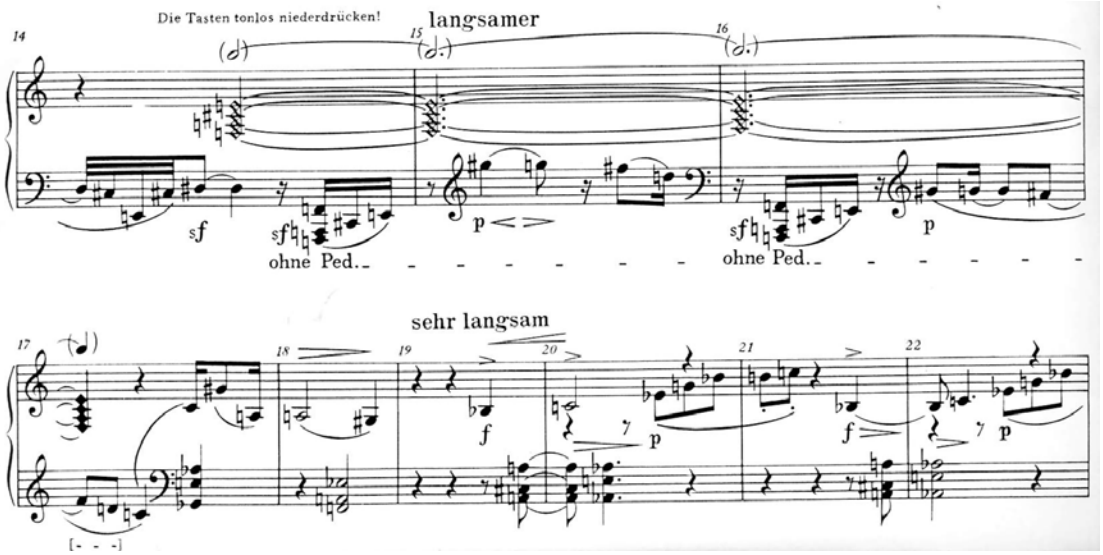


Example 3.575. A. Schoenberg: *Am Strande* opus 14 (1909), bars 5-9. © With kind permission by UNIVERSAL EDITION A.G., Wien.

The three low staccato notes in bar 7 – together with the c^1-e^1-f^1-b^1 chord, this is the main material in the song – are not related closely enough to the silently depressed notes in order to activate their open strings again, so they do not add to the resonance. Instead they anticipate the notes of the soprano, as does the following forte chord anticipate the next part of the text. The song is written organically, though the main material reoccurs many times as it has entered the composition, not undergoing much change. The silently depressed keys do not reoccur, not even when the accompanying text returns – the only words that are repeated. (Ex. 3.576.)



Example 3.576. A. Schoenberg: *Am Strande* opus 14 (1909), bars 13-18. © With kind permission by UNIVERSAL EDITION A.G., Wien.

A little over two weeks later, the composer finished the first piece of his three piano pieces opus 11.[1093] In it, Schoenberg returns to the flageolet to give it more presence than in the song. (Ex. 3.577.)
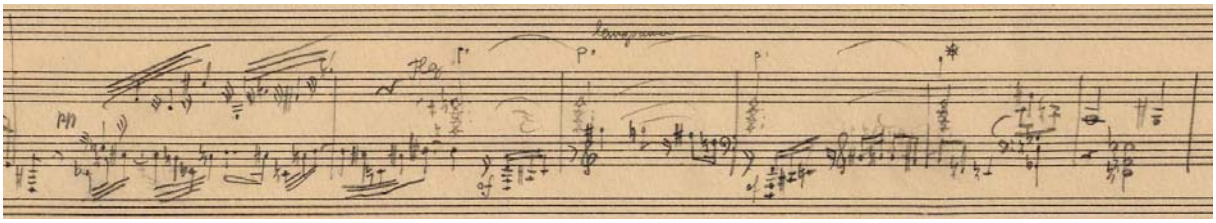


Example 3.577. A. Schoenberg: *Drei Klavierstücke* opus 11 (1909) nr. 1, bars 14-22. © With kind permission by UNIVERSAL EDITION A.G., Wien.

The "Klavier-flageolet" has no programmatical context here: its function is structural and serves as a transition to the re-entering of the main theme's first part.

[1093] Dating according to Brinkman 1969, p. 3. Universal Edition first published opus 11 in 1910.

Schoenberg seems to have wanted to add the duration of the silently depressed keys on top of the stave. Even though the sympathetic resonance is hardly continuous (for it depends on the register and volume of the tones that are to actuate the open strings), Schoenberg probably meant to indicate the duration of the actual "flageolet"-sound. In the manuscript, this additional duration wrongly starts with a dotted quarter (ex. 3.578), but even with a correct value, the open strings would not start sounding immediately if they are actuated over the pianissimo *d#* in the left hand. That must be why a *sforzato* sign was added over that note for the published score.



Example 3.578. A. Schoenberg: *Drei Klavierstücke* opus 11 (1909), nr. 1, bars 13-18. Reproduced by permission of the Arnold Schoenberg Center, Wien.
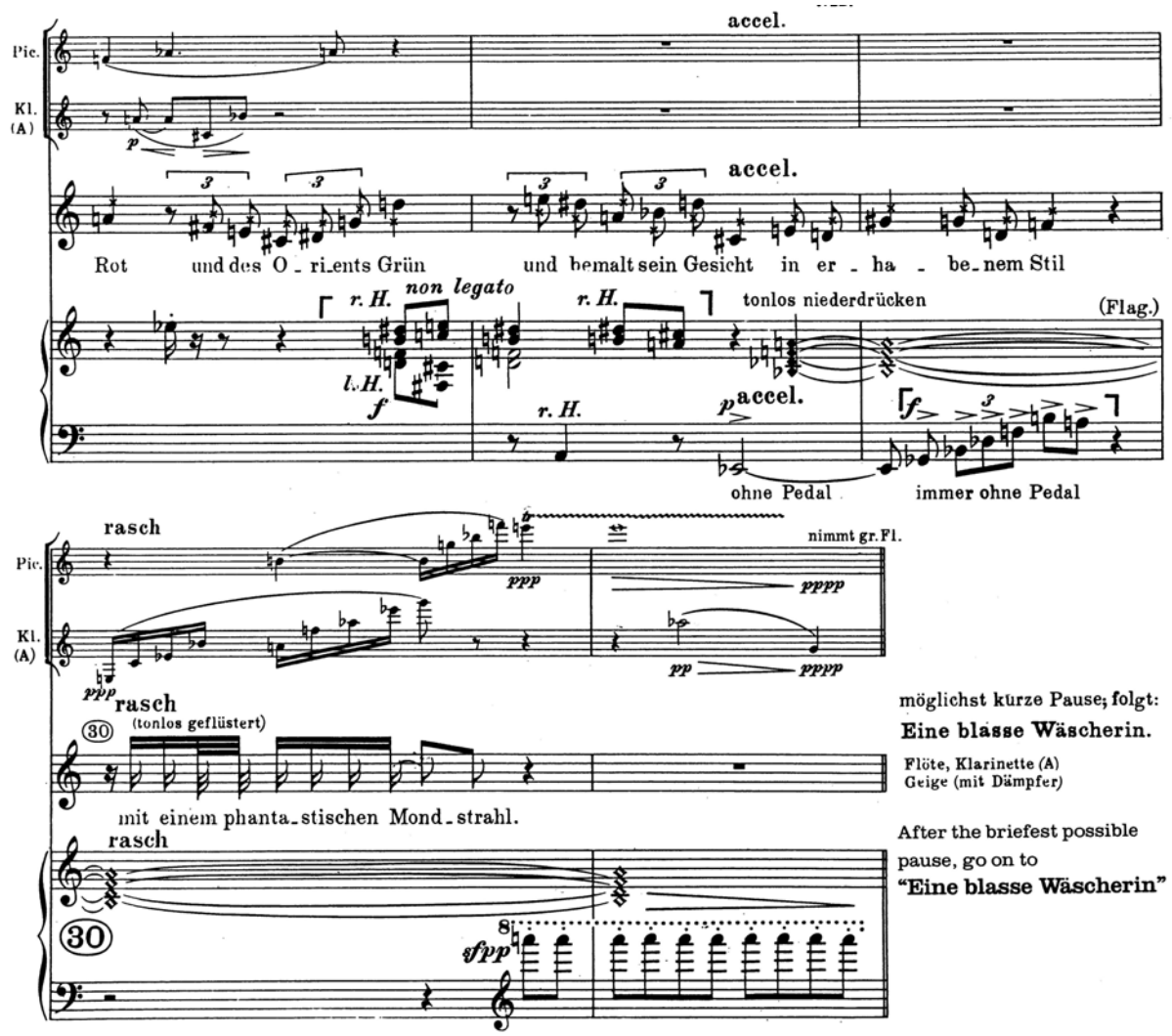
It is further odd that the square notes and the added rhythmical values in the manuscript are written in a lighter shade pencil, as if notated later than the rest of the music.

Most important here in opus 11/1, however, is the fact that Schoenberg uses the silently depressed keys and the sympathetic resonance in an already more developed way compared to the earlier opus 14/3. The overtones of the sforzato *d#* in bar 14 of opus 11 are caught in the same way as in opus 14, but in opus 11 the open strings are reactivated through the loud chords that follow. Furthermore, all the notes in those loud chords have a causal relation to the open strings, which is not the case with the staccato notes that follow the silently depressed notes in opus 14.

As for performance practical indications, Schoenberg is not yet convinced that the special shape of the notes is adequate in assuring that the performer will use the right technique. The indication of "toneless" depressing the keys is expressed as an exclamation and there can be no misunderstanding about the required lack of pedal. (See above ex. 4.577.)

Between March 3 and July 9, 1912, Schoenberg worked on *Pierrot Lunaire* opus 21. In this cycle, Schoenberg uses the "Klavierflageolett" four times, once in each of four pieces spread over the complete set.

At the end of the third piece of this cycle, *Der Dandy* (manuscript dated 1/4.1912 - 2/4.1912), a long "toneless" seventh chord illustrates the "fantastic beam of moonlight" which the voice whispers, equally "toneless." (Ex. 3.579.)
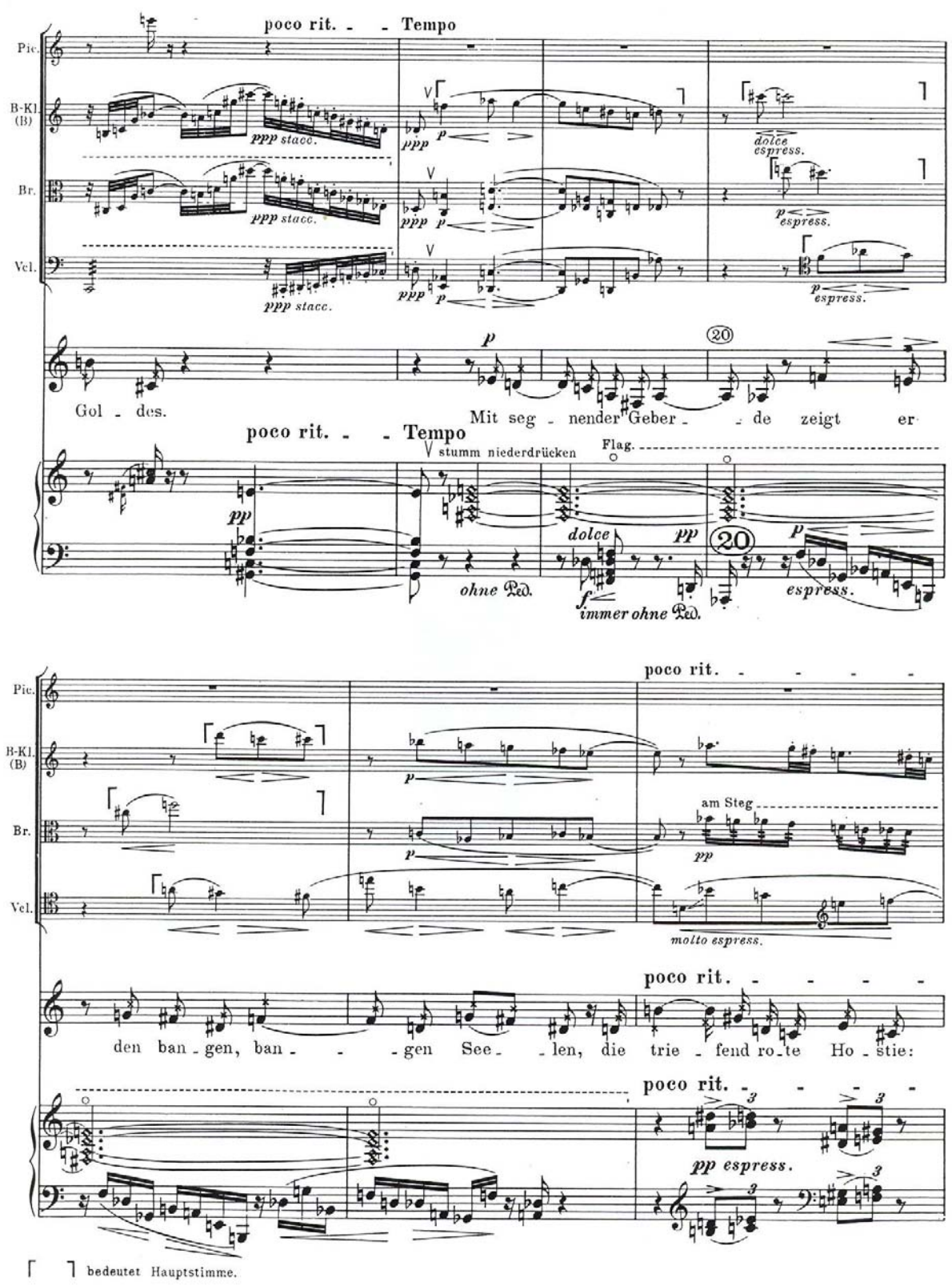


Example 3.579. A. Schoenberg: *Pierrot Lunaire* (1912), *Der Dandy*, bars 27-31. © Dover Publications, Inc.

As in opus 11/1, the main effect is produced by activating strings that are already open and ready to vibrate through sympathy. The warning not to use the pedal is still in place, only now the duration of the "flageolet" was not deemed necessary; instead the indication of the effect is put at the place where it commences.

To make sure the effect lasts for as long as the voice needs its accompaniment, the tempo is suddenly increased and the other instruments play as soft as possible to maintain the right balance. The highest note on the piano ends this piece, too high to activate any of the strings still open.

In the *Rote Messe,* the eleventh movement of *Pierrot Lunaire*, the silently depressed keys return. Now all four indications – "stumm niederdrücken" / "Flag." / "°" above each toneless chord / "ohne *Ped.*" – are present. (Ex. 3.580.)
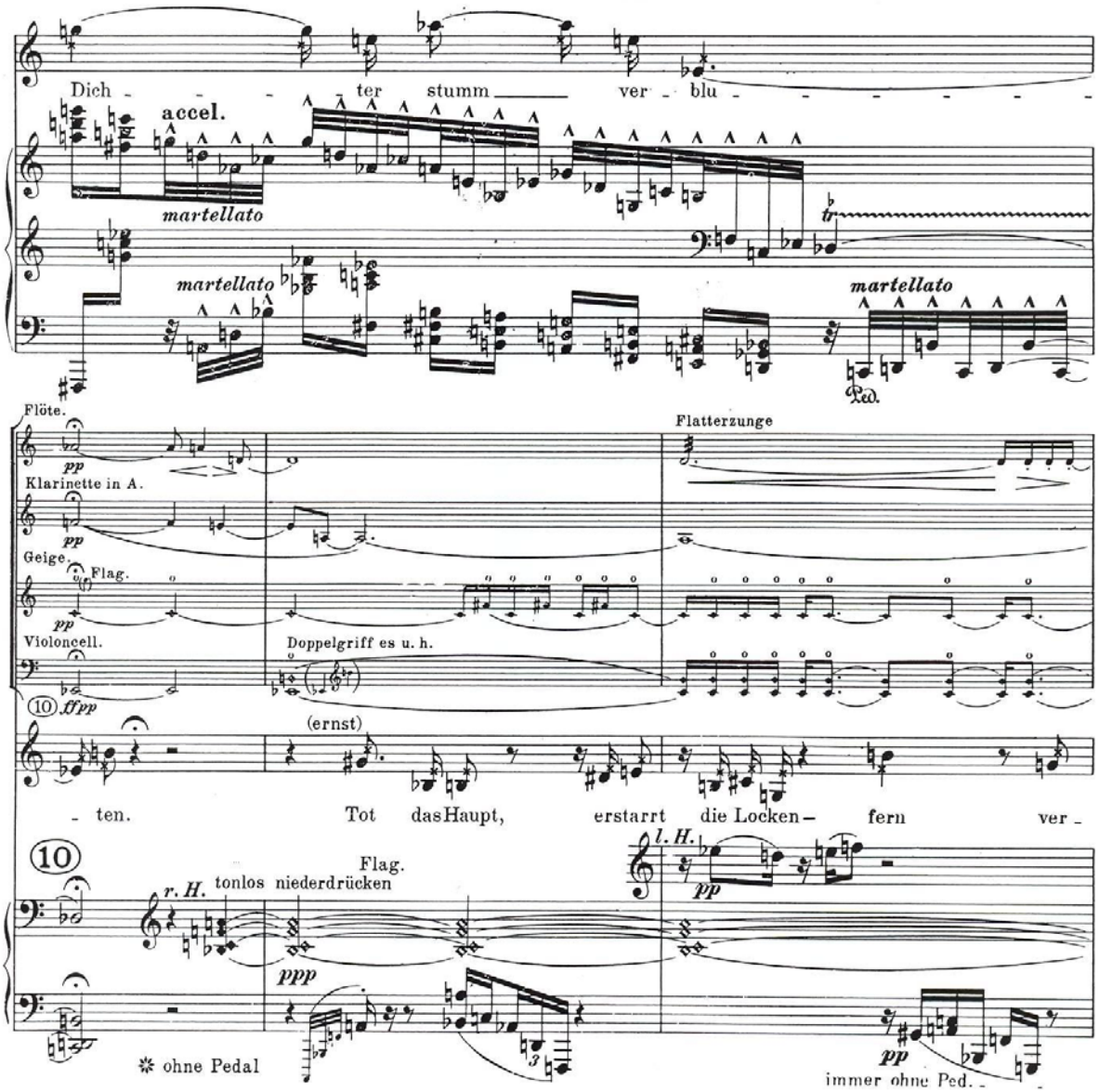


Example 3.580. A. Schoenberg: *Pierrot Lunaire* (1912), *Rote Messe*, bars 18-23. © Dover Publications, Inc.

The application is a little more theoretical than before, with only the first left hand chord forte, and the following piano and pianissimo, hardly enough to set the open strings in motion. The ethereal sounds aimed at through the "Klavierflageolett" accompany the text
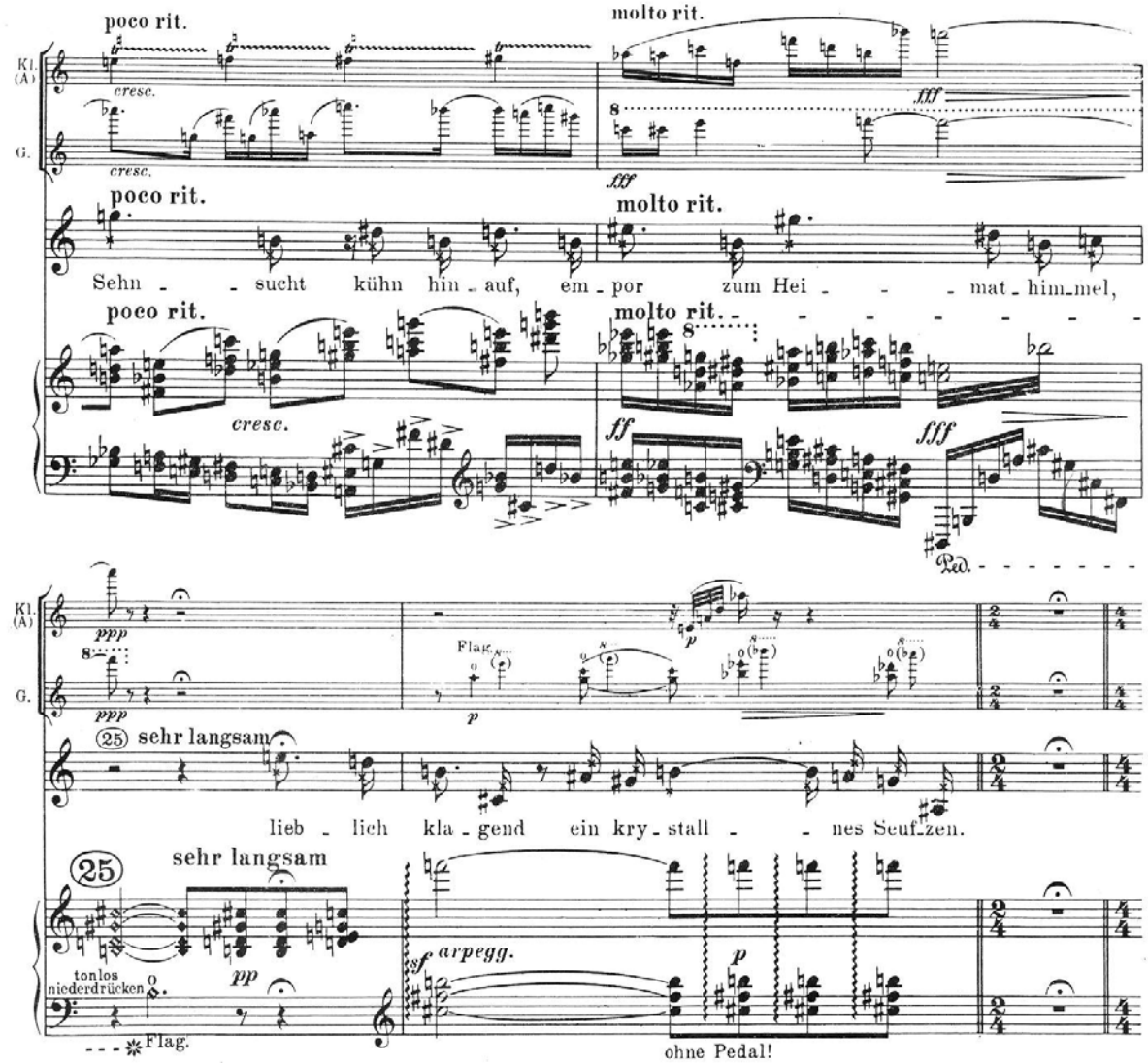
well, the other instruments will be hard pressed not to cover the piano resonance, though.

A few movements later, number 14 *Die Kreuze* has in some ways the same problem with the length, the dynamics and some of the accompaniment working against the effect. The Flatterzunge and the viola's flageolet are more in tune with the piano, this time. Interesting to note here is the similarity with opus 11/1 in the left hand *Seufzer* motifs crossing the right hand. (Compare bar 13 in ex. 3.581 with bar 15 in ex. 3.577.)



Example 3.581. A. Schoenberg: *Pierrot Lunaire* (1912), *Die Kreuze*, bars 10-13. © Dover Publications, Inc.

Most interesting is the last piece of the cycle incorporating the "Klavierflageolett": *Heimweh*. Like the previous piece it follows a violent outburst, but in contrast to all previous pieces, the use of the technique is new. (Ex. 3.582.)
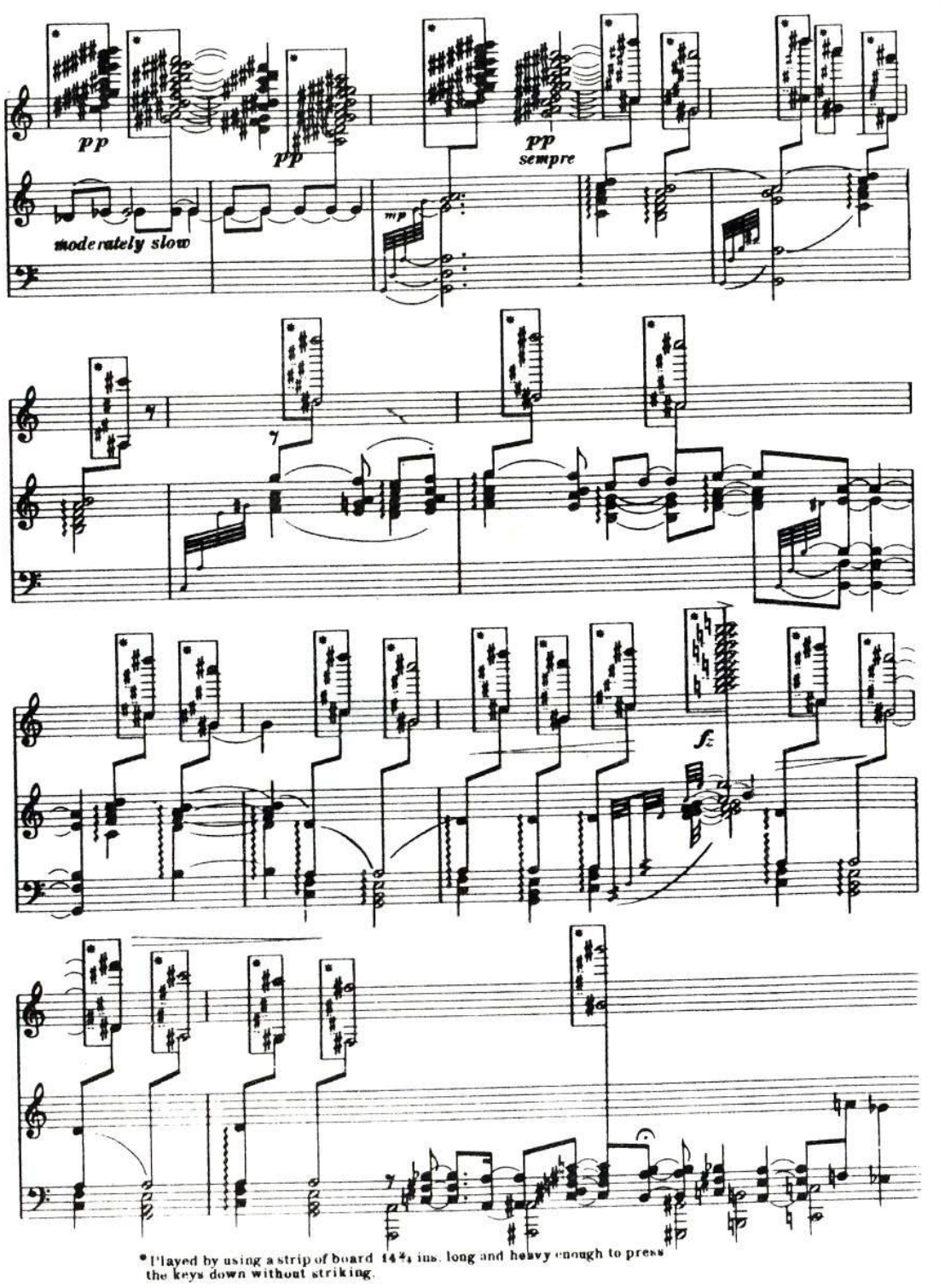


Example 3.582. A. Schoenberg: *Pierrot Lunaire* (1912), *Heimweh*, bars 23-27. © Dover Publications, Inc.

The *fortissimo* "noise" made in bar 24 is kept in the pedal while the new chord is depressed silently. Once the pedal is lifted, the sympathetic resonance is filtered through. The left hand square *b* (it should actually be a dotted quarter) looks deceivingly like it should be played, but it is only the indication of the exact moment the open strings are heard and has nothing to do with that single pitch. The piano sets the atmosphere for and anticipates the crystal sighing; the violin echoes.
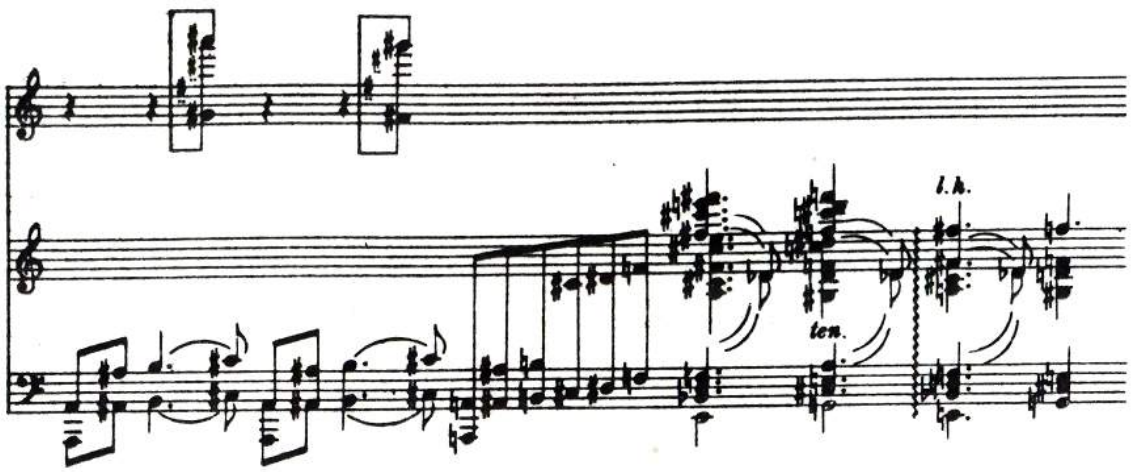
Schoenberg will return to his Klavierflageolett in the 1940's when writing his piano concerto. For now it is obvious that he is still struggling a little with the notation on paper. As for functionality, the composer has shown that he rapidly grasped the versatility of the technique.

3.4.2.3.2 1911?- Ch. E. Ives and distant bell-sounds

In Charles Ives' *Sonata No. 2 for Piano: Concord, Mass., 1840-60* the second movement *Hawthorne* contains a famous passage with large clusters to be played "using a strip of board 14 ¾ inches long and heavy enough to press the keys down without striking." (Ex. 3.583-584.)



Example 3.583. Ch. E. Ives: *Sonata No. 2 for Piano: Concord, Mass., 1840-60*, 2nd movement *Hawthorne*, pages 25, first edition (1920). © Edwin F. Kalmus & Co.



Example 3.584. Ch. E. Ives: *Sonata No. 2 for Piano: Concord, Mass., 1840-60*, 2nd movement *Hawthorne*, top of page 26, first edition (1920). © Edwin F. Kalmus & Co.

> None of the extant manuscript sources give us any exact information on how early the idea of the silently depressed keys could have come to Ives' mind. (See above 3.4.2.2.3.3.) The earliest *ante quem* date is 1920, when the first edition stated that the last nine chords of the cluster passage should be "played without striking."[1094] According to later (1930's) memos on the sonata by the composer, the clusters had originally been
>
> intended to be played by a second piano off the stage or in another room. These were played by pushing down very lightly with a strip of board 14 ¾ inches long with felt on one edge. It gives a kind of sound of distant reverberations that one may hear in the woods under certain conditions. Then, on the third staff, in the third measure, from the eighth group of notes, this is played in the same way on the first piano, but not struck, so that the lower piano part (which becomes louder here) will start strings vibrating. The nine groups written in the same way from here to the top of page 26 are played in the same way. It takes some practice to get this effect going just right, and the idea has been misunderstood by the great majority of people who have seen this music."[1095]

The idea of an assistant in the second sonata was not unique to the *Hawthorne* movement. The viola and flute parts in the first, resp. the last part are further testament to previous inceptions of this music for ensemble settings. Ives also cherished the idea of a second pianist as a "pitch-hitter" for the "wilder" passages in *Hawthorne*, to "make the music faster – and as it should be – which is not quite possible when only 1 man is at work." In fact Ives repeatedly thought of *Hawthorne* "in terms of a piano or a dozen pianos sometimes," as is demonstrated again by the fact that the 2nd movement of the 4th symphony, so closely related to the *Hawthorne* ideas, called for three pianos: a solo piano, an orchestra piano and a piano for the bell parts.[1096]

[1094] According to Clark 1971 (p. 203) the first edition contained a note by Ives, printed at the bottom of the relevant page, stating "Mr. Kirkpatrick devised and used a framework the weight of which held the keys down effectively. John Kirkpatrick put a strip of felt under the bat to keep it from falling on the home plate too often." Kirkpatrick only met Ives for the first time in 1927 and had seen the score of the 2nd sonata for the first time only in that same year. (Kirkpatrick 1972, p. 198.)

[1095] Kirkpatrick 1972, p. 81.

[1096] Clark 1971, p. 68-69.

Those "bell parts" are in part programmatic, recounted best in Ives' suggested backdrop for some of *Celestial Railroad*, which shares the *Hawthorne* material:

> [...] he gets riding on the Celestial Railroad [...] Then all of a sudden he is in the old churchyard – he hears the solemn old hymn, the distant bells – his old ghost friend greets him – he feels suddenly reverent I an honest boylike way – why not, Art? And then he gets hit and jumps on the railroad train again and is off [...][1097]

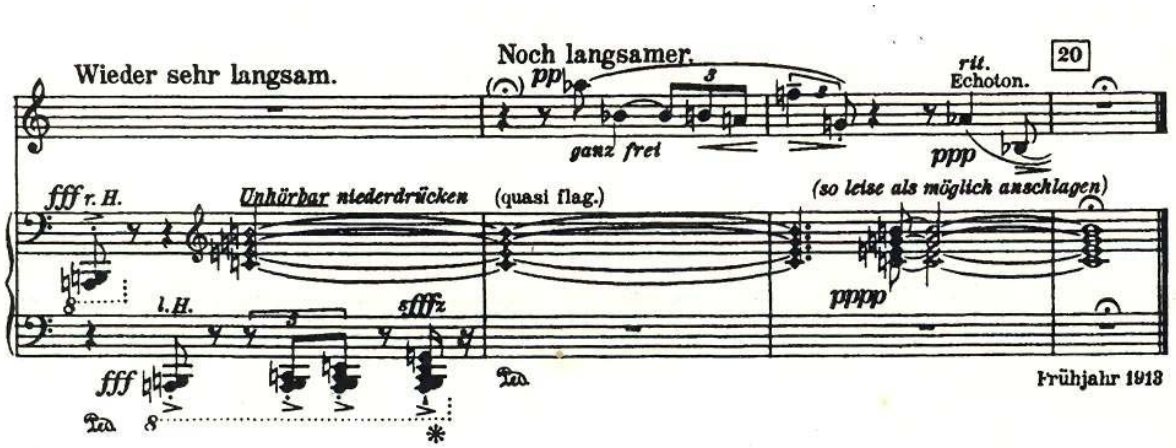
Realizing that various acoustical factors enter the issue, Ives allowed the player the right to use his judgment as to whether to strike the clusters in the event that the depressed keys were not satisfactorily ringing.[1098]

3.4.2.3.3 Further early developments

After Schoenberg and Ives, both in Europe and the US, the technique of silently depressing keys spread through the works of many composers relatively quickly. It is striking how composers sought to use it on their own terms. Very few used it more than once, but most tried to do something personal with it. As with the cluster, Henry Cowell developed a long-standing relation with the technique of silently depressing keys, but we shall treat his contribution separately (see below) so that it can be considered as part of an overview of his interest in all the extended techniques that he was involved in.

3.4.2.3.3.3 1913 Alban Berg: "quasi-flageolet" vs. proper sound

Less than a year after Schoenberg's *Pierrot lunaire*, Alban Berg dedicates *Vier Stücke für Klarinette und Klavier* opus 5 to his teacher. The very end of the cycle contains a silently depressed seventh chord very much reminiscent of Schoenberg's use of the technique in his opus 11 and 21. Berg prescribes activation of the open strings by low bass notes that are mostly in octave relation to the "quasi flag." notes (with the lowest piano note added for a more percussive and noisy timbre). The sympathetic vibrations of the chord are followed by proper struck string sounds of those same four notes, to be played "as quietly as possible." (Ex. 3.585.)



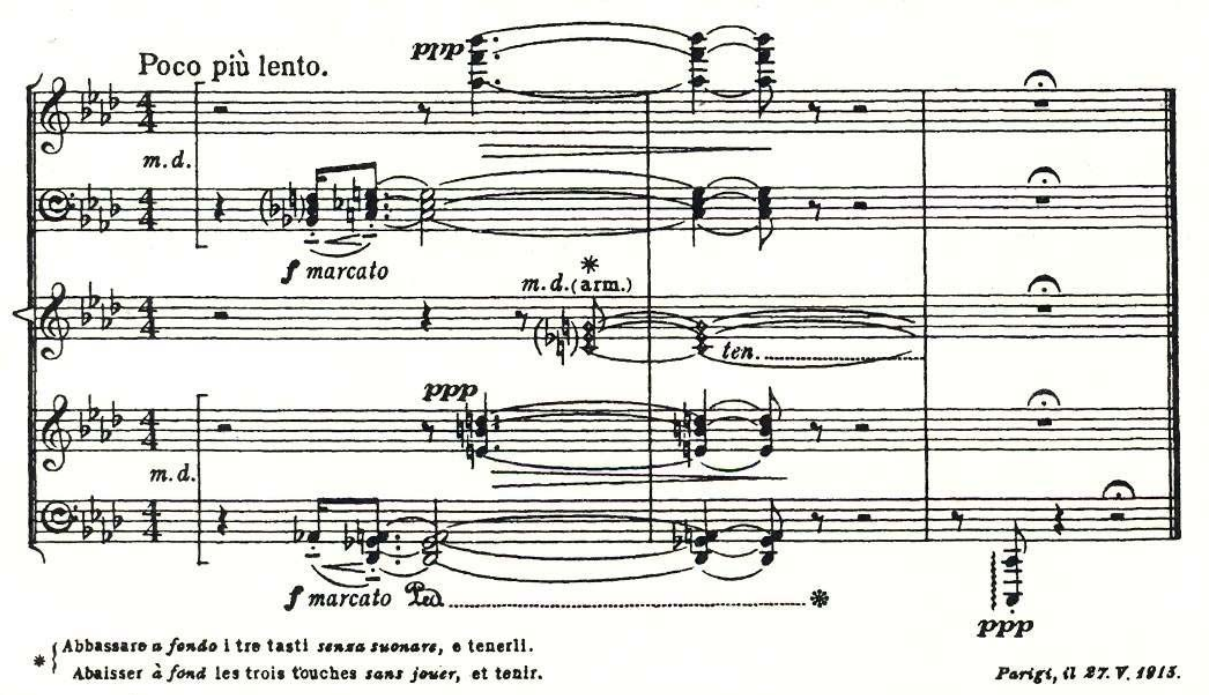
Example 3.585. A. Berg: four pieces for clarinet and piano opus 5 (1913), last movement, final bars. © Universal Edition.

[1097] Kirkpatrick 1972, p. 187.
[1098] Clark 1971, p. 76: fn. 27 and 34.

3.4.2.3.3.2 Filtering and sympathy

Depending on the constellation of accumulated sounds from which notes are filtered by silently depressing their keys, overtones or struck string sounds or both are filtered.

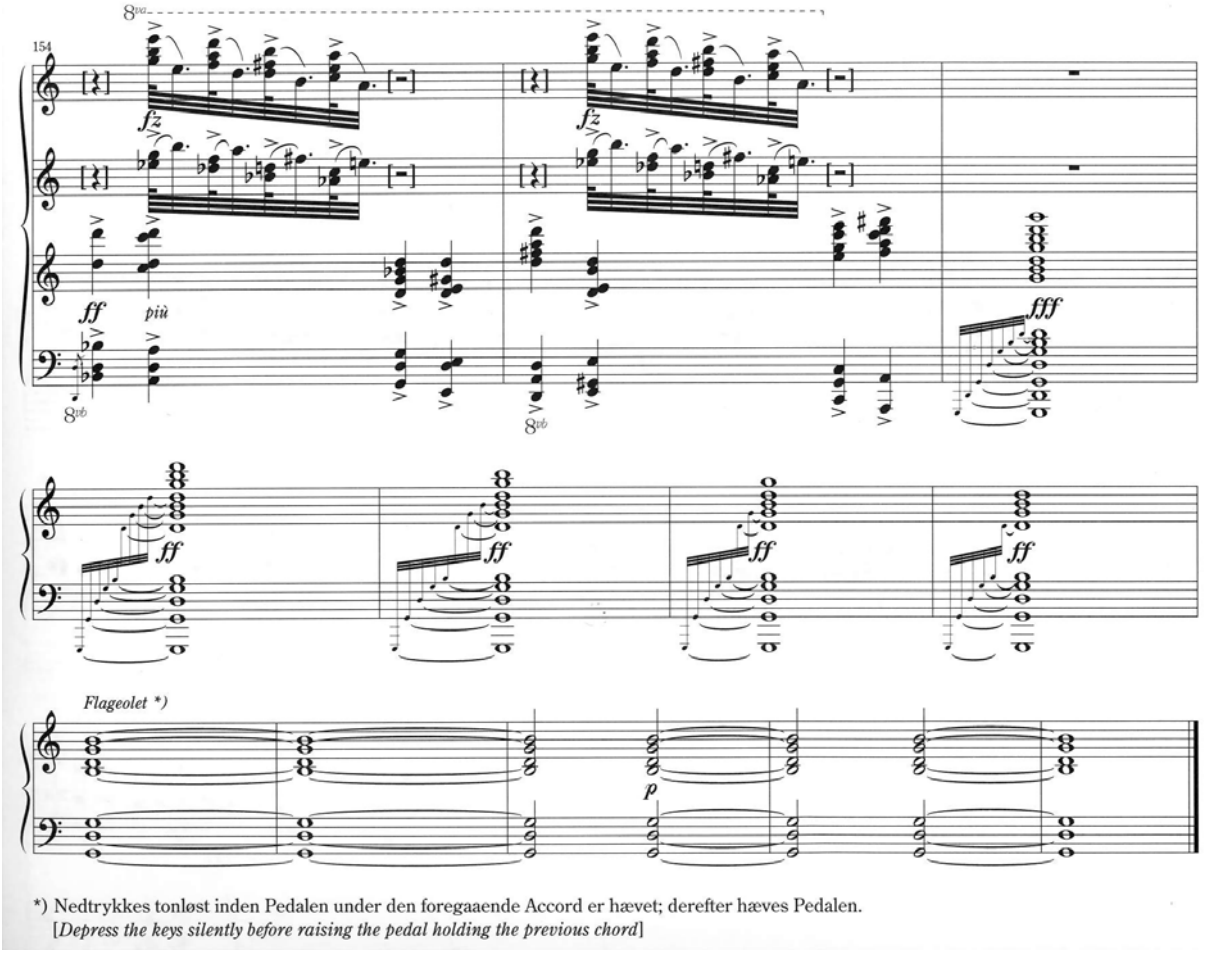
In Casella's *Mort, ta servante, est à ma porte* (1915), the silently depressed C minor chord will make only overtones audible, as none of the three diamond shaped notes sounded before. The overtones are mostly sympathetic to the forte chord *c-e♭-g* chord on the second staff (ex. 3.586): only few of the other notes (d^2, $a♭^2$, f^3, $b♭^3$) have some sympathetic relations to any of the C minor notes.



Example 3.586. A. Casella: *L'adieu à la vie*, *Quatre lyriques funèbres* opus 26 (1915), 2nd movement *Mort, ta servante, est à ma porte*, final bars. © Chester Music.

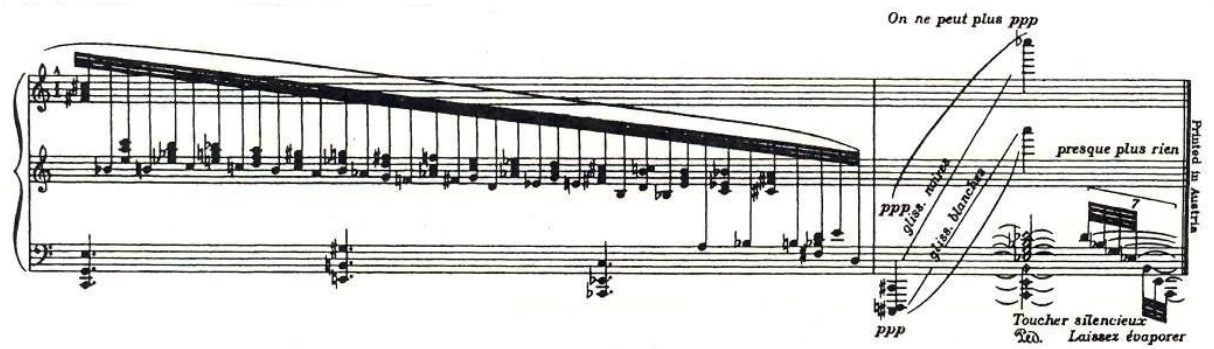
In Rued Langgaard's 1921 *Music for the Abyss – A Sonata for Piano*, the indication "Flageolet" refers to Schoenberg but has in fact little to do with it.[1099] (Ex. 3.587.) What is caught here is mainly the remaining resonance of strings that are already vibrating. The loud G major chords in the previous bars, possibly all in one sustaining pedal, provide an accumulation over a large range of many reverberating strings, all belonging to G major. The ones that are the same as the notes in the silently depressed chord, will just continue to vibrate, the others will have been dampened by the release of the damper pedal. Like in the Saint-Saëns example (see above, ex. 3.389), but contrary to Schoenberg, Cowell and Casella (where only sympathetic vibrations are triggered through silently depressed keys), in Langgaard's sonata the many previous G major vibrations are forced to converge into the smaller, silently depressed G major chord, giving it a timbre which is slightly off. It is not clear whether Langgaard wants both last G major chords to be silently depressed also. If not, and Langgaard wants the filtered notes to be followed by the same notes properly played on the keyboard, which requires a delicately balanced touch to achieve evenness in timbre (depending on how evenly the notes of the previous chords were played), the instance represents a more evolved stage of technical mastery compared to the Saint-Saëns passage.

[1099] For more on Langgaard, see below, 3.4.2.8.1.



Example 3.587. R. Langgaard: *Music for the Abyss* (1921), final bars. © Society for Publication of Danish Music & The Royal Library.
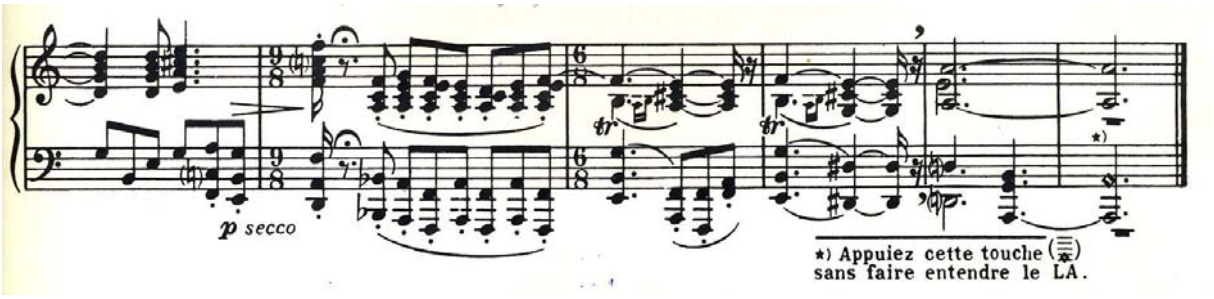
If Langgaard's example was a question of funneling 14 G major through a filter of 7 silently depressed keys, Kaikhosru Shapurji Sorabji (1882-1988) filters 7 notes from over 70 that were glided over and sustained by the damper pedal. (Ex. 3.588.) Depending on the relation of all those accumulated struck string sounds to the seven silently depressed keys, they will have more or less influence on the filtered sound. As there are about ten times more notes that are filtered *indirectly* than the seven that are basically sustained, the filtered sound is extremely colored compared to when the chord would be played properly.
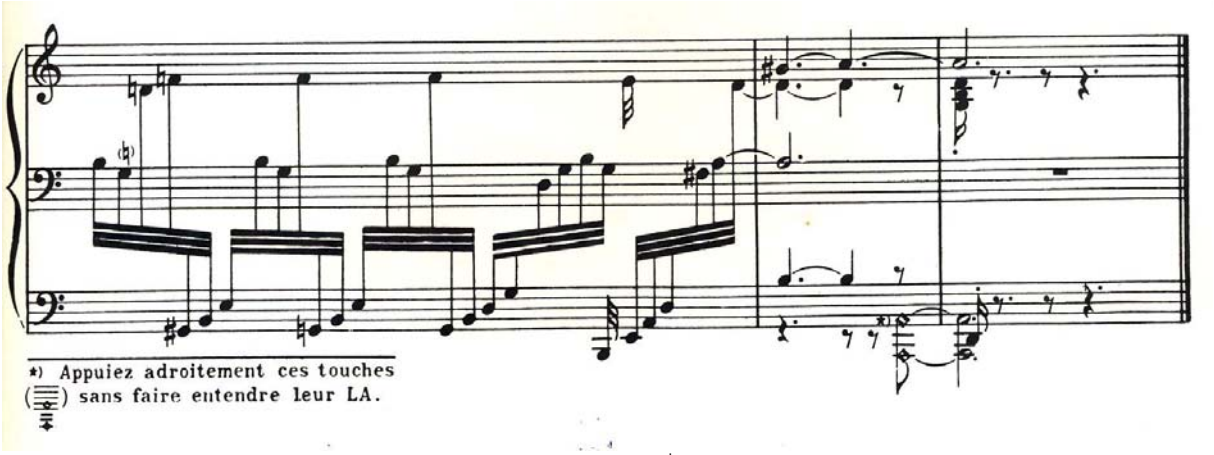


Example 3.588. K. Sorabji: *Le Jardin Parfumé, Poem For Piano* (1923), final bars. © J. Curwen and Sons, Ltd.

3.4.2.3.3.3 1925 Igor Stravinsky: structural use
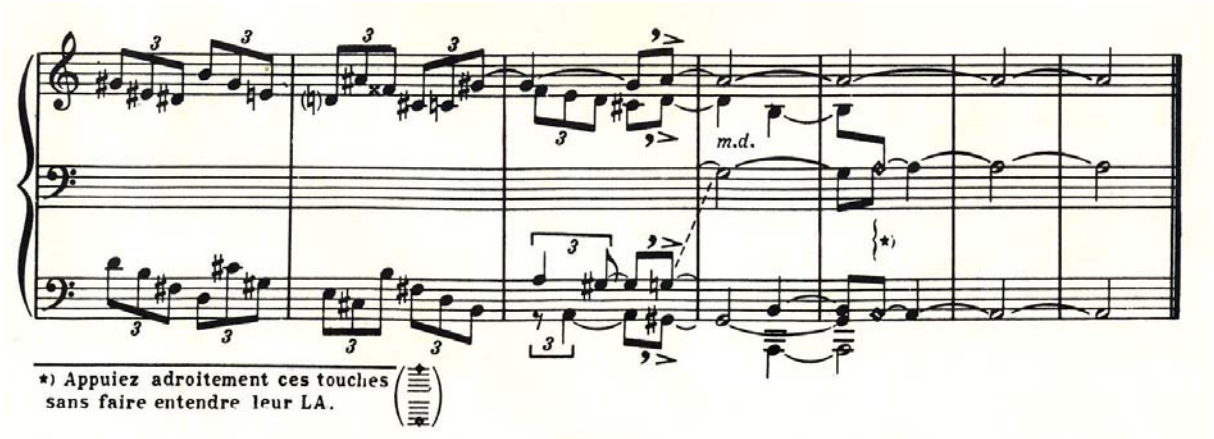
For his *Sérénade en La* Igor Stravinsky (1882-1972) used sympathetic resonance to connect different movements motivically. Each of the first three movements ends with a B-A motive of which the A – central to the entire composition – is silently depressed. (Ex. 3.589-591.)



Example 3.589. I. Stravinsky: *Sérénade en La* (1925), 1st movement *Hymne*, final bars. © Boosey & Hawkes.
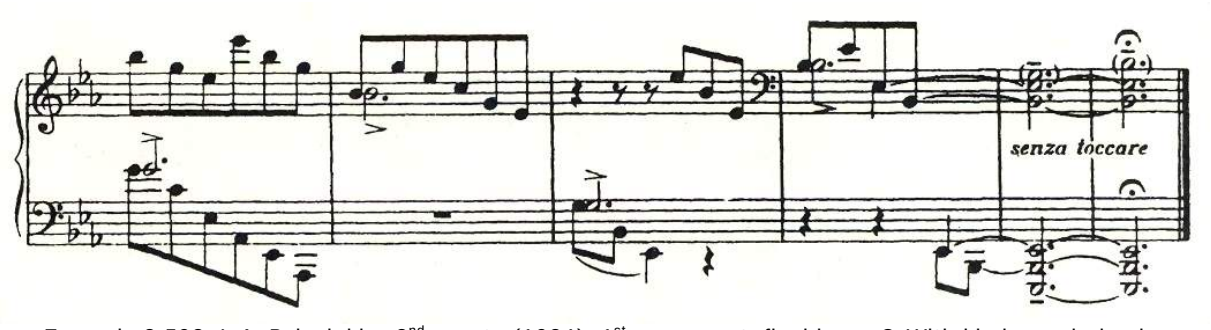


Example 3.590. I. Stravinsky: *Sérénade en La* (1925), 2nd movement *Romanza*, final bars. © Boosey & Hawkes.



Example 3.591. I. Stravinsky: *Sérénade en La* (1925), 3rd movement *Rondoletto*, final bars. © Boosey & Hawkes.

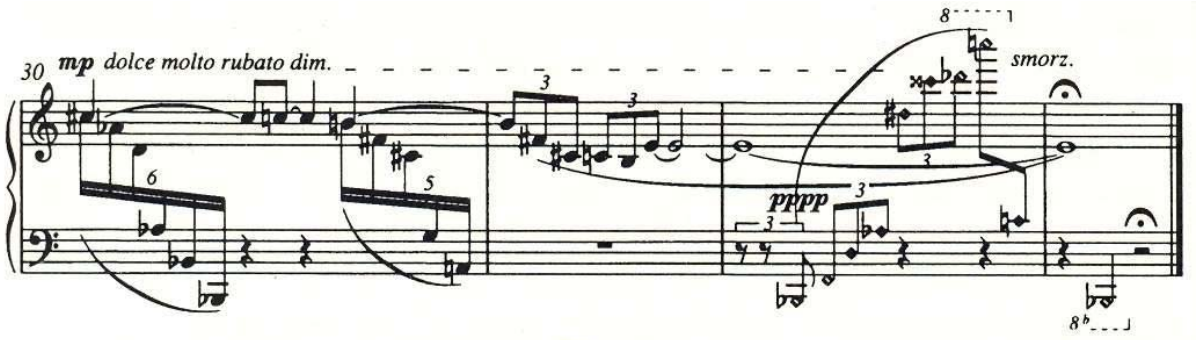
3.4.2.3.3.4 Growing pains

Despite the steady spreading of interest in the technique of creating sympathetic resonance, its use and notation was not always understood or accepted. Despite having been trained as a pianist at the Moscow conservatory, Leonid Alekseyevich Polovinkin (1894-1949) asks to play two notes "without hitting" but does not compose any properly played notes that would be needed to activate the open strings. (Ex. 3.592.)



Example 3.592. L.A. Polovinkin: 2nd sonata (1924), 1st movement, final bars. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Erwin Schulhoff (1894-1942) uses the diamond shaped note-head for "quasi-flag." playing, but this can only mean that the notes are to be played as quietly as possible, since there is no sympathetic resonance the way the passage is written. (Ex. 3.593.)
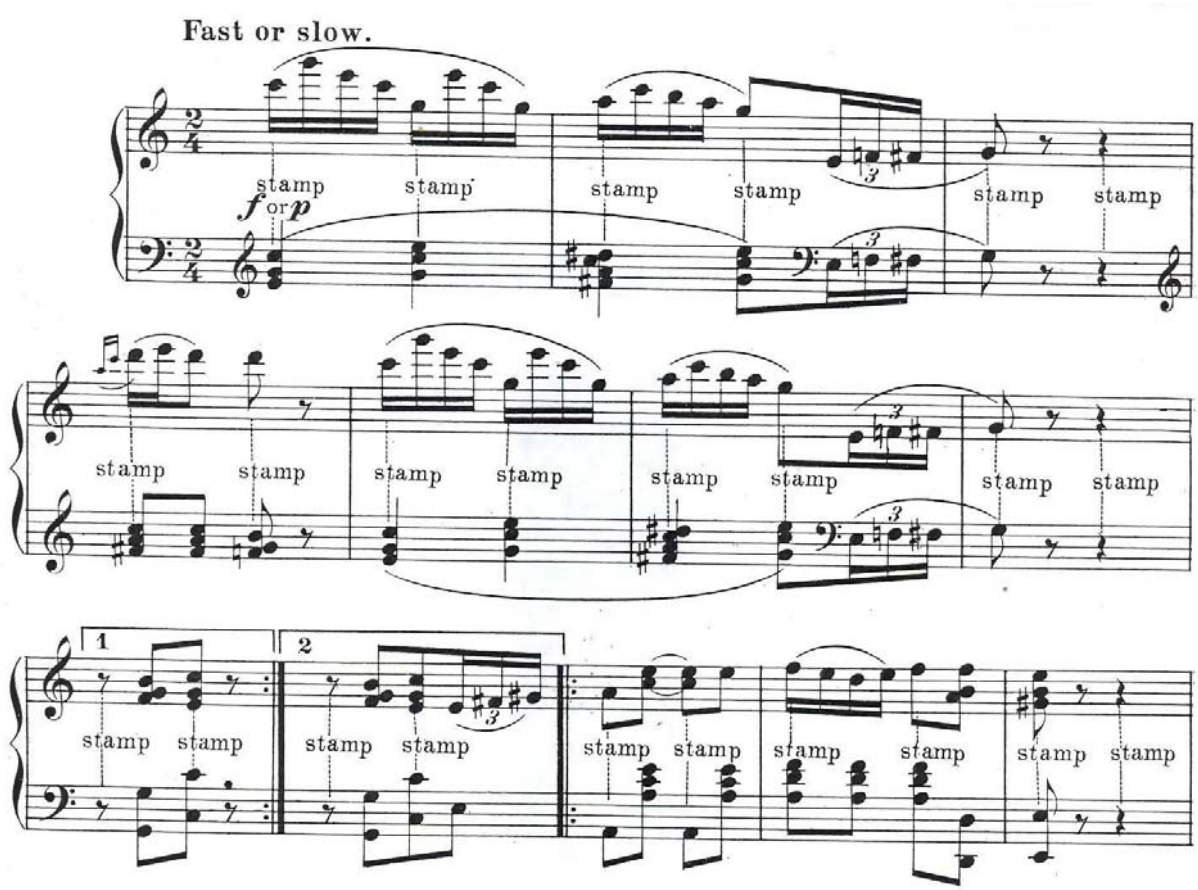


Example 3.593. E. Schulhoff: 3rd suite for the left hand (1926), *Improvisazione*, final bars. Reproduced by permission of SCHOTT MUSIC GmbH & Co. KG, Mainz - Germany.

3.4.2.4 1910- Improperness in Ragtime

Following on Blind Tom's Battle of Manassas (see 3.3.3.3.3), it is again in early African-American entertainment that some high-grade extension found their way into the piano repertoire. In 1910, a ragtime by Scott Joplin (1867/68-1917) was published, called *"Stoptime" Rag*, with the quotation marks in the title. A performance practical note explained that

> To get the desired effect of "Stoptime" the pianist should stamp the heel of one foot heavily upon the floor, wherever the word "Stamp" appears in the music.
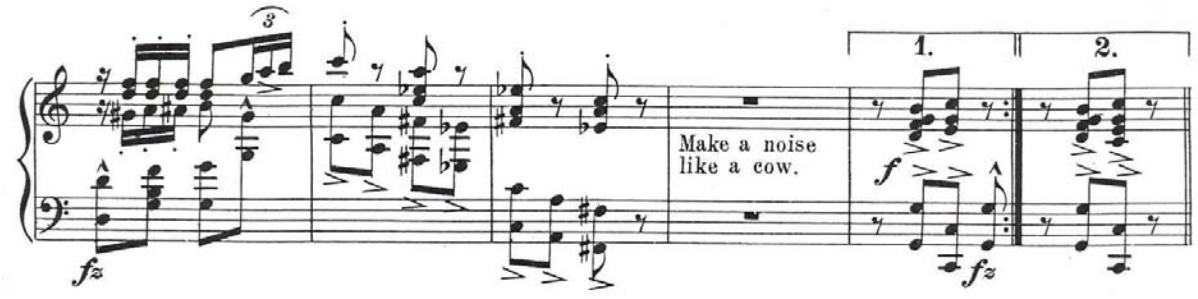
A common and old jazz technique, stop-time means that the pianist or band stops the characteristic accompanying rhythm to let a soloist take command.[1100] In this Joplin rag every single beat in this 2/4 piece carries the stamp-indication (whether the pianist plays notes or rests) but the effect of the music's interruption is clear. (Ex. 3.594.)



Example 3.594. S. Joplin: *"Stoptime" Rag* (1910), opening bars.
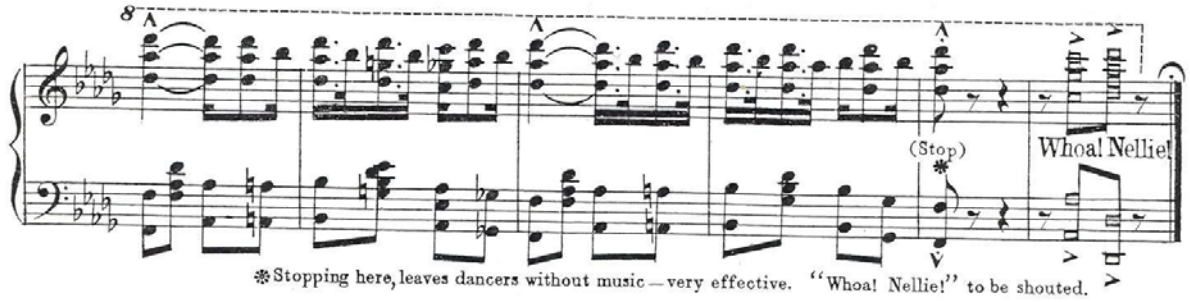
In the same year, Charles Humfeld applies the same stop-time technique in *Who let the cows out* (subtitled a "bully rag") to let the pianist make an obvious reference to the title of the piece. (Ex. 3.595.)

[1100] Kernfeld 2002.



Example 3.595. Ch. Humfeld: *Who let the cows out* (1910), bars 16-21.

Another "stop rag," *Whoa! Nellie!* by George Gould, also ends with the pianist making a vocal sound. (Ex. 3.596.)



Example 3.596. G. Gould: *Whoa Nellie* (1915), final bars.

In 1917 the Original Dixieland Jazz Band recorded the *Tiger rag*, with some downward trombone slides in it. Rumour has it that the tune would have been a standard even before. Jelly Roll Morton, son of a trombone player, recounted how he

> happened to transform [*Tiger Rag*] from an old quadrille, which I also named, from the way I made the "tiger" roar with my elbow. A person said once, "That sounds like a tiger hollering." I said to myself, "That's the name." All this happened back in the early das before Dixieland was ever heard of. [1101]

According to himself, the way Morton made the tiger roar was by rolling his left forearm across two octaves of black and white keys. When exactly Morton would have "invented" the imitation of the tiger roaring is not known. Neither is it confirmed that he was involved in it. But the rag did become known for its arpeggiated left arm clusters.

It is safe to assume that clusters and other improper piano techniques were not uncommon in the repertoire of early jazz keyboard improvisers, especially in connection to local vaudeville performances, to which some of the above ragtime pieces surely are related.[1102]

[1101] Lomax 2001, p. 66-67.
[1102] Tichenor 1979, p. xii.

3.4.2.5 1913/14- Paris and the early prepared piano

In the first quarter of the 20th century, three composers are connected to the prepared piano in Paris: Erik Satie and Maurice Delage around the beginning of 1914 and, in the early 1920's, Maurice Ravel. Of the former two, it is not clear which one was first, but that is not too much of an issue since both their experiments were closely connected to each other in time and circumstances. Following the chronology of the evidence that is left to us, Erik Satie (1866-1925) appears to have been the earlier one to slide paper in between the strings of a piano for a public performance.

3.4.2.5.1 Erik Satie: *Le Piège de Méduse*

On March 28, 1913, Satie had announced to his young friend Roland Manuel that he finished the absurdist text for *Le Piège de Méduse*. By the end of June, seven "very small dances" for piano were ready to be played in between the nine scenes of the one-act lyrical comedy. At the end of the year, or early 1914, the piece was premiered privately in the Paris salon of Mr. and Mrs. Fernand Dreyfus, the parents of Roland Manuel. Almost forty years later, poet and critic René Chalupt wrote how he was present at this event:

> … I assisted at the first private representation of the *Piège de Méduse*. One [we] had taken care, for this occasion, to slide sheets of paper in between the strings of the piano… [1103]

From the way Chalupt tells the story, it is not clear in what capacity he assisted. Did Satie – who performed the piano part at the occasion – prepare the piano, or did more than one person help. Hence it is also unclear how the idea entered the production of the piece. Was Satie prepared in advance to do this or was it concocted on the spot?
We further lack the information to gauge what kind of paper Satie used, how exactly he put the paper "in between" the strings. Were they small pieces per chorus or bigger sheets to cover several strings at once? Were they slid over the first string, under the second and over the third string? Folded as to fit tightly? More importantly, for which (if not all) notes were they intended, and for which (if not all) of the individual pieces? It has been imagined that Satie would have wanted to "produce a muffled sound,"[1104] "as stuffed as the monkey which was supposed to do the dances,"[1105] or that he had attempted at creating a "mechanistic effect."[1106] Regretfully, too little is known about the way the part of the monkey was choreographed for the first performance of the play, and neither can we find anything that tells us what Satie was aiming for. The association[1107] of one of the play's characters – Polycarpe, the manservant of the protagonist Baron Méduse – with the patron saint of earaches – Saint Polycarp of Smyrna – is imaginative as well, but does not reveal anything, really. Even the earlier futurist manifesto The Art of Noise – distributed in Paris in March of 1913 – and the later dispute between Satie and Jean Cocteau, who, at the time of *Parade* in 1917, was pressed to "replace the cult of Saint Cecilia by the racket of Saint Polycarpe,"[1108] hardly explain why Satie left this idea

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[1103] Chalupt 1952, p. 41: "…j'assistai à la première représentation privée du *Piège de Méduse*. L'on avait eu soin, pour cette circonstance, de glisser des feuilles de papier entre les cordes du piano et l'unique rôle féminin était confié à Mlle Suzanne Roux, à la veille de devenir Mme Roland-Manuel."
[1104] Volta 1998, p. 67. "…produire un son étouffé…"
[1105] Volta 1996, p. 172. Taken over in Striegel 1997, p.113. This beautiful, big, masterfully stuffed monkey – Jonas, a mechanical toy that the protagonist had made for his own personal distraction – is to dance to the quadrilles, waltz, mazurka, polka and other types of dance Satie wrote.
[1106] Orledge 1990, p. 120.
[1107] Volta 1998, p. 60.
[1108] Volta 1998, p. 61. "…Jean Cocteau, pressé lui, à l'occation [sic] de *Parade*, de remplacer le culte de Sainte Cécile par le raffut de Saint Polycarpe."

of alienating the piano sound out of the published score. In the orchestration that Satie made in 1921, hardly any real trace of such intentions is found either, except for the fact that the setting includes not only clarinet, trumpet, trombone, percussion, violin, cello and double bass, but also a triangle, bass drum, cymbals, tambourine and *tambour Basque*. The percussion is not required for every single dance, and when it is used there is no effect imitating or orchestrating anything close to paper on strings. The score for *Parade* – a "Ballet Réaliste" – contains several "racket-making" instruments (e.g. a typewriter, foghorn and an assortment of tuned bottles, next to a percussion set-up including a *tambour Basque*), but it seems that Cocteau had added these, with Satie dismayed rather than pleased.[1109] At least the original 1916 *Parade* score for piano contains no references to noise.

Apart from guesswork, there is nothing to tell us exactly what had triggered Satie's preparation of the piano on that particular moment in the Paris salon. Nevertheless, that there was a context in which it was fitting, is beyond doubt. Russolo's manifesto *l'Art des bruits* was published and reviewed in the Paris Journal a few months before Satie wrote his music. For a few years already, he had left the 'old-school' ideas of D'Indy's Schola Cantorum and the National Society of Music behind him to support the new Independent Musical Society, known for its provocative programs. As for the improper use of the piano, we must here continue once more – if briefly – the story of Friedrich Wilhelm Rust. In January of 1913, D'Indy had edited twelve sonatas by Rust after a heated public debate over the value of Rust's works.[1110] The music publisher eagerly took advantage of the specialised press' full coverage of the Rust case, advertising the edition for the rest of the year. There should be no doubt that the sonata for clavichord in G, which we have encountered in the previous chapters, and which was contained in D'Indy's edition, went through the hands of at least those that had taken D'Indy's course in composition. This compendium had allocated an important place to Rust as the most important precursor to Beethoven, citing heavily from nine of Rust's keyboard sonatas as early as 1909.[1111] At last, in that special year that 1913 had been, the first performance of Stravinsky's *Sacre* must have filled the Paris air with scandal, making it hard to imagine anything too outrageous, even if it entailed putting paper in the piano. That the first prepared performance of *Le Piège de Méduse* – as private as it had been – went by without so much of a fleeting comment anywhere, may not need to be much of a surprise, considering what there already was to marvel at.
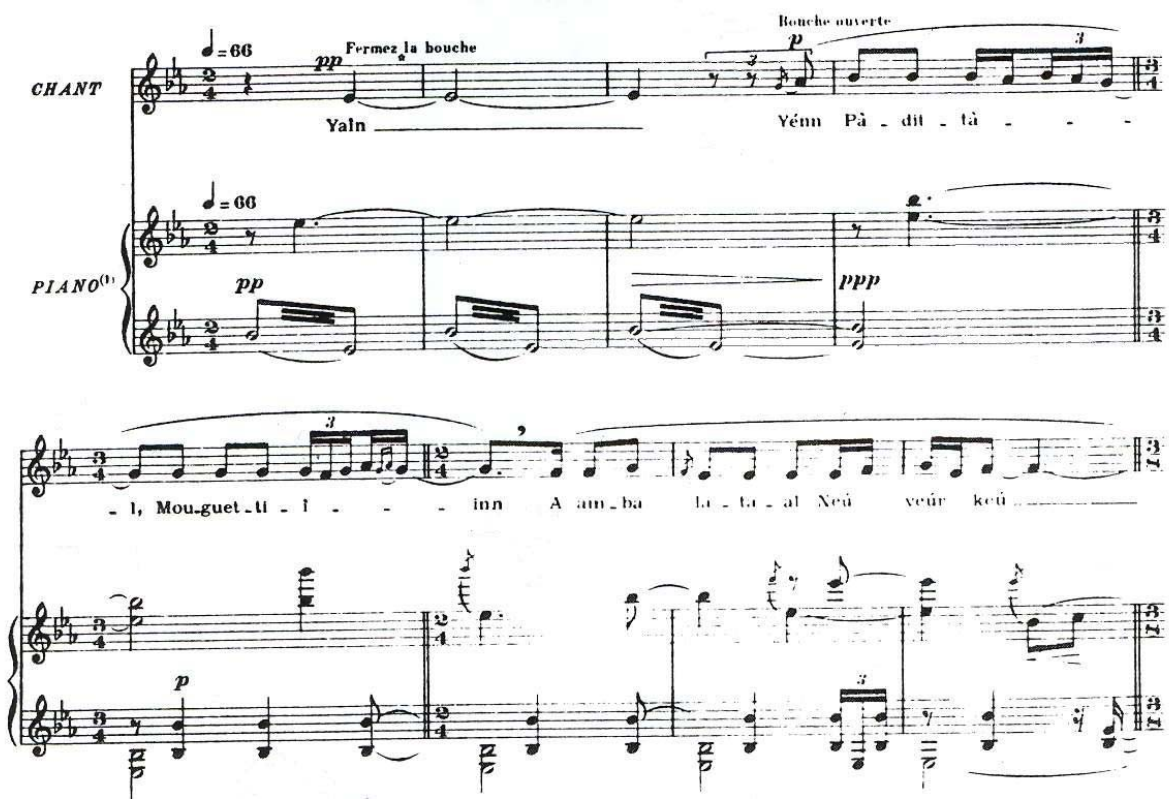
3.4.2.5.2 1914 Maurice Delage: *Ragamalika*

It has been stated that this "first experiment with the prepared piano" did not have any immediate follow-up.[1112] This is not taking into account a most peculiar work by Maurice Delage (1879-1961), though, the composer who was another one of the forty guests at the first performance of *Le Piège de Méduse*.[1113] We do not know how well Satie and Delage were acquainted and we cannot make any educated guesses as to whether or not they may have discussed the idea of putting paper in between piano strings prior to that particular performance. Crucial to the problem of establishing a historical chronology is

[1109] Orledge 1990, p. 224.
[1110] German musicologist E. Neufeld had published an article exposing the editions of grandson Rust as musicological fraud. Amidst an international musicological row over this "hoax," D'Indy defended the 18th century composer against the way he thought Neufeld degraded the original Rust sonatas together with the misplaced efforts by the grandson. See Cook 1979, p. 6-11 for the German part of the quarrel. Also see *Revue Musicale S.I.M.* [=*Société Internationale de Musique*] 1913 nrs. 4, 5, 11 and 12 for the French input.
[1111] Apparently d'Indy only got to know the sonata in G when he went to Berlin in 1913 to check on what Neufeld had been claiming. (*Revue Musicale S.I.M.* 1913 nr. 4, p. 49).
[1112] Volta 1998, p. 67.
[1113] Volta 1998, p. 66.

that it could have been either of the two composers who walked around with the idea and may have passed it on to the other at the salon where *Le Piège de Méduse* was premiered. What we do know is that, by that particular performance, Delage had already returned from his travels to India and must have been working on *Ragamalika – Chant Tamoul* for voice and piano. According to the score (published in 1915), the piece was finished in May of 1914, just a few months after Satie's singular prepared piano premiere.
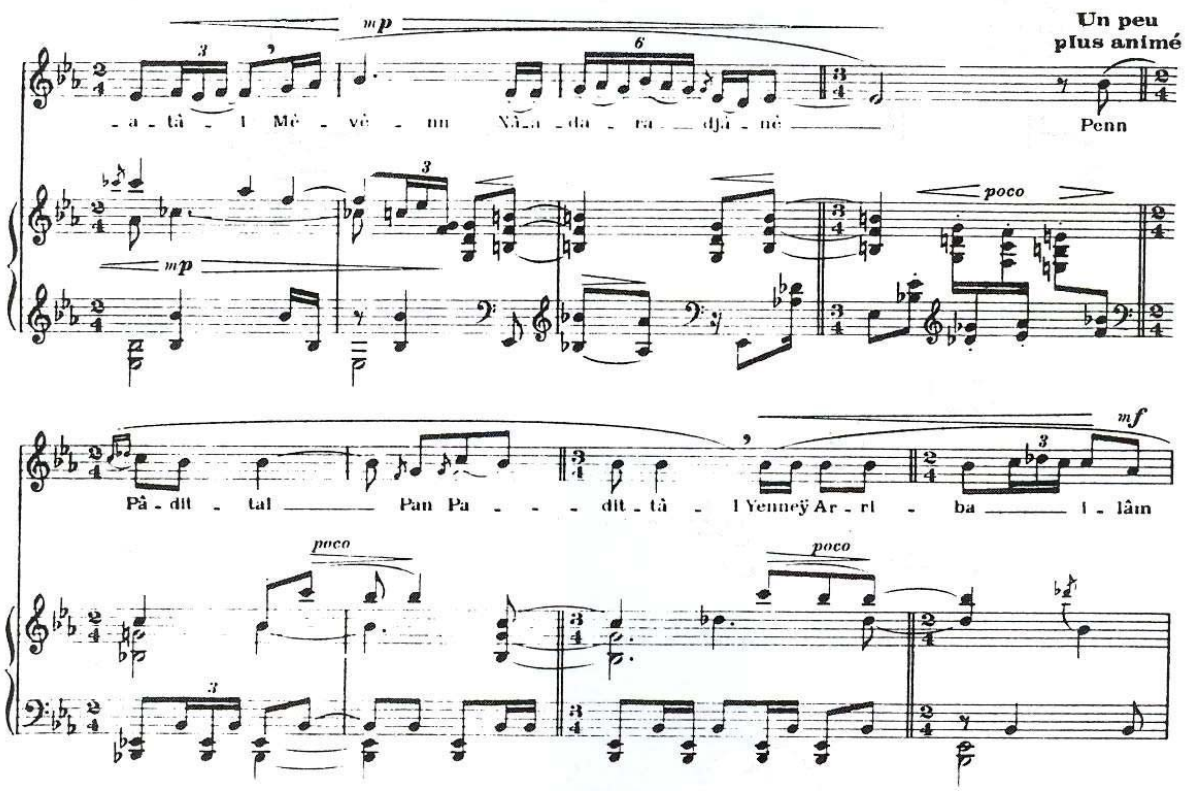
In the score, just above the beginning of the music, Delage remarks that it is a 'softly expressive complaint, written for the lower register of a soprano'[1114]. Looking at the score from the perspective of the piano accompaniment, a general rondo form can be seen in the I-II-III / I'-II'-III' / I" structure.[1115] Example 3.597 shows the style of the first part.



Example 3.597. M. Delage: *Ragamalika*, bars 1-8. Editions Durand et Cie.

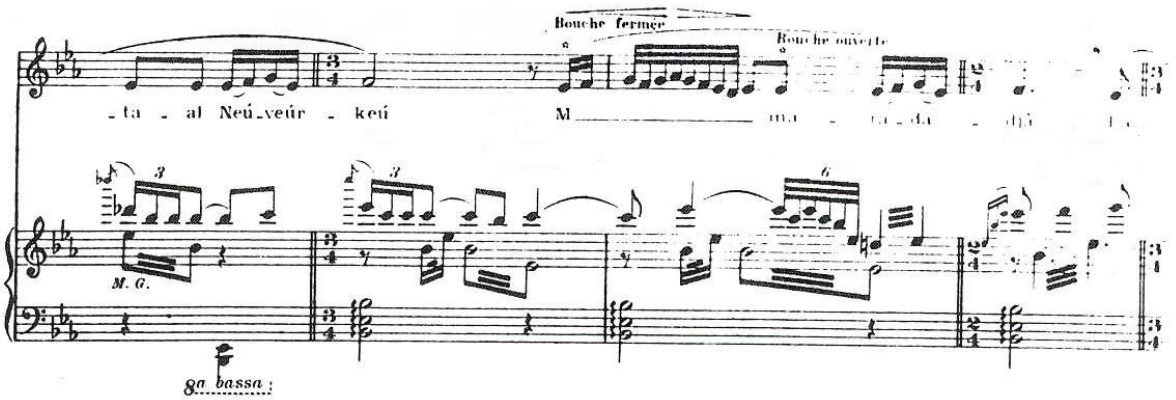
On the bottom of the first page, Delage writes a footnote for the piano part: "The sound of the [*B♮*] can be muted by placing a thin [light] piece of cardboard under the strings where the hammer strikes."[1116] The *B♮* in question does not actually appear before bar 37, in the slightly more animated second part. (Ex. 3.598.)

[1114] On the first page of the score, above the beginning of the music: "Complainte doucement expressive, écrite pour le registre grave d'un Soprano."
[1115] For an in-depth analysis of the textual and musical structure, see Van Geeteruyen 1989, p. 37-40.
[1116] On peut amortir le son du [*B♮*] en plaçant un carton léger sous les cordes, à l'endroit où frappe le marteau.
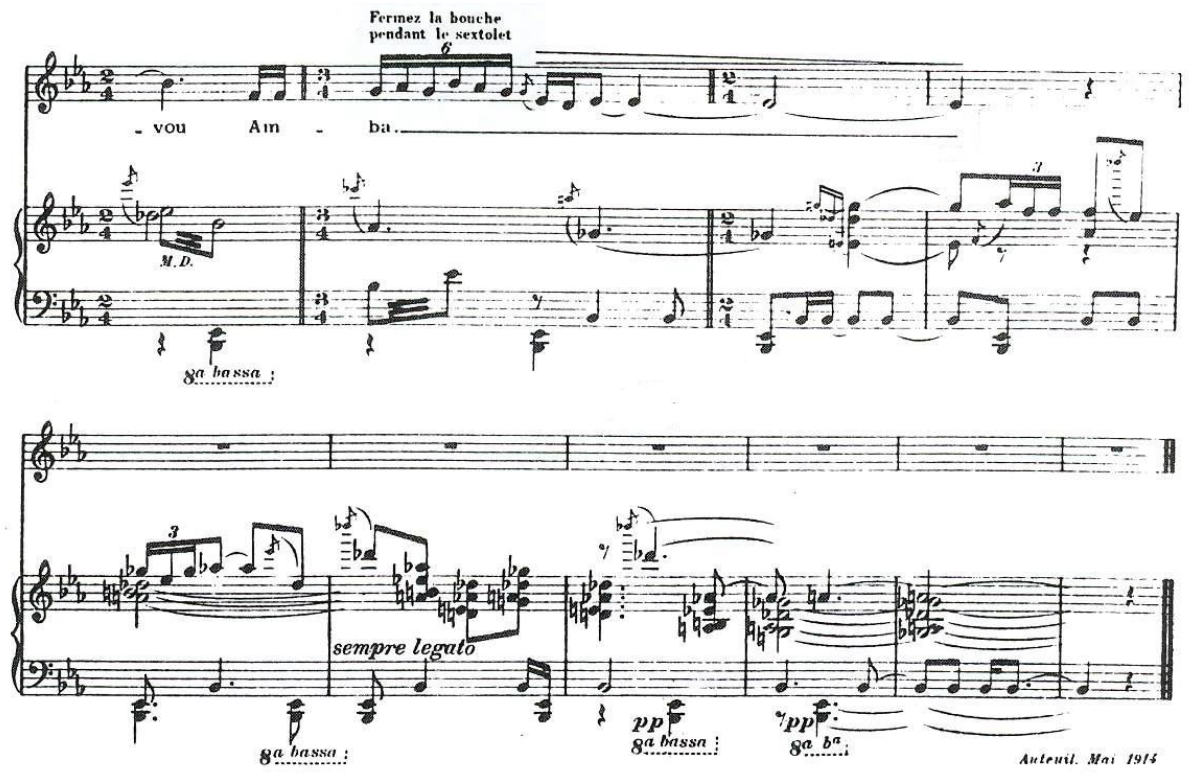


Example 3.598. M. Delage: *Ragamalika*, bars 33-40. Editions Durand et Cie.

After this section the first part returns (bars 59-69) before the *B♭* accompaniment is heard again (bars 70-98). From bar 102 until the end, the prepared timbre is used in two new guises, once as part of a more static arpeggio (ex. 3.599) and once as repeated single sounds in the final bars of the song (ex. 3.600).



Example 3.599. M. Delage: *Ragamalika*, bars 101-104. Editions Durand et Cie.



Example 3.600. M. Delage: *Ragamalika*, final bars. Editions Durand et Cie.
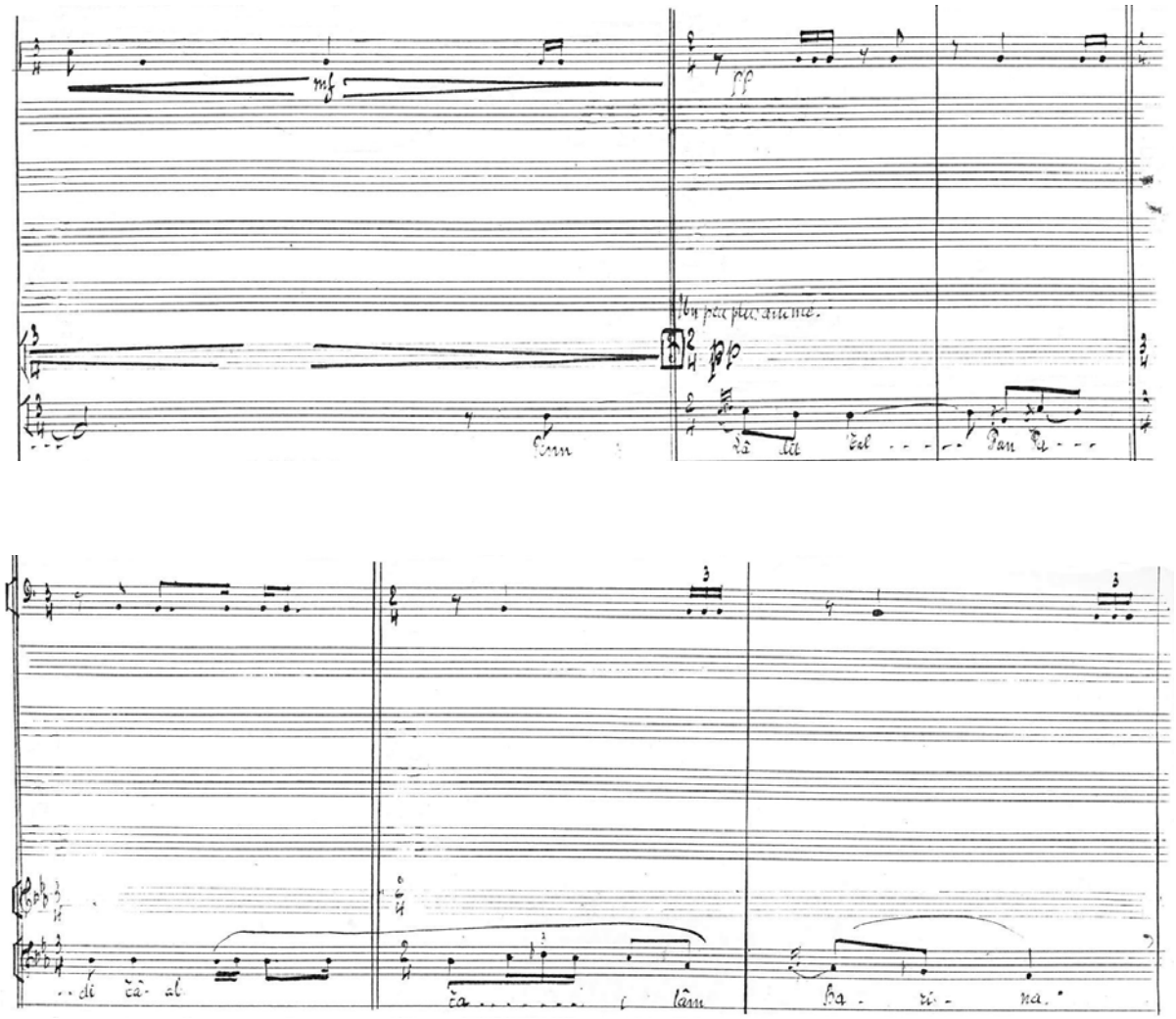
It may be that, at the time of Satie's performance in his *Le Piège de Méduse*, Delage had already been thinking about how to incorporate some kind of association to the sounds he had loved while in India, maybe experimenting with paper and telling Satie about it before the première, possibly even on the very day of the concert. It may have been the other way around, with Satie inspired to elegantly but incidentally refer to the futurist manifesto of noise, and Delage taking this gimmick one step further to integrate into the exotic song he was musing on. Whatever the actual facts in this little story, whoever came up with the idea, it was Delage who used the idea most musically, if only once.

In the spring of 1912, Delage had gone to India and Japan with his parents who owned some shoe polish factories in the Orient. It was probably in India that Delage heard Coimbatore Thayi, at that time the most famous of the Tamil singers, contracted to the British Gramophone industry and one of their top selling artists in the second decade of the 20th century. When Delage returned home, he wrote *Quatre Poèmes Hindu*, followed by *Ragamalika*, a transcription of a recording by Coimbatore Thayi.

The text is nonsensical, only the timbre of the phonetics having any value here. The piano part is rather easy, both technically and interpretatively. The prepared note makes sense only as a coloration to differentiate between the pitches and the rhythm in the bass. Emile Vuillermoz, who heard the music in 1925, wrote of "the most refined of Europeans' dream, cradling in the monotone and ecstatic greyness of the sonorities and rhythms of the Far-East,"[1117] most likely referring to the *b♭*, which stands out as an exotic drum amongst the piano sounds in the rest of the static accompaniment. When comparing the piano part to the orchestration Delage made in 1915, the rhythmic rather than melodic function of the prepared *b♭* is confirmed by looking (and listening) to the percussion parts in the relevant sections of the orchestral score, where the timpani

[1117] Vuillermoz 1925, p. 23. "…où se berce, dans la griserie monotone et extatique des timbres et des rythmes d'Extrême-Orient, le rêve du plus raffiné des Européen."

percussion become acutely more active and play the specific rhythm of the prepared *b♭* in the piano part of the original song. (Compare bars 37-38 in ex. 3.601 and ex. 3.598.)[1118]



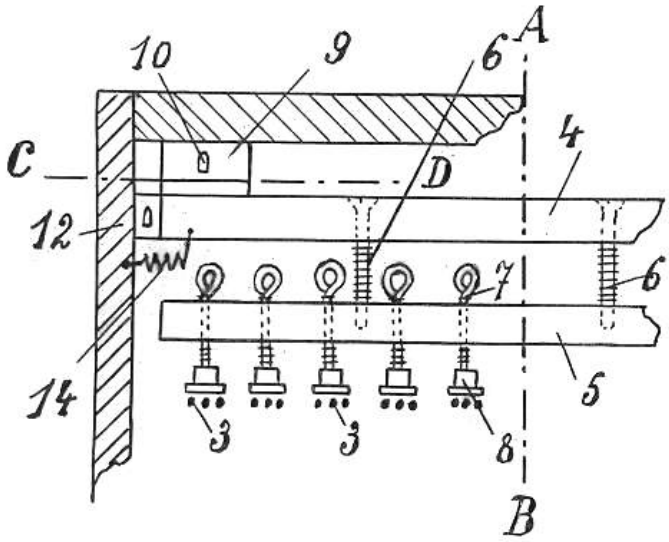
Example 3.601. M. Delage: *Ragamalika*, voice and orchestra, bars 36-41. Editions Durand et Cie.

[1118] The timpani part deviates from the piano part in bar 39, where the voice also has a different rhythm and (less) text.

3.4.2.5.3 Maurice Ravel: *Tzigane* & *L'enfant et les sortilèges*

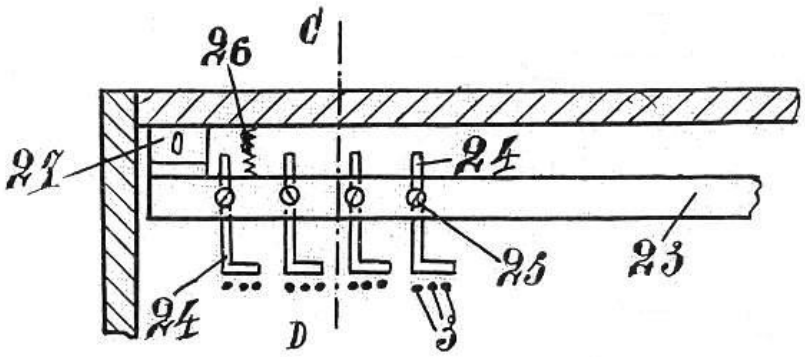
From the end of the 20th century's second decade, Belgian organ builder Georges Cloetens (1870-1949) applied for a series of patents to protect some inventions of his that would enable a performer to modify the timbre of stringed instruments.[1119] Several kinds of constructions were to be attached to the instrument, with contrivances operated as stops to press certain materials (ebonite, iron, felt) onto the strings, altering the main timbre.[1120] On March 22 of 1922, the inventor sent in a final "ameliorative" patent application (superseding the previous ideas and their stages of development) for a mechanical device to be attached to the piano.[1121]

From the different earlier patents two systems are withheld: one producing harmonics by pressing felt-covered "members" against nodal points on the strings (cf. ex. 3.602), and the one letting vibrating strings strike against a certain hard material like metal or ebonite to achieve "the effects of plucked strings analogous to those produced by harpsichords, cimbalom, harps, etc." (Cf. ex. 3.603.)



Example 3.602. G. Cloetens: drawing from 1919 Belgian patent 278726 (January 1919) for an application to produce harmonics on strings. A bar (5) runs over the strings, attached to the piano's inner frame and carrying "pressers" (7) that are comprised of a disk (8) covered with felt and secured to the end of a screw-threaded rod fixed in the bar. These screw-threaded rods permit the exact adjustment of the position of the pressers with respect to the chorus of strings (3) that each presser relates to. The whole bar can be lowered so that the pressers stop the strings and produce harmonics when the strings are activated by the keyboard action.

[1119] Between 1904 and 1947 (when he was 77 years old) Cloetens applied for dozens of patents, e.g. for an organ pipe that could produce different tones and timbres (Belgian patent 212661 – 1908 / 224240 – 1910), for mechanisms that would produce and vary vibrato and tremolo without loss of air in organs, harmoniums and wind instruments (Belgian patent 284326 – 1920), a monochord with keyboard (Belgian patent 341751 – 1927) and advertisements printed on toilet-paper (Belgian patent 300150 – 1920).
[1120] Belgian patents 278726, 280828 and 282081.
[1121] Belgian patent 306002, filed on March 22, 1922.



Example 3.603. G. Cloetens: drawing from Belgian patent 280282 (May 1919) for an application to produce the effects of plucked strings on stringed keyboard instruments. Hard pieces of metal, ebonite, or other "suitable" material (24), is placed close to the string (3), so that the latter strikes against these pieces when vibrating.

Both systems can be actuated independently as well as simultaneously and both can be left unused to obtain the regular piano sound. The upper and lower range of strings have their own set of the two systems, operated separately and independently from each other. In total, four separately operable modifying mechanisms are thus available, each with their own stop, providing the performer with 16 theoretical combinations, including regular piano playing.

The instrument that incorporated these inventions was called "the Luthéal" and built in Paris. Only one such instrument seems to have survived to us: a 1911 Pleyel with the attachments as described in Cloetens' final patent[1122]. (Ex. 3.604.)

[1122] This instrument was found in the cellars of the Brussels Musical Instrument Museum by Theo Olof, has been restored to working order and is now part of the collection of the Musical Instrument Museum. The Dutch craftsman who did the restoration – Evert Snel – made a copy of the mechanism and attached it to a Fazioli. (Personal communication between author and Evert Snel.) In 1987 Daniel Magne reconstructed a Luthéal on the occasion of Ravel's 100th birthday (the "Piano-Luthéal," based on a small grand Erard, now at the Musée de la Musique, part of the Cité de la musique in Paris). (Cotte 2002, p. 364.)



Example 3.604. Pleyel, Wolff, Lyon & Co. (Paris, 1911)/Cavaillé-Coll, fitted with the Luthéal system by Georges Cloetens. Part of the collection of the Brussels Musical Instruments Museum (inv. 3613). Reproduced by permission.

How exactly Ravel became interested in the Luthéal is not known, but sometime towards 1924 he wrote his *Tzigane* with this instrument in mind.[1123] When Durand published Ravel's score of *Tzigane*, they issued three versions: one for violin and piano, one for violin and orchestra, and one for violin and Luthéal; and when the piece was first premiered in 1924 in London, it was with a piano and not the Luthéal.[1124] Yet the sophisticated registration in the published Luthéal part is evidence that Ravel had taken out time to get to know the novel instrument. The way the compositional material is constructed so as to optimally profit from the possible combinations of the stops further shows that Ravel composed this piece *specifically for* the Luthéal and that this version is the main one, the others (violin and piano; violin and orchestra) are the derivatives.
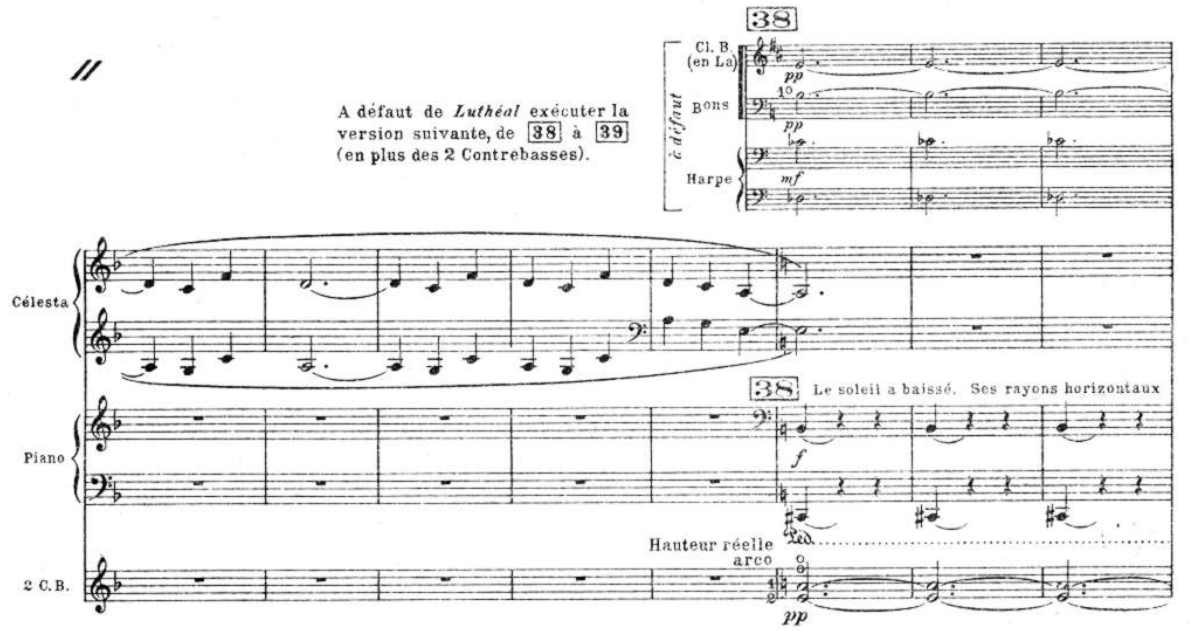
Throughout *Tzigane*, Ravel took great care in writing only notes that fit the range of the stops that he prescribed. He also had an obvious predilection for the "Harp" stop (referring to nodal point presser, cf. ex. 3.602), using its flageolets to bring the piano sound closer to some of the comparable violin effects. The "clavecin" stop (the device that allows strings to clatter against fixed pins – cf. ex. 3.603) is only used twice in the whole of *Tzigane*.

[1123] After "ideas lay dormant," *Tzigane* was written between March 1924 and the premiere in April of that same year (Wright 1995, p. 3-4).

[1124] There is no evidence as to why the Luthéal was not used in London. It could have been due to the hassle of transporting the complete instrument: the attachment alone is useless to tour with, as it needs to be bolted onto the frame with care and precision in order for it to touch exactly upon the nodal points of the strings.

Ravel prescribed the Luthéal once again for his opera *L'enfant et les sortilèges*, which was finished in 1924 and first performed a year later.[1125] Here as much as in *Tzigane*, Ravel prescribes different combinations of the Luthéal's stops, indicating them before and after passages. Considering his registration throughout the opera, we find a much higher differentiation than just the imitation of the harpsichord as is hinted at in the performance note at the beginning of the score.[1126]

Only in one instance Ravel offered an alternative instrumentation in the orchestra for performances without the Luthéal: at number 38, where the libretto indicates how "the sun has set" and where "its horizontal rays" are sounding through the Luthéal and double bass flageolets, the composer suggests the double basses, harp, bassoons and bass clarinet to take over from the Luthéal. (Ex. 3.605.)



Example 3.605. M. Ravel: *L'enfant et les sortilèges* (1924), at cue 38. Editions Durand et Cie.

It is not known whether a Luthéal was actually used during the premiere of *L'enfant et les sortilèges* in Monte-Carlo on March 21, 1925. Rumours have it that the original Luthéal, which had served for the 1924 Paris première of *Tzigane*, was lost in a fire.[1127] The absolute lack of any trace as to what happened to any other Luthéal that may have been built makes one wonder. Cloetens certainly had entertained high hopes, applying for patents in at least four countries in two continents, no doubt aspiring to elaborate on the success of another of his inventions – the Orphéal[1128] – which earned him the 'grand prix' at the Exposition Universelle of 1910. Yet the Luthéal rapidly ended up shrouded in oblivion. The score for the opera, published in the year of the first performance, includes the piano in the instrumental nomenclature, with "luthéal" only in between brackets. The score of *Tzigane*, in the version for Luthéal, also says "for violin and piano" in the titles on the front and first pages and only a mentioning of the Luthéal in the list of versions with the price indications on the first page and above the first bars of the music. In 1926,

[1125] *L'enfant et les sortilèges* was commissioned as early as 1917, but most of the time it took to finish seems to have gone to matters different from the actual scoring of the music.
[1126] The "X" is our indication for those passages that are played with the regular piano sound. 1 and 2 are stops at the left of the keyboard, operating the lower range of the "Clavecin" (1) and "Harpe" (2) mechanisms; 3 (Harpe) and 4 (Clavecin) alter the sound of the upper range of the piano.
[1127] http://www.pianotopics.nl/20FB20.htm. Last accessed February 18, 2009.
[1128] The Orphéal was a combination of piano, organ and harmonium.

when *L'enfant et les sortilèges* was performed in the Paris Opéra Comique and *Tzigane* was also played again in Paris, no word on the Luthéal is to be found in any writings following such performances. Equally unknown is the number of Luthéals ever produced by either Pleyel or Cloetens.

It is significant that, already in the year of the opera's first performance, and in the first edition of its score, Ravel foresaw an alternative to the Luthéal. A performance note to the score of the opera strikingly advises: "By lack of a Luthéal, use an upright piano, and place a sheet of paper on the strings, at the indicated moments, to imitate the timbre of the harpsichord."[1129] Considering the timbral diversity of Cloetens' invention and the intricate application by Ravel of its potential, the single timbre of the paper preparation can only have been a disappointingly weak alternative. Furthermore, to "place" paper on the vertical strings of an upright piano is easier said than done, even when a page turner is relied upon.

It is hard to imagine that Ravel could seriously have considered such an impractical and artistically poor surrogate. That he most likely did not have a better alternative still does not explain how the paper preparation was even considered in the first place. Ravel entertained a close friendship with Delage and must have known about *Ragamalika* (see 3.4.2.7.2) – perhaps that was enough for Ravel to link up his predicament to the early prepared piano. Another possible way is the suggestion that the Paris opera relied on a piano thus prepared to imitate a harpsichord when such an instrument – still not very common at the time – was needed for a production of an 18th century opera.[1130]

3.4.2.6 1916-21 On the inside of the piano

Around the First World War, three composers – apparently independent from each other – experimented with playing on other parts of the piano besides the keyboard. After Rued Langgaard's and Percy Grainger's contributions, those of Henry Cowell will be treated separately in the course of the overview of his work on all extended techniques.

3.4.2.6.1 Rued[1131] Langgaard

Danish composer Langgaard was born in a bourgeois environment to parents who were both pianists. A child prodigy, he made his debut as an organist and improviser at age 11. Three years later he had his first orchestral composition played and at 19 an all-Langgaard symphonic concert was presented in Berlin. After this climax, Langgaard knew no break-through, no commissions, no pupils, and no significant posts. Only half of his works were performed during his lifetime (mostly once, mostly with himself as musician/conductor) and after his death, his music was forgotten until about the 1960's.

Langgaard's early compositions, until 1916, were written in the late romantic spirit of Schumann, Wagner and Strauss. From 1925 they were uncomplicated in their neoromantic tonalities, fitting the trends of neoclassical music and new objectivity.

[1129] " A défaut du Luthéal, employez un Piano droit, et mettez une feuille de papier sur les cordes, aux endroits indiqué, pour imiter la sonorité du clavecin."

[1130] Cotte 2002, p. 364. Upright Luthéals were also made, as stated on an advertisement by Cloetens' Orphéal company (Meijer 1982, p. 84), but no further conclusions can be made.

[1131] Named "Rud," he changed the spelling of his name to "Rued" in 1932.

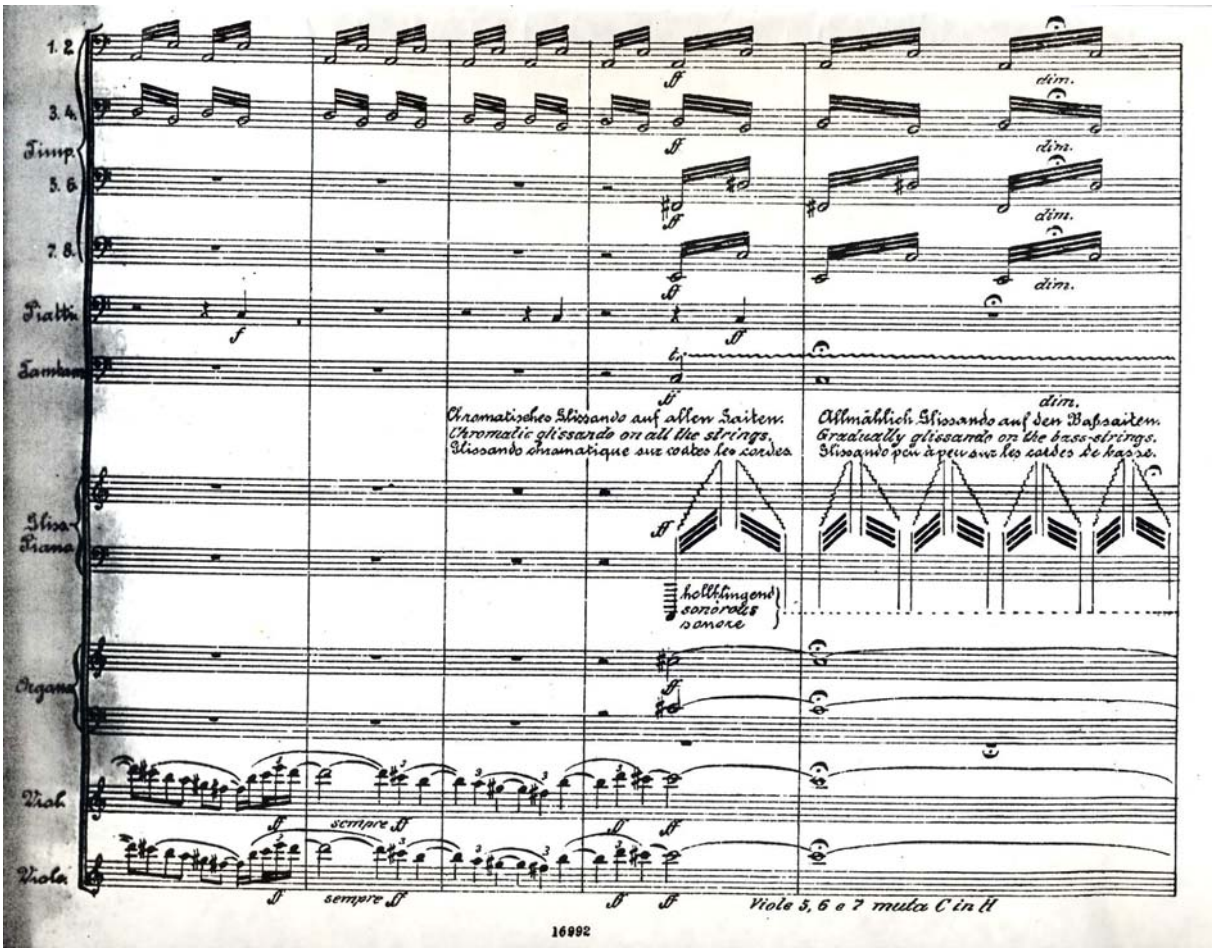
In between these periods of relative conformism, Langgaard had his "modernist" and artistically most fruitful period. From 1916 to 1924, he experimented with dissonance, form, apocalyptic themes and sounds of nature, machinery and "space."

The Music of the Spheres[1132] (1916-18) may be the prime example of this visionary period. In this original composition, Langgaard had "completely abandoned any sort of motif, planned structure, form or coherence" and called the piece "music cloaked in a black veil and the impenetrable mists of death."[1133] An introductory text in the published score reads:

> The celestial and earthly chaotic music from red glowing strings with which life plays with its predatory claws – with a rainbow-coloured crown round its marble-face with the stereotypic – yet living – demoniac and lily-like smile.[1134]
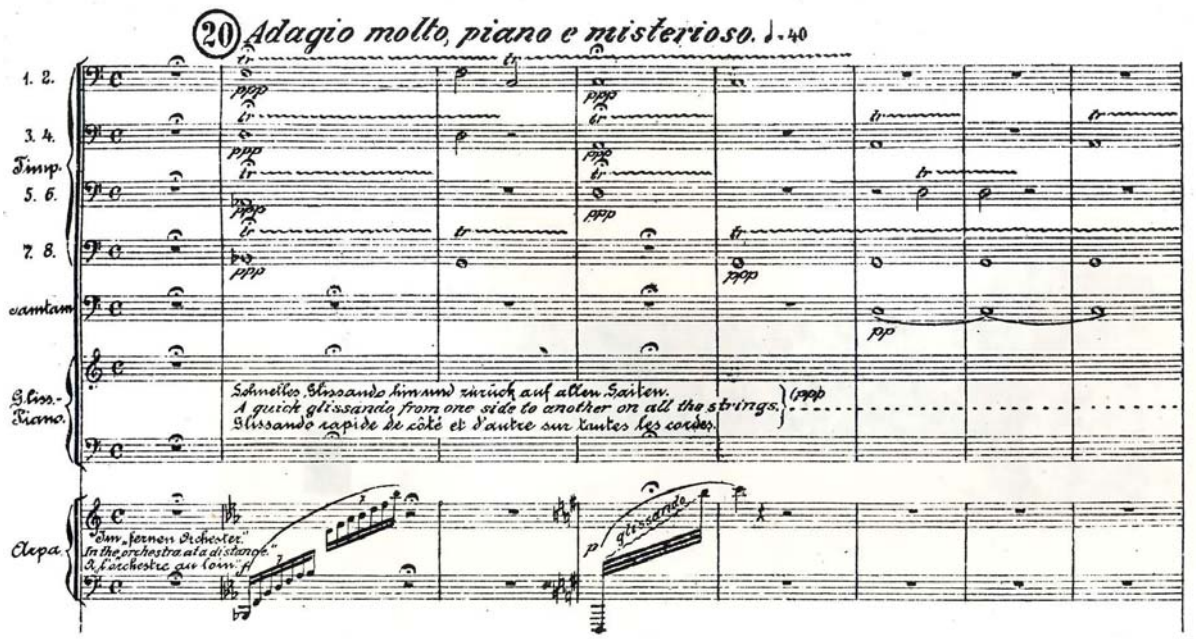
Written for soli, organ, large orchestra (e.g. 13 winds, 15 brass, 8 timpani) and choir, Langgaard also prescribed a 15-piece "distant" orchestra and – in the main ensemble – a "glissando-piano." The latter is clearly seen as a percussion instrument, with a footnote on the first page of the music explaining that only "the body with the strings of a piano" is needed. The introductory part of the piece, with 15-part divisi strings "Like sunbeams on a coffin decorated with sweet-smelling flowers,"[1135] slowly builds up towards a climax with all timpani in fortissimo and the glissando-piano entering with "sonorous" "chromatic glissandos on all the strings," evolving in a diminuendo towards bass-string glissandos only. (Ex. 3.606.)

[1132] The score, published in Kopenhagen & Leipzig by Wilhelm Hansen in 1919, has titles in Danish as well as in German, English and French. The texts in the music are in German, English and French.
[1133] See Nielsen 2007.
[1134] On page 2 of the score: "Die himmlische und irdische chaotische Musik von roten, glühenden Saiten, mit denen das Leben mit Raubtierkrallen spielt – mit der regenbogenfarbigen Krone um ihr marmarnes Anblitz mit dem stereotypen doch lebenden – dämonischen Lächeln wie von Lilienwänglein." / "La musique chaotique céleste et terrestre sortant des cordes rouges et ardentes avec lesquelles la vie joue aux griffes de bête féroce – la couronne irisée autour de son visage froid comme le marbre au sourire stéréotype – et pourtant vif - démoniaque et semblable au lis." An English version was printed also, with the main difference being that the French "cordes" and the German "Saiten" was translated into "chords." We have taken this as a mistake and translated it as "strings."
[1135] As indicated in the score.



Example 3.606. R. Langgaard: *The Music of the Spheres* (1916-18), p. 21. © Wilhelm Hansen.

At the end of *The Music of the Spheres*, the glissando-piano comes in once more, with soft glissandos "from on side to another on all the strings" over soft strings, timpani and chorus (singing "a"). Only the harp interrupts the tapestry by playing three glissandos in ascending dynamic until a fully orchestral chord ends the piece. (Ex. 3.607.)



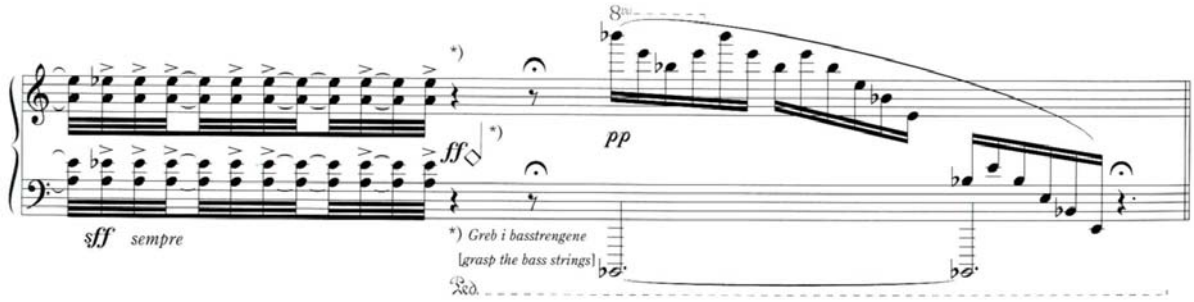
Example 3.607. R. Langgaard: *The Music of the Spheres* (1916-18), p. 69. © Wilhelm Hansen.

The Music of the Spheres was published in 1919, first performed in 1921 at Karlsruhe and again in 1922 in Berlin, after which the musical world forgot about it for some 40 years, when another Danish composer entered a competition anonymously with this score, prompting the jury to recognise one of the most original Danish compositions of the 20th century, and one jury member – Györgÿ Ligeti – to exclaim that he discovered himself to be "an epigone of Langgaard."[1136]

When composing *The Music of the Spheres*, Langgaard finished his *Insektarium* cycle of "9 Puzzle Pictures by Crótalus durissus"[1137] in April of 1917. In this work for solo piano the composer asks the performer to throw his hands in the air, play directly on the strings or to tap with his knuckles on the lid of the piano.

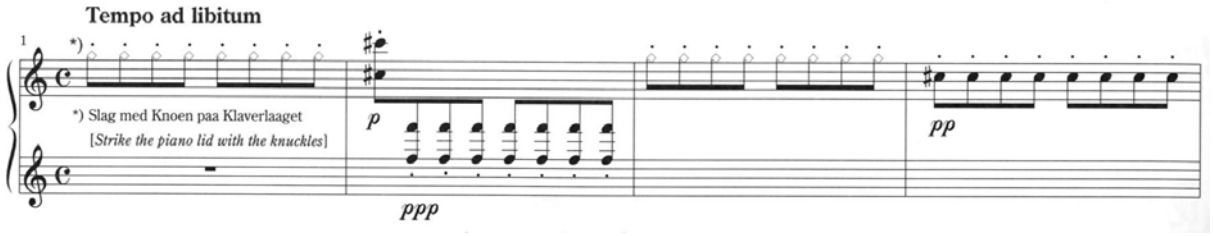
The first piece – describing the earwig (*Forficula auricularia*) – starts with soft "crawling" until a sudden "crazy" outburst of ad libitum repeated diminished fifth chords (with the tempo gradually reaching "the unbelievable") ends in a theatrical action of the pianist (again ad libitum), who may throw his "hands above the head."[1138] At the return of this outburst, a bass string is plucked vehemently, after which the crawling mode ends the short piece. (Ex. 3.608.)

[1136] Nielsen 2007.
[1137] *Crótalus durissus* is the Latin name of a South-American rattlesnake.
[1138] All indications are in Danish and in English in the printed score. (Rued Langgaard / Insektarium / 9 Fixerbilleder (for Piano) / BVN 14 / Afgrundsmusik / En Sonate for Klaver / BVN 169. © 1993 The Royal Library & The Society for Publication of Danish Music.)



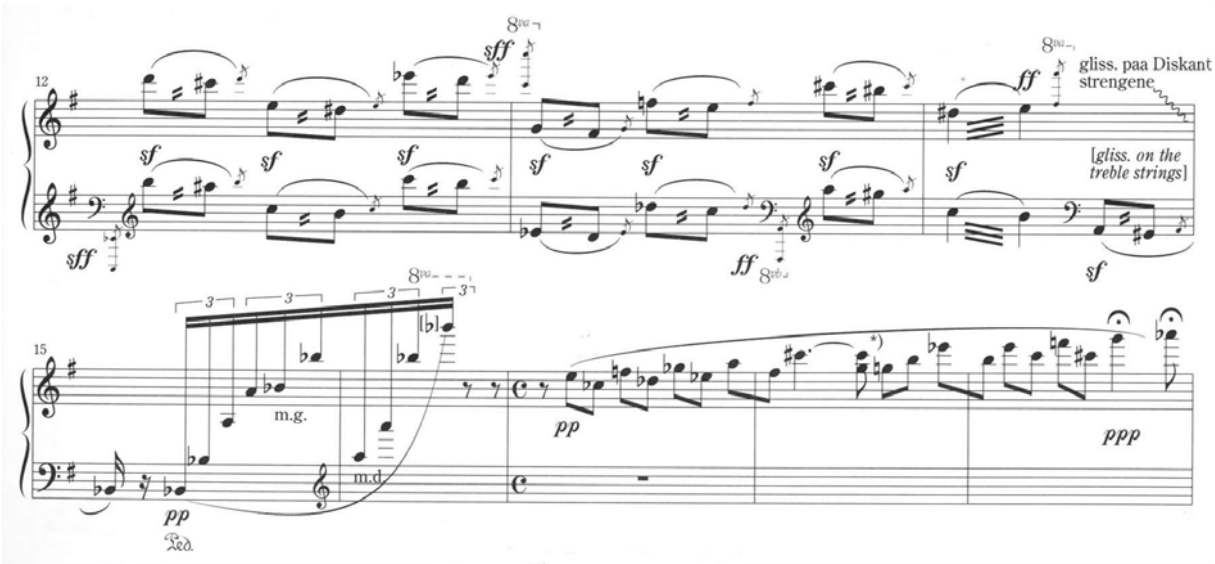
Example 3.608. R. Langgaard: *Insektarium* (1917), 1st "puzzle" *Forficula auricularia*, last line. © Society for Publication of Danish Music & The Royal Library.

In two of the 12-bars long sixth piece – about the deathwatch beetle or *Anobium pertinax* – the performer is asked to rhythmically hit the lid with his knuckles. (Ex. 3.609.)



Example 3.609. R. Langgaard: *Insektarium* (1917), 6th "puzzle" *Anobium Pertinax*, opening bars. © Society for Publication of Danish Music & The Royal Library.

The next number – *Musca domestica* or "the housefly" – contains a fast glissando on the treble strings. (Ex. 3.610.) Because of the tempo (*Agitato*), the preceding right hand octave on the keyboard and the time needed to get to the inside of the piano, the glissando is in effect a fast interrupting sweep over the strings rather than a run connecting the previous high part of the range with the subsequent low register.



Example 3.610. R. Langgaard: *Insektarium* (1917), 7th 'puzzle' *Musca domestica*, bar 12-19. © Society for Publication of Danish Music & The Royal Library.

The set of insect portraits was not performed until the 1970's and only published in 1993, making it unlikely to have had any influence on composers outside of Denmark, even if

one can wonder about the similarity between the *Anobium pertinax* and for instance Bartók's *From the diary of a fly*, number 142 from the sixth volume of his *Mikrokosmos* from the 1930's.

3.4.2.6.2 Percy Grainger

Though mostly known, remembered or appreciated as a classical pianist and a composer "wedded to folk song," [1139] Percy Aldridge Grainger (1882-1961) carried out wide-ranging experiments with sonority. He liked to include unusual and new instruments in his instrumentation[1140] and contributed seriously to the extension of percussion in classical orchestration.[1141] While his writing for non-pitched percussion compares to contemporaries such as Stravinsky, Grainger developed the melodic section to become a new, separate and equal entity in the orchestra, working independently even from the standard percussion section.[1142] He was the first to write for marimba in serious orchestral and band works, the first to use the vibraphone and worked closely with percussion manufacturers to develop the more unusual "tuneful" percussion instruments[1143]. Remarkable is his persistent interest in finger-operated keyboard versions (with damper pedal) of mallet percussion instruments, e.g. the Bar Piano and Bell Piano.[1144] If need be, he would have these developed specifically for his compositions, as for instance *The Warriors,* commissioned for Diaghilev Russian Ballet in 1913[1145], of which one version calls for four percussionists, eleven keyboard percussionists, three pianos, bell piano, bar piano and celesta.

It must have been a curious twist to his love for mallet percussion instruments fitted with a keyboard, urging Grainger to look at the issue the other way as well. In the first version of the score of *The Warriors*[1146] (including only two pianists), an annotation to the part of the second pianist reads "Strike the strings with leathertips of Deagan's Combination Marimba beater No 2017".[1147] This score was ended on December 1916, the

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[1139] Grainger is known to have declared himself "sick of always appearing only as a composer wedded to folk song." Quoted in Servadei 1996, p. 1.

[1140] *Tribute to Foster* is scored for voices, chorus, musical glasses and orchestra (1913-1916, 1931), *Beatless Music* and *Free Music* for four to six Theremins (1935-36), *Early One Morning* is for reed organ and two solovoxes. (A solovox was a monophonic keyboard attachment instrument, to be mounted under the piano keyboard and connected to an electronic sound generation box and speaker. Intended to accompany the piano with organ type lead voices, it was developed by the Hammond Organ Co in the US between 1940 and 1948.)

[1141] Grainger was born in Australia, spent his childhood there, studied in Germany, settled in London in 1901 and immigrated to the US in September 1914. Those works by Grainger that we will discuss were composed and completed in the US, hence treating them here.

[1142] Saoud 2001, p. 42-43.

[1143] Servadei 1996, p. 29: New York company R.H Mayland custom made Grainger's Steel Marimba (precursor of the vibraphone).

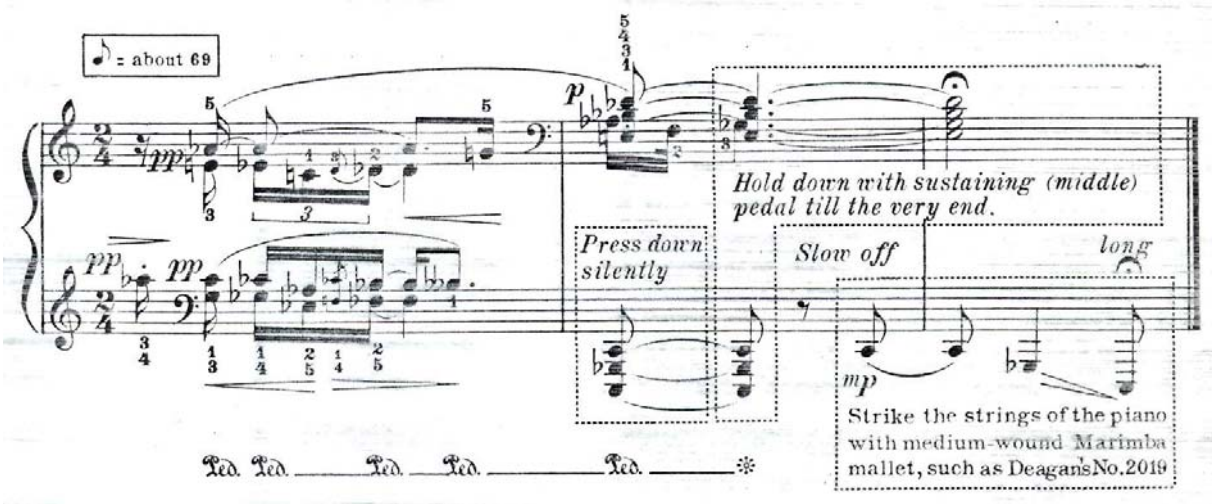
[1144] The Bar Piano sounds like a vibraphone; the Bell Piano is a keyboarded set of Staff Bells. Both allow for a choice of mallet hardness, both are now obsolete.

[1145] See Servadei 1996, p. 9-11 for the story on how the commission for a ballet became 'music to an imaginary ballet'.

[1146] This version has only two piano parts.

[1147] At bar 133. As this score was annotated to show changes that were incorporated into the published version (including the extra 3rd piano part), it would in principle be possible for this use of the mallets (and the accompanying prescription of the sustaining pedal to block the dampers of the notes that are to be played with the mallet) to have been added after 1916. There are annotations in the manuscript score that begin on page 19 in fine-lined black ink; dark, thicker black ink; and red ink. It would appear that the red ink and darker black ink are later additions, but the fine-lined black ink looks consistent with the rest of the original score. That the indication of the mallet action is written in the fine-lined black ink suggests that Grainger was indeed using this technique earlier than the date of the published score, that is, by the end of 1916. I am grateful Jennifer Hill, curatorial assistant to the Australian Grainger Museum for providing me with this information and insight.

year in which Grainger also completed *In a Nutshell*, a “suite from music to an imaginary ballet”[1148] The instrumentation for this four-piece set also includes tuneful percussion instruments, e.g. the Steel Marimba, the Wooden Marimbaphone, the Swiss Staff Bells and the Nabimba (all "marvelously perfected examples of American inventive ingenuity in the field of instrument-making"[1149]), grouped together with the usual xylophone, glockenspiel and celesta, for a total of 7 or 8 percussion players. At the end of the third part of the suite, Grainger asks the pianist to take out a Daegan mallet as well, this time No. 2019. (Ex. 3.611.)



Example 3.611. P. Grainger: *In a Nutshell*, Nr. 3, *Pastorale*, piano solo version (1916), final bars. Reproduced by permission of SCHOTT MUSIC GmbH & Co. KG, Mainz - Germany.

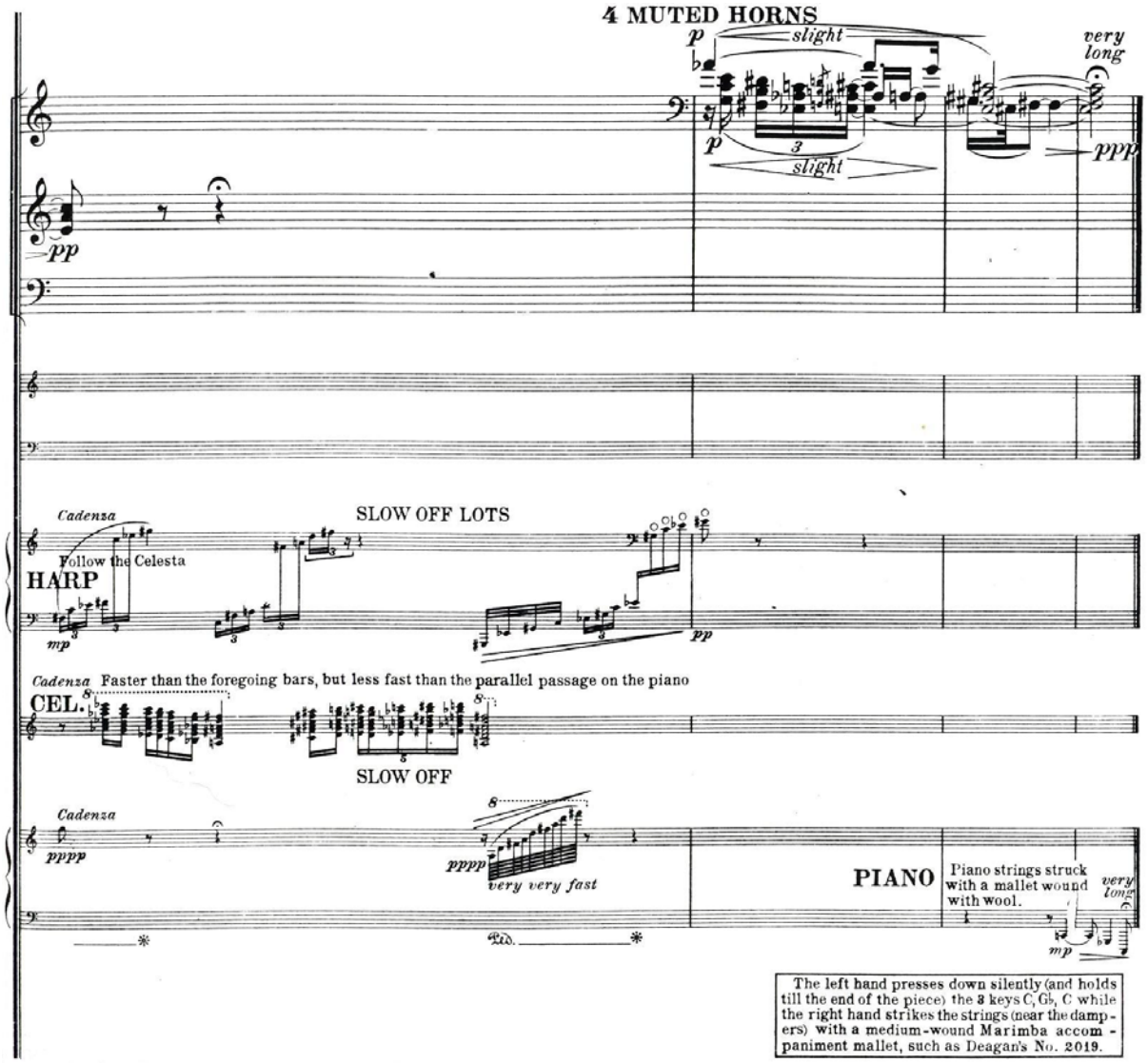
The left hand chord in the before last bar is to be depressed silently in order to provide the pianist not only with open strings (so the notes struck by the mallet will sound freely) but also with lifted dampers indicating which strings exactly have to be hit while standing bent over the keyboard. The effect is furthermore used with musical finesse, as the right hand chord is "colored in" at the very last minute, when the open strings start to vibrate and change the tonal reference from G♭7+ to something less defined.

Grainger clearly used his known-how and connections in the field of percussion tools an their manufacturers. That he specified types, brand and serial numbers of two different mallets in musically different but chronologically parallel compositions, shows that he must have been serious about testing the technique before writing out the result.

Two other versions of this four-piece set were made: one for 4-hands and one "for Orchestra, Piano, and Deagan Percussion Instruments." In the latter, the pianist is given more time to prepare for playing on the strings, as the orchestra takes over the music from the last four bars. (Ex. 3.612.)

[1148] In 1917, Grainger looked back on a productive four-year period as a composer and regarded both *The Warriors* and this *Pastorale* as "significant." (As quoted in Servadei 1996, p. 1.) According to the published score (1916), the Pastorale dates from 1915 and 1916 (composed in different cities in the US), put together and scored during the spring and summer of 1916 in New York City.

[1149] The Daegan percussion manufacturer built all four instruments. As quoted from Grainger’s preface to the 1916 edition. As if insisting on this composition being perceived as serious and not having anything to do with the light music he was apparently so famous for, his introduction begins with the assurance that no folk-songs or any other popular tunes are used in any if the numbers of this suite, and that the piano is not treated as a virtuoso solo instrument.



Example 3.612. P. Grainger: *In a Nutshell*, Nr. 3, *Pastorale*, piano and orchestra version (1916), final bars. Reproduced by permission of SCHOTT MUSIC GmbH & Co. KG, Mainz - Germany.

While the muted horns prepare the atmosphere, the pianist is given ample time to silently depress the right notes, change position an aim for the right strings.

All versions of this piece were published in the same year, but it looks as if the concerto version was thought of first. Grainger may not have needed orchestral rehearsals to confer with the percussionist present what kind of mallet would fit the effect and then notate the product's specifics: the composer had frequent contact at this time with the percussion manufacturer of these mallets.[1150] The delicate and intricate orchestration allows for the mallet effect much more than the when it is isolated at the end of a 10' long piano solo piece. The silently depressed keys work less well in the solo arrangement also because they will vibrate sympathetically with the right hand $G\flat^1$ still to be played. Finally, it seems likely that the overly detailed description of the mallet in the orchestral version was a result of the insecurity of a first experience, afterwards reduced to a more practical and less self-repeating text.

[1150] Saoud 2001, p. 43.

Grainger must have ended up liking 2019 mallet better, for in the early 1920's[1151] he prescribed that one again in the "Two Pianos / Six Hands" version of *The Warriors,* asking the first pianist to press down keys silently and block the dampers with the sustenuto pedal, or – in absence of such a pedal – to "wedge down these keys," and to "strike the piano strings with mallets wound with soft wool, such as Deagan's N°2019."[1152] This would be the first known instance of what we would call a "prepared keyboard," with rubber tuning wedges holding specific keys down while using the fingers for other actions.

[1151] Finished May 1922, published in the spring of 1923 and first performed on July 16, 1925at the Chicago Musical College. (Servadei 1996, Appendix 4.) According to the Grainger museum in Melbourne, Australia, the technique may have been part of the first version

[1152] Bars 131-137, as described in Servadei 1996, p. 94.

3.4.2.2 1913- Henry Cowell: trailblazing toward the extended piano

If there is one composer who deserves special attention in any discussion on extended techniques, it is Henry Dixon Cowell (1897-1965). Of his more than 500 works for or including the piano (roughly half of the total output), at least 63 extant compositions contain instances of cluster technique and 32 require the pianist to play directly on the strings.[1153] Cowell must be considered a pioneer in the way he handled many techniques and effects, bringing new and existing ones (not knowing they already existed) to the level of objective compositional material, combining them into what is the first attempt at synthesis of the extended piano sounds, even developing and publishing the first musical theories for the cluster. Like Franz Liszt with the glissando, Cowell lived through a long and personal relationship with many extended techniques, presenting us with a major opportunity to study the way a composer's vision of the extended piano, and his performance practical attitude towards it, can evolve and mature over time and repertoire.

Born in California, Henry Cowell was raised in Bohemian fashion "to be free, independent, progressive, literate, versatile, devoted to nature in both its scientific and poetic aspects, versed in religious tradition but skeptical, and perhaps above all, devoted to art."[1154] Much, if not most, of this was done at home and away from public schooling. Impressing neighbors by his singing, he was given a mandolin-harp – "a kind of zither" – for his fourth birthday and a violin before his fifth, taking lessons until he offended his conservative teacher. A nervous disorder – juvenile chorea (a.k.a. "St. Vitus' Dance") – troubled Cowell from 1906 till at least 1914 with convulsions like the so-called "Milkmaid's grip," which clenches the hands uncontrollably into fists. Cowell's youth was further characterized by his father leaving the family, resulting in wanderings to New York and relatives in the Midwest as well as periods of dire poverty. In 1910 he returned to California, relieved to leave the country and the city. Little more than a month before his fifteenth birthday, he was able to buy his first upright piano, a cheap instrument "so badly worn that it could not be kept in tune without paying sums to a tuner almost equal to the rent of an instrument."[1155] Within a month he started to take lessons. In October 1912 a better instrument was brought in.

3.4.2.7.1 Early works

Between 1907 and 1913, Cowell's first attempts at composing are of a typical juvenile kind, with titles showing how a limited perspective can be compensated for by imagination and musical ambition. Next to pieces like *The Waves* (L1)[1156], *The Wierd* [sic]

[1153] Lichtenwanger 1986 describes 966 compositions by title, some incomplete and others not located. In the summer of 1998 I went through 695 pieces in all the manuscripts containing music for piano as available at the Library of Congress. Except for the five *Encores* to *Dynamic Motion*, which are all known mostly as separate pieces, we counted titles as listed in Lichtenwanger 1986, even if a title consists of more than one piece (e.g. *The Building of Bamba* with three pieces based on clusters, or the *Concerto for Piano and Orchestra*). We did not count arrangements of solo piano works into the concerto format when the solo pieces were already counted (e.g. the four cluster pieces of the *Four Irish Tales* for piano and orchestra), neither did we take into account those works in which cluster chords or clustered aggregates appear but no cluster technique. The two numbers do overlap, though, with some works containing both clusters and inside playing. Lost but documented works are counted when proof exists of the use of extended techniques.
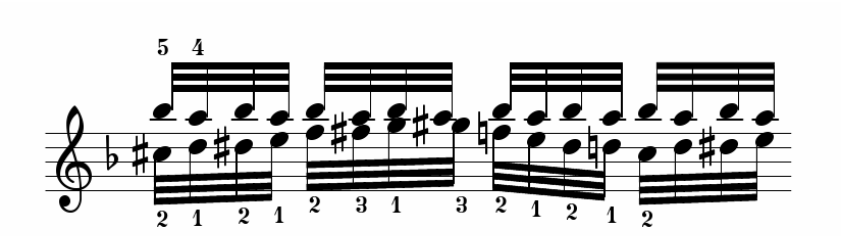
[1154] Hicks 2002, p. 16. All biographical information is taken from this highly detailed and expertly researched chronicle of Cowell's early years.

[1155] According to his mother's "Material for a biography," as cited in Hicks 2002, p. 35.

[1156] According to a letter from his mother to his father, identified by Cowell's later wife Sidney Robertson Cowell as having been sent in 1907, Henry Cowell wrote the poem to this song, of which only the words and melodic line survive. (As in Lichtenwanger 1986, p. 1.) This seems to be the oldest reference to music by Henry

Night (L9), *The Dinosaur's Skirt Dance* (L11) and *Flashes of Hell Fire: A Dance of Devils* (L27/4), there are *The Night Sound: A Sonata* (L10 – containing the indication 'il basso poco marcato'), a *Piano Quartette* (L24) and a *Quasi Fuga* (L25). The former deliver the tone depicting experiments they seem to promise as little as the latter lack any mastery of (and concentration on) the forms they announce. This can and should of course be forgiven to a composer who wrote at least 93 pieces in those six years before his sixteenth birthday[1157].

Between January and May of 1913, Cowell's compositional and pianistic perspectives start to broaden. His boyhood imagination is still running wild, but the captions – e.g. *Freak de concert* (L30), *Savage Suite* (L40 – with pieces like *Savage Dance*, *Savage Music*, *War Dance*, *Fire Dance*, *Funeral March of the Natives*, *A Savage Rhythm* and *A War*) or *Message from Mars* (L46) – still do not deliver any of the musical primitivism or modernism they suggest. In this first quarter of 1913, it is mostly a more historical awareness that starts to come to the foreground, with for instance a *Nocturne* (L29) or a *Valse Lente* (L34), an *Invention quasi Bach, a tre voce* (L37) or a *Quasi Mozart* (L47), and preludes (L32, L33), romances (L39, L57) and four sonatas (L49, L56/1-3). In his piano technique also, Cowell clearly attempts at transcending his level in the classical tradition, with for instance double note passages reminding us of Liszt's *Feux Follets* – as well as of Cowell's large hands – (*Etude*, L51 – ex. 3.613). Only some glissandos the size of half the keyboard (*Sonata in B major*, L56/3) or for the right hand thumb (last page of *Savage Suite*, L40), or the minor 9th tremolos with dyads at each end of the stretch (*Sonata in B major,* L56/3) ever so slightly suggest anything musically extravagant is coming.



Example 3.613. H. Cowell: Etude in d minor (1913), bar 10, right hand staff. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Nevertheless, during the summer of 1913 this development seems to have reached a point where our story needs to pick it up in more detail. The *Adventures in Harmony (A Novelette)* (L59) can safely be considered a milestone in the early work of Cowell's. Its length (34 pages), organization (Chapters I-VI, identifiably conceived as a whole instead of heterogeneously assembled from existing pieces) and the fact that he played this at the recital he considered the beginning of his professional career as pianist and composer[1158], are new to the young oeuvre. Much more important to us here: this set contains the earliest found evidence of Cowell's clusters.

As with more than one composer in the first decades of the 20th century, dating their works is a slippery path with more than one pothole in the road. *Adventures in Harmony* was likely finished by June 10, 1913. None of the primary and secondary sources are in

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Cowell. It is listed as number 1 in Lichtenwanger's meticulously compiled descriptive catalogue. We will use his numbering (e.g. "L51") throughout these pages on Henry Cowell.

[1157] Only eight of these pieces are not for piano alone: Song (L52, L92) four-part choir (L53) violin and piano (L71, L74), piano quartet for three violins and piano (L24), flute (L80), string quintet (L81).

[1158] Lichtenwanger 1986, p. 14-15. That recital was on March 5, 1914, in San Francisco.

conclusive agreement on this date[1159] and there is the distinct possibility that the set was worked on or at least in part conceived before June of that year. Writing 34 pages in just the 10 days since having finished the previous piece on May 30th seems a lot, though according to Cowell's own list of that time, he accelerated from 21 works (some 55 pages of pencil drafts) in the three months between January and April of 1913 to 9 works (41 pages) in the month of May alone.[1160] At least this argument sounds more convincing than the other side of the perspective. 1911 seems unlikely early when comparing the music of the *Adventures* to what Cowell realized two years before, especially considering how so many of his earliest works are left unfinished and show how his composing talent struggles to keep up with his mind's hunger for fast changes in interest. There are no indications that young Cowell – however precocious he was considered to be[1161] – was able to let creative ideas rest over long stretches of time, and two years is a very long time when one grows from ages 14 to 16. There is no early sketch or draft showing signs of reworking music over time either. Finally, there is no discernable reason why Cowell would have put in the 1913 date if he had performed it in 1912 and/or written as early as 1911.

Whenever between 1911 and 1914 Cowell conceived, composed, completed and performed his *Adventures in Harmony*, in that period he hardly could have known Ives' intentions towards the cluster technique (we are not even certain how much of them were clear to Ives himself at that very time – see above). Neither could Cowell have heard or seen clusters by Ornstein, for the latter only changed his style towards cluster technique from that summer of 1913 onwards (see above). Whatever their exact date, Cowell's harmonic adventures also remain the first known of his music to contain signs of keyboard clusters.[1162]

[1159] Cowell's own "Compository Dates" notebook (started in 1913, deposited in the Library of Congress and reproduced "as exactly as possible" in Godwin 1969, p. 403-422) originally lists this set of pieces as opus 34 from June 10, 1913 (Godwin 1969, p. 406). At some time the remark "1911--. To Mrs. Veblen -- I performed it at arts and crafts in Carmel" was added to the CD list (Lichtenwanger 1986, p. 14), an addition not reproduced in Godwin and therefore from in between 1969 and 1986. In the main text of Godwin, and in his own list of Cowell's works ("each with as much information as was available to me as of May 1969"), 1911 is used as the date for the composition, based on the "date written by H.C. or S.R.C. on manuscript" (Godwin 1969, p. 21 (main text), p. 399 (explanation of source) and p. 424 (listing of Cowell's compositions). However, that manuscript (there is only one known) contains an insert stating " piano adventures in harmony 1911-12." (Manuscript consulted by author at the Library of Congress on August 19, 1998). To make matters more confusing, at some point (Lichtenwanger 1986, p. 14 - the way he mentions the additions suggests that they took place at different moments) "later information" was added to the date in the Compository Dates notebook "from HC via SRC's hand": "Performance was June 10, 1913," probably meant to prove that it is only logical that the pieces were written before that date while still administering a reason for Cowell to have put down that particular date in the list. However, this addition in turn contrasts with an earlier recorded statement that the *Adventures* were "played by H.C. at his first recital (12 March 1912)" (Godwin 1969, p. 424, in the list with the information available to him by 1969). That Godwin did not seem to know Lichtenwanger's information points to the latter having "come to light" after 1969 (when Godwin completed his research, four years after Henry Cowell's death), most likely then by Sidney Robertson Cowell. This later addition may also have been meant to assure that the music was written before June 10, 1913. Unfortunately, both attempts contradict each other and we have no evidence of the 1912 performance. The first public mentioning of the *Adventures in Harmony* is given in two newspaper reviews the day after a recital on March 5, 1914 (in the *San Francisco Chronicle* and *San Francisco Examiner* – see Hicks 1993, p. 434 and 436). It is odd that none of the recent probes into Cowell and his clusters, making full use of both Godwin and Lichtenwanger, mention this discrepancy between the earliest suggested date (1911) and the first evidence (1913/14) (Hicks 1993 (p. 434: "safely dated at 1913") and Hicks 2002 (p. 44 – "June 1913")), even if some are well aware of the challenges in sorting out Cowell dates from among attempts to 'clarify' historical chronology and questions of primacy, discussing the problems at length and in detail (Hicks 1993 (p. 433) and Hicks 2002 (p. 4-7)).
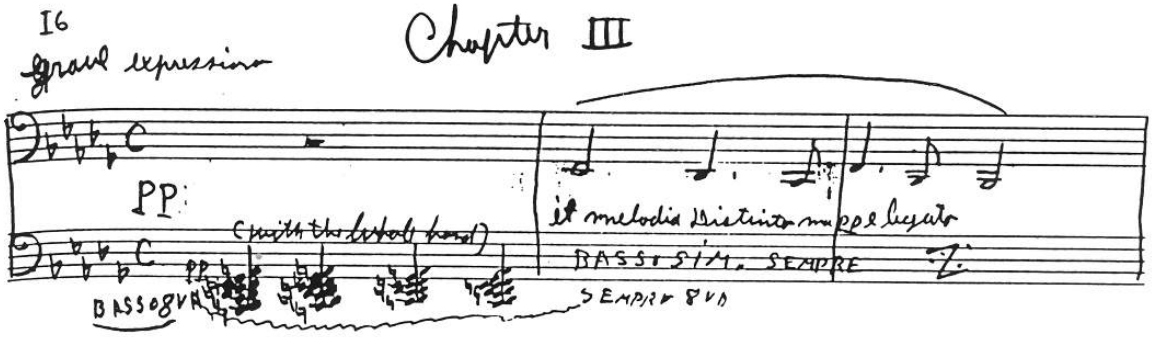
[1160] According to Lichtenwanger 1986, p. 8-14. Obviously, lost but listed pieces are not included in this count.

[1161] See Hicks 2002, p. 16-17 and 32-33.

[1162] As for what Slonimsky called this "remarkable synchronization of invention" (Slonimsky 1994, p. 150, "5 March 1914"), the present study cannot possibly be extended towards solving the question as to why the years
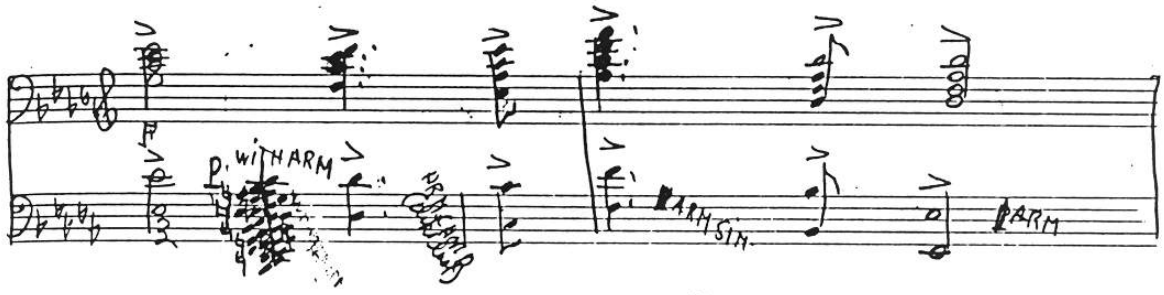
On the insert in the manuscript, it is mentioned "first tone clusters p. 6. " The densest chord we find on that page is E#-G#-A#-B. While it is contextually atonal and certainly an ergonomically comfortable aggregate, it has nothing to do with the clusters that Cowell later identified as such in his writings and statements.

It is really only in the third chapter (*Grave expressive*) on pages 16-18 that Cowell first notated clusters and their performance technique. (Ex. 3.614.) They are written out note for note and the added advise in between brackets ("with the whole hand") shows how – at least in Cowell's mind – pianists would wonder about how to play these chords without the ergonomical indication. In fact, Cowell may well have been so careful to notate the performance technique of the cluster as elaborately as possible (even if he forgot a few notes) given his documented interest in finding a publisher. [1163]



Example 3.614. H. Cowell: *Adventures in Harmony (A Novelette)*, Chapter III (1913) opening bars. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

It is not immediately clear whether these are diatonic or fully dodecaphonic clusters: with ten notes there is too much for the white key kind and not enough for the chromatic one. By the next page, we find such clusters for the whole arm, again written out in full, this time too many notes for even a chromatic cluster in what appears to be a two-octave $B\flat^1$ - c^1 stretch. Very soon after this muddle, the notation is limited to just a vertical line with the added remark "arm chord," then even that further diminished to a short thick stripe and "arm." (Ex. 3.615.)

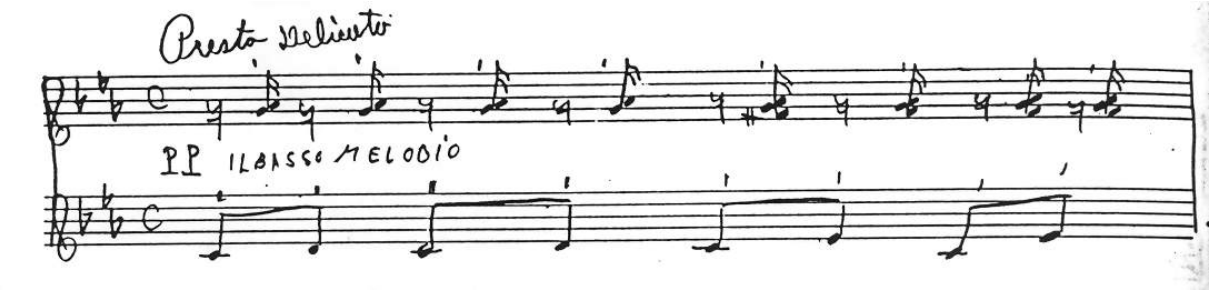


Example 3.615. H. Cowell: *Adventures in Harmony (A Novelette)*, Chapter III (1913) bars 12-13. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

around 1913 seem to have been such an accumulation of simultaneous yet seemingly unrelated epoch making events such as the world premieres of Stravinsky's Rite of Spring and Schoenberg's Pierrot Lunaire and Five Orchestral Pieces, Cowell's and Rebikow's clusters, Russolo's *Futurist Manifesto* and *Intonarumore* concerts, etc.
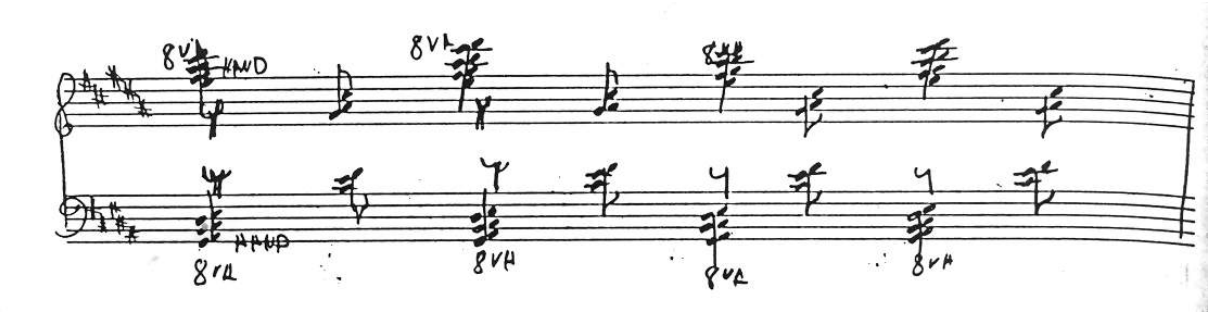
[1163] On June 1st of 1913, he had sent his *Savage Suite* to Schirmer. Apparently it was rejected.

In chapter V there are some "clustered" three-note chords, but these contain two consecutive seconds at most. (Ex. 3.616.)



Example 3.616. H. Cowell: *Adventures in Harmony (A Novelette)*, Chapter V (1913), opening bar. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Only three pages later do we encounter the cluster again, with palm clusters in both hands. (Ex. 3.617.) Again, it is not clear which cluster Cowell intended here. They are likely pentatonic, in accordance with the backbeat chords on the black keys.



Example 3.617. H. Cowell: *Adventures in Harmony (A Novelette)*, Chapter V (1913), bar 27. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

All in all, Cowell's first clusters are non-descriptive, rhythmic and "orchestral" in function. As such, they fit well in this composition, much of which relates to the well known 19th century (and today still advocated[1164]) "grand manner," with examples as Liszt, the larger compositions of Schumann and Brahms, etc. The work was dedicated to Cowell's piano teacher, Mrs. Veblen, no doubt where he saw, heard or otherwise got to know such repertoire. The hand cluster of the beginning will become typical of one kind of cluster in Cowell's work: soft low right-hand melody in the bass with soft chords even lower, so that their sound become less defined and a cluster is not too far from appropriate, even in a tonal environment.

Since Cowell's clusters seem to have appeared in his work without any possible evolutionary explanation – as was the case with Ives and Ornstein – a peculiar reason has been established. There is, of course, the unavoidable association of Cowell's youth with any child's attempt at getting sounds from the piano by pounding its keyboard by lack of necessary dexterity. Cowell may well have had pains playing chords when fits of the "milkmaid's grip" turned his hands uncontrollably into fists. On the other hand, one might just as well think that such convulsions would force Henry to play not with the

[1164] This mode of interpretation is based upon techniques borrowed from 19th century opera singing and orchestral playing. The author has had teachers who taught pianists to play with rubato concepts determined by (vocal) legato and (orchestral) color.

open palms of the hand (as in the *Adventures in Harmony*) but rather with the fists, which he did not compose for until the end of 1916, five years after the last evidence of these spasms was recorded.[1165]

Next to such indirect evidence of possible preconditioning, there are other reasons that may have been more of a real impetus than universal childlike playfulness or painful pathological symptoms. Cowell's parents were philosophical anarchists and through his upbringing their ideas may certainly have helped Cowell overcome any feelings of impropriety when using hands and arms to "accept natural sounds and noise as appropriate musical materials."[1166] Even if the latter were not yet evidenced in pieces like *The Night Sound* (L10 – ca 1910), it would appear in very unabashed fashion in the first piece he wrote after the *Adventures in Harmony* (cf. below). More concrete – if still circumstantial – events that could point towards Cowell's interest in the cluster sound and its technique is the fact that he wrote *The Battle Sonata* (L87) in the same year. Had he seen or heard perform one of the popular European battle pieces, e.g. one by Viguerie or Ricksecker?[1167]

As little as these reasons constitute "hard" evidence, they may be more close to the logic of events than the story that "first he heard the clusters of sounds; then he invented the medium for their expression."[1168] Cowell reminisced this way in the 1930's and had already done so in 1926:

> As a child I was compelled to make my mind into a musical instrument because between the ages of eight and fourteen years I had no other, yet desired strongly to hear music frequently. [...] so I formed the habit [...] of deliberately rehearsing the compositions I heard and liked, in order that I might play them over mentally whenever I chose. [...] No sooner did I begin this self-training than I had at times curious experiences of having glorious sounds leap unexpectedly into my mind – original melodies and complete harmonies such as I could not conjure forth at will, and exalted qualities of tone such as I had never heard nor before imagined. I had at first not the slightest control over what was being played in my mind at these times; I could not bring the music about at will, nor could I capture the material sufficiently to write it down. Perhaps these experiences constituted what is known as "inspiration."[1169]

Cowell mentioned these experiences – which were from 1908 – after Antheil and Ornstein had used similar arguments to explain their stylistic epiphanies. In an article on Leo Ornstein in Musical America from 1914, it is claimed

> One morning he went to the piano and played a chord which he had mentally heard. He was skeptical of its significance at first; then he sat down and wrote an

[1165] To be fair, the argument of the influence of Cowell's disease (Hicks 2002, p. 47) is that Cowell "still exhibited choreic symptoms when he was fourteen, the year he bought his first piano. However obliquely, his pathology must have affected his technique." No specifics are known to substantiate such "influence" other than the deduction that Cowell would think of composing for fingers and hands/arms because he may not always have been able to use his fingers in the past.
[1166] Nathan Rubin, 26 Pianos at mills, p. 2
[1167] Number 87 in Lichtenwanger 1986, p. 22. According to the Compository Dates, the sonata was finished in 1913 without further precision, but listed after the *Adventures* (which carry Nr. 34). Lichtenwanger states this to be a belated entry.
[1168] As quoted in Hicks 2002, p. 48.This is what Cowell told Homer Henley who then wrote it in "*Music: The Anatomy of Dissonance*" for *Argonaut* in 1932.
[1169] Cowell 1926, p. 235.

> entire composition following on this chord. It was unnamed then, but it is now the "Funeral March of the dwarves."[1170]

Two years later, he was quoted as saying:

> Suddenly the new thing came to me, and I began to write and play in the style which has become identified with my name.[1171]

Later, in 1945, Antheil would tell of his experiences in 1922:

> I dreamed, simply, that I was living during some future period, a time of "The Great Peace." […] I found myself walking along a pathway of small residential buildings. Out of them, as I passed it, came the music of a symphony orchestra playing – my music! But it was not similar to anything I had written or, indeed, to anything I had known. […] I woke up, and as I have a very retentive, almost "photographic" ear – which often outwits me when I get to liking and hearing too much of any composer's work – I immediately snatched a piece of blank music paper and, for the next two hours, wrestled with the problem of getting down as many fragments of the music as I could remember. These, as I discovered the following morning, were very unsatisfactory. [… One month later Antheil returned to the manuscript containing his dream "hieroglyphics"] I sat down at my piano and played them, over and over. Then, grabbing a piece of music paper, I wrote as if by automatic writing a whole but very difficult piano sonata, the "Airplane Sonata." I called it that because, as a symbol, the airplane seemed most indicative of that future into which I wanted to escape.[1172]

These stories were certainly influenced by each other and by a general inclination to account for musical ideas as "inventions" by way of inexplicable inspiration – especially in the heydays of modernism, when possible influences must be denied to preserve innocence and primacy. How these remembered or recounted stories relate to each other is difficult to unravel. We will come back to how and when Cowell met Ornstein, and how Antheil and his music relates to both. For now it suffices to point out how hard it is to believe that Cowell first heard the clusters and then invented the medium for their expression. The "invention" and "medium" refers directly to his *New Musical Resources*, the book for which he started to prepare in 1914 at the very earliest, when he met Carl Seeger who would encourage him to develop theories upon which to base his musical ideas.

Further considering realistic and direct links from Cowell's world to his first clusters, it should be noted that the lack of properly tuned instruments – such as his first piano – will make the pianist lenient towards sounds that do not fit what is in the score. An out of tune C major chord in the deep bass may sound much more inappropriate than a diatonic cluster. After playing in F# major on an out-of-tune piano, a black-key cluster on a tuned instrument gives an altogether less noisy and more consonant impression. Finally, it is certainly credible that he had been used to imagining sounds and chords by lack of

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[1170] As quoted in Broyles and Von Glahn 2007, p. 62. According to Broyles and Von Glahn, *Funeral March of the Dwarves* is nr. 6 in *Dwarf Suite* (see 3.4.2.3.3.2). In the score of this set, however, this piece is called *Funeral March of the Gnomes* and placed nr. 3.

[1171] From *Music and Bad Manners* by Carl Van Vlechten, 1916, as quoted in Broyles and Von Glahn 2007, p. 66. Sixty years later, Ornstein is still used to telling how "I remember when I first began to hear the inklings of the *Danse Sauvage* and the *Impressions of Notre Dame*, I happened to be in Vienna. … I began to hear these things. I remember that actually the start of the "Impressions of Notre Dame," I began to put down the notes." (From an interview with Ornstein by Vivian Perlis (Yale University Archives of Oral History American Music), as quoted in Broyles and Von Glahn 2007, P. 68.)

[1172] Antheil 1945, p. 22.

instruments[1173] – but as he did not have perfect pitch, "hearing" cluster sounds will most likely have meant hearing unpitched sounds (noise) and trying to come up with a musical configuration for it to reproduce it on the keyboard, much like Ives' father is reported to have experimented with. Which sounds he had had in mind when he wrote *Adventures in Harmony*, remains unclear.

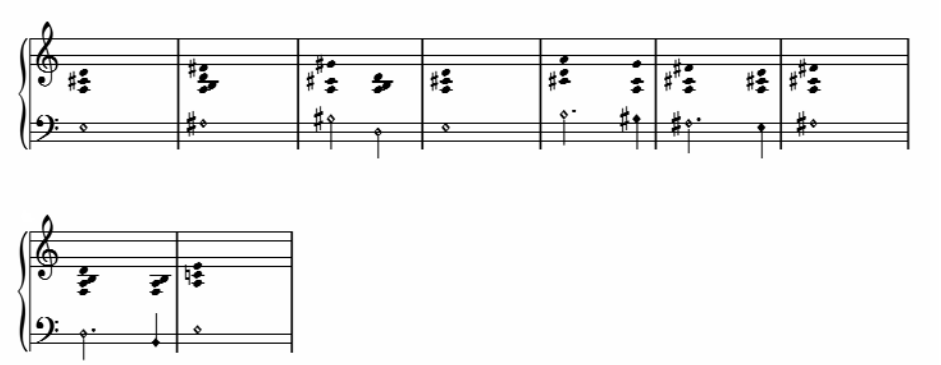
In terms of harmonic adventure, the satirical polytonality Cowell thought of for his *Sounds from a Conservatory* (L60) – depicting different students simultaneously practicing a Haydn sonata in B♭, a D major scale (including the mistakes and ensuing refuge to the easier D♭ scale) and some favorite waltz in B (unaware of Ives at this time) – is more daring in sound than the clusters he wrote just before.

On the lookout for other experiments in early Cowell, works like the *Sonate Progressive* (L83) or *Modern Stucke* (L104/7 – lost) look promising, but apart from some tremolos in *Orchestra Stucke* (L84), we have to wait until 1914 to find more novelties.[1174] In the mean time, Cowell became visibly interested again in old masters such as in *Chopin* (L108/1 with chromatic sixths in the right hand), *Brahms* (L108/2 with left hand jumps of a tenth), *Schumann* (L108/3) and *Grieg* (L108/4), spending some time in the summer with the sonata form until he wrote a *Resumé in Ten Movements* (L120). As it was the opus 100 on his list, the suite may have felt like a "compendium of his achievements as a composer thus far,"[1175] although not a single cluster is in it. Going on the titles of the individual pieces (*Savage*, *Choral*, *Contrapuntal*, *Classic Sonata*, *Folk Music*, *Romantic*, *Operatic*, *Oriental*, *Modern* and *Futurist*), and on his compositional interests in the preceding months, the set was more likely to be a historical overview, the kind Cowell would enjoy presenting in lessons and writings in the decades to come and which would translate into the "innate eclecticism"[1176] of his musical work. According to his mother, he had written all 44 pages in less than a week, interrupted only for an evening out and to visit the Palo Alto library in order to (according to Sidney Robertson Cowell) learn how to write a fugue, "which he felt he needed in his *Resumé*."[1177] How far advanced he was in putting his "resume" to paper we don't know. It is clear however that he was introduced to Charles Louis Seeger jr. before the set was finished. In the early Fall of 1914[1178], Henry played his *Adventures in Harmony* before the young college professor, who responded by showing some of his own music, the last preludes by Skryabin and Schoenberg's opus 11 (including the "Klavierflageolett").[1179] Cowell remembers how Seeger added tactfully: "You might like to see how someone else has handled similar problems."[1180] He must not have referred to Cowell's use of clusters but rather attempted to initiate a leap forward in the education of the young composer. Cowell in turn took it

[1173] See Hicks 2002, p. 23, 25-26.
[1174] Godwin 1969 (p. 25) considers the upwards and downwards chromatic run in Chapter III of *Adventures in Harmony* an arpeggiated cluster (Hicks 1993, p. 435 agrees) but, from our point of view, this is not meaningfully related to clusters. It is in principle no different than any scale, and as such some of the runs in Cowell's earlier works, e.g. in *Night Sound-A Sonata* (L10 – 1910/11), would also qualify.
[1175] As seen by Hicks 2002, p. 62.
[1176] Nicholls 1990, p.134.
[1177] As quoted in Lichtenwanger 1986, p. 32.
[1178] Weisgall 1959 (p. 487) as well as Seeger himself (1940, p. 288) report that the first formal session with Seeger took place in the fall of 1913. Lichtenwanger 1986 lists 1914 (p. xxvii), as does his biographer Pescatello (1992, p. 64). In an interview by Andrea Olmstead, Seeger disentangled the matter by calculating that Cowell took lessons from him for three and a half years before he (Cowell) was drafted in the Army in 1918. Two articles from the early 1920's also confirm that it was in fact 1914. (Michael Hicks 2002, p. 66-68.) Hicks deduces that Cowell began classes at Berkeley on Tuesday, 15 September 1914.
[1179] Seeger ordered scores from European composers (Debussy, Satie, Ravel, Skryabin) as they were published). He also was sent unpublished scores by Ives, which he showed Cowell, but is not clear about whether this was as early as 1914. (Seeger 1977, p. 8.)
[1180] Weisgall 1959, p. 487. See also Pescatello 1992, p. 65.

to heart and immediately incorporated the silently depressed keys technique into his own work and on his own terms.
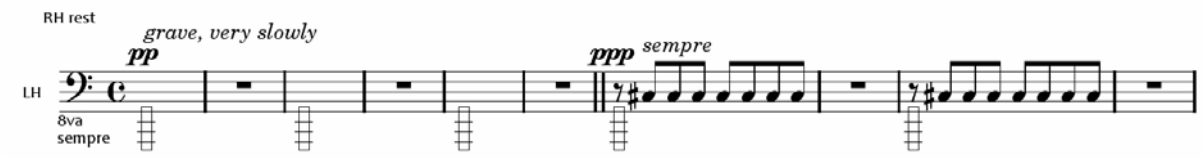
The 9th movement – *Modern* – of this set consists in itself of two parts: *Earlier modern* and the *Rag*. The former is written as a sonata in one movement (*Moderato maestoso – lento – Allegro scherzando*), of which the slow part contains diamond shaped note-heads indicating bass notes to be held down and sounded as overtones by sympathetic vibrations. (Ex. 3.618.)



Example 3.618. H. Cowell: *Resumé*, Movement 9 *Modern*, part I *Earlier modern* (1914), excerpt transcribed from the manuscript, page 40. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Cowell had already heard Schoenberg's first string quartet in the summer[1181], now he had a chance of profiling himself against the European "ultramodernist." In contrast with opus 11, Cowell deploys the technique of silently depressed keys for melodic purposes, unfortunately underestimating its potential, as clearly audible as it is in the Schoenberg instance.

It was probably Seeger who was informed enough about what went on in Europe to enlighten Cowell of the recent 1913 futurist actions[1182], leading to the completion of the *Resumé* with the tenth and final "futurist" movement. Cowell must (still) not have associated futurist noise with the cluster for there are none to be found. Sometime in 1914 Cowell did seem to have considered his invention, the cluster, worthy of a follow-up. The exact date is not known, and he did not list it in his summing up of compository dates, but *The Prelude* (L151) shows the very reason for which Cowell elaborated on the opening of the 3rd chapter of the *Adventures in Harmony*.[1183] (Ex. 3.619.)



Example 3.619. H. Cowell: *The Prelude* (ca 1914), opening bars. Excerpt transcribed from the manuscript, page 40. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

[1181] Hicks 2002, p. 60.

[1182] In March 1913, Russolo issued his Futurist manifesto "legislating the fundamental tenets of Art of Noises" (Slonimsky 1994, p. 139, "11 March 1913") and in June of that year, he presented for the first time in public his ensemble of Intonarumore (Slonimsky 1994, p. 143, '2 June 1913').

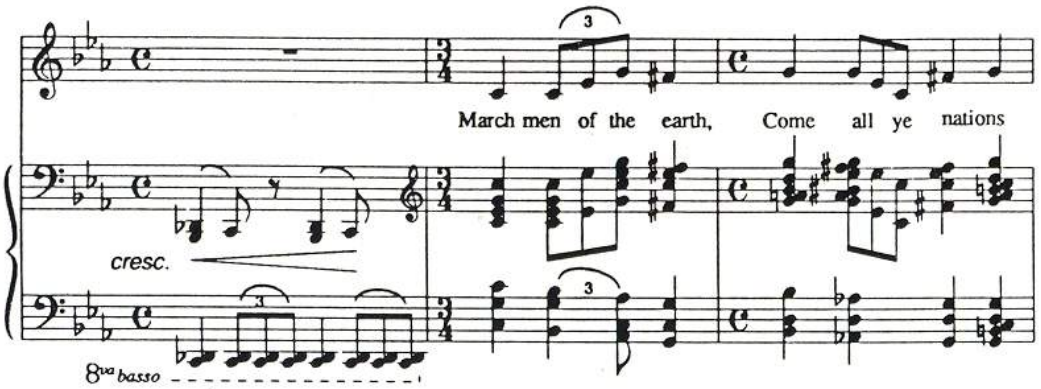
[1183] *The Prelude* is dated by Lichtenwanger 1986 p. 36-37 without further explanation. Hicks 1993 (p. 436) does not mention the piece – also without explanation – and, based on the list of Compository Dates only, states that "none of the surviving pieces that Cowell listed in his log book during the three and a half years following his *Adventures in Harmony* contains any indication of hand or arm chords."

The low and slow bass clusters in the opening appropriately set the atmosphere for the monotonous voice part, which recites "Eternal darkness and silence of the ages of non-existence [...]" on 23 *c#*'s. This appears to be the first of Cowell's works that connect the cluster to the spoken word. Noteworthy is the fact that those words were written by John Osborne Varian. Father of Russel Varian, a friend of Cowell's, the bohemian amateur musician was head of a Californian splinter group of Madame Blavatsky's theosophical movement in Halcyon along the Californian coast. He found and expressed strong pride in his Irish heritage, and fused both in his mystical poetry. Cowell spent considerable time with the colony and through a warm friendship Varian became an important influence in the composer's intellectual adolescence. More than twenty Cowell pieces are set to Varian's words.[1184]

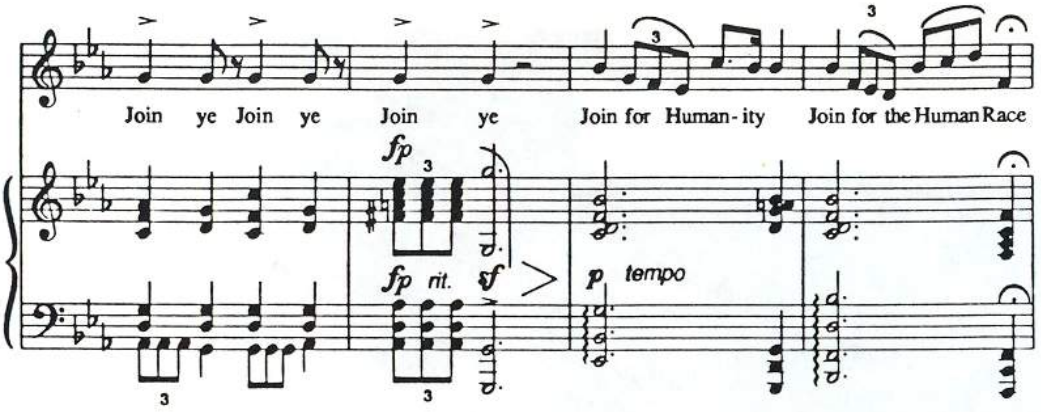
Cowell discovered how the cluster functions well in such settings and quite a few such illustrative pieces would follow, though not before another two years. Not that Cowell forgot about the phenomenon: he tried it out in one of his first encounters with the larger instrumental forces of the orchestra. Around 1914 he conceived of *The Birth of Motion* for 9 woodwind instruments, three brass parts, timpani and tam-tam, and strings. The celli and double bases are each divided into 8 parts to be able to perform the clusters as Cowell wrote them down: both string sections each forming a chromatic cluster C-G, basses gliding up for the second half of the 4/4 (or 2/2) bar and coming back down for the second half of the next bar; the celli go up for the second bar, come down for the third. The dynamics for the clusters are *p – mp – p* and the other instruments (the rest of strings + winds) have traditional melodic material). In 1915 Cowell began to rework some of this material for an even larger orchestra, this time narrowing the clusters in the lower strings to the width of a fourth. In his orchestral music Cowell uses the clusters as structural devices rather than emphatically, but it is striking how he hears his cluster sounds predominantly softly and in the lower registers, both in the orchestra and most of the piano piece that employ them.

In circa 1916 there is another song on a text by John O. Varian: *March Men of the Earth* (L215). In bar 9, Cowell added a remark that the pianist is to "play with combination of hand, wrist, elbow, arm." For the first time, Cowell systematizes the notation of the three main types of clusters: "line from left side indicates all the white keys as far down as line goes," "line from right side indicates all the black keys as far down as line goes" and "line from both sides indicates all the keys as far down as line goes."

The piece contains many clusters, following the structure of the text only to an extent. They are not tone-painting the words directly but grow out of build-ups in chromatic embellishment of basic tertial harmonies towards well-chosen moments in the text. (Ex. 3.620.)



[1184] See Johnson 1993, p. 1-27 for more on Cowell, Varian and Halcyon.



Example 3.620. H. Cowell: *March Men of the Earth* (ca1916), opening bars. Reprinted by permission of Steven Johnson and The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

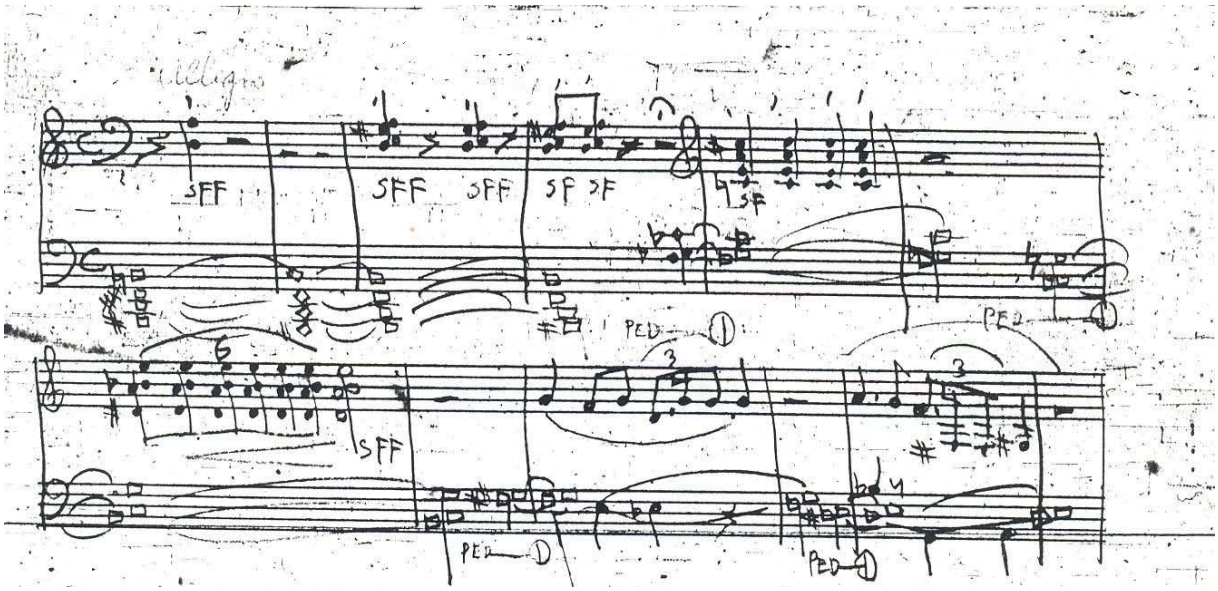
Though it does not begin with a hand-shape cluster like the previous (and next) piece on a Varian text, the opening does contain a small cluster by Cowell's definitions. Like all of Cowell's cluster pieces before, the cluster technique is limited to one hand only. The *ritardando* (or *ritenuto*) may be calculated to facilitate the shift of position from proper to improper.

3.4.2.7.2 Developing cluster techniques

In November of 1916, Henry Cowell went to New York to study briefly at the Institute of Musical Art and prepared for his first public performance in the city on December 3rd. Sometime in between November and December, Cowell met Ornstein and wrote *Dynamic Motion* (L213). This is Cowell's first real ultra modern piece, more completely and thoroughly radical than anything he had written before, even more radical than Ornstein's music. In his own words: "Style highly atonal; […] using secundal chords independently for musical extension and variation."[1185] Until now Cowell either deployed the cluster technique to extend the orchestral potential of the piano timbre or to evoke decorative atmospheres; with *Dynamic Motion* he starts to develop the cluster in both the compositional and performance practical sense. Besides the cluster, this piece also incorporates the technique of silently depressing keys and even combines it with the cluster technique.

Dynamic Motion starts with the sympathetic vibrations of composed combinations of strings. The planning is somewhat theoretical as the relations between the open strings and the struck chords are not the most favorable.[1186] (Ex. 3.621.)
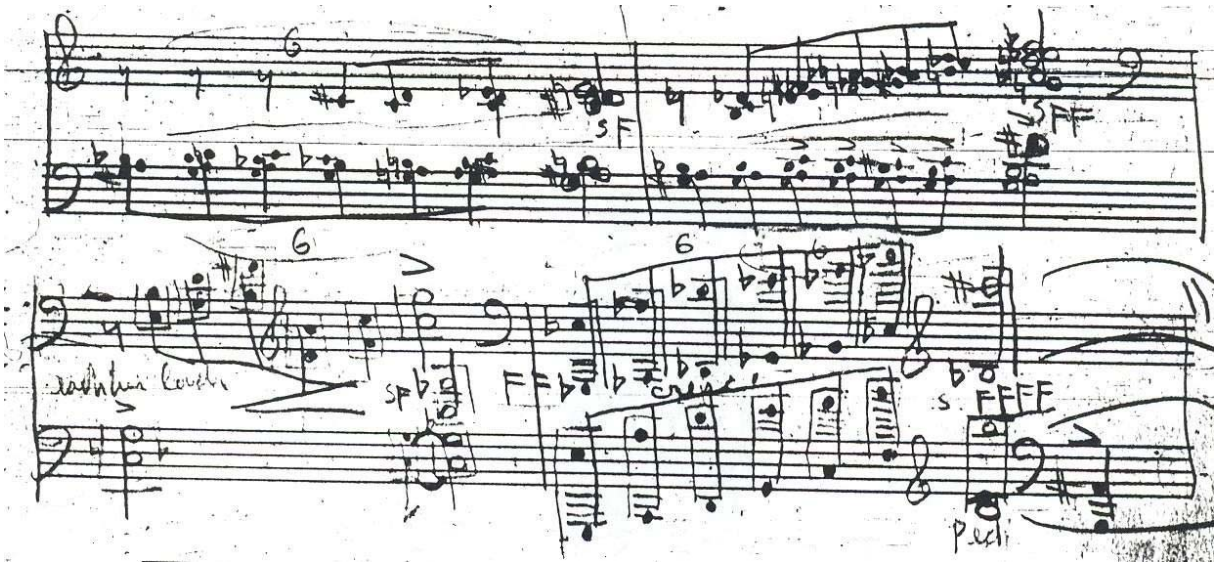
[1185] Cowell 1963, p. 7.
[1186] This may be the consequence of having written the passage on an out of tune piano.



Example 3.621. H. Cowell: *Dynamic Motion* (1916), bars 1-12. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

The rest of the opening is equally consciously constructed, with the chords building up from the (symbolically?) open fifths in the first bar to the double minor seconds in bars 3 and 4, on to the double thirds and the double fifths (or augmented fourths, depending on how one looks at the chord). Ever higher, more dissonant and less patient, the section ends with the relaxing entry of a melody. The theme in bar nine must be one of what Cowell stated as the basis of the piece: "two main themes, one a melodic idea, the other a rhythmic one, each developed by clusters."[1187]

The second section is again a build-up in register, dissonance and – this time – in cluster width. (Ex. 3.622.)



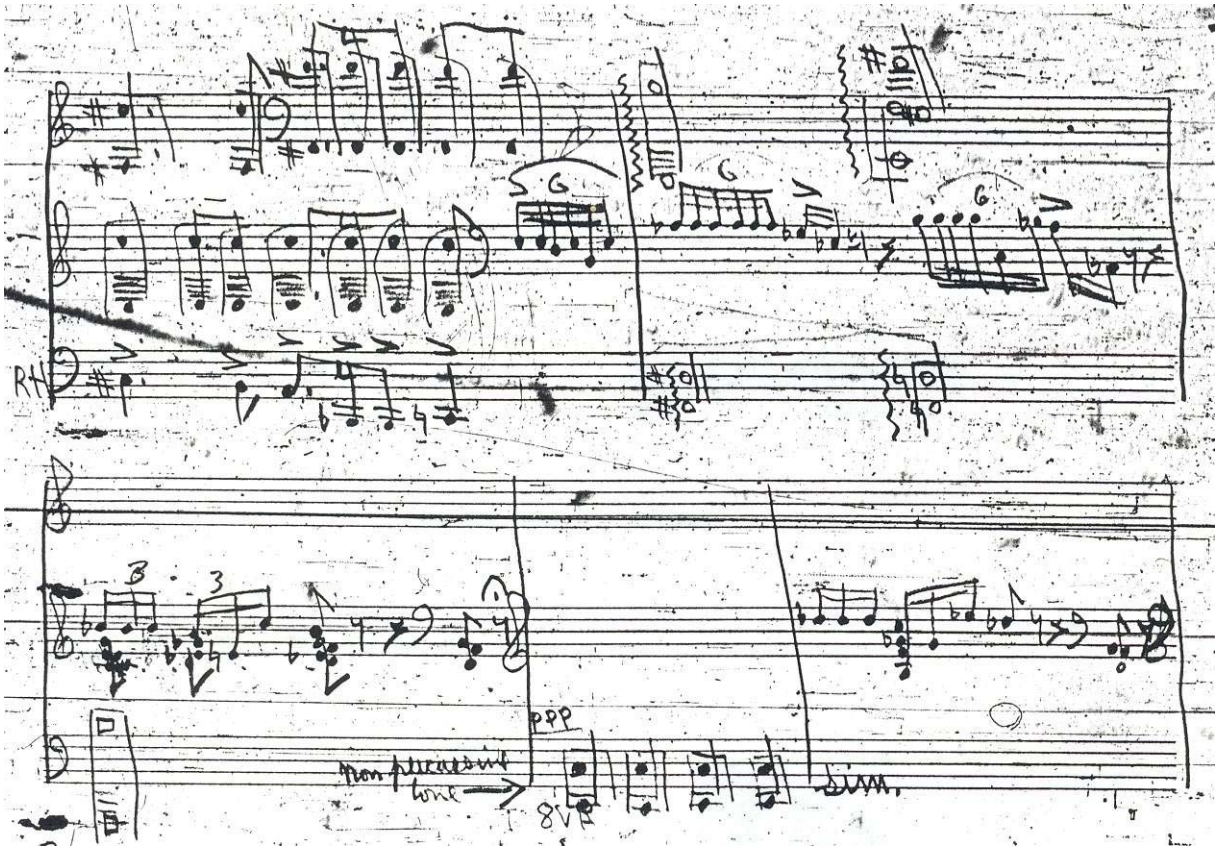
Example 3.622. H. Cowell: *Dynamic Motion* (1916), bars 13-16. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

The reiterated upward motion can be considered the other "theme." As both ideas are developed throughout *Dynamic Motion* by way of cluster use, the theme in bars 9-12

[1187] Cowell 1963, p. 7.

would be the rhythmic theme from Cowell's explanation, whereas the upwards motion as in bars 13-16 would be the melodic theme.[1188] Again, Cowell noticeably put in efforts to construct his build-up and as many levels as possible. Not only does the interval of each cluster grow, the cluster kind evolves from accumulated seconds to minor third fingered clusters (dividing three of them over two hands in the second half of bar 1) to palm- and then arm-clusters. When the arm clusters divide the dissonance over black and white keys, Cowell is forced to adapt the musical compositional building blocks to the performance technique: whereas the left hand goes up in steps of a fourth all the way to B, the right hand needs to stick to the pentatonic part of the keyboard.
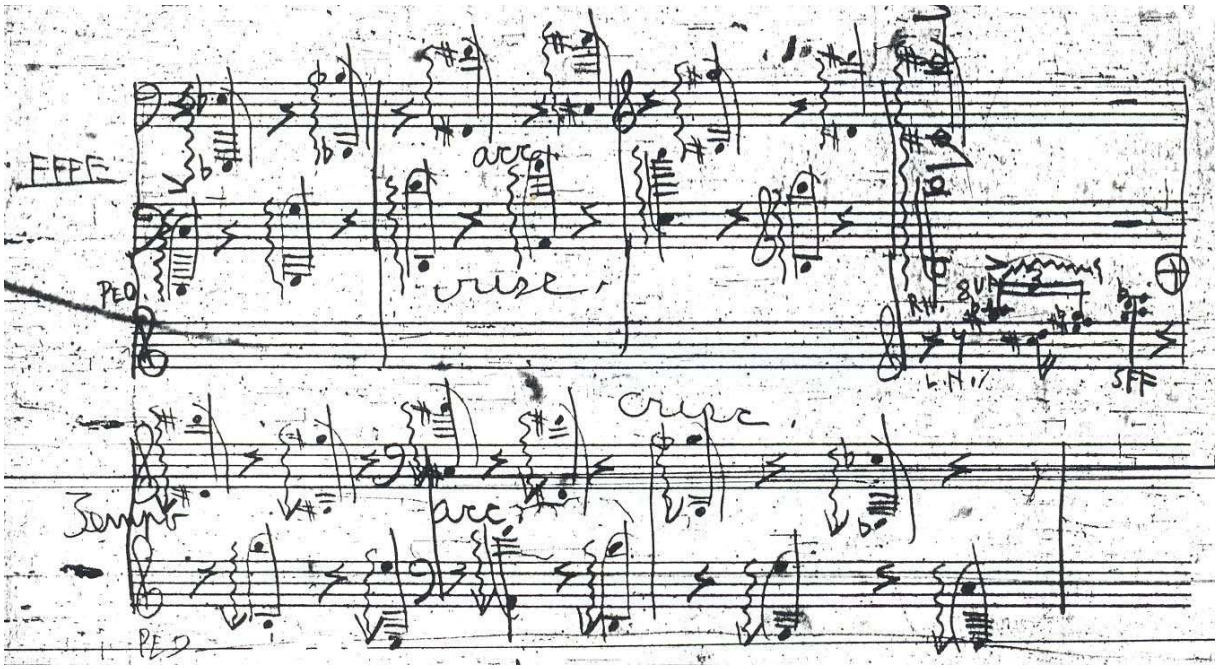
New cluster types appear: arpeggiated arm clusters, silently depressed clusters, even an arm cluster partly on black and partly on white keys. Strikingly, he asks for non-percussive chromatic octave clusters. (See bar 23 in ex. 3.623.)



Example 3.623. H. Cowell: *Dynamic Motion* (1916), bars 20-24. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

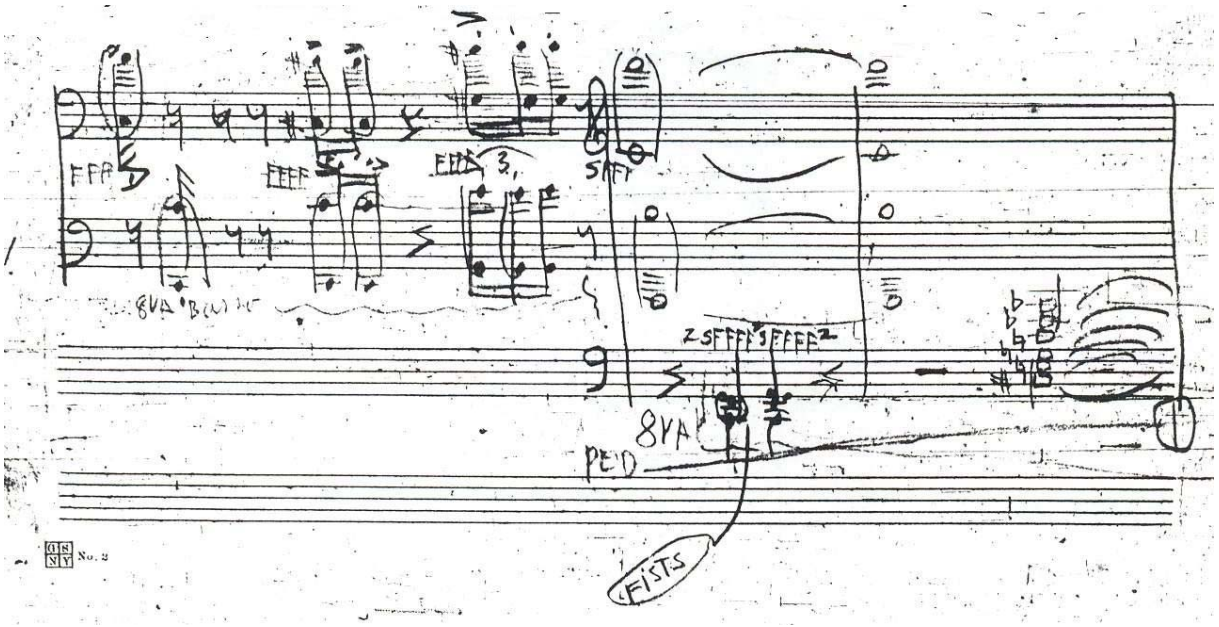
Although in the manuscript, he hesitates between square and diamond shape note heads for notating Schoenberg's "Klavierflageolett," the clusters benefit from the system Cowell had devised for *March Men of the Earth*. In *Dynamic Motion*, downwards arrows indicate the direction of arpeggiated arm clusters. (E.g. ex. 3.624.)

[1188] Alternatively, the theme in bars 9-12 could be both at once: its melodic and its rhythmical aspect are also developed independently from each other.



Example 3.624. H. Cowell: *Dynamic Motion* (1916), bars 43-49. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.
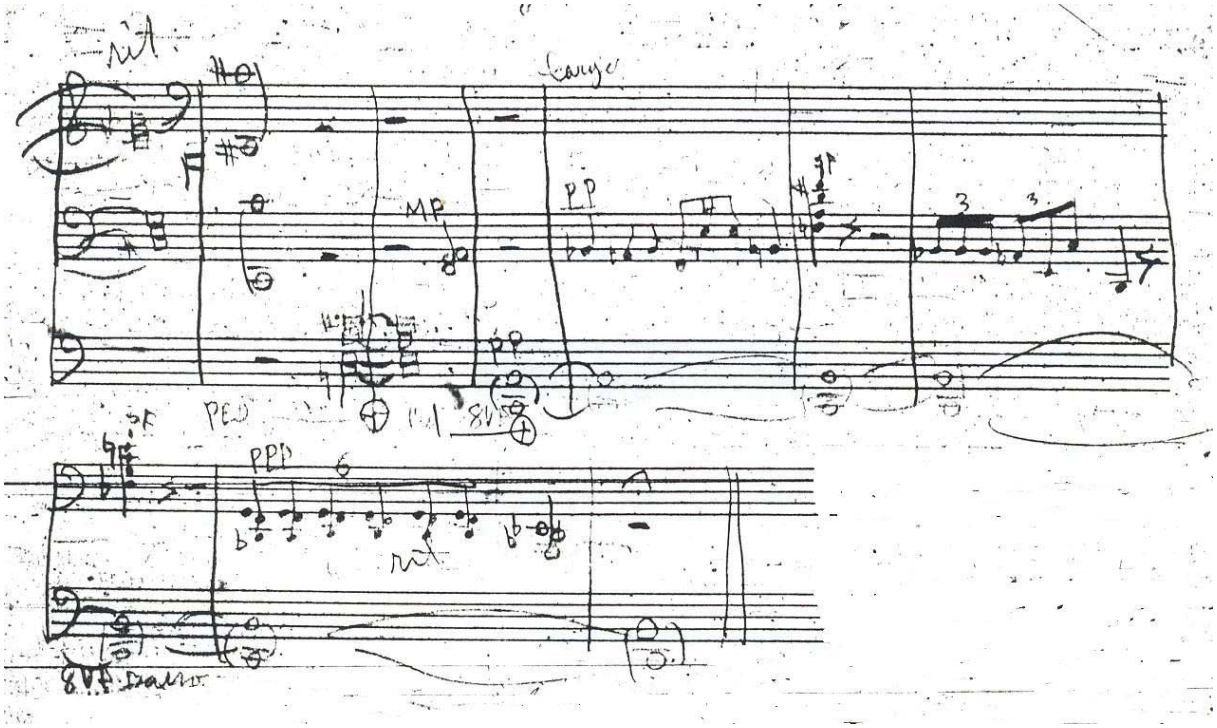
At the end of yet another build-up, Cowell introduces the fist. (Ex. 3.625.)



Example 3.625. H. Cowell: *Dynamic Motion* (1916), bars 52-54. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

One wonders whether Cowell knew of the sostenuto pedal, which would certainly enrich the sound pallet by keeping the fist clusters short and percussive while preventing the fists' possibly louder sound to interfere with the evenly spread volume of the arm clusters' sound which needs to service the filtering that is to follow.

At the end of *Dynamic Motion*, Cowell comes full circle by returning to the sympathetic vibrations, this time written with apparent practical know-how. The influence of all the preceding clusters upon the material in the last seven bars – silent or quiet as they are – bears fruit and the music can now fully benefit from the atmospheric sounds the technique can offer when applied through the use of the ear rather than theoretical constructions. (Ex. 3.626.)



Example 3.626. H. Cowell: *Dynamic Motion* (1916), final bars. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Cowell himself explained *Dynamic Motion* as depicting the New York subway, extrapolating the association to the noise of the big city.[1189] Practically, the title can just as much refer to the amount of rubato needed to perform most of the clusters. This is a highly virtuoso piece, of a kind that the repertoire has not seen before. The diversity is staggering: all the kinds of clustering appear: clustered chords, black-key, white-key, chromatic-, fist-, palm- (5th and 8th) and arm-clusters, voiced as well as non-percussive, rolled arm-, and rolled palm-clusters, combinations of arm-cluster and melody, of silently depressed key technique and cluster technique, of black- and white-key clusters, of fist and palm technique, sympathetic vibrations and filtering. There is even the suggestion of the use of the sustaining pedal.[1190] The 19-year-old Cowell derived all of this from the few kinds of clusters and the one instance of sympathetic vibrations he had composed with before.

[1189] Lichtenwanger 1986, p. 49.
[1190] For the performance practical problems in this piece, especially in the printed edition, see the next chapter.

There are two reasons for such an outburst of compositional interest in this new kind of piano writing. First of all, Seeger's advice that "it is for the innovator himself to create the initial repertory embodying his innovations"[1191] and that "if people are to get used to them and come to accept them as natural, you are going to have to play the music yourself at first"[1192] surely stuck in Cowell's mind when he encountered Leo Ornstein in New York. With *Dynamic Motion* Cowell certainly made a confident start building the repertory for his innovations. To help him put into practice the most efficient ways to disseminate his ideas himself, he had now encountered the perfect example of a pianist succeeding in making people accept his music. That not all Ornstein concerts were met favorably would not be proof to the contrary of success: it was easy for anyone to deduce the guaranteed media exposure from the shade of scandal that surrounded most of Ornstein's reputation. In New York he heard the celebrity play and immediately expressed in letters to the home front his admiration for the man's technique ("better than Paderewski") and for the "magnificent" compositions, which aroused him "to such a pitch of excitement that […] I lay awake all night thinking of the genius of Ornstein."[1193] Cowell met Ornstein sometime during his New York stay and showed him some of his music. It is not known which pieces Ornstein saw, but reportedly he found them "the most interesting compositions' by any living American."[1194] It would be interesting to know whether *Dynamic Motion* was one of them. Cowell would certainly have wanted to present to this "futurist" composer-pianist his own most radical pieces and Ornstein's purported reaction would presuppose nothing less. No documentation was found as to when exactly the meeting took place. Between November 15th and 18th, Ornstein toured near the geographic center of North America, returning to New York for a concert on the 25th and performing in Montreal on December the 3d. Since Cowell's letters, in which he expressed how much he "would like to meet and study" with Ornstein, were dated November 18 and 22, that meeting would likely have taken place after November 22 and before December 3, when Cowell himself played at the New York Public Library. [1195] Whether or not Cowell was already working on *Dynamic Motion* is not clear. Cowell's list of compository dates it as written or finished in December of 1916 and he did not seem to have presented it on his own recital at his New York debut. There is no reason to think that Cowell would have been too sensitive to consider his most advanced compositional thoughts inappropriate for a program sponsored by "Our Family Music." We may therefore safely assume that *Dynamic Motion* was at least finished after the meeting with Ornstein. The impression Ornstein's playing and composing had made on Cowell would certainly account for how the latter made this sudden leap forward in establishing a stylistic profile, both as a composer and pianist, both to take the next step in his own oeuvre and to develop characteristics that would set him apart from Ornstein's music. Comparing both, it is easily traced how Ornstein bridged the relatively short distance from atonal to clustered chords, only briefly flirting with techniques based on keyboard lay-out and hand shapes, while Cowell evolved basically from simple, soft, decorative, orchestral, diatonic hand and single arm clusters to virtuoso, loud, percussive, angular, black and white fist and double-arm clusters. In other words: Ornstein had taken the road along the traditionally cerebral evolution of chromatics towards (and across) its boundaries - by this time already acknowledging its dead-end character – while Cowell blazed the trail which led away from that tradition to move towards an idiom based on a more physically direct approach towards the instrument.

[1191] Weisgall 1959, p. 487.
[1192] Sydney Robertson Cowell in *Charles Seeger 1886-1979*, an article in *Musical Quarterly 65* (April 1979), as quoted in Pescatello 1992, p. 67.
[1193] Hicks 2002, p. 77. Confusingly, Hicks suggests that Cowell heard Ornstein play in a concert at Aeolian Hall and wrote about it in a letter postmarked November 22. Broyles and Von Glahn 2007 list Ornstein's only New York City concert in November 1916 to be on the 25th (p.134) Cowell must therefore have referred to Ornstein's November 12 concert in Brooklyn. Or else another concert took place before November 15 (when Ornstein left New York to concertise in Winnipeg and Saskatoon) and did not find its way into Broyles & Von Glahn's listing.
[1194] From an article in *Globe and Commercial Advertiser* (31 January 1920), as quoted in Hicks 2002, p. 77.
[1195] Lichtenwanger 1986, p. xvii.

Nonetheless, Cowell was on the verge of laying theoretical foundations for his inspiration. Seeger had urged him "to work out a systematic technique for any unusual musical material he wanted to employ."[1196] Integrating ideas into a systematic approach could ensure that an idea - and its creator – gets proper attention. It was perhaps the second reason for the ear-catching appearance of *Dynamic Motion* at this particular moment in Cowell's career as a composer and pianist. The diversity of the cluster types and functions in *Dynamic Motion* are in fact a catalogue of the cluster as musical resource, resembling the way Seeger had sorted resources of tonality, dynamics and timbre in his own *Treatise on Musical Composition*.[1197] Cowell was not ready to go beyond exploring possible categories of clusters and some tentative composing with sympathetic vibrations. The whole piece is still a musical representation and much of it is simplistically based on reiterated attempts at straightforward build-ups with no discernable theoretical underpinning of the techniques. As in some of the other pieces of that year, e.g. the *String quartet* (L197), there are definite signs of "the establishment of dissonance, rather than consonance" as the norm[1198] – despite tonally broken chords and allowances for the limitations in the atonal potential of pentatonic black key sequences – but there is not an inkling yet of the more serialist tendencies that Cowell was developing as a take-off on Seeger's lessons.[1199]

In January of 1917, Cowell went back to California, dissatisfied with the way "everyone here composes along old lines, […] using discords without reason."[1200] Although Cowell played Ornstein's *Impressions of Notre Dame* in May of 1917[1201], he himself was not occupied with the cluster much, anymore. In fact, Between December and April, he composed nothing, except for a chorus piece. Or so it seems, when consulting his list of opus numbers. In fact he must have been busy with another Varian project. It was to be a large one this time, in fact it was about "the greatest battle between light and darkness of al Irish mythology"[1202] and Varian had already contacted Cowell about it in the autumn of the previous year. In the summer of 1917 *The Building of Bamba* (L219), an Irish mythological pageant for soloists, mixed chorus and piano was scheduled for production with text by Varian and "home made" music by Cowell. Bamba was one of the three goddesses representing the spirit of Ireland and one document – its caption "Oberammergau in America" referring to the famous yearly Passion Play in that Bavarian town – specifies that the epic would depict:

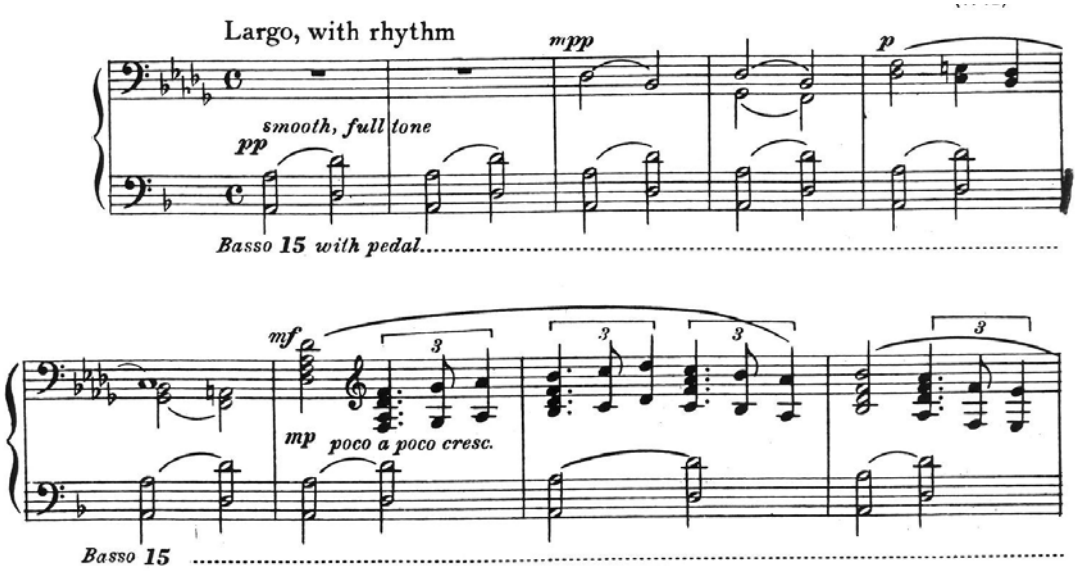
> nothing less than the story of the creation of the Universe out of chaos and the parallel evolution of the human soul, a theme vast enough for the great outdoor stage, with the sky for a dome, and the booming undertones of the ocean for majestic accompaniment to the lesser but harmonious human music, a theme vast enough for the New Age being born in bloody travail, and for this Western world, completing the circle mankind has put around the globe.[1203]

No music for the "introduction" to this mystery play survived, but Cowell's *The Tides of Manaunaun* (L219/1) fits the function perfectly:

[1196] Weisgall 1959, p. 487.
[1197] See Pescatello 1994, p. 39-161. The treatise is part of Seeger's *Tradition and Experiment in (the new) Music*, the basis of which was formed by the lessons he prescribed for Cowell. (Pescatello 1994, p. 19.)
[1198] Seeger: *On Dissonant counterpoint*, article in *Modern Music* (Vol. 7, 1930), as quoted in Nicholls 1991, p. 90.
[1199] It is interesting to learn that Cowell corresponded to Russell Varian in December 1916 about the comparison of overtone-relations and those of incompatible metric divisions. See Johnson 1993, p.13.
[1200] From a letter by Henry Cowell to Russel Varian, as quoted in Hicks 2002, p. 75.
[1201] Hicks 1993, fn 39, p. 455.
[1202] From a letter by John Varian to Henry Cowell (18.XI.1916), as quote in Hicks 2002, p. 83.
[1203] From an unsigned typescript in the Varian Papers at Stanford University, as quoted in Hicks 2002, p. 86. Oberammergau is also known as neighboring the artist town of Murnau, home of Kandinsky, Münter and the Blaue Reiter.
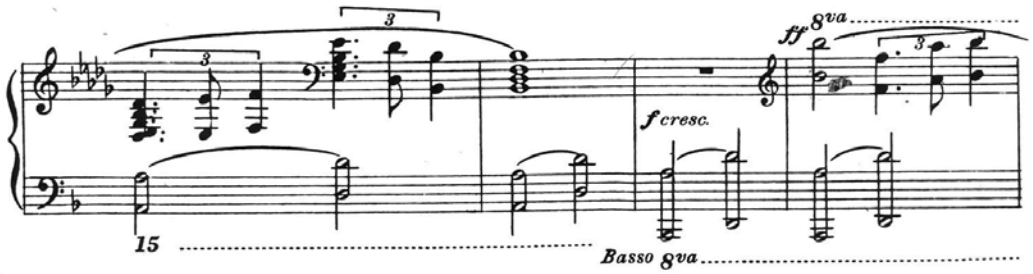
> Manaunaun was the god of motion, and long before the creation, he sent forth tremendous tides, which swept to and fro through the universe, and rhythmically moved the particles and materials of which the gods were later to make the suns and worlds.[1204]

The "majestic undertones" and the "human theme" are most harmoniously combined to form the overture to the story of how Bamba built the universe. (Ex. 3.627.)



Example 3.627. H. Cowell: *The Tides of Manaunaun* (1917), opening bars. Reproduced by permission of Breitkopf & Härtel.

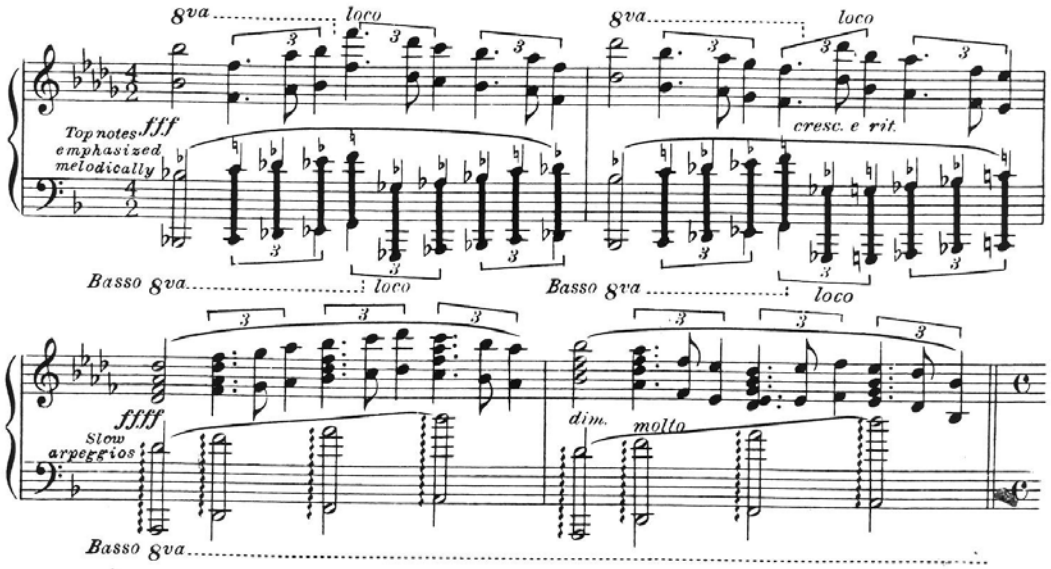
The opening is familiar by both its emergence from the darkest regions of the piano's bass as by the ceremonial melody it introduces. With their decorative character, the clusters are typical of the music that Cowell wrote for Varian texts. The young composer had already used clusters to represent darkness and oblivion; in the *Tides* they illustrate the whole gamut of moving water masses, from relaxed undulations to huge tidal waves. The cluster technique is developed accordingly, representing yet another step forward in its evolution by consecutively building up the size and complicating the performance mode. The accompaniment of the Irish waltzing tune switches to double octave arm clusters and a higher dynamic level when the melody reaches a first high point. From here on, an extended part demands two simultaneous positions for the body. (Ex. 3.628.)



Example 3.628. H. Cowell: *The Tides of Manaunaun* (1917), bars 10-13. Reproduced by permission of Breitkopf & Härtel.
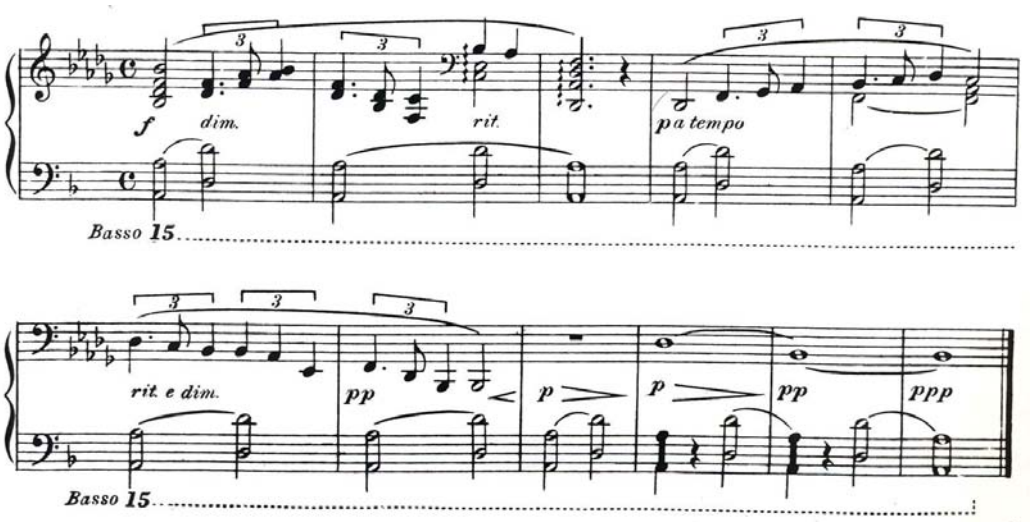
[1204]"Story according to John Varian," text by Cowell printed under the title of the piece in its first publication in 1922 by Associated Music Publishers, Inc, New York (copyright renewed by Breitkopf Publications Inc, New York in 1950). In Cowell 1963, p. 4, he tells how the tremendous tides through the universe were meant "to keep its particles fresh until the time should come for the gods to make of them stars, seas, suns and worlds."

Following the large structural build-up, the repeat of the second phrase is put in counterpoint against a scale in arm cluster technique. This is the first time Cowell uses his special technique for melodic arm clusters, using individual finger articulation to voice the top notes of clusters, introducing a combination of improper and proper piano playing in one hand. The inwards movement of the two hands culminates at the middle of the keyboard with the effervescent tidal waves coming in surfing on the largest one-arm clusters Cowell could write. (Ex. 3.629.)



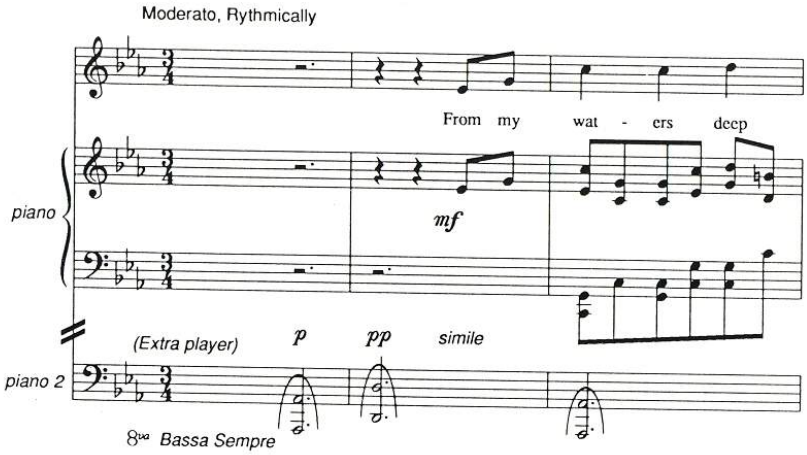
Example 3.629. H. Cowell: *The Tides of Manaunaun* (1917), bars 22-25. Reproduced by permission of Breitkopf & Härtel.

The structure of the piece represents the tides following the law of ebb and flow on multiple levels. The melodic format is a persistent up-and-down movement, the surge of the left hand waves is repeated relentlessly in each bar, and the clusters' size expand and contract over the course of the composition. In the end, the sea returns to its peaceful calm with Seufzer motives in the melody and in the deep sound masses echoing the minor downward third from the opening. (Ex. 3.630.)



Example 3.630. H. Cowell: *The Tides of Manaunaun* (1917), final bars. Reproduced by permission of Breitkopf & Härtel.

Cowell makes ample use of his catalogue of clusters. In contrast with *Dynamic Motion*, however, they are here integrated organically in the compositional structure. It would take a while before he reaches this level of sophistication again in one cluster piece. Of the other thirteen numbers in the *Building of Bamba*, there are three *Manaunaun's Song* (L219/4 for the first and second, and L219/10 for the third), where clusters can also be found. Perhaps not so fully integrated as in *The Tides of Manaunaun*, but with still fresh ideas to show for Cowell's interest in developing the compositional use of the cluster. The same basic and calmly undulation cluster as found in the introduction to the *Bamba* opera constitutes the bottom layer of the accompaniment in this song. The piece was intended for two pianos (one of which would theoretically benefit from having an *A♭*[2]) but one would have been all right as long as a second player was available. (Ex. 3.631.)



Example 3.631. H. Cowell: *Manaunaun's Song 1* (1917), opening bars. Reprinted by permission of Steven Johnson and The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Between the songs, another vocal number uses clusters in the accompaniment. *The Birth of Midyar (Bron's Word)* – number 8 for SATB and piano – contains descriptive white key clusters in the low bass at beginning of each bar in first 16 bars. Connected to the Bamba opera – at least by title, possible also as part of it[1205] – are the incomplete sketches for *The Red Flame of Midyar* (L220), which contain what looks like an octave and double octave glissando.
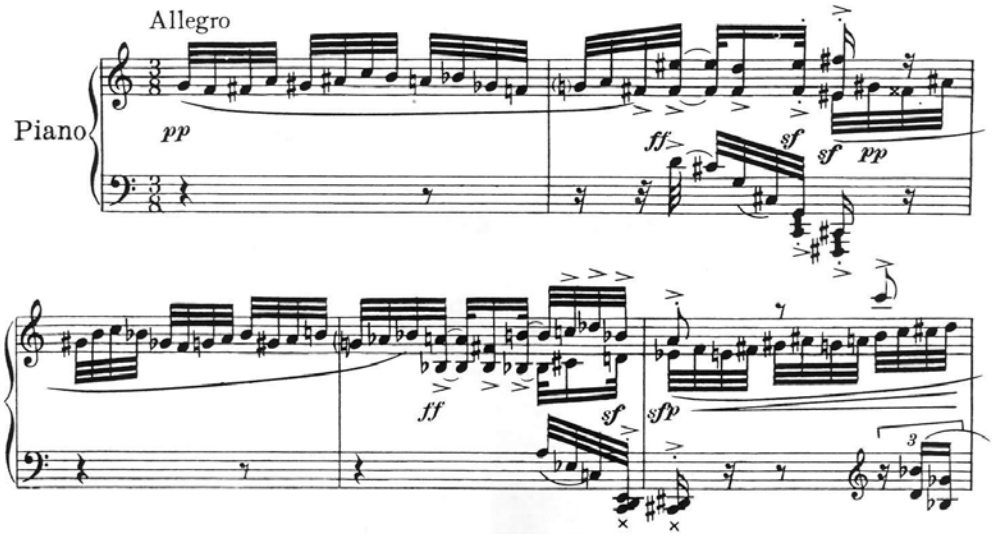
After the summer, Cowell seems to have been occupied with clusters a bit in *Some M*usic (L221 – listed as September 1917, though lost). This piano piece must certainly connect to *Some Music* for orchestra (L221a), which was listed by the composer as dating from 1922 but evidently relates to *The Birth of Motion* (L147 – see above). More importantly, he started putting to practice some new ideas he had been deriving from Seeger's class in dissonant counterpoint. Studying the counter rhythms that were a necessary component of Seeger's dissonant counterpoint, it had struck Cowell how "the lower reaches of the overtone series were expressed by the same ratios I had been using to describe counter-rhythms."[1206] He had already corresponded with Russel Varian about this in December of 1916[1207], but only now do we find these theoretical insights transferred to his compositions. With the *Quartet Romantic* (for two flutes and two strings) Cowell tests the implications on four-part counterpoint of this concept of the

[1205] Lichtenwanger 1986, p. 57.
[1206] From Cowell's preface to the published score of the *Quartet Romantic* and *Quartet Euphometric*, as quoted in Nichols 1991, p. 140-141.
[1207] Johnson 1993, p.13. It is interesting to see how both young men's ideas differ and compare over the course of the correspondence.

physical relationship between harmony and rhythm.[1208] Surprisingly, Cowell's piano works do not closely follow his rhythmical theories. By November he had written some *Ings* (pieces the titles of which end in '-ing') and only one of them, *Seething* (L353/6), contains metric juxtapositions between the two hands.[1209] None of the *Ings* from the late 1910's (Cowell definitely wrote some more later) contain any clusters.
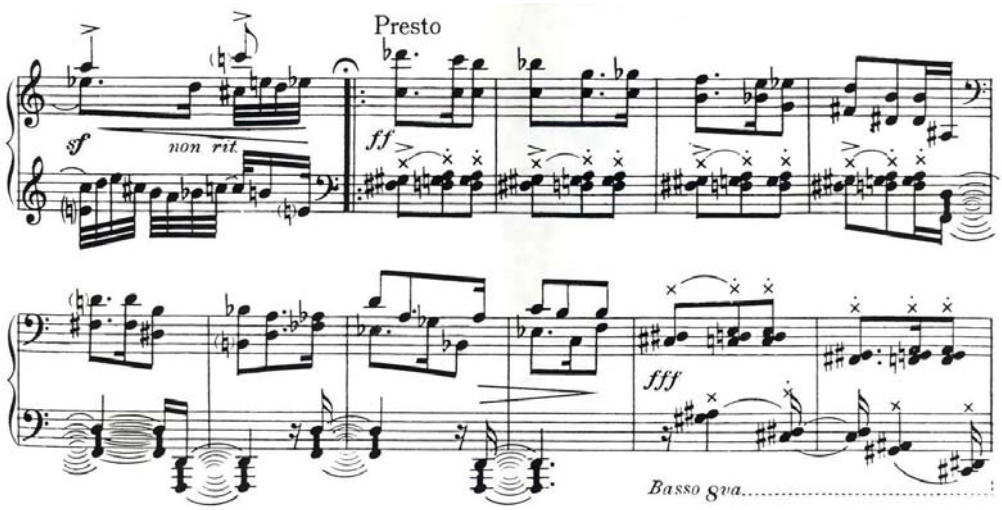
The next cluster pieces are written at the end of 1917 as separate pieces but published later (in 1922) as a set of *Encores to Dynamic Motion* (L213/2-6). The *Encores* integrate extended techniques in a context that lacks the hard-core primitivist and abstract qualities of *Dynamic Motion.* In them we also find still only little of the rationalizations that would make up *New Musical Resources* in a few years time - the cluster construction is related merely in superficial ways to the whole chapter that Cowell would devote to it in his book (see 2.5.2.2.1)[1210]. These pieces do however show to an extent how Cowell starts to think in building theoretical concepts to support and develop his cluster use.

The title of *What's This* – listed in Cowell's opus list as the second *Encore,* published as the first and most likely finished before the others - was explained by Cowell in true lecture-recital style: "Since it's a curious little bit, people often ask me 'What's That?' – to which I of course reply, *What's This?.*"[1211] The short and flashy encore looks like a parody on a virtuoso style of playing that ruins a difficult atonal piece and a salon waltz: the beginning passagework repeatedly ends with a cluster as if the fingers could not keep up (ex. 3.632) and the pianist continues the dance with a cramped fist accompaniment before he gives up completely. (Ex.3.633.)



Example 3.632. H. Cowell: *What's This* (1917), opening bars. © Associated Music Publishers, Inc.

[1208] These principles are worked out in his *New Music Resources* (Cowell 1930, p. 49-66: Part II/1)
[1209] Lichtenwanger 1986, p. 87-89 It is not known whether two other *Ings* – *Floating* and *Frisking* – were actually written before 1922, so we will include them later in this chronology.
[1210] According to Cowell in the introduction of *New Musical Resources* (first published in 1930), it was written "during 1919" (Cowell 1930, p. xxii). Godwin states in his preface to the reprint of that edition that "For three years, then, Cowell worked sporadically on what was to become *New Musical Resources* […] By 1919 the book was completed in what was virtually its present form." (Cowell 1930, p. x.) It is most likely that Cowell took more than one year to conceive, develop, test and explicate his theories.
[1211] Lichtenwanger 1986, p. 50.

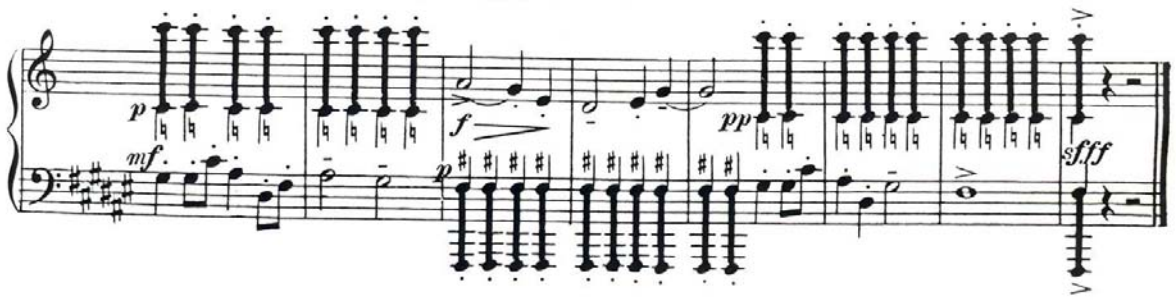


Example 3.633. H. Cowell: *What's This* (1917), bars 6-16. © Associated Music Publishers, Inc.

What's This is a little more than the parody, although Cowell may have had his own predicament in mind to portray the playing of a musician suffering from choreic convulsions. The opening is constructed on the basis of major and minor seconds circling a shifting center. The searching character of this run ends with a cadence in which the cluster functions to accentuate the structure of the phrase, as much as a I-IV and V-I cadence does in functional harmony. In that loud dynamic and fast tempo, the cluster sound is as close to any atonal chord that might have taken its place in a more traditional atonal setting. From the theory Cowell was to develop around the cluster – which says it is built from seconds as classical triads are built from thirds – its use is here in complete harmony with the chromatic run from which it grew. These two aspects of the cluster in the opening passage can be found in the *Presto* as well: the "harmony" in the left hand (containing what can be interpreted as appoggiaturas and acciaccaturas) is made of the same material as the highly chromatic "melody." The deeper the accompaniment falls into the indefinable regions of the bass register, the less distinguishable it becomes from the more proper atonal aggregates that could have replaced it. *What's This* is Cowell's first composition for piano that practically demonstrates the idea of secundal harmony and clusters, which, in *New Musical Resources,* he had explained to be the next step in the historical evolution of music.

According to the composer, *Amiable Conversation* (L213/3)[1212] is "gentle burlesque of a dispute overheard in a Chinese laundry"[1213] which is "finally brought to a close by the banging of the door of the laundry and the coming of a customer."[1214] (Ex. 3.634.)

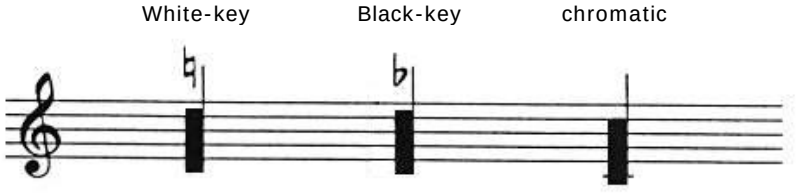
[1212] The pencil draft at the Library of Congress reads: "Scherzo amabile, Amiable conversation." The title in the compository Dates is "scherzo: amiable conversation."
[1213] Cowell 1963, p. 7.
[1214] As quoted from a review in the *Musical Courier* (26 February 1920), printed in Manion 1982, #448 p. 117.



Example 3.634. H. Cowell: *Amiable Conversation* (1917), final bars. © Associated Music Publishers, Inc.

According to Cowell, "the four-tone inflections of Cantonese are audible, along with the increased tension that raised the pitch of the voices in argument."[1215] Considering the evolution of the cluster in Cowell's chronology, this is the first use of arm clusters that are gently and repetitively percussive. They also present a new performance practical challenge, however: the piece is as easy in its form and homophony as it is difficult for the pianist who has never accompanied a classical melody by arm clusters. The right hand diatonic and left hand pentatonic arm clusters – now really accompanying instead of demanding all the attention – require a swift switching of bodily positions that show a new type of virtuosity. Compared to the challenges of a similar type in *Dynamic Motion*, the integration of the cluster in the classical, non-ultra-modern format of *Amiable Conversation* reveals an approach that attempts less to overpower or impress by sheer force.

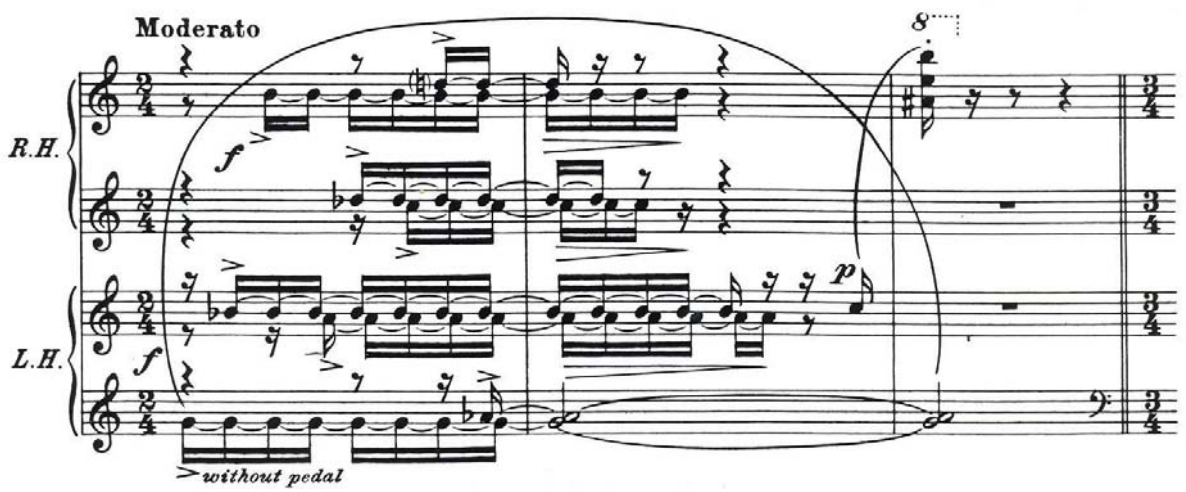
Amiable Conversation dismisses with the previously used "sideline" cluster notation (see for instance ex. 3.627-3.631 and ex. 3.632-3.633[1216]) and is notated in the pencil draft with black boxes covering the stretch of the cluster, with a sharp or natural distinguishing between diatonic or pentatonic cluster.[1217] (Ex. 3.635.)



Example 3.635. H. Cowell's second type of cluster notation.

[1215] Cowell 1963, p. 7.
[1216] There is no manuscript for *The Tides of Manaunaun*, but judging from its place in the chronology, its clusters would have been notated by way of the sidelines. As it is difficult to make out details on the manuscript for *What's This*, we have reproduced above examples from the score published by Breitkopf & Härtel in 1922, which contains a later type notation.
[1217] Here also, we have chosen to print the published score dating from 1922. The manuscript of *Amiable Conversation* has only a cluster at the beginning of the first and second staff, and at the end of the piece. Like in many manuscripts to come, Cowell did not take out time to write repeated clusters: the rest of the draft is filled in with "sim.," "etc." and "like 1" or "like 2."
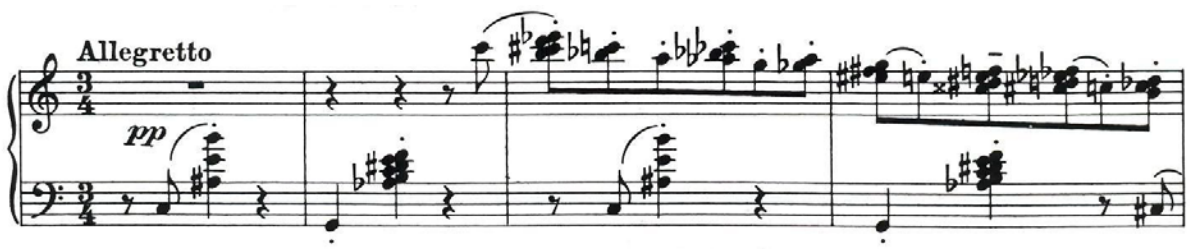
The last of the *Encores* that date from November 1917 is *Advertisement*. Again, Cowell enlightens us: this is "a satire on repetitious advertising of a raucous nature,"[1218] "a caricature of modern billboard display"[1219] or "a humorous impression of the repetitive advertising in the flashing lights of Times Square."[1220] Staring us in the eye is the first (and rare) example of what Cowell will describe to be "moving clusters."[1221] (Ex. 3.636.)



Example 3.636. H. Cowell: *Advertisement* (1917), opening bars. © Associated Music Publishers, Inc.

Cowell does not yet use the notation he will especially develop for it in *New Musical Resources,* where he demonstrates more possibilities for this technique, e.g. different rates of expansion at both sides of the cluster, parallel and oblique progression, counterpoint in moving clusters, etc. (See 2.5.2.2.1.2.) This opening passage is a perfect illustration of what Cowell regards as the basic behaviour of clusters "changing size."[1222] First spreading randomly upwards, then being reduced in downwards-chromatic movement, the technique of filtering – known since Beethoven – is here complemented by its reverse and, by putting it in the perspective of the idea of a cluster, drawn more closely to the world of extended techniques.
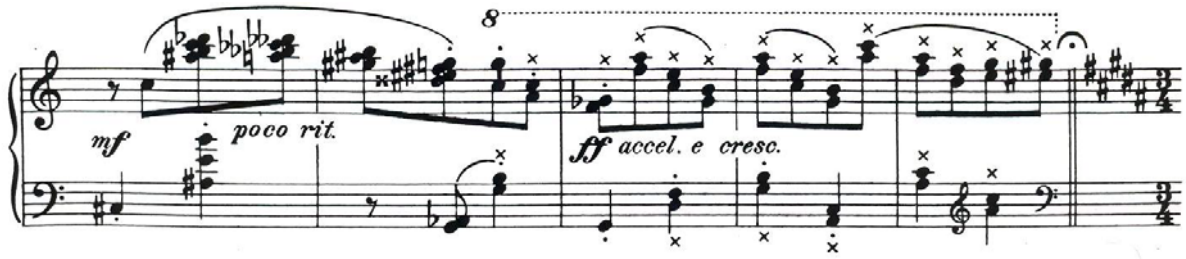
Like in the first *Encore*, *Advertisement* also uses a dance to show what happens when things get wild and improper. It starts out gently enough as a little scherzando waltz with some coloration at the edges of the harmony and melody. (Ex. 3.637.)



Example 3.637. H. Cowell: *Advertisement* (1917), bars 4-7. © Associated Music Publishers, Inc.
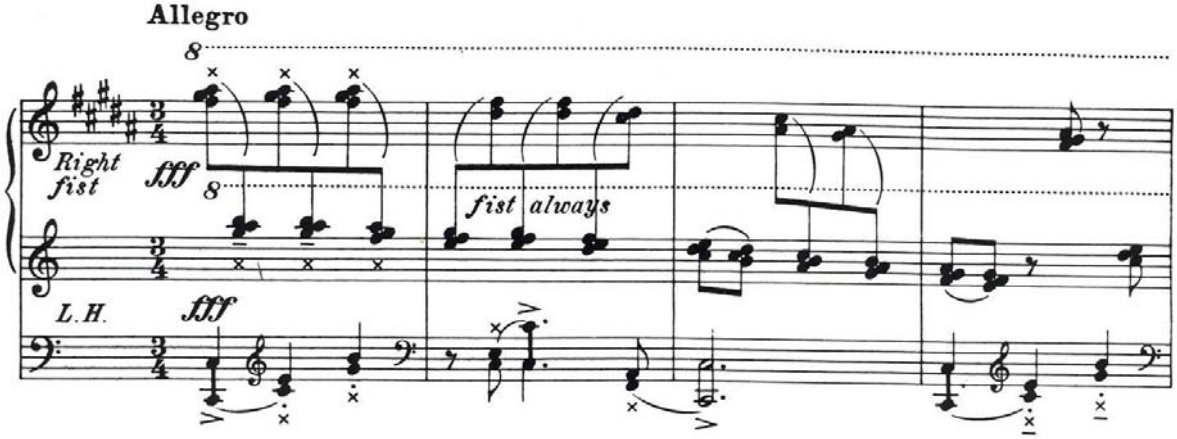
[1218] Cowell 1963x.
[1219] According to Lichtenwanger 1986, p. 51, this was printed in notes for Cowell's New York recital in 1924.
[1220] Cowell 1963, p. 5.
[1221] Cowell 1930, p. 126-132.
[1222] As explained in the chapter on theory, we do not consider Cowell's moving clusters as "clusters" for the purpose of this study. As a rare example of his use of this technique, however, we cannot possible neglect discussing it.

Quite soon, the clustered chords evolve into fist-clusters, indicated by "X"-signs. (Ex. 3.638.)



Example 3.638. H. Cowell: *Advertisement* (1917), bars 18-22. © Associated Music Publishers, Inc.

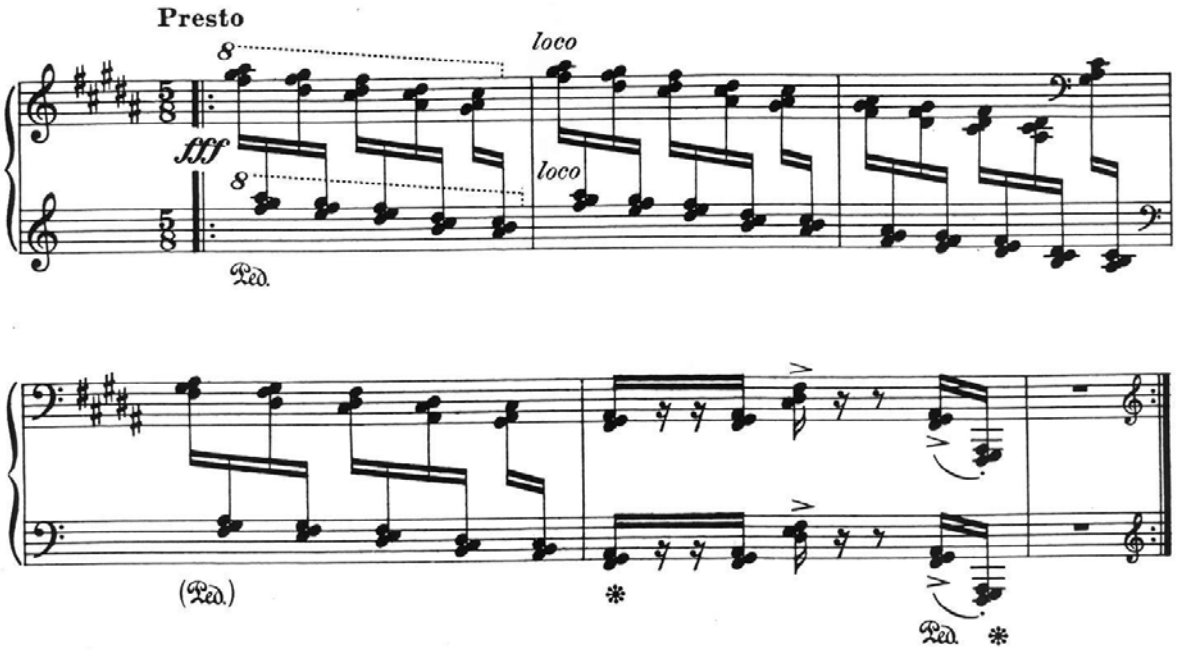
The evolution is unstoppable and the dance is now continued with clusters alone, at higher speed and volume. (Ex. 3.639.)



Example 3.639. H. Cowell: *Advertisement* (1917), bars 23-26. © Associated Music Publishers, Inc.
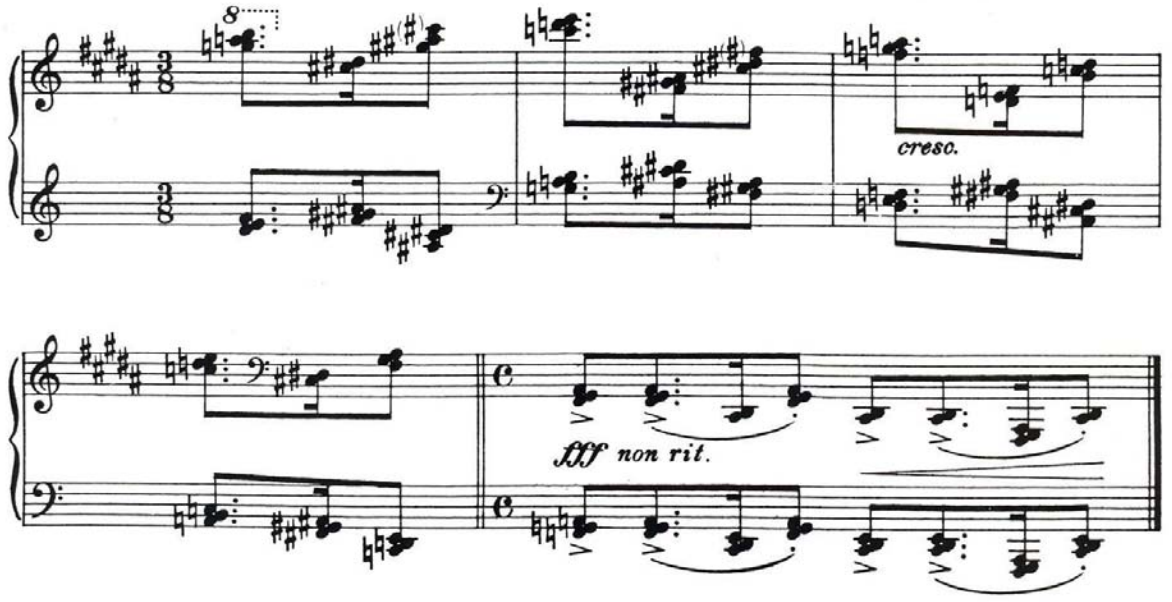
This madman's dance – reminding us of Ornstein's *Wild Men's Dance* from before 1914 (published in 1915) and which Cowell probably new[1223] – ends in what must have been Cowell's most scandalous performance feat: a "karate glissando"[1224] repeatedly testing the strength of most of the keyboard and meant "to emphasize the absurdity" [of the subject].[1225] (Ex. 3.640.)

[1223] Schott published the score in 1915 – it was the Ornstein's most often performed piece at his own recitals.
[1224] The term karate glissando has been used informally among pianists familiar with this piece and with similar instances in e.g. Kazimierz Serocki's *Pianophonie* (1978-79).
[1225] Cowell 1963, p. 5.



Example 3.640. H. Cowell: *Advertisement* (1917), bars 46-51. © Associated Music Publishers, Inc.

As if such a "showstopper" was not enough, the composition ends with one more such exercise in alternated fists (which we can deduce from the context of the previous passages), only now not forgetting the uppermost range. The coda consists of quick jumps with both fists (somewhat similar to some passages in Liszt's transcendental study *Wilde Jagd*) and ends as loudly as possible. (Ex. 3.641.)



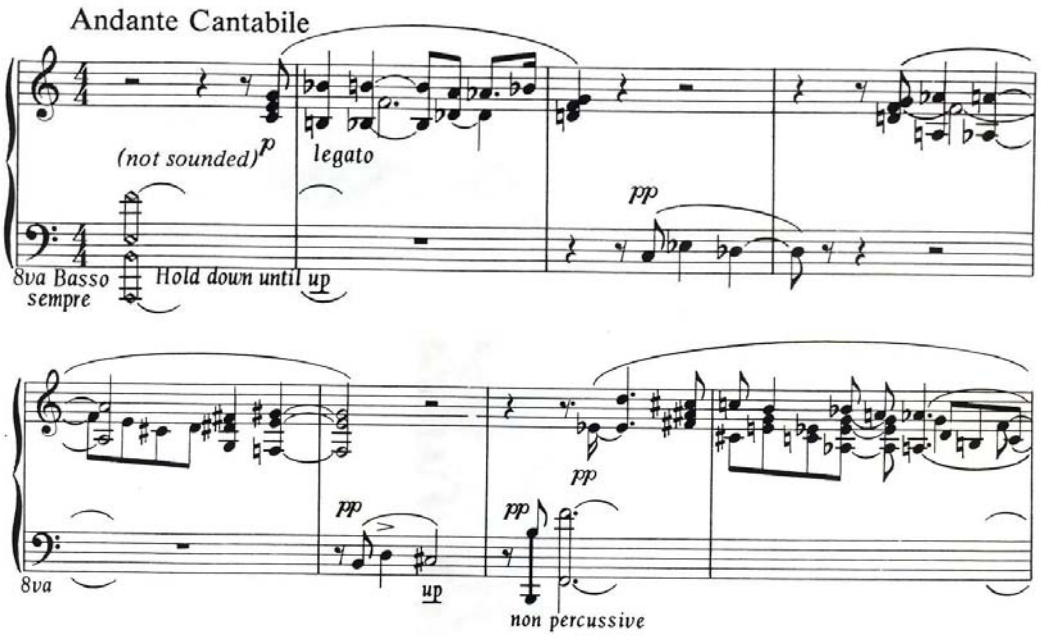
Example 3.641. H. Cowell: *Advertisement* (1917), ending. © Associated Music Publishers, Inc.

In this piece, clusters are used for both melody and accompaniment (which he had only done once, for two bars in a very fast tempo and towards the deeper bass register), chords and aggregates only appear in 16 of the 63 bars (not counting the repeats, which

only contain clusters) and fist-clusters are written in sizes of seconds, thirds and fourths. There are no arm clusters.

One more aspect deserving notice: at this time, Cowell was still working towards what would become his final cluster notation in the early 1920's. With *Amiable Conversation* he had begun to leave the sideline cluster indication in favour of boxed notation; in the draft for *Advertisement* we see those boxes applied to nearly all the clusters. However, the notation of the fist clusters show how Cowell struggled with the issue. He never really chooses between using a cluster-symbol such as the "x" (as in bars 19-22) and writing out individual notes (with or without the fist-sign as in ex. 638 and 639) or indicating the "fist always."

In December of 1917 Cowell finishes two more *Encores*. One of them, *Time Table,* concerns itself with the ins and outs of sympathetic vibrations and – again – with the relationship between clusters and the dissonant counterpoint, with which he had been confronted by Seeger and which he had explored in his own works in the previous months. The piece starts with the acoustically most efficient way to produce sympathetic vibrations. As he had learnt in *Dynamic Motions*, silently depressing a cluster opens many strings at once whereby the sympathy towards the properly made sounds is elevated to its highest level of efficiency. Cowell now goes one step further with this technique, allowing for proper notes to sound in the same register as the sympathetic overtones. (See the left hand staff in ex. 3.642.)
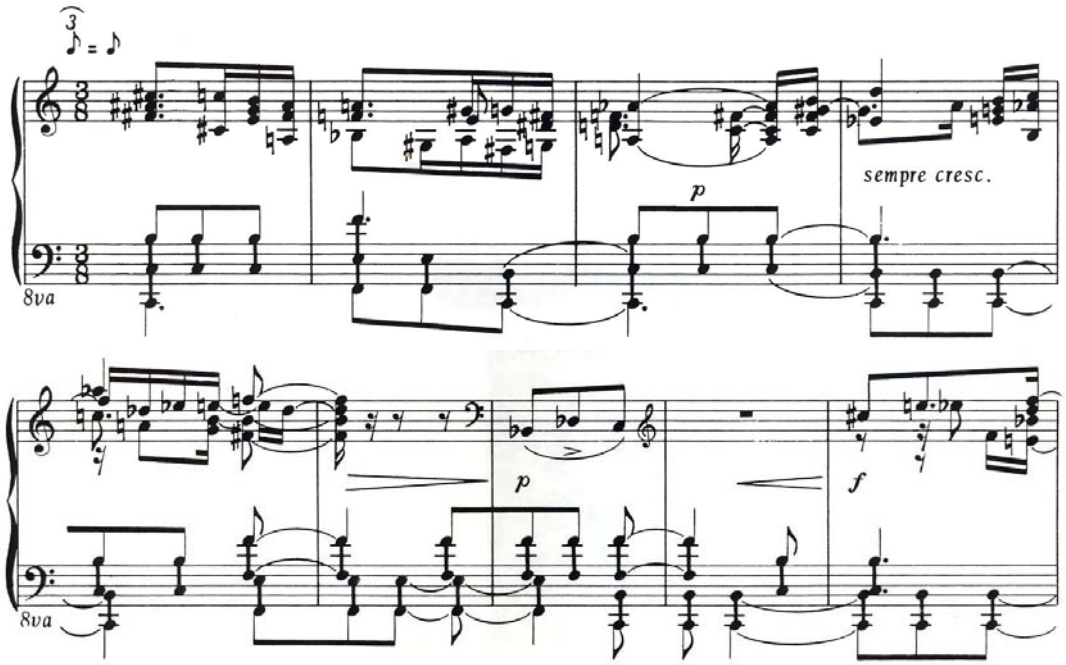


Example 3.642. H. Cowell: *Time Table* (1917), bars 1-8. © Associated Music Publishers, Inc.

The counterpoint chromatically and symmetrically expands and contracts while Seufzer motifs in the left hand echo the beginning of the right hand melody. Clusters are used to demarcate structural points in the development of the musical material, something which Cowell already integrated in for instance the opening of *What's This* (ex. 3.632) but which is here connected with the melodic material as well by anticipating the upbeat and by its non-percussive character.

Clusters are also set against chromatic counterpoint in a relaxed waltz that is reminiscent of some material in Skryabin's ninth sonata. The peculiar cluster writing in the

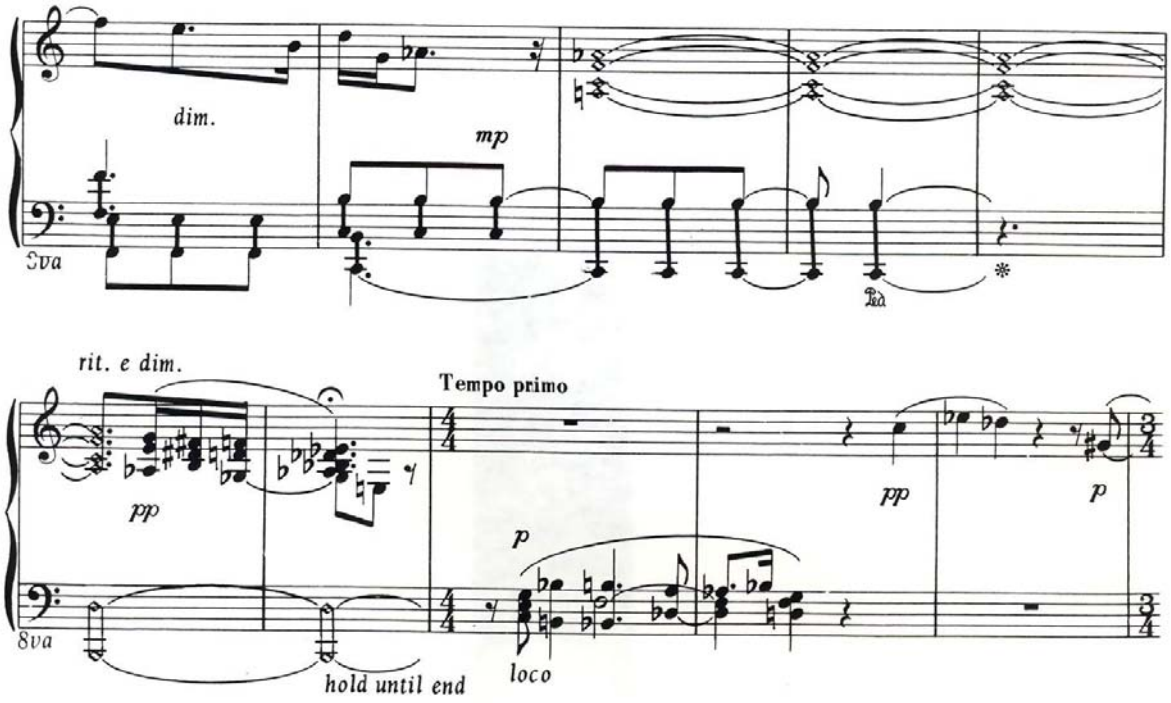
accompaniment accentuates the dance rhythm and its diatonic character takes the bite out of the dissonances in the right hand. The new type of 7th interval cluster, after so many octave clusters, finally brings Cowell's cluster idiom closer to the concept of dissonant writing. (Ex. 3.643.)



Example 3.643. H. Cowell: *Time Table* (1917), bars 13-21. © Associated Music Publishers, Inc.

In this passage also, the cluster looks a little theoretical and its performance becomes tricky with space needed in bar 19 for the right hand to play the Seufzer in between the double cluster in the left hand staff. Again it would have been handy to know how Cowell saw the pedalling in this piece. In the opening bars it seems as if only the third pedal can allow for sustaining the double cluster while playing with the right hand. In the waltz, we don't know how much damper pedal is allowed to sustain the larger clusters without muddling up the counterpoint in the right hand more than the necessary contrast with the cluster sounds would bear. We do not imagine Cowell intended the left hand passage to be played with arm technique. It is possible to do so by bringing the arm-wrist-hand stretch in a 45° angle so that the upper octave is played with (part of) the palm, the lower octave with the lower part of the arm (closest to the elbow), clearing the necessary notes for the right hand motif. This would be less than accurate in terms of the actual lengths of the clusters, however. The clusters in bar 19 are most likely to be played with both hands, with the left hand taking the *c* at the end of the motif.
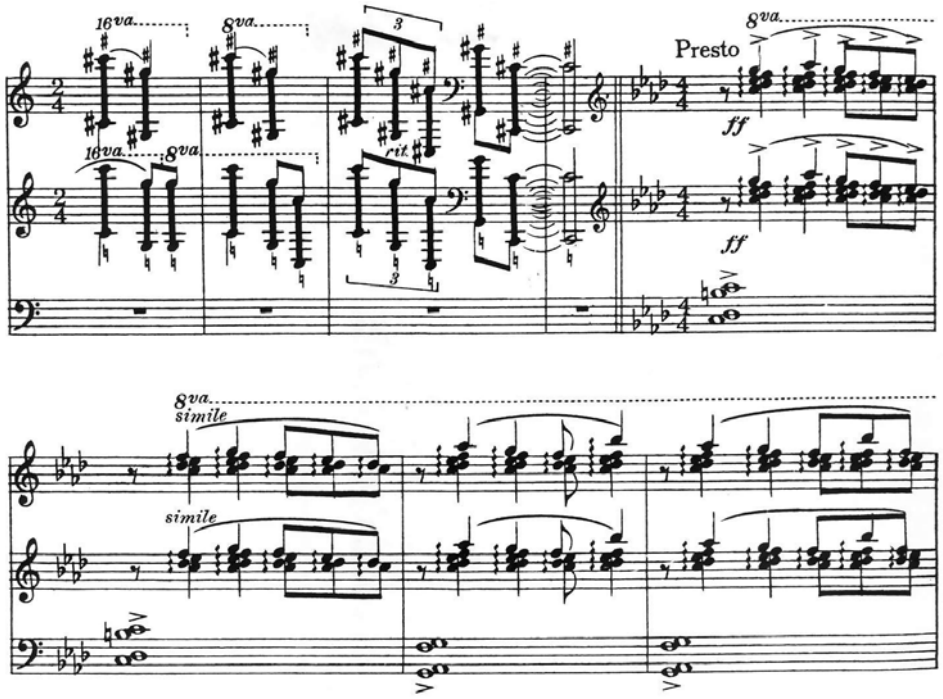
The combination of cluster and counterpoint in *Time Table* represents an embryonic stage of what Cowell developed unto a much higher (theoretical) level in *New Musical Resources* and he would never put it into practice more than in this *Encore.* However, there is no trace of sympathetic vibrations in *New Musical Resources*, despite the level of sophistication Cowell already achieved in 1917 with this piece. On top of the silently depressed cluster and the combination of its open string timbre with proper piano sounds in the same range (ex. 3.642), Cowell experimented with the transition from filtered overtones to proper struck strings sounds (ex. 3.644, bar 40.)



Example 3.644. H. Cowell: *Time Table* (1917), bars 35-44. © Associated Music Publishers, Inc.

Antinomy, the fifth and last of the *Encores,* is provided with the following clue in the opus list: "6th Antimony [sic] of Pure Reason"[1226] Cowell later explains how "two contrasting logical reasonings can come to the same conclusion"[1227] and that "Kant's antinomies were elements which seemed different but which could logically be shown to be identical – hence a theme with variations, in music."[1228] The antinomies in Kant's *Critique of Pure Reason* were actually contradictory statements that both could logically be proven to be true. Cowell does not elaborate on how exactly this notion of logical entrapment relates to the music at hand, but the key to understanding his motivation is demonstrated by the integration of clusters in more traditional contexts and concepts. Cowell presents the cluster and the chord as seemingly unrelated and even opposed phenomena (ex. 3.645). At the same time, he can logically reason them to be identical: a cluster can be a chromatically embellished triad with passing notes in an arpeggio, or a dissonated octave (or a dissonant chord) obtained by spreading out a cluster. (Ex. 3.645, bar 17-20).

[1226] A common mistake: "antimony" is a chemical element (atomic number 51), a metalloid used in paint, ceramics, enamels, a wide variety of alloys, electronics and rubber.
[1227] Cowell 1963x.
[1228] Cowell 1963, p. 5.
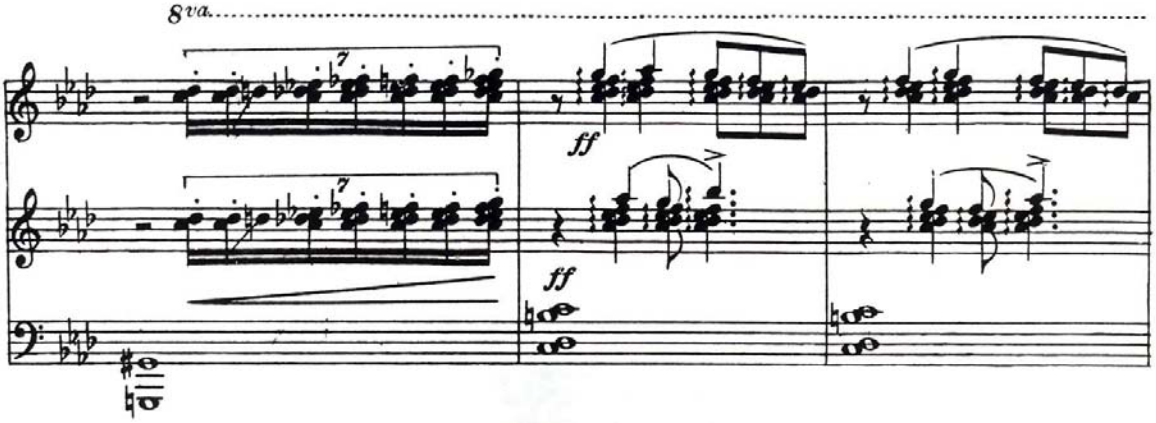


Example 3.645. H. Cowell: *Antinomy* (1917), bars 13-20. © Associated Music Publishers, Inc.

As the classical philosophical antinomies can be unraveled to expose the inconsistencies in the reasoning that make for the resulting contradiction, here too we can discover the root of the contradiction to be in the fact that Cowell intermingles different concepts in chord construction and perception. Aside from the theoretical basis for the vertical relationships between notes, he also makes use of the acoustical perception and interpretative freedom of the performance technique to blur the boundaries between the concepts. The right hand chords in bars 17-20 can be considered as rolled clusters or as arpeggiated triads with acciacaturas. In spreading out a cluster by inversion, or a chromatically embellished chord through an arpeggio, the dissonance that is associated with the cluster can be explained away or a chord can be made to sound as a cluster depending on the speed of the arpeggio or on the width of the inversion. As such, playing an arpeggio can confuse the basis of the theoretical construction. Similarly, an inversion of a cluster can be heard as an octave with acciaccaturas depending on how much differentiation in sound the pianist chooses to apply. In between theory and acoustics, performance practice can be responsible for building the bridge as well as obscuring the path.
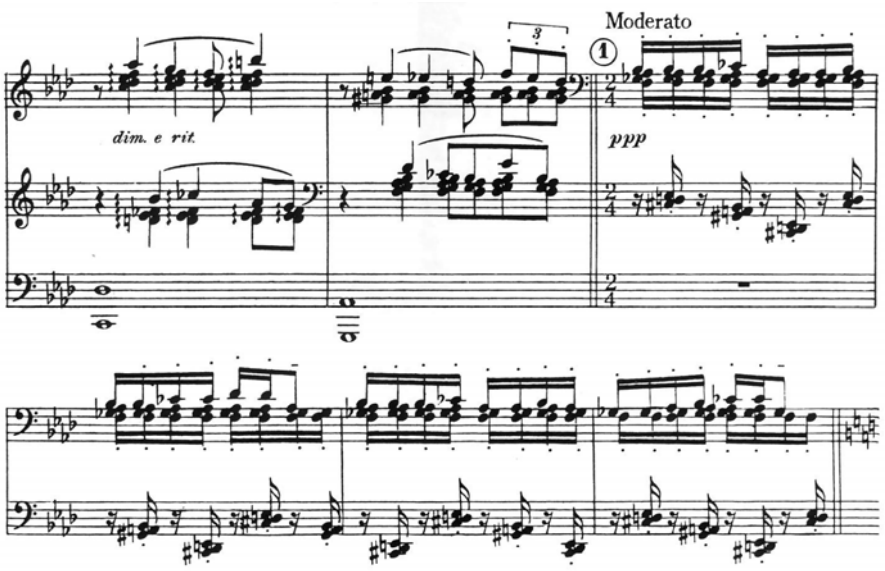
After this "main theme"[1229] Cowell goes on playing with the transition between the worlds of theoretical construction and performance practical manipulation of sound. The more the arm clusters in bars 13-16 (and other such instances) are voiced, the more they will sound as chords. By occasionally putting in less "confused" octaves and recognizably traditional musical gestures (ex. 3.646) on structural signal posts, the perception will tend to base itself on harmonic concepts. The interpreter is the final manipulating factor: depending on how much he gives priority to the vertical over the horizontal by more or less voicing dissonated chords and clusters, he will influence that perception.
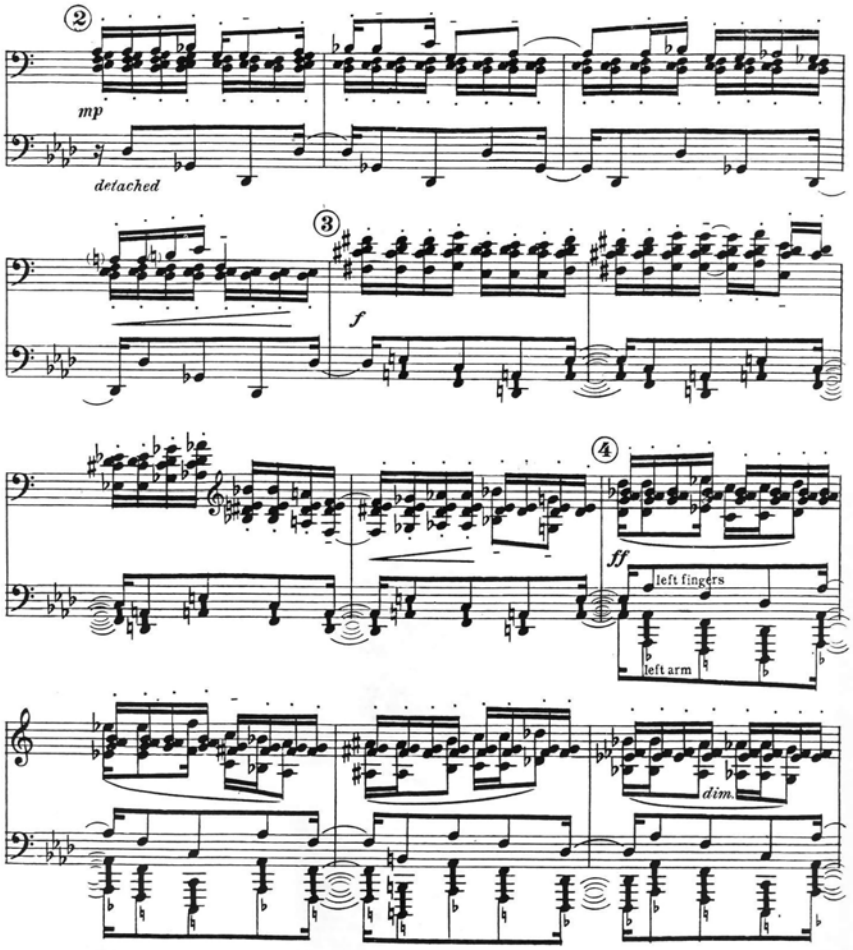
[1229] According to Cowell 1963, p. 5 this theme "survives from Cowell's very first composition, an unfinished setting of Longfellow's *Golden Legend*, begun when the boy was eleven."



Example 3.646. H. Cowell: *Antinomy* (1917), bars 24-26. © Associated Music Publishers, Inc.

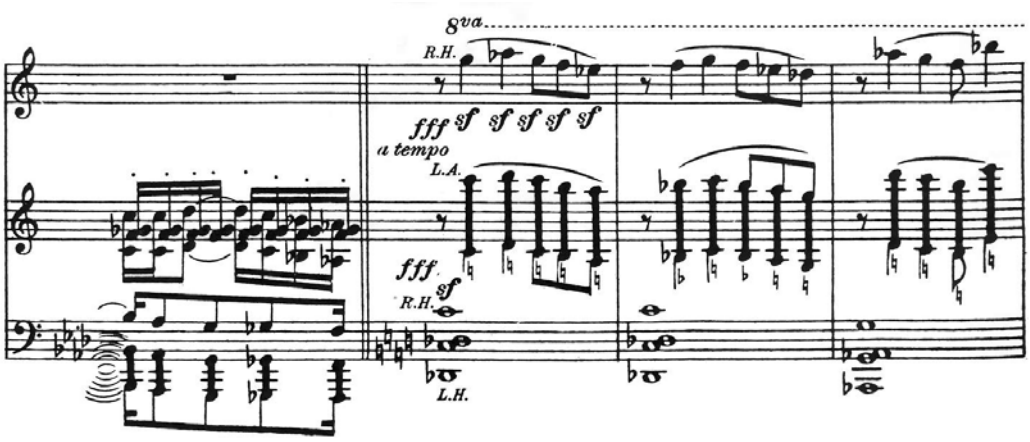
After the exposition of this musical theme (and the philosophical concept as it were), Cowell presents a new theme with variations, at the same time further exploring these contradictions. From the "colored" G♭ major melody and D♭-A♭-D♭ accompaniment ("1") the music gradually evolves through bitonality ("2") to palm ("3") and full arm cluster accompaniment ("4"), all the time increasing the volume and the chromatic embellishment of the melodic. (Ex. 3.647.)





Example 3.647. H. Cowell: *Antinomy* (1917), bars 31-48. © Associated Music Publishers, Inc.

The sequence of variations is then reversed (3-2-1) to build up one more time towards the return of the first theme, now colored in at maximum saturation. (Ex. 3.648.)

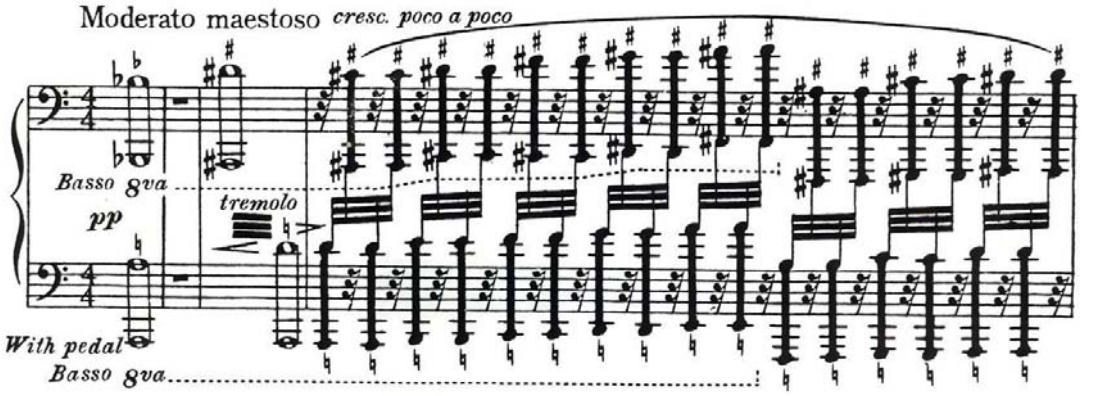


Example 3.648. H. Cowell: *Antinomy* (1917), bars 76-79. © Associated Music Publishers, Inc.

From the variations to the return of the syncopated melody, Cowell plays with the borderline between chordal melody and voiced clusters. At this climax, the timbral use of

the arm clusters is a developed stage of the melodic scale clusters in the *Tides of Manaunaun.* (Ex. 3.629.)

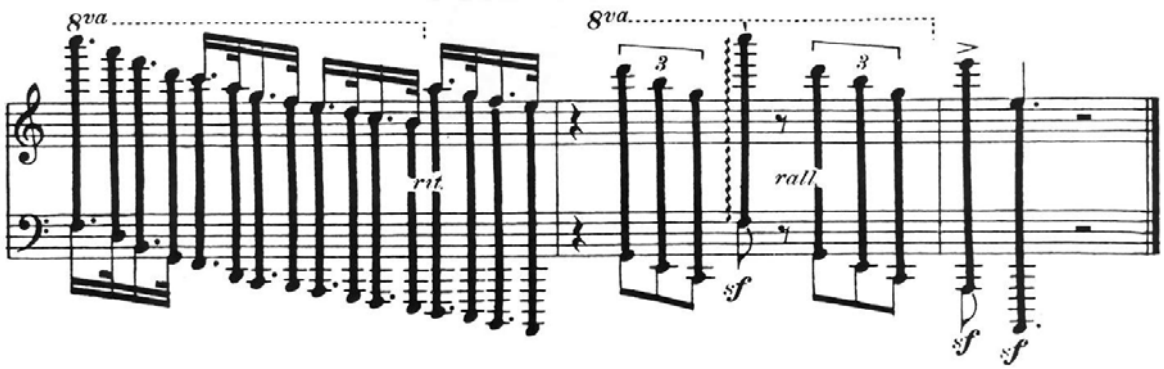
As far as the evolution in Cowell's cluster types, the most remarkable instances are the arm cluster with the melody an octave apart (ex. 3.647) and the arm cluster trill and ensuing fast chromatically alternating arms at the beginning. (Ex. 3.649.)



Example 3.649. H. Cowell: *Antinomy* (1917), opening bars. © Associated Music Publishers, Inc.

To catch the attention of the audience, this opening is on par with the "karate" technique in *Advertisement* and could serve to start a whole recital program as well as closing the evening. For the rest of the piece, the whole array of cluster types Cowell has developed until now is parading in front of us: fists, palm (5th and 8th interval), arm, arpeggiated, percussive, melodic and timbral.

From another perspective, Cowell is nearing the borderline between the realistic and the theoretical further development of the cluster. As with arm and melody clusters in "4" (bars 45-48 in ex. 3.647), the translation of a traditional finale flourish into cluster technique at the end of the piece is well thought of, but the feasibility for the pianist to accurately realize the rhythms and place of the arm clusters becomes questionable. (Ex. 3.650.)
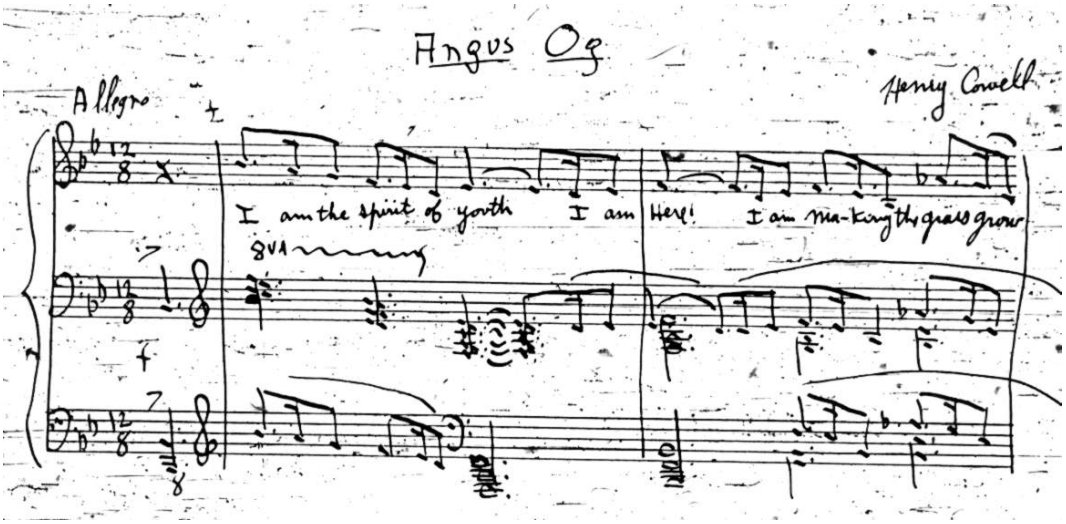


Example 3.650. H. Cowell: *Antinomy* (1917), final bars. © Associated Music Publishers, Inc.

Ironically, Cowell's search for ways to further developing new cluster-types and -usages by looking at the traditional use of chords conflicts with the notation of that tradition. Phrasing it by way of his notion of Kant's antinomies: to show that reasoning can reconcile essentially different concepts here proves impractical. Clusters reveal themselves to Cowell to be so essentially different from chords in their ergonomical and

theoretical essences that *showing* them to be the same is delusional. It can only be rationalized, for trying to practice it on a keyboard is an entirely different matter. The classical notation – however much already adapted to the cluster – is fundamentally in conflict with ergonomics as a point of departure. By lack of a proper notation the fist clusters in *Advertisement* and the tonally inspired ending (as well as other instances) of *Antinomy* are notated more exactly than that they were intended or even possible to be realised.[1230] The ascent in fourths from *Dynamic Motion* already showed us how Cowell sometimes needed to compromise a musical idea to be able to apply it to the cluster idiom (ex. 3.622); in *Antinomy* he compromises cluster ideas in order to notate them. Only the concept behind the music - the wild chaos the dance from *Advertisement* ends up in, or the tension between the identities of chords and clusters in *Antinomy* - leaves any clues as to how much of the notational exactitude is crucial to the actual music.

Also in December of 1917, Cowell wrote another song on a text by John Varian: *Angus Og* (L228). According to Cowell, "Angus Og is the god of eternal youth in Irish mythology, charged with renewing the youth of the gods with the tones of his trumpet."[1231] We see or hear no specific tone painting that relates any extended technique to the mythological given. The importance of the piece here is merely to indicate how Cowell does not always include full-fledged clusters in his writing for the piano. Throughout his life Cowell was able to swiftly change orientation and write in different styles as the occasion demanded. The three clustered chords in this piece fit the key of B♭ major as no cluster would have. (Ex. 3.651.)



Example 3.651. H. Cowell: *Angus Og* (1917), opening bars. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Despite appearances, the clustered chords need cluster technique to be played: for the second chord thumb is required to play the d^2 and $e♭^2$ (unless the is taken with the left hand) and in the third chord the thumb needs to play the *f* and *g*. Besides such an occasional side step, however, Cowell was working steadfastly on building theoretical support for his cluster techniques. Sometime in 1916 or 1917 Cowell worked on *Clusteriana No. 1* (L956), an "Analysis of the tone cluster examples in the form of the
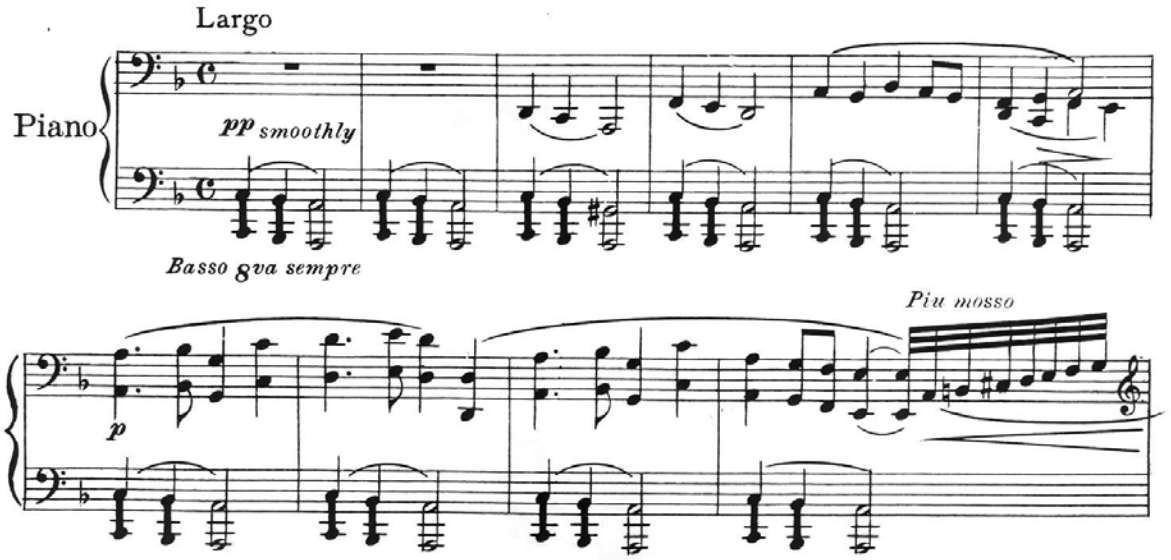
[1230] Cowell would later insist that his clusters must be played exactly as written, but that can be understood as a warning against those who think that you can just beat the keyboard as loudly as possible. Cowell himself did not play his clusters as accurately as he has written them out. We will discuss this further in the chapter on performance practical matters.
[1231] Cowell 1963, p. 7.

movement of one cluster." These dozens of examples, written without meter, point towards the concepts of the moving clusters, of which we encountered a concretely composed example in the opening of *Advertisement* (Ex. 3.636.)

Between *Angus Og* and Cowell's military service (from February 1918 to May 1919), he mostly wrote songs[1232]; during and after the service he concentrated mainly on symphonic settings, chamber music and composing for voice(s). The lack, in this period, of any piano music relevant to our investigation may be due to the fact that he wrote *New Musical Resources* in 1919 (and towards which the systematizing in *Clusteriana* was probably one of the first attempts).

The earliest new piano piece dates from November 1920, when Cowell sets another Varian text to music: *The Voice of Lir* (L354/3). Cowell tells the story of "Lir of the Half-Tongue," who was father of the gods in Ireland and of the universe. When he gave orders to the lesser gods for the creation of the universe he was only half understood because he only had half a tongue. As a result, for everything that has been created there is an unexpressed and concealed counterpart, which is the other half of Lir's plan and without which Creation remains incomplete. "And that, say the Irish, is what is the matter with the world."[1233]

The beginning goes back to all the earlier pieces dealing with Celtic mythology, and beyond to the early *Adventures in Harmony*. (Ex. 3.652.)
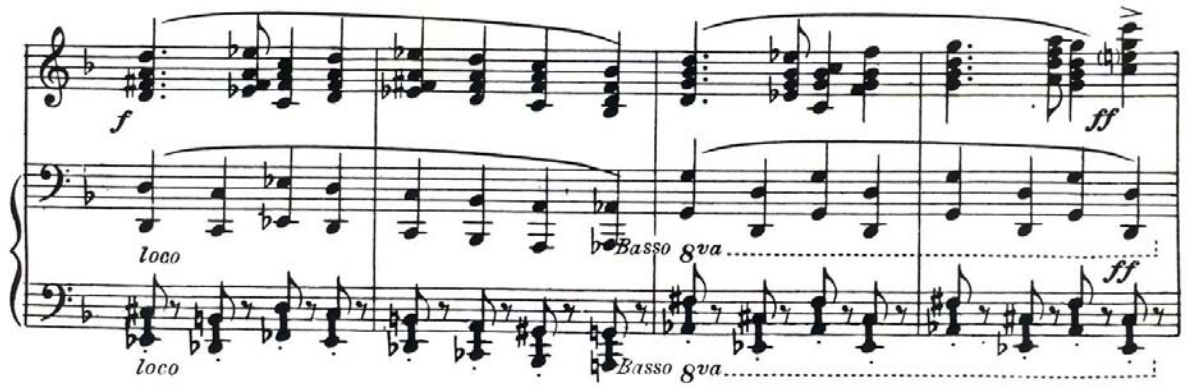


Example 3.652. H. Cowell: *The Voice of Lir* (1920), opening bars. Reproduced by permission of Breitkopf & Härtel.

As familiar as it looks, the opening shows a subtle development in the relationship between the less-defined clusters and the melody. The right hand preparation (in bars 3-6) for the actual arioso (starting in bar 7) is meant to develop imperceptibly out of the clusters in the first two bars: its notes neighbor the clusters, even making it necessary for Cowell to carefully adapt (in ink on the pencil draft) the left hand cluster on the third beat of bar 3 to make room for the A^1 in the right hand.

[1232] Lichtenwanger 1986, p. 65-68.
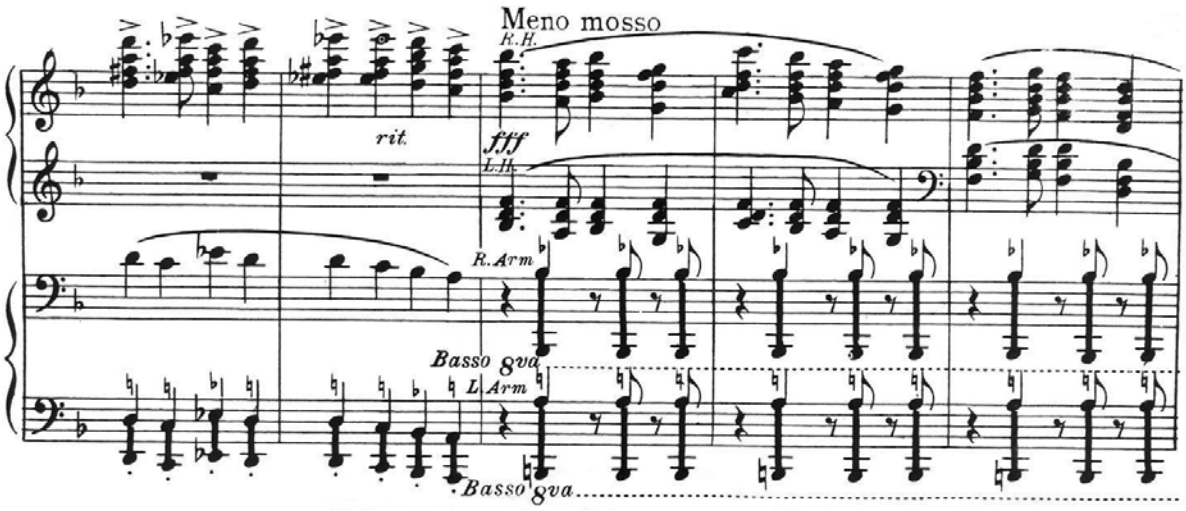
[1233] Put together from Cowell 1963; p. 7 and from the "story according to John Varian" as printed under the title of the piece in the Associated Music Publishers' edition.

Also new is the fact that other cluster types enter the format of the Irish mythological song. The staccato clusters within the legato left hand octaves may refer to the "unexpressed and concealed counterpart" of Lir's other half-tongue. (Ex. 3.653.)



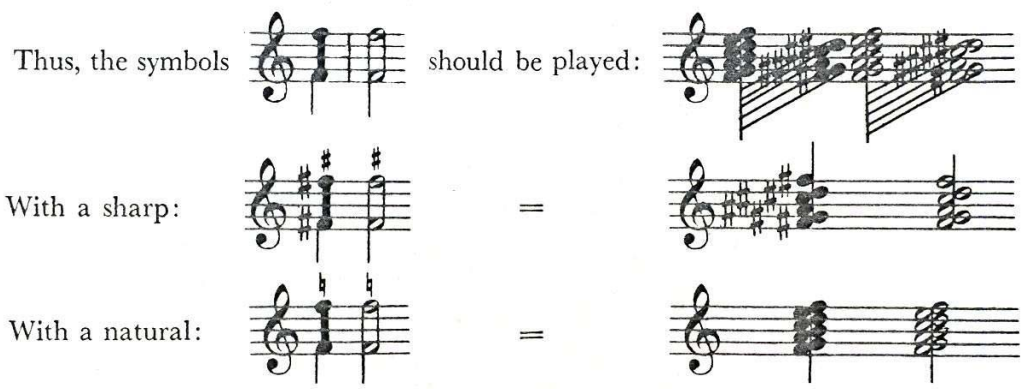
Example 3.653. H. Cowell: *The Voice of Lir* (1920), bars 15-18. Reproduced by permission of Breitkopf & Härtel.

Like in *Adventures in Harmony* (and recalling one of the variations in Liszt's *Totentanz*), large back-beat clusters accompany and glorify the climax of the song. (Ex. 3.654.)



Example 3.654. H. Cowell: *The Voice of Lir* (1920), bars 19-23. Reproduced by permission of Breitkopf & Härtel.

The manuscript of *The Voice of Lire* shows how Cowell finished developing his notation for the cluster: the boxes (see 3.635), which had replaced the earlier sidelines, are now left for a more efficient third type which would be used for the published versions of all his cluster pieces from 1922 onwards. (Ex. 3.655.)



Example 3.655. Henry Cowell: final development in his cluster notation, from the preface to the 1922 edition of some of his piano works. Reproduced by permission of Breitkopf & Härtel.
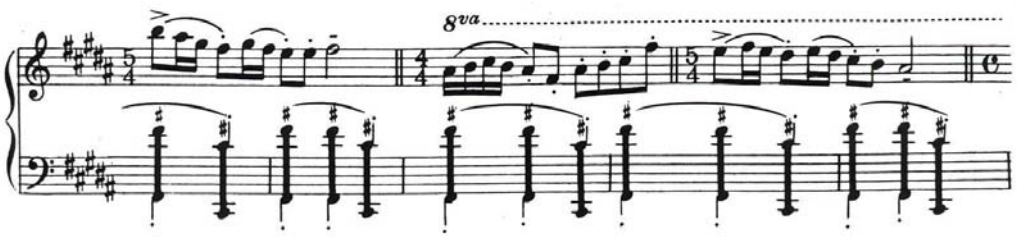
It is striking that the drafts for *New Musical Resources* were never corrected to include this third type notation in the chapter on clusters. All examples in the 1930 publication contain either (a few) fully written out clusters or the second, boxed type. It provides further proof that Cowell finished writing at least that chapter before November 1920. He never further developed this third type of notation to include species for the fist clusters or for the moving clusters and contrapuntal effects that he thought of in his treatise.

The confirmation of Cowell finalizing his cluster notation is found in the *March* (L342 – ca 1920-1921), where the ink copy carries the first instruction Cowell wrote for playing the clusters:

> Tone clusters are represented by a solid line through the staff; all notes between outer limits are played together simultaneously with forearm or flat hand.

Although this points to the chromatic cluster as the basic one, and the pentatonic and diatonic clusters as derivatives, he uses the cluster mostly as pseudo-tonal chords the way he has done since after *Dynamic Motion*.
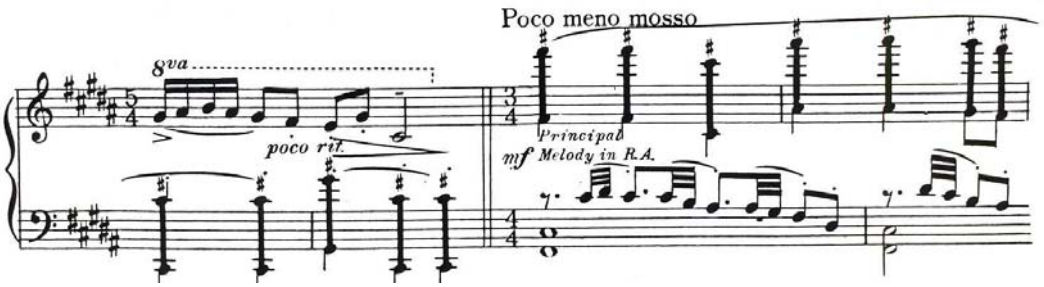
In the spring of 1921 *Exultation* (L328) was composed as an "Irish walking tune." Cowell often struggled to hit upon exactly the title he wanted. For *Exultation* some of the alternatives hint at what we are looking for in this period, by which time *New Musical Resources* should be finished and its theories should be applied to his musical materials: crossed out in favor of *Exultation* were e.g. *Contradanza, Impulse Counterrhythmique* and *Joy Rhythmus.* In *Fabric* (L307), from 1920, Cowell had explored new notation for note heads to write out complex relations between metric layers according to what he had developed in *New Musical Resources*. He didn't go that far in *Exultation* but the piece starts with left hand arm clusters in ¾ as an accompaniment like in *Amiable Conversation*, with a quirky tune on top of it alternating in 4/4 and 5/4. (Ex. 3.656.)



Example 3.656. H. Cowell: *Exultation* (1921), second staff. Reproduced by permission of Breitkopf & Härtel.

Maybe Cowell did not want to go into theoretical matters when he told the story of the Irish walking tune "that alternates emphasis between right foot and left foot, thus not wearing out one foot alone as in regular marching."[1234] Whether or not this is true of Irish walking tunes, the simultaneous use in independent melodies of different metrical values in *Exultation* is an unpretentious derivation from one of the chapters on rhythm in *New Musical Resources*. The simplicity of the metrical counterpoint (compared to what Cowell toyed with on a more cerebral level)[1235] may be caused by the performance practical aspect of the arm cluster, which limits the rhythmical virtuosity by the comfort of the body's position.

In the second part – "the piece is in the form of a sonatina"[1236] – the roles are reversed on two levels: clusters are played by the right hand and they become the principal melody (still in 3/4), whereas the first walking tune undergoes a metamorphoses to become the left hand accompaniment in 4/4. (Ex. 3.657.)



Example 3.657. H. Cowell: *Exultation* (1921), fourth staff. Reproduced by permission of Breitkopf & Härtel.

This type of arm cluster writing will be typical of Cowell's Irish tune pieces just as the undulating bass cluster has become idiomatic of so many of the settings for Varian's texts. The Irish tunes also consistently use the non-chromatic arm clusters and plot them onto C or F# major.

It takes a year before Cowell uses the cluster again: in May of 1922, *The Hero Sun* (L354/2) is performed together with *The Tides of Manaunaun* and *The Voice of Lir* as a set of *Three Irish Myths* (L354)[1237]. Like the rest of the set, *The Hero Sun* is based upon a story by John Varian:

> The gods created all the suns and sent them out into space. But these suns, instead of lighting the universe, congregated closely together, enjoying each other's society, and the universe was in darkness. Then one of the gods told the suns of a place where people were living in misery on account of the lack of light, and a strong young sun rose and hurled himself out into the darkness, until he came to this place, which was our earth; and the Hero Sun who sacrificed the companionship of the other suns to light the earth is our Sun.[1238]

Unlike any of the previous Varian pieces, this one opens not with darkness but with sky-high cluster chords filtered like rays of a sun: (Ex. 3.658.)

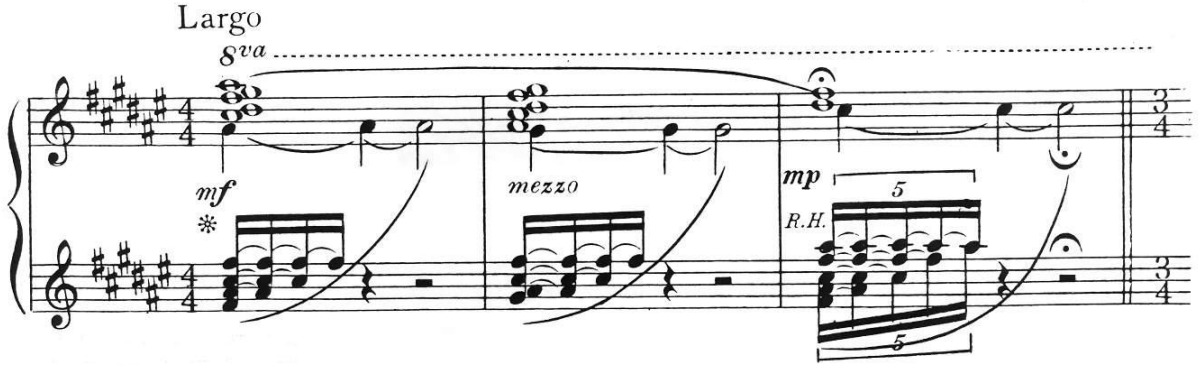
[1234] In the liner notes of the LP (Cowell 1963x) containing Cowell's own recording of this piece, it is explained "The Irish consider us silly to walk to a tune which accents only the left foot, so that 'one foot is worn out while the other is still perfectly good'!"

[1235] See for instance Cowell 1930, p. 66-81 in the chapter on meter in Part II, where he proposed to "get at the root of the trouble and bring the possibilities of metrical variety up to the same standards now applied to other branches." (p. 71)

[1236] Cowell 1963, p. 5.
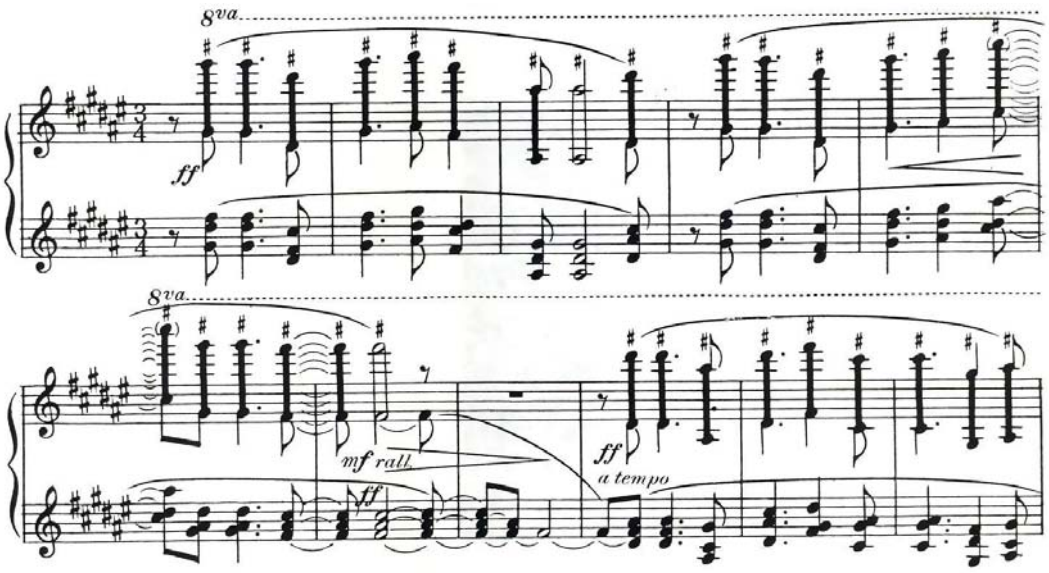
[1237] Lichtenwanger 1986, p. 90.

[1238] As printed underneath the title in the published score, signed by Henry Cowell.



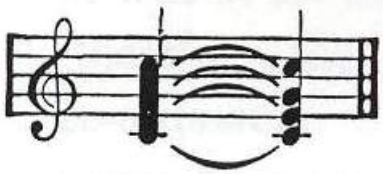
Example 3.658. H. Cowell: *The Hero Sun* (1921), opening bars. Reproduced by permission of Breitkopf & Härtel.

New to the Varian-type of Cowell's formats is the Allegro con Brio dance in arm clusters, depicting the joyful gatherings of the many suns congregated closely together. The added filter at the cadence points is another example of Cowell's structural use of the cluster. (Ex. 3.659.)
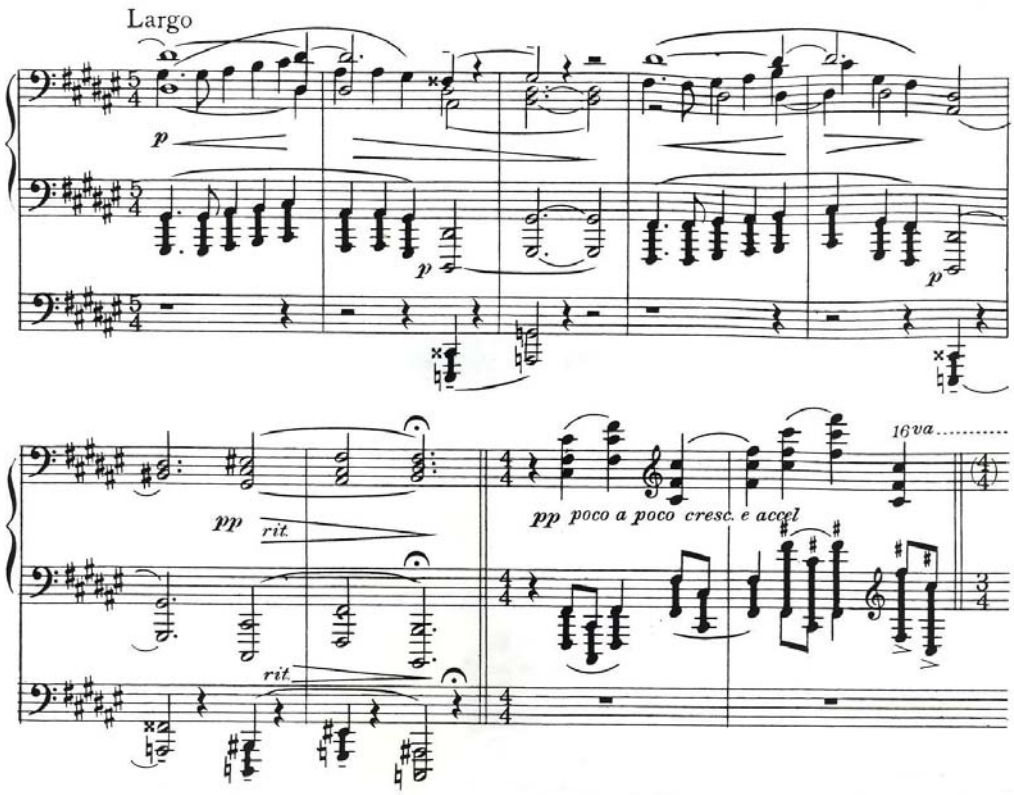


Example 3.659. H. Cowell: *The Hero Sun* (1921), bars 4-14. Reproduced by permission of Breitkopf & Härtel.

The middle part – the earth deprived of sunlight – contains a new use of the cluster: after chromatic octave clusters serving to add a darker shade to the bottom of the slow octave melody, one of the ideas from *New Musical Resources* – reducing a cluster to a chord (Ex. 3.660) – is applied in the three cadences of this phrase. (See bars 21-22, 24-26 in ex. 3.661.)
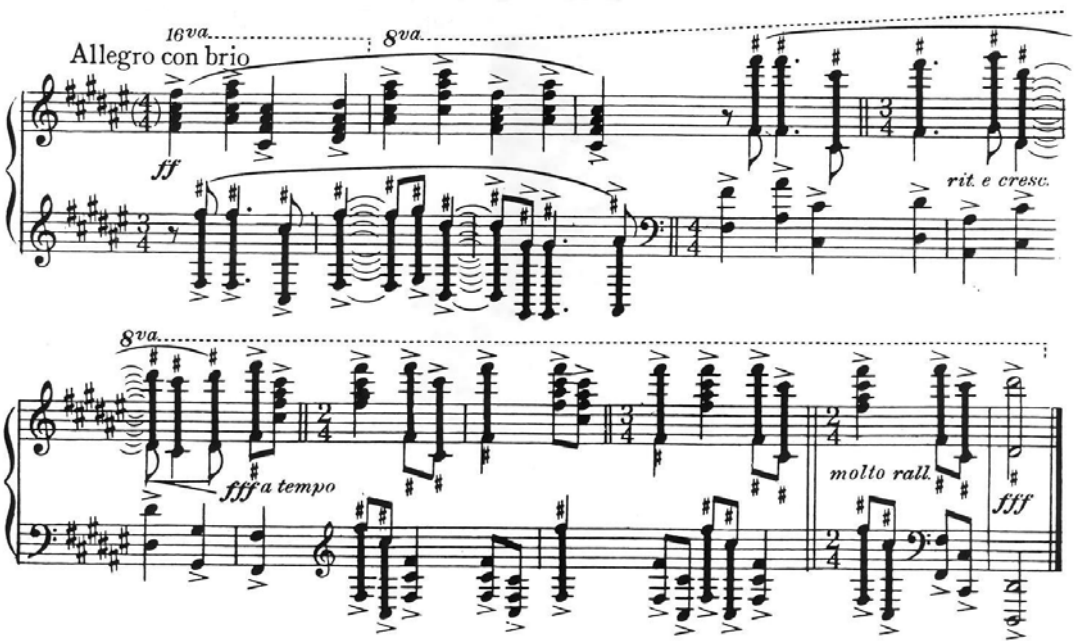


Ex. 3.660. H. Cowell: cluster reduction, ex. 54 from *New Musical Resources*, p. 136. Reproduced by permission of Cambridge University Press.



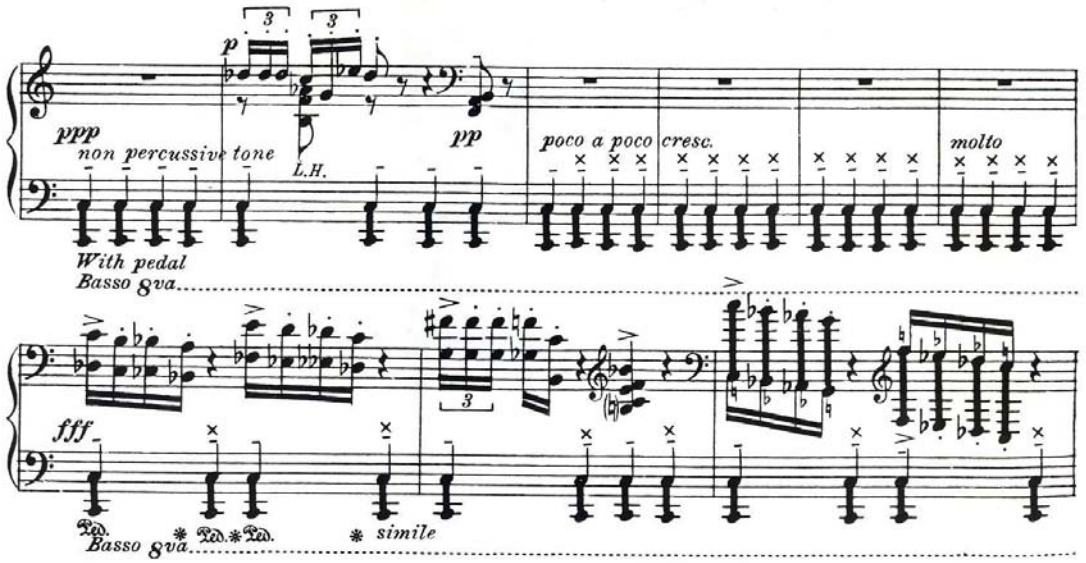
Example 3.661. H. Cowell: *The Hero Sun* (1921), bars 20-28. Reproduced by permission of Breitkopf & Härtel.

When joy and bells sound together and all is well again between earth and suns, *The Hero Sun* ends with a slightly more advanced case of multi-meter compared to *Exultation*. The left hand is only really a notational complication of 2/4 (through the use of hemiolas), but with different lengths of the phrases, both hands do not come together without compromising the meter. (Ex. 3.662.)



Example 3.662. H. Cowell: *The Hero Sun* (1921), ending. Reproduced by permission of Breitkopf & Härtel.

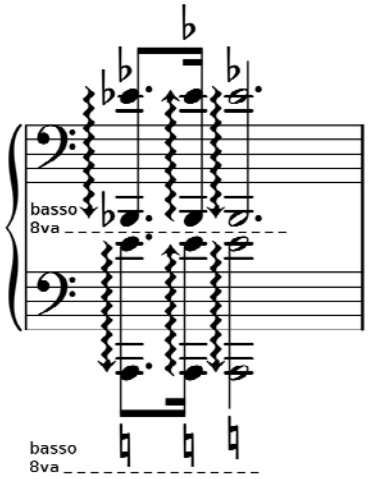
The set of three Varian stories in Cowell's music was published in October 1922 as *Three Irish Legends*. That year also saw the publication of *Dynamic Motion*, the five *Encores* to it and six of the *Ings*. Since the first drafts of *Dynamic Motion* and the first of the *Encores*, Cowell's cluster notation had changed and all pieces to be issued were revised in that sense. Unfortunately the process of the proofreading was not followed though very meticulously for very many mistakes were made in the transition from draft to print. Some changes were undoubtedly made for the better, other – such as leaving out pedal marks and obvious oversights – are unfortunate. In one instance, Cowell added a performance practical novelty worth mentioning. Playing with the variety of possible performance modes, he asks the pianist to use the right hand fist in order to press down his own left hand, which is lying on an octave size white key cluster.[1239] (Ex. 3.663.)



Example 3.663. H. Cowell: *Dynamic Motion* (1916) bars 23-31, 1922 version. © Associated Music Publishers, Inc.
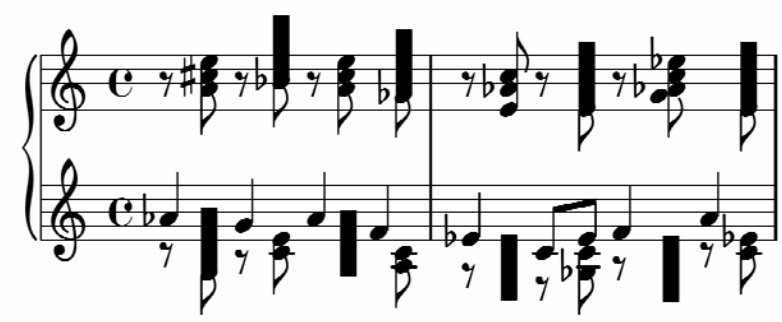
[1239] On the bottom of the page in the score where the "x" signs first appear.

On top of this public outpour of Cowell piano music, he wrote or started more new cluster pieces that year, though from then onwards, dating Cowell's works becomes more difficult.[1240] At the same time, and despite the success of having his cluster pieces now published, few new developments can be signalled. Two more *Ings*, *Floating* (L353/1) and the bi-atonal *Frisking* (L353/2), incorporate some mild metric dissonance and phasing, but no clusters. *It Isn't It* (L355) and the song *Sentence* (L365) contain some of the known types of fist, palm and arm clusters as well as clustered chords. *Conservative Estimate* (L349) is an incomplete first attempt at what he would later (in 1926) call *Dash! Tiger*[1241], and later again *Tiger* for the Russian published edition (L463), showing in the pencil sketch an indication *all elbows* over the top notes of the melody, while in the ink copy (which is only part of that draft) we find some very large (2.5 octaves) rolled arm clusters (ex. 3.664.) amongst the regular types for the arm and the fist.



Example 3.664. H. Cowell: *Conservative Estimate* (1922), fragment. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Somewhere between 1920 and 1923 he started but never finished *Dance* (L375) and *The Vron of Sorrows* (L376), the latter with octave clusters in bass at the beginning of every measure and melody chords in the right hand, the former with a virtuoso combination of alternating arm clusters in eight note back-beats. (Ex. 3.665.)



Example 3.665. H. Cowell: *Dance* (ca1920-23), fragment. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

[1240] Lichtenwanger 1986, p. xxxiv. Cowell stopped indicating days and months in his list of Compository Dates and more and more works failed to be entered. Sometime in 1924 he stopped adding works to it altogether.
[1241] According to Cowell's list of compository dates.

Sometime before June 23, 1923, he composed music to another Irish legend: *The Vision of Oma* (L369)[1242], with many (mostly soft) hand, arm and elbow clusters, some arpeggios, and triangular notes in the sketch which became diamond note heads in the holograph.

It may be well to elaborate on the issue of the "elbow clusters" here. These were mentioned often in reviews of Cowell's concerts and in articles on him or his music.[1243] At one time Cowell denied ever having used his elbow "despite rumors to the contrary,"[1244] but that was certainly to try and stop the derogatory comments about his music, which the elbow-references often were. (Ex. 3.666.) The contradiction between his statement and what can be found in several of his manuscripts lies in the confusion between the definition of an elbow and the perception of some arm cluster techniques. It is true that Cowell (or anybody else that we know of) never specifically wrote for the joint of the under- and upper arm as portrayed in the cartoon, but without knowing what Cowell wrote in his drafts (for the word elbow is not in any printed score) the audiences could in fact often catch him red-handed with the elbow on the keyboard: when executing an upwards or downwards arpeggiated arm-cluster in the right hand, the audience at the right of Cowell will, at one moment in the time that it takes to perform such a technique, see the arm lifted upwards while the elbow is on the keys. What Cowell meant in his scores is not always clear: in *March Men of the Earth* (L215 – ca 1916) he indicates "play with combination of hand, wrist, elbows, arm" (bar 9) and in *Conservative Estimate* the pencil draft indicates "all elbows" over single notes (bar 5) where the ink copy shows two-octave arm clusters with arpeggiation marks. Certainly the combination of a left hand tenor melody with added octave cluster below, like in *Antinomy* and *The Voice of Lir* (ex. 3.647 and 3.654), can be considered to be possible "elbow" clusters.



Ex. 2.666. Cartoon accompanying a review in the *Glasgow Evening Times*, 12 December 1923. As reproduced in Manion 1982, p. 133.
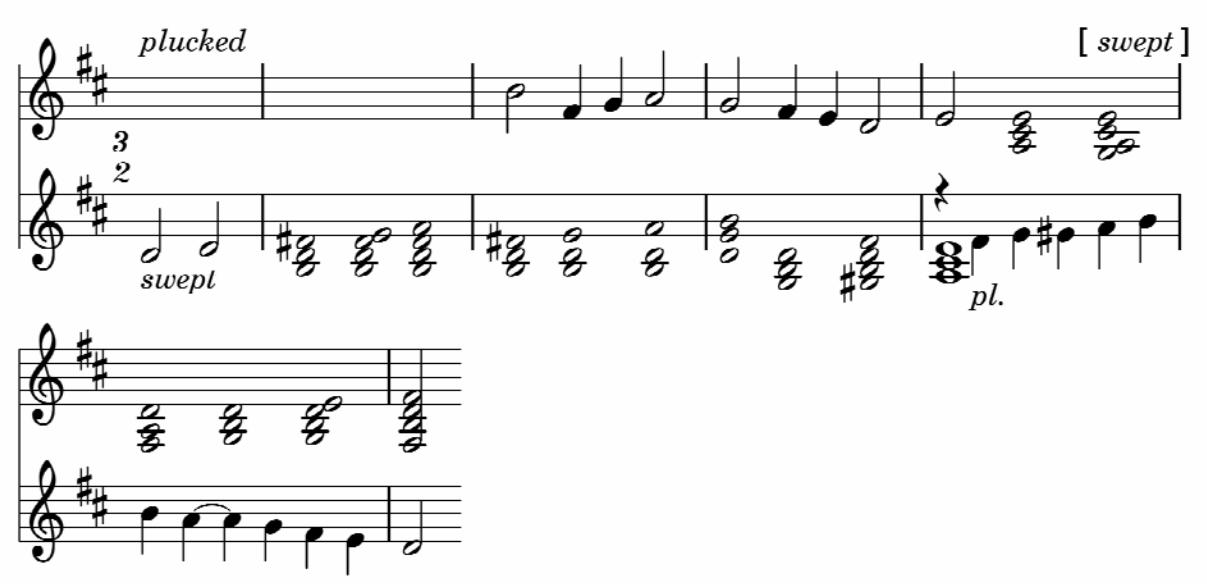
[1242] On the holograph the story is written: "In Irish Mythology 'Oma' was the god of imagination, sitting eternally surrounded by a blue flame; and each thing he imagined became real as he thought it."
[1243] Between July 1922 and December 1923 alone at least nine newspaper articles in the US, Germany and France wrote about Cowell's playing with the elbow (Manion 1982, p. 120-133: #459, 468, 482, 485, 492, 497, 499, 502, 505).
[1244] As quoted in Hicks 2002 (p. 129) from the New York Herald Tribune, 22 November 1953.

3.4.2.7.3 Adding the String and Percussion Piano

From May 29th, 1923 until February 4th, 1924, Cowell went on tour in Europe. Considering what his reputation in the US was built on, and given the European penchant for artistic bad boys, it was a perfect match. Ornstein had warmed up the old continent, so to speak, and when he backed out of international career planning, his manager took on George Antheil to replace him. As it happened, Antheil and Cowell were in Europe at the same time, though the closest they seem to have been was perhaps when both were in Germany in June of 1923 and when Antheil was in Paris while Cowell in Basel at the beginning of October.[1245] At any rate, Antheil was there before Cowell and when the latter arrived, American new music played by the composer was "hot."

The repertoire Cowell packed for the trip included *Dynamic Motion* and four of its *Encores*, *Exultation*, *Three Irish Legends*, *Six Ings*, and four more pieces without clusters.[1246] These would have been ample to make an impression even after Ornstein and Antheil. Yet, at the end of the tour, Cowell added one more piece to the two last recital programs, of a kind that he had not yet presented publicly. After extending the pianist's fingers with palms, arms and fists, Cowell left the concept of a keyboard altogether and started to explore the inside of the piano.

Long before the tour, sometime between 1916 and 1921, a six bar fragment had already been sketched, called *Two strings* (L346). No instruments are specified, but going on the content, it is most likely meant for the inside of the keyboard. The directions *plucked* and *swept* in combination with triads would exclude other string instruments.[1247] (Ex. 3.667.)



Example 3.667. H. Cowell: *Two Strings* (ca 1916-21?), complete. Transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

[1245] It must be said that there are long gaps in the chronology of both tours as we know them.

[1246] *Fabric*, *Chiaroscuro* and *Two Episodes*. All the music was from the last seven years, with about half from 1920-1922.
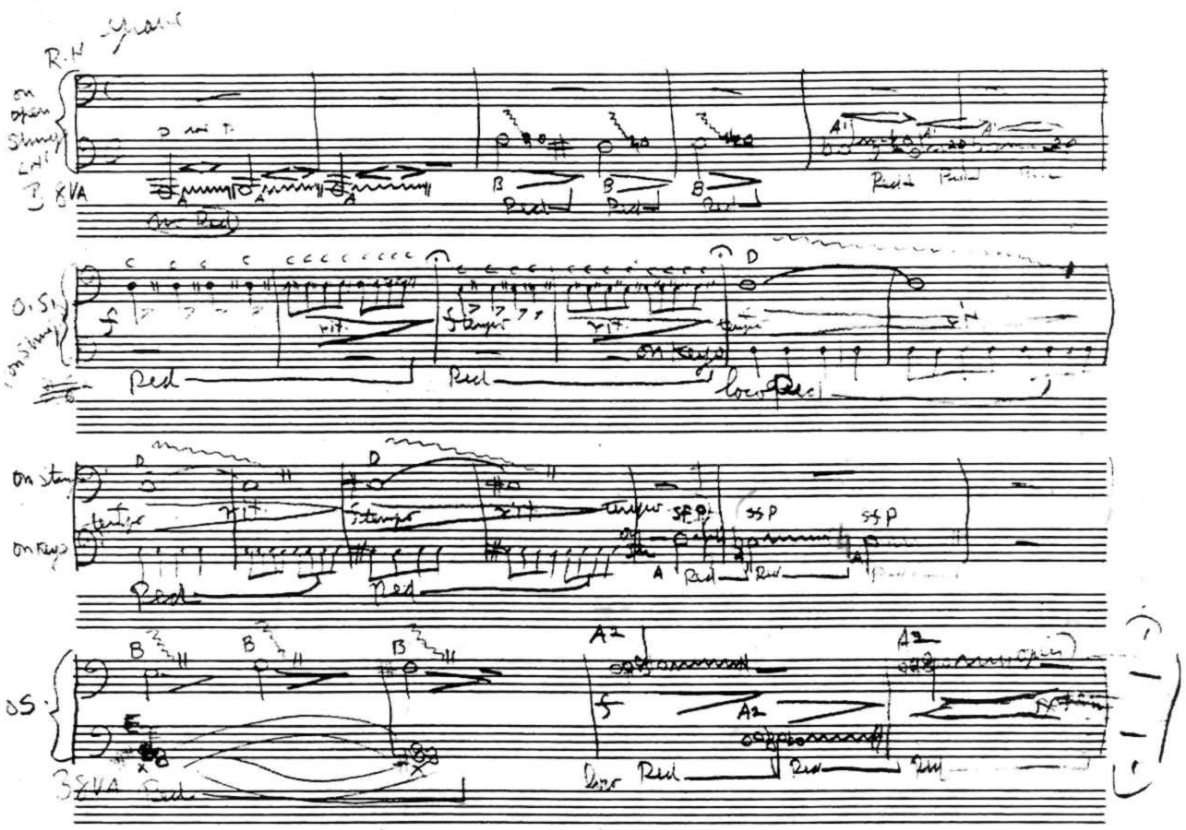
[1247] Lichtenwanger 1986, p. 86 leaves the possibility of "some other instrument" open. However, on stringed instruments (bowed as well as harp), the chords could only be played by pizzicati (often with two out of three notes of the chords on the same string when played on e.g. the violin) and they would not be referred to as "swept." This "gliding" over strings with the intent of producing a chord and not a scale (or a gliding sound), is only possible on the piano, where selected dampers can be lifted by silently depressing keys. See 3.2.6.2.1.2 for this issue in the context of Friedrich Wilhelm Rust's sonata in G.

Whether this means that *Two Strings* may have been thought of later than the suggested dates of 1916-1921, or that Cowell began experimenting with this idiom earlier than generally acknowledged[1248], cannot be determined with the evidence available, but the latter is a distinct possibility. Cowell has been said to have been "immensely relieved to find a man who thought that music might reasonably include the things that he himself considered to be music against all contradiction, such as tone clusters and sounds from the piano strings" when he met Charles Seeger.[1249] Admittedly, this statement was communicated long after his death, more than sixty years after the event referred to, so the mentioning of sounds from the piano strings may have been a generic example to support the point. But there is another piece – completed this time – which predates the European tour and which also requires direct playing upon the piano strings. According to the manuscript, *The Sword of Oblivion* (L367 - ca1920-1922[1250]), would be "one of the swords in John Varian's version of Irish mythology,"[1251] "for one of a series of 'swords' [...] possibly the first use of piano strings, probably antedating the published pieces."[1252]

In the score, all 23 bars of the music take only as much space on the page as the explaining of the different methods to produce sounds directly from the strings in the piano: (ex. 3.668)

- A – scratching along the coils of a single string with the finger nail;
- A' – like A, depressing the pedal slowly in the middle of the action;
- A² – like A, with all 5 fingers;
- B – running along the coils of the string with the flesh of the finger, releasing the pedal before the end;
- C – hitting a string with the finger, holding it long enough to damp the vibrations;
- D – pressing the nail of the finger on the string so that it sounds ½ step higher than the proper pitch (to which the string is tuned); gradually sliding the nail down the string until the proper pitch is reached, releasing the pedal slowly as the proper pitch is obtained;
- E – running up and down along the coils constantly with the flesh of the four fingers, stopping at each end long enough to damp the sound;
- II– dampening the sound with the finger at the end, not allowing the string to vibrate after the finger has left. "o" means open / "zo"[1253] means half open - the string allowed to vibrate.

[1248] The start of Cowell's writing for the "String Piano" is generally connected to *Aeolian Harp*, the first such piece to receive public notice and dated mostly around 1923. (Lichtenwanger 1986, p. 94; Godwin 1969, p. 424) Hicks 2002, p. 112-113 dates both *The Sword of Oblivion* and *Aeolian Harp* as "probably" from 1924.
[1249] Sidney Robertson Cowell in 1979, as quoted in Pescatello 1992, p. 67.
[1250] On the holograph somebody wrote "1921 +/-."
[1251] As written on the top left corner of the manuscript.
[1252] On an insert in the folder containing the four pages of the draft. The published pieces referred to would be the cluster pieces copyrighted by Breitkopf & Härtel on October 11, 1922.
[1253] Cowell's handwriting is difficult to decipher here.



Example 3.668. H. Cowell: *The Sword of Oblivion* (ca 1920-22), complete. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Apart from the fact that *Two Strings* and *The Sword of Oblivion* are to be played mostly on the strings, the techniques for each piece are completely different in kind and concept. In *Two Strings* Cowell relies on simple plucking and gliding action; for *The Sword of Oblivion* he has developed new techniques such as pitch bending (D), scratching the coils and gliding over them (A, A', A² and B), hitting strings with the finger (C), damping and muting of the string (E and II).

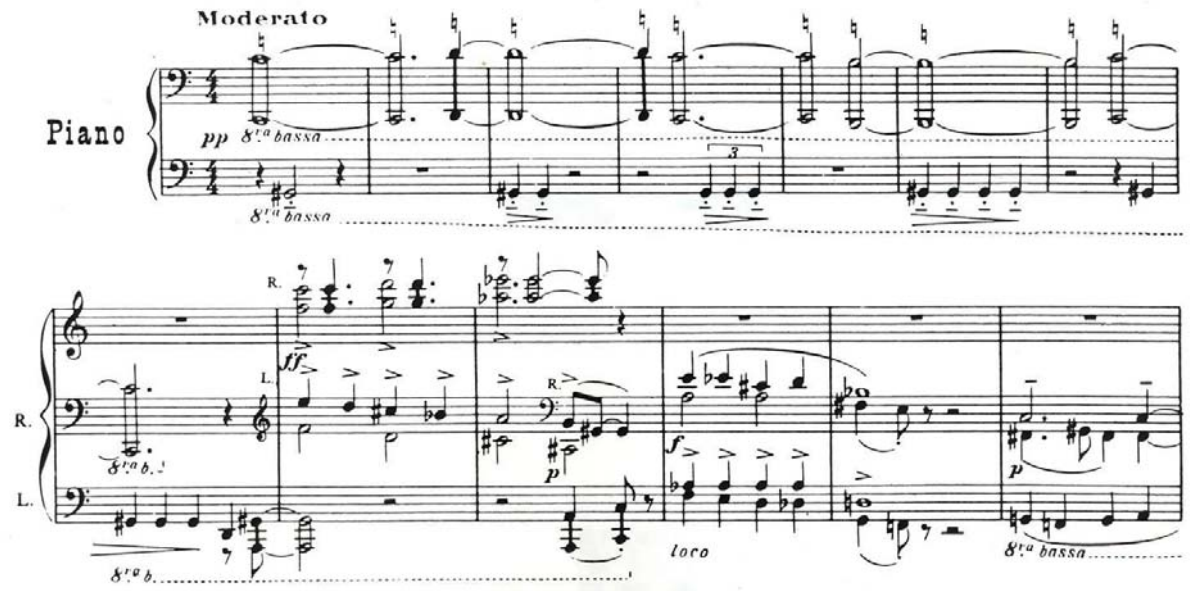
If *The Sword of Oblivion* was completed before the 1923 tour, it is incomprehensible that he didn't play it in Europe. We may not have all the information on the programs he presented and the reviews that were written, but we know that in London and Paris he played yet another piece for the strings: the *Piece for Piano with Strings* (L389)[1254]. It is reasonable to assume that he composed the latter while in Europe[1255], so it is not as if he considered the idiom too controversial for the Old Continent's taste – at least not for the last leg of it.

Here the techniques of both *Two Strings* and *The Sword of Oblivion* are used and integrated musically, making *Piece for Piano with Strings* the first composition to include all categories of extended techniques that existed so far. Considered within Cowell's compositional development, the piece is furthermore impressive in that it shows a

[1254] Other titles that had been used were (amongst yet others) *Piece for Keyboard and Strings, Morceau pour piano avec cordes, Two Movements (Pièce pour piano avec cordes).* (Lichtenwanger 1986, p. 101.) The *Piece for Piano with Strings* would become the first of *Two Movements for Piano* (389) but the second movement was left incomplete with 46 bars on 2 pages.
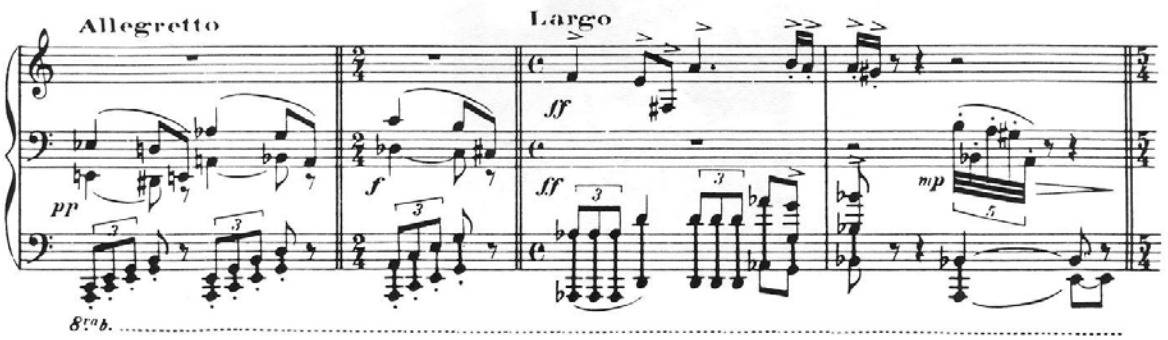
[1255] *Piece for Piano and Strings* did not appear on the program of the concert in Paris on November 17. Its first performance seems to have been during Cowell's London debut at Aeolian Hall on December 10, 1923. He added it to the Paris program for the second concert in that city on December 16; it was published there in the musical supplement to *Le Courier Musical* of February 15, 1924.

mature handling of form through organic treatment of musical material and structure, more so than in his previous piano pieces. Already in the first eight bars we can notice a carefully calculated organization of the right hand arm clusters, forming a C-D-C-B-C *grupetto*. (Ex. 3.669.)



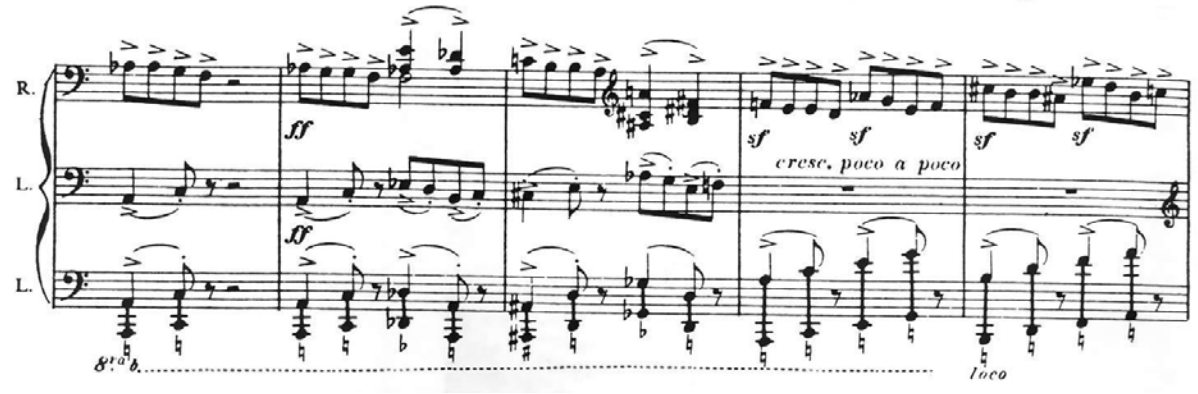
Example 3.669. H. Cowell: *Piece for Piano with Strings* (1923)[1256], opening bars. © Associated Music Publishers, Inc.

After the extensive search for diversity in cluster technique – sometimes leading to far-fetched ideas – Cowell is now able to sift through his catalogue and use only those most technically effective and musically useful. Back-beat clusters have evolved into overtone-rich echoes of the open fifths (ex. 3.669, bar 9), fist clusters are set in *pp* (ex. 3.670, bar 21), and the virtuosity of octave-plus-melody arm clusters is subordinate to contrapuntal necessity (ex. 3.670, transition bar 23 to 24; ex. 3.671).



Example 3.670. H. Cowell: *Piece for Piano with Strings* (1923), bars 21-24. © Associated Music Publishers, Inc.

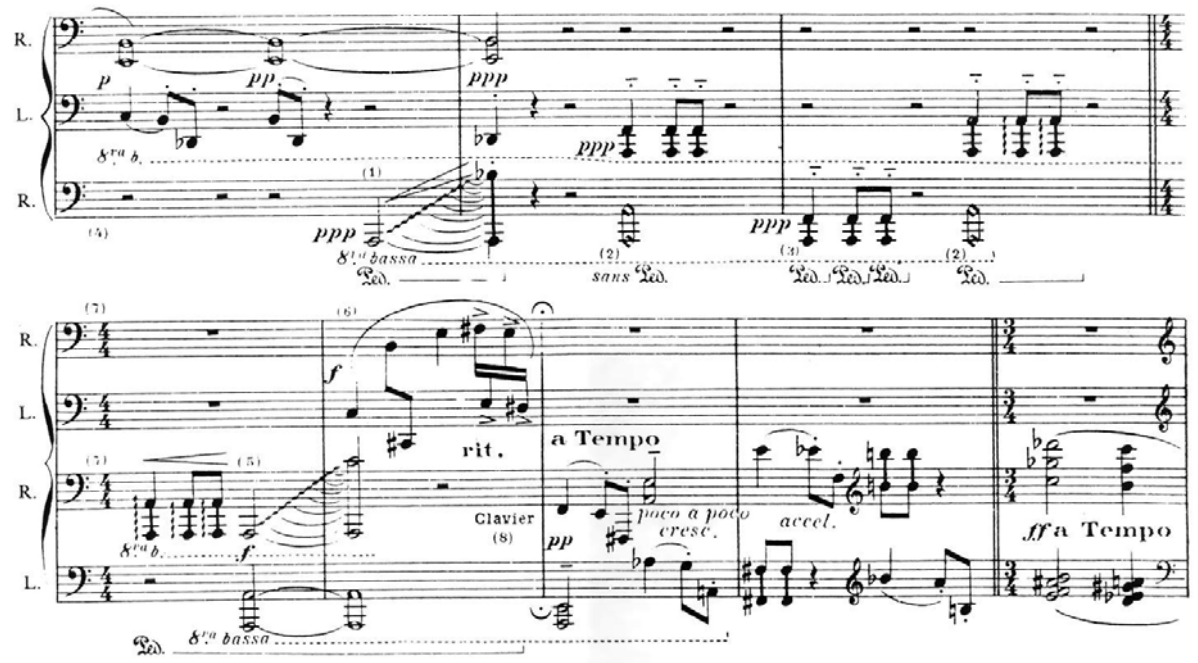
[1256] We date the piece based on its premiere rather than the first publication.



Example 3.671. H. Cowell: *Piece for Piano with Strings* (1923), bars 30-34. © Associated Music Publishers, Inc.

After the orchestral climax of the first part containing chords, clusters and counterpoint, a transition into the softest regions leads to the effects on the inside of the piano. After indicating to the pianist that the lower right hand staff will contain inside piano actions (by way of the indication "(4)" at the beginning of the lowest staff in ex. 672 – the numbers in between brackets are Cowell's own in the score), Cowell prescribes and explains four basic techniques (ex. 3.672):

a) Gliding across strings with the pads of the fingers	*(1)* in bar 51 *(7)* in bar 54[1257]
b) Muting strings while playing on the keyboard[1258]	
o non-arpeggiated clusters, without pedal	*(2)* in bar 52
o (non)-arpeggiated clusters, with pedal	*(2)* in bar 53
c) Striking strings with the palm	*(3)* in bar 53
d) Plucking strings with the pad of the finger	*(6)* in bar 55
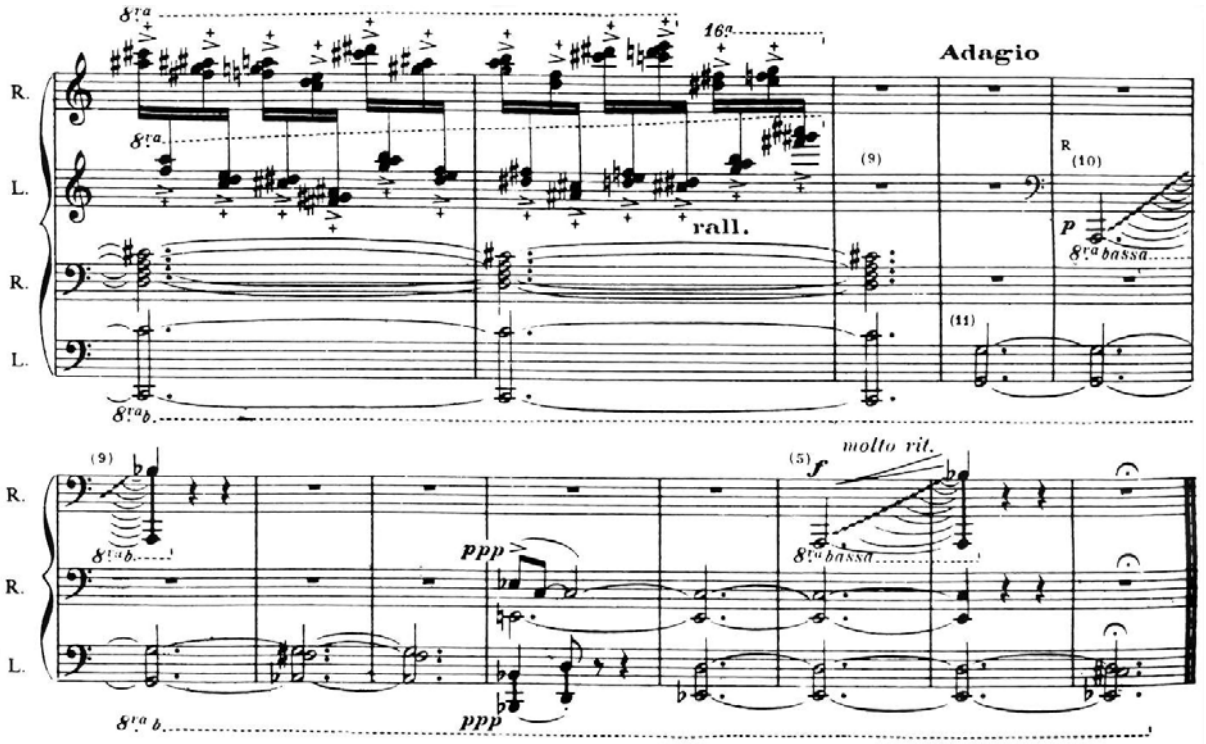


Example 3.672. H. Cowell: *Piece for Piano with Strings* (1923), bars 51-58. © Associated Music Publishers, Inc.

[1257] "(7)" and "(4)" both mean "Play on the Strings."

[1258] "Gently place the hands [sic] on the strings without creating vibration."

After this slow section (the tempo descended from Allegretto via a *rall. molto* to a non-described tempo) the player is given time to switch to keyboard playing ("Clavier (8)" in bar 55) and the music works itself up again from the atmospheric depths to music much like that from the first part. The *ff* chord and cluster sequence is interrupted three times by rapid sixteenths in alternating hands technique – the last time with the fists – and returns to the string section of the instrument for the final Adagio, warning the pianist of it in the process ("(9)" in bar 74, ex. 3.673). In the final section, Cowell prescribes silently depressed clusters ("(11)" in bar 75 and – though not indicated – in bar 81) to open strings that sound when glided over ("(10") in bars 76 and 82).



Example 3.673. H. Cowell: *Piece for Piano with Strings* (1923), bars 72-84. © Associated Music Publishers, Inc.

As detailed the instructions are, several instances are nevertheless questionable. First of all, it is not clear whether Cowell really wanted the pedal to be lifted right after the first glissando on the strings in bar 51-52, when the right hand cluster should still sound for another quarter (but is not held by the right hand anymore since that is needed to play the glissando). The question applies to the last bars as well: should the sound of the chord (*E-c*) in the second right hand stave be sustained at the end of bar 81 while the hand moves towards the inside of the piano to play the glissando? Finally, one wonders about the change of cluster size in the left hand of bar 78 and whether it should not have been a major 7th *A♭-G* to start with, comparable to the *E♭-d* cluster in the last bars.

Any pianist attempting this radically new music will have had to be as practical as Cowell most certainly will have expected him to be – we know that for instance the French pianist composers did so at the time[1259] – and will have understood how pedal marks were perhaps only notated when they were not considered absolutely necessary from a

[1259] There are hardly any pedal markings in the works of Debussy or Ravel, and yet these would hardly be played without the pedals.

pianist's point of view but would make an artistic difference, as in for instance the bars 52 and 53.

Apart from these details, the use of the techniques is remarkably well organized in terms of musical logic. It is also surprisingly advanced, with for instance not just a glissando on the strings as an effect to quickly astound the listener, but rather a "slow arpeging [sic]" with carefully chosen dynamics and functions (e.g. leading up to a note played on the keys in bar 52, or straight to a pizzicato as in bar 55). In the pencil draft, Cowell later even added in ink a note with symbols to differentiate between slow and fast string arpeggios (as he called them). Considering that we should take the Rust case out of the equation here (not knowing whether Cowell may have seen the edition of the Sonatas which d'Indy had issued in Paris, or whether he may have heard about it from e.g. his friend Calvocoressi[1260]), Cowell here produces sounds he had hardly had much practice with, let alone on a level of artistic integrity that he had not always even reached in his many cluster pieces. To compose with the string sounds so discretely as he did here, is in striking contrast to the radical cluster pieces he played on the rest of the program for the Paris and London concerts at the end of 1923. Integrating the sounds in a structure that also uses cluster techniques and proper keyboard playing further sets the *Piece for Piano and Strings* apart from previous attempts like *Two Strings* and *The Sword of Oblivion*.

Back in the US, Cowell must have been anxious to explore the inside of his instrument further. The second movement that he planned to add to the *Piece for Piano and Strings* includes yet more new techniques such as

- double note tremolos on the strings with the flesh of all fingers "expressing each note";
- 5th size clusters with the "flat of hand on all strings," "hold[ing] hand on string till damped, not allowing full sound to vibrate";
- multiple strings "picked with flesh";
- "picked with nail."

Some techniques were already tried out in *The Sword of Oblivion* (running the "nail along direction of string, very short," "with nail running whole length of string").

As much as *Piece for Piano and Strings* can be considered a musically successful composition, Cowell would not continue to explore the combination of clusters and string piano for a while. 1924 and the following years did harvest a wealth of music for clusters and for string piano separately, however.
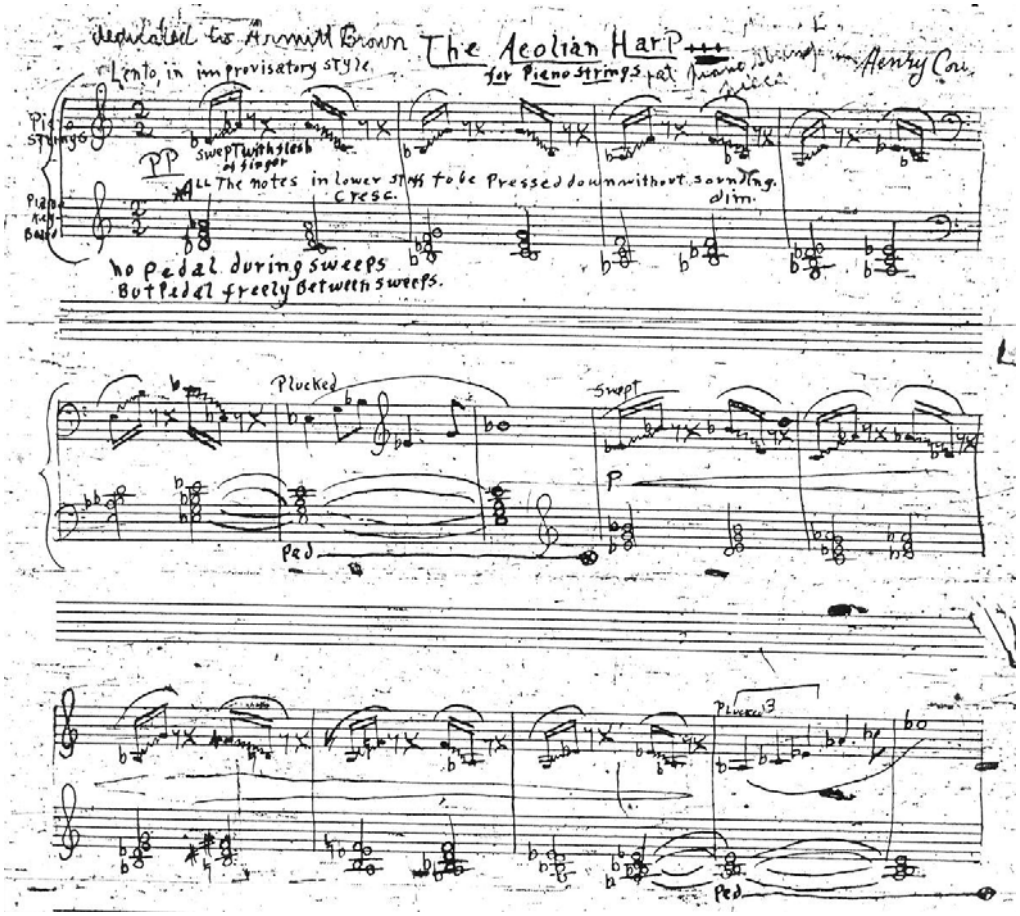
The Aeolian Harp (L370)[1261] is generally considered to be from ca 1923. Cowell himself often referred to this work as his "first piano strings piece" and he is reported to have sometimes spoken of its dating from before the 1920's.[1262] Here once more we have to wonder why Cowell would not have premiered his string piano techniques in Europe with Aeolian Harp. To be precise in this matter, we have to note that, while *Piece for Piano and Strings* is close to *The Sword of Oblivion* in the techniques that are experimented with, *The Aeolian Harp* is just as close to the earlier *Two Strings*, so the evolutionary

[1260] Musicologist Michel Dimitri Calvocoressi had taken a public stand in the dispute over the authenticity of the late 19th century edition of Friedrich Wilhelm Rust's work. See 3.4.2.6.2.

[1261] Cowell 1963 (p. 5) explains, "an Aeolian harp is a tiny wind harp that children make of silk threads stretched across an arched twig like a bow. Hung in a windy spot, the silken strings give forth high faint indiscriminate sounds, loud or soft according to the force of the wind." The music is also related to Irish mythology, as the "Harp of life" was used by the god of life to create"a new living creature with each tone sounded on his great cosmic harp, a harp described as reaching from above heaven to beneath hell."

[1262] Lichtenwanger 1986, p. 94. On the Folkways recording (Cowell 1963x) the piece is said to be from "about 1923," probably remembering mostly the year of his first European tour and the fact that he had then played a piece for piano strings. The first edition (Quincke & Company , Los Angeles) from 1930 indicates '1923'.

argument is of no avail. The pencil draft decodes *The Aeolian Harp* as "quasi improvisation" with "strings swept similarly back and forth throughout, always between the outer [notes] of the chords, except when plucking." (Ex. 3.674.)



Example 3.674. H. Cowell: *The Aeolian Harp* (1923), bars 1-14. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

The technique here used is clearly what *Two Strings* seems to be about: silently depressed chords open strings that are activated by gliding over them. The lack of pedal during the sweep results in letting the strings of the chord filter through the noise of the glissando. The pedal is then used to sustain the filtered sounds while silently depressing the next chord. The "swept" part is alternated with a "plucked" part, when pizzicatos mark the end of each modulatory sequence. Cowell further differentiates the techniques by distinguishing between glissandos with the nail or the flesh of the finger.[1263]

Cowell was by now well aware that not all pianos have their inside frame designed in the same way and some techniques (e.g. gliding over strings) may be difficult or impossible to execute on instruments that have their struts laid out differently in between the strings compared to the instrument he composed his pieces for. At least in the manuscript of *Aeolian Harp*, he starts making provisions: "This composition maybe transposed, if necessary, for performance on pianos where the indicated key is impractical."

Whether or not Cowell was stimulated by the many negative reviews he had gotten in Europe for is "elbow" music to persevere in writing for clusters, the remainder of 1924

[1263] The printed version – from 1930 and still the only one available today – differs considerably from the manuscript. See further down in this chapter.

was a cluster year for Cowell: even a musical greeting on the back of a letter to his friend the composer Dane Rudhyar (L377) contains tone clusters.

The Fire of the Cauldron[1264] (L382) is another Irish Legend according to John Varian:

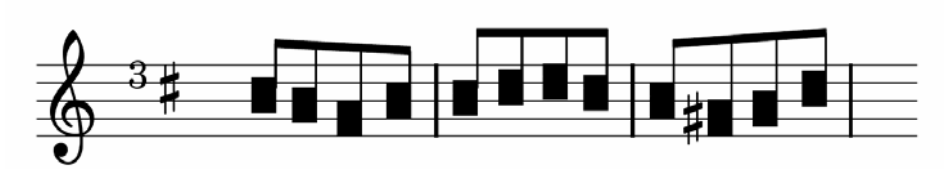
> In the center of the land of the high gods burned a cosmical cauldron of living green flame. All the gods partook of the flame as a food for the fire of their souls. The flame was customarily slow moving, but before the birth of a new god it would increase in intensity until none could look at it.

There are a lot of clusters in this mythological composition. Next to the return of the "tremolo with left arm between black and white keys," we notice a new performance mode "by rolling flat of hand from side to side." (Ex. 3.675.)



Example 3.675. H. Cowell: *The Fire of the Cauldron* (1924). Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

The trio *Four Combinations for Three Instruments* (L383) as well as *Swaying* (L353/9) both contain clustered chords, but the sketch for the *Ing* has them written out in cluster notation. As they are "all on key notes of A [major] only, unless marked"[1265], it is clear that Cowell used the notation for practical (time-saving) purposes rather than for distinguishing between cluster technique and finger technique. (Ex. 3.676.)
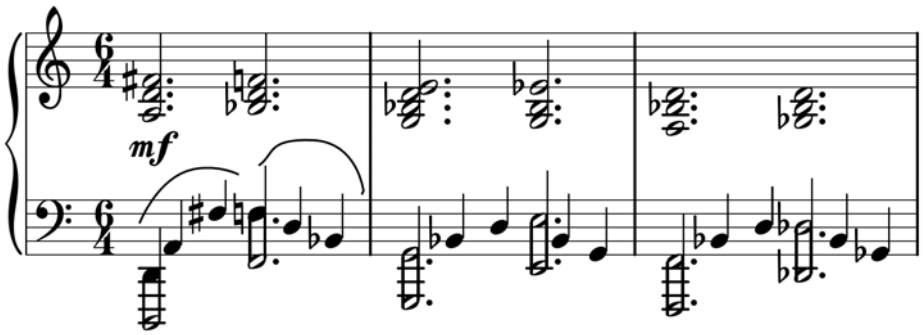


Example 3.676. H. Cowell: *Swaying* (1924). Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

[1264] A.k.a. The Cauldron of the Fire.

[1265] Written on the verso side of the sketch "Rocking" (earlier title of Swaying).

Further reason to wonder about Cowell's meticulousness in the relation between notation and performance practice, is the fact that the pencil draft for *The Harp of Life* (L384) – another Varian story[1266] with the typical beginning and back beat clusters evolving from octave to arm width – contains the arrowheads for the direction of the cluster arpeggiation while the ink copy does not indicate their direction, and has less arpeggiation marks to begin with.

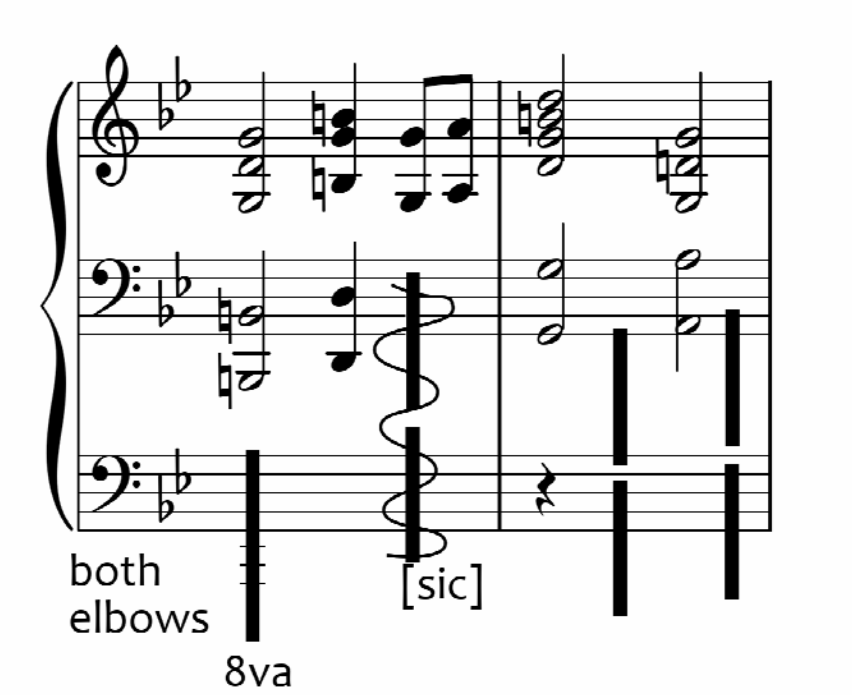
More pieces related to Celtic mythology follow. *Manaunaun's Birthing* (L387) for voice and piano has hand clusters integrated in a 19th century type of broken chord accompaniment with the palm octaves chromatically coloring the harmonic progression. (Ex. 3.677.)



Example 3.677. H. Cowell: *Manaunaun's Birthing* (1924), opening. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

March of the Feet of the Eldana (L388) is about Eldana, the collective name "for all the many powers and capacities that the hero Lugh, the "Hero Sun," could summon to his aid in battle."[1267] The music is composed with a right hand march melody accompanied by a cluster figure consisting of a melodic line with after beat octave clusters. According to the written indications, these can be considered of the "elbow"-type and evolve into a left hand melody in octaves with melodically accentuated arm clusters after the beat, now accompanying the right hand carrying its melody in chords. Arpeggiated 2 octave clusters follow until in bar 42 "both elbows" are needed (ex. 3.678) – afterwards even without a sign of the clusters themselves – and in bar 48 the compositional structure returns the material to a less exulted state and the use of only "one elbow."

[1266] See footnote at discussion of *The Aeolian Harp.*
[1267] Lichtenwanger 1986, p. 100.



Example 3.678. H. Cowell: *March of the Feet of the Eldana* (1924), bars 42-43. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

The *Trumpet of Angus Og (The Spirit of Youth)* (L399) was entered in Cowell's list of opus numbers under 1924, though it may have existed already in 1918 (a year after he wrote the *Angus Og* song). The clusters are all on white keys only. The figuration is mostly in scales of palm size clusters evolving to right hand double octave cluster scales. Interesting to note is how some left hand palm size clusters runs need the "thumb on top notes a little accented." As they are all on white keys, the five fingers could easily play and voice them, yet Cowell seems to have clusters in mind, which means the hand would be at 90° with the keyboard so that the thumb is in place to balance the hand towards accentuating the top of the cluster.

March of the Fomer (L403) was one of several titles contemplated for this Celtic piece, such as the more emotional *Urge*, *Impetus*, *Urgeful* or *Impetuous*.[1268] The caption Cowell settled on refers to the mythological "Fomer, or Fomorians, the earlier people who ruled Ireland from Tory Island off the northwest coast until they were overcome in the Second battle of Midyar by mighty Lugh and his Eldana or Ildánach – a collective term for the many different talents and capacities Lugh (a sort of Celtic Mercury) could call forth and assume."[1269] Musically, chords are built from a single note, growing chromatically to the sizes of fifth- and, towards the end, double octave clusters. In the last bar the pedal is released for the sound to be filtered by allowing it "to vibrate after releasing clusters."
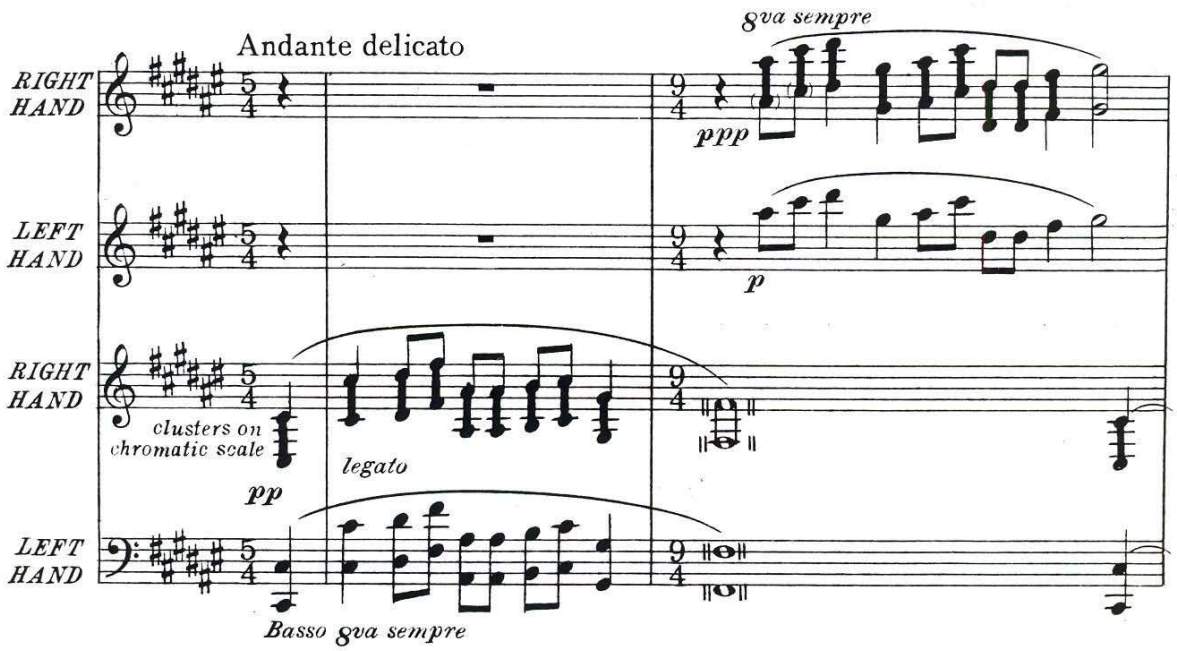
After the many inspirations from Varian's stories, Cowell lets his attention turn towards Japan with *The Snows of Fuji-Yama* (L395):

> According to an Old Japanese Legend, there are in reality no snows on the mountain of Fuji-Yama. When a maiden dies, her soul takes the form of a white moth, which climbs Fuji on the way to Nirvana. The moth's wings fall to the

[1268] Lichtenwanger 1986, p. 105.
[1269] Lichtenwanger 1986, p. 105.

> ground as it nears the summit, and they appear as snows to those looking from below.[1270]

The score is written out on four staves: two for the bass register and two for the treble, each range being played with both hands. The bass part consists of octaves as fundamentals with octave clusters above as the compressed series of harmonics. The treble is similarly divided between the left hand playing the melody and the right hand adding the overtone coloration on the keyboard. (Ex. 3.679.)
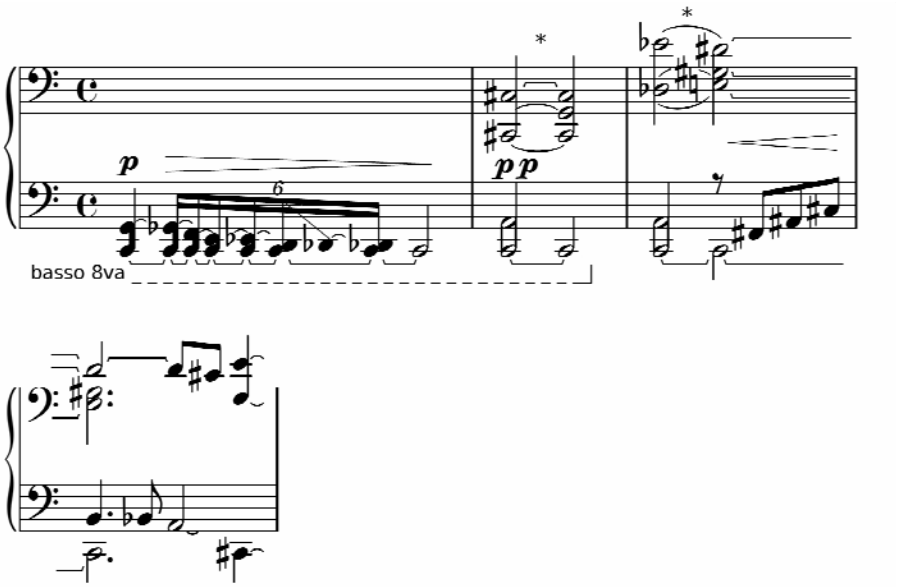


Example 3.679. H. Cowell: *The Snows of the Fuji-Yama* (1924), bars 1-2. © Associated Music Publishers, Inc.

The music was published three years later and contained not only an advertisement for a book on "the truth about Leo Ornstein,"[1271] but more importantly some advice on how to play the clusters in Cowell's music. Besides the explications of the cluster notation, it is noted how "care should be taken to play all the tones exactly together, and in legato passages, pressing down the keys, rather than striking them, thus obtaining a smoother tone quality."[1272]

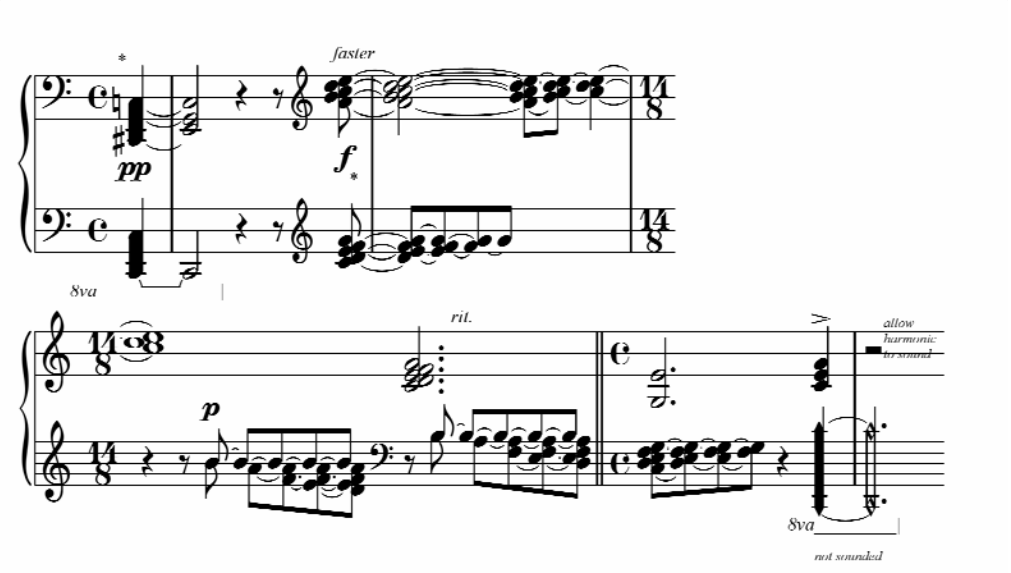
Where She Lies (L400) for voice & piano was published even sooner: in 1925 by Curver & Sons in London, a contact Cowell no doubt established while in London during his tour from two years earlier. The piece is further important as it shows us that Cowell was still working on details of his practical cluster theories for *New Musical Resources*.
The opening already confronts us with different modes of filtering out clusters: gradually – note for note – towards a single note, or suddenly from 26 to 4 notes. (Ex. 3.680 – the notation, unfortunately, does not indicate the obvious need to play clusters in the right hand at the beginning of the 2nd and 3rd bar.)

[1270] As printed in the score published by Associated Music Publishers, Inc, New York, © 1927.
[1271] In the book by Frederick H. Martens *Leo Ornstein. The Man – His Ideas – His Work*, first published in 1918 as part of the series "The Modern Jewish Experience." (Martens 1975.)
[1272] Preface to the edition issued by Associated Music Publishers, Inc, New York, © 1927.



Example 3.680. H. Cowell: *Where She Lies* (1924), bars 1-4. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.
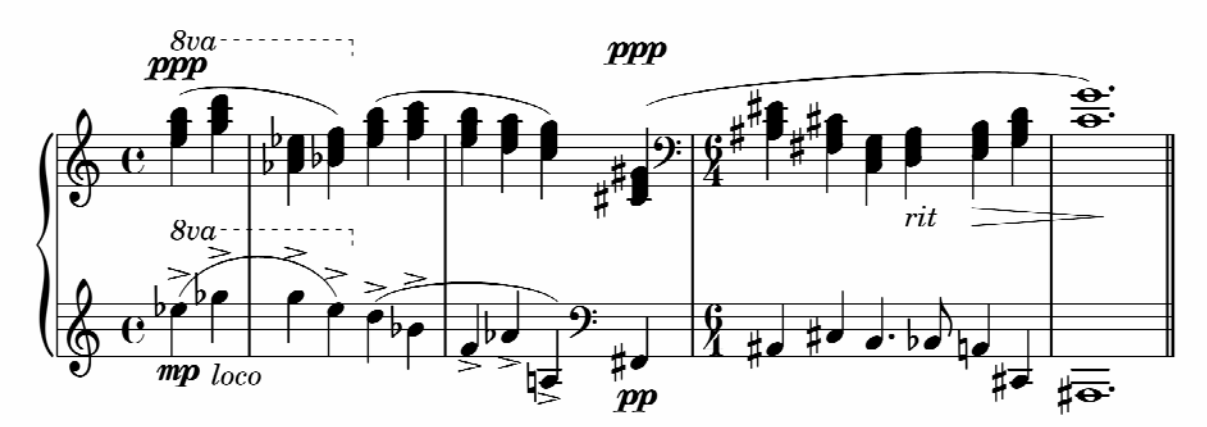
The asterisks served to warn the player to "watch for notes to be dropped out, while others are sustained." The reverse of eroding or emptying clusters was to construct them while playing. (Ex. 3.681.)



Example 3.681. H. Cowell: *Where She Lies* (1924), bars 8-12. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

The accumulation of clusters is less effective on the keyboard due to the immediate delay that causes the build-up to sound like a melody more than clustered reverberations. This is likely the reason why Cowell did not make much use of it, regardless of how promising the prospects for this technique of moving clusters look when he theorized it in *New*

Musical Resources.[1273] Initiating sympathetic reverberation by opening a large range of strings through silently depressing an arm cluster (ex. 3.681) or using the cluster to enrich (or enforce) the overtone quality of a melody (ex. 3.682 – see also *The Snows of the Fuji-Yama* in ex. 3.679) proved to be more rewarding.



Example 3.682. H. Cowell: *Where She Lies* (1924), ending. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

It would seem hard for Cowell to top the year 1924 as a golden period for piano output, but the following year was no less fruitful and he would produce some striking pieces as well as developing new applications or refining existing usages.

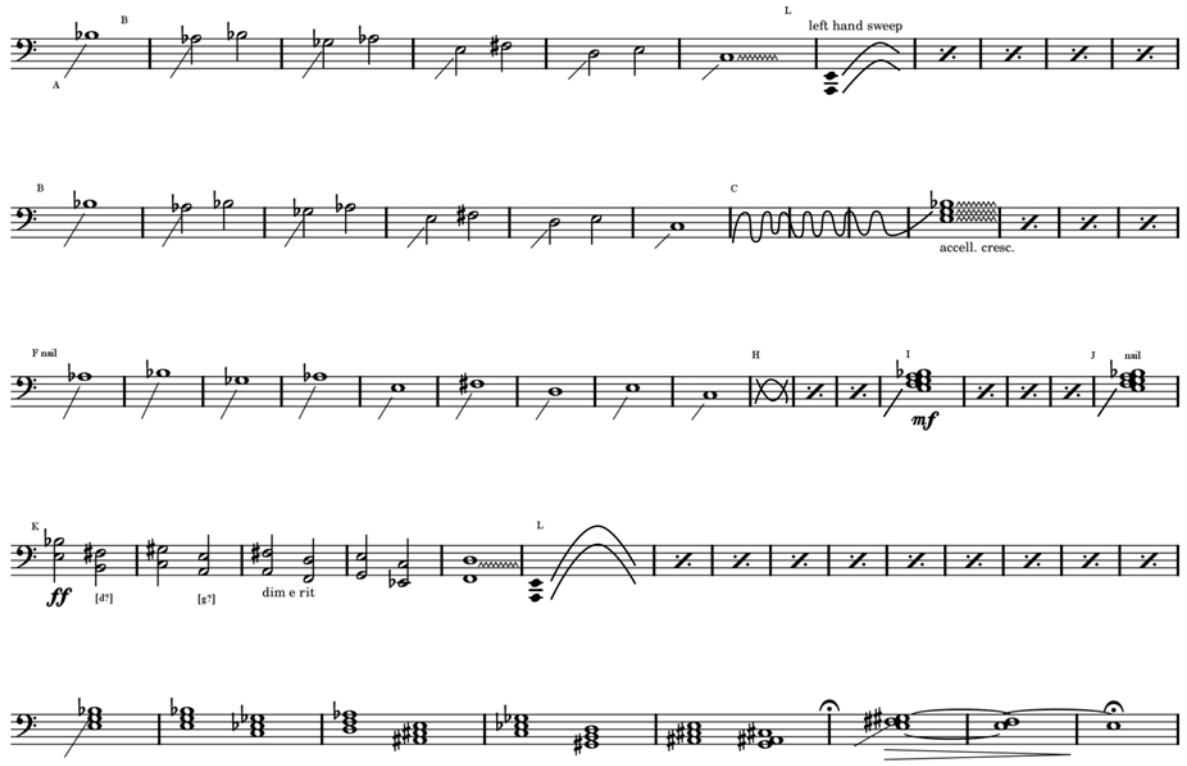
The Banshee (L405)[1274] is the result of a request by John Varian to set a poem of his to music, for "a very high soprano or a deep contralto," Cowell may have considered the voice unsuitable to comply with Varian's demand that the singer's be someone "who can feel like a Ban Shee." Perhaps certain manipulations of the piano strings could come closer to what his friend considered "the first necessity." [1275] The banshee, tells us Cowell, "is a fairy woman, a woman of the Inner World, who comes at the time of a death to take the soul back into the Inner World. She is uncomfortable on the mortal plane and wails her distress until she is safely out of it again. The older your family, the louder will your family banshee wail, for she has that much more practice at it."[1276] This wailing is "a very eerie sound roughly four octaves above the keyboard sound, with a strange tone quality of its own."[1277]

In terms of sound production, *The Banshee* is to the *Sword of Oblivion* what *Aeolian Harp* was to *Two Strings.* The basic techniques are the same, only evolved to a level on which they can be used for making music instead of merely effects. As much as *Aeolian Harp* concentrated on perpendicular glissandos over open strings, *The Banshee* exploits parallel glissandos on strings above all. Compared to *The Sword of Oblivion*, one specific evolution is literally very noticeable: the techniques are all selected for performance without the need for a keyboard. The pianist takes place at the other side of the grand piano while a second player depresses the pedal for the whole length of the piece. Most

[1273] Cowell 1930, p. 126-136.
[1274] According to Lichtenwanger 1986, p. 106, *The Banshee* may have been composed as early as 1923 but not written down until later. Greta Sultan remembers Cowell coming to her home in Berlin in 1923 playing *The Banshee* with herself as the second player to depress the pedal. The interview during which she recollected this (Gagne 1977, when Sultan was 71) is not free of uncertainties.
[1275] Johnson 1993, p.12.
[1276] Cowell 1963, p. 6.
[1277] Quoted from Cowell 1963x.

of the essential techniques come straight from *The Sword of Oblivion*, such as gliding lengthwise over the coils of a string, but also musical ideas such as the ending, when an aggregation of three notes is gradually filtered until one string remains.

The draft of *The Banshee* is interesting since it does not have the pizzicatos of the version published in 1930.[1278] (Ex. 3.683.)



Example 3.683. H. Cowell: *The Banshee* (1925), initial draft. The capital letters must have been added when preparing the piece for publication, as they show up more completely (A through L) in the printed version and D (for pizzicato) and E (for gliding alongside three strings simultaneously) are not used in the draft. Transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Deservedly popular among his output, *The Banshee* is one of those Cowell pieces that succeed in musically developing a single and simple idea through matured use of extended techniques. The only techniques used in the draft are types of glissando playing on strings and can be reduced to three basic types:

- gliding across the strings with the flesh of a finger (A, C)
- gliding across the strings with the hand (L)
- gliding lengthwise along the string of a given note (B, F, I, J, K)

There are several ways to execute the latter technique: with the flesh (B) or the nail (F), and along the strings of several notes at the same time with the flesh (I) or with the nail

[1278] We will here consider this draft as the 1925 version, admitting that it is not known how soon afterwards the revisions took place that lead to the version of the 1930 edition.

(J, K).[1279] For K both hands are necessary to glide over the strings of up to 10 adjacent notes.

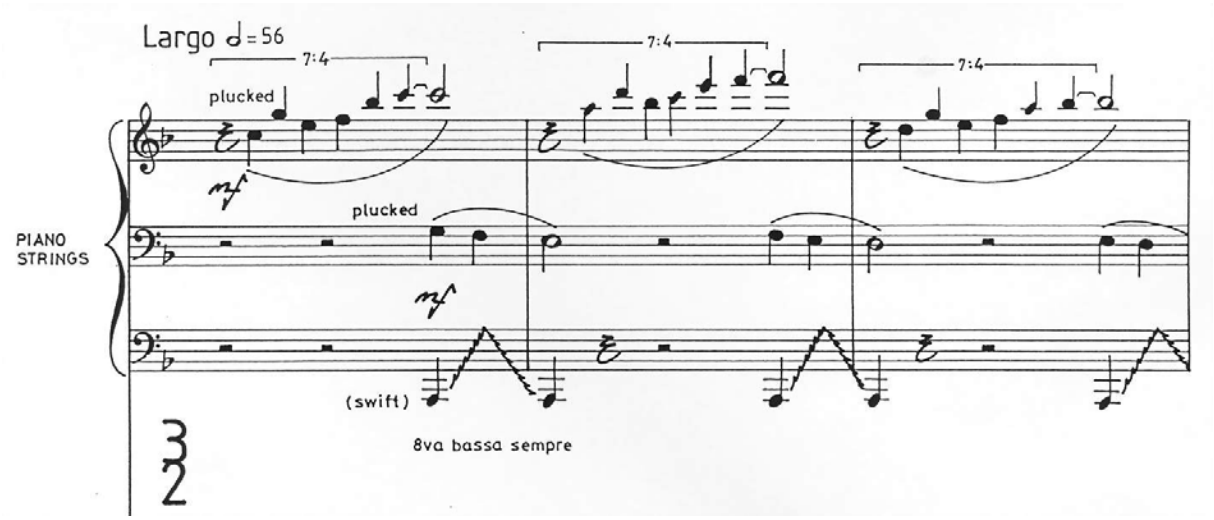
The hand glissando across the strings (L) is akin to the illusionary cluster glissando on the keyboard: gliding with the hand over strings will mostly produce consecutive tones as the hand will actually dampen the strings that were activated by the side of the palm as it hits on each next string. Depending on the force with which the hand is applied to the strings, these may actually be muted. There is no doubt that Cowell did not intend this to happen. The noise made by the flesh dampening the strings that have just been activated is part of the character of the technique. It is this noise that sets it apart from the basic technique (C, H).[1280] Coincidently, the special sound this hand gliding makes – as compared to the regular glissando across the strings – is closest to the sound produced by gliding on the strings lengthwise. This may be the reason why Cowell introduces the hand gliding before the regular glissando in the sections between the wailing phrases.

Writing for the piano from this perspective (literally also) made Cowell approach it like the zither he had played with and upon more than twenty years before. From the start of *The Banshee* both hands are required to make the most of the potential between the lid and the soundboard. The way the different glissandos are connected to each other shows an ergonomical point of view, so characteristic of all of Cowell's piano techniques. As naturally as the techniques connect the performer's position with the layout of the inside of the piano, as simple is the composition structured. The initial phrase is repeated, after which its first tone is enriched by a diminished triad underneath to anticipate the more pronounced and sharper sound of the fingernail, a development which is repeated with larger and clustered intervals at the most dramatic of the banshee's wailing, before all subsides and crystallizes into the melody presented in diminished triads, finally filtered to *niente*.
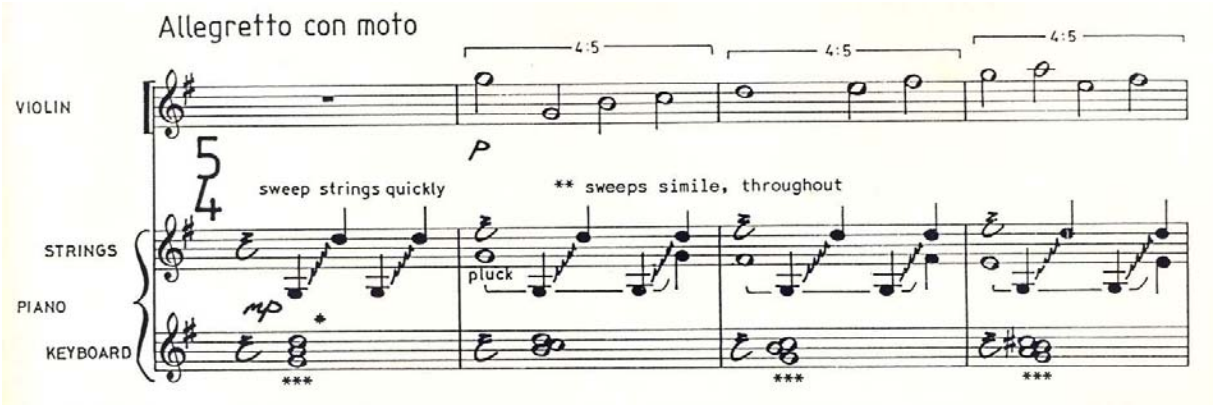
Cowell was soon ready to try out the sounds from the inside of the piano in chamber music setting. *A Composition for String Piano with Ensemble* (L406) presents Cowell's first attempt at regarding his "string piano" as a new instrument capable of interacting with other instruments.[1281] The work consists of three pieces in three different settings:

1. *Largo* for "string piano with small orchestra." The piano part has pizzicatos and back-and-forth glissandos across strings (ex. 3.684);
2. *Allegretto con moto* for "string piano with solo violin." The violin has poper notes while the pianist plays pizzicatos and glissandos over strings that are opened by silently depressed keys (ex. 3.685);
3. *Presto* for "string piano with string quartet." The pianist uses several techniques:
    - Playing repeated or alternated notes on the keyboard with one hand while sliding over the strings with a metal object in the other hand to bend the pitches and sound successive harmonics. (Ex. 3.686);
    - Gliding across strings (notated with straight or curved lines that represent the movement of the hand) (ex. 3.687);
    - "Flicking along strings quickly with fingernail" (ex. 3.688);
    - Hitting strings with a metal object (ex. 3.688).

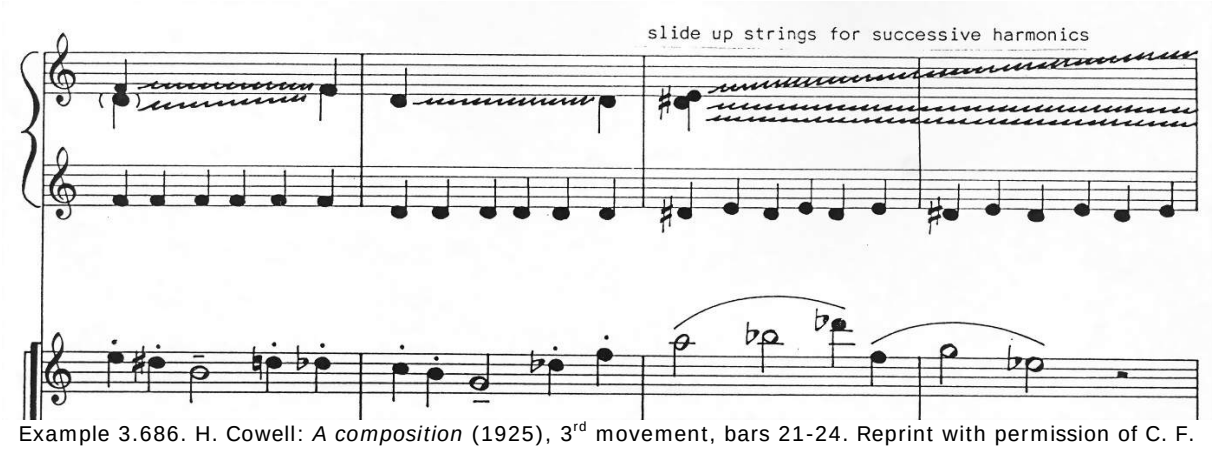
[1279] Lichtenwanger 1986, p. 106 mentions 12 different ways to sound the piano by counting each version of the same technique. Essentially, there is no difference between gliding alongside one string with one finger or alongside five strings with five fingers.
[1280] As opposed to the cluster glissando on the keyboard, where such noises will not be heard. The cluster glissando is nothing more than a regular glissando. See also the next chapter for more on these techniques.
[1281] In January of 1926, Cowell introduced the term 'String piano' publically in an article for Musical America.
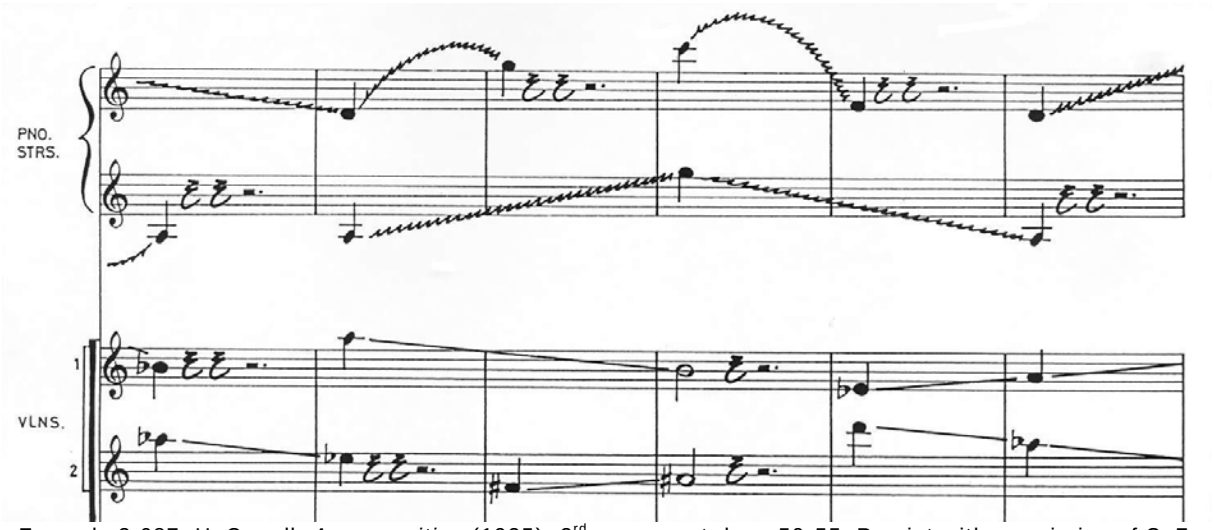


Example 3.684. H. Cowell: *A composition* (1925), 1st movement, bars 1-3. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



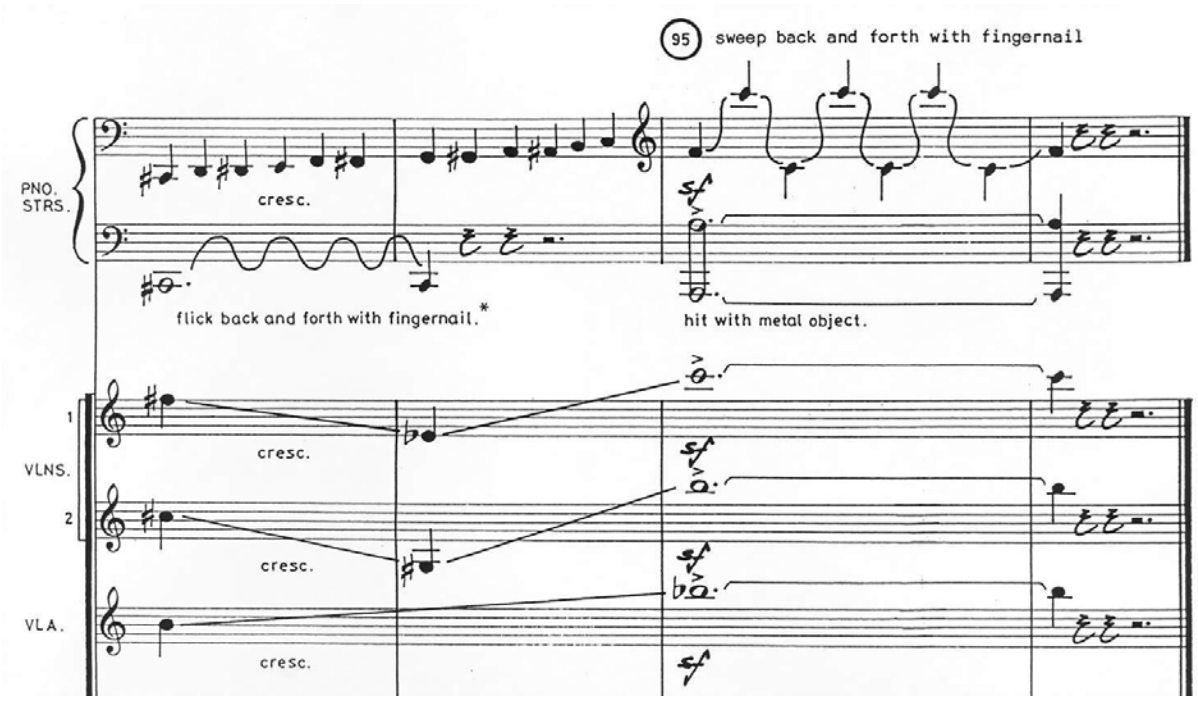
Example 3.685. H. Cowell: *A composition* (1925), 2nd movement, bars 1-4. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.686. H. Cowell: *A composition* (1925), 3rd movement, bars 21-24. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.687. H. Cowell: *A composition* (1925), 3rd movement, bars 50-55. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.688. H. Cowell: *A composition* (1925), 3rd movement, final bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Like in the score of *The Aeolian Harp*, and in accordance with the diligence Cowell had began to display in his performance practical notes explaining the details of his piano techniques in general, we see equal caution towards playing upon the right instrument in *A Composition*:

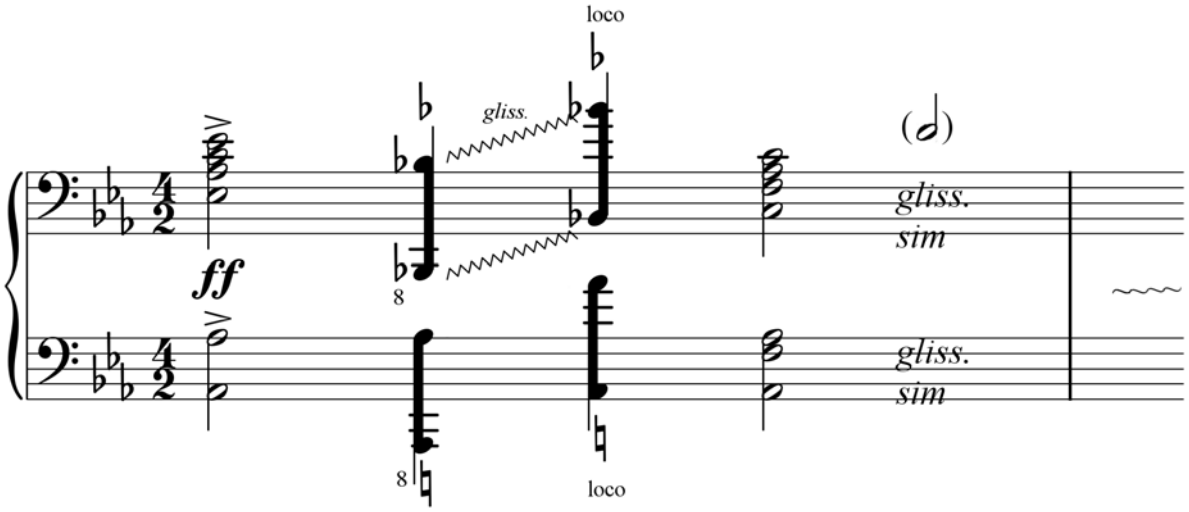
> The sweeps in this work can be played on any upright piano, and upon most grands; certain makes of grands will be found however, upon which they are impractical owing to the horizontal posts which prevent the frame from collapsing.

The work has served to provide later compositions with individual movements, as the first part of the "String Concerto," as it was initially called, became the first movement of

the *Piano Concerto* (L440 – 1928) and the second part became *Duett to St. Cecilia* (L406/2a).
Although not certain whether from 1925, several other handle the cluster again. *The Battle of Midyar* (L412) tells the story of one of the battles between the early Irish and the Fomer[1282] and has a melody in double octave clusters. *Irish Jig* (L415) also has such a melody but here the clusters are explained as "all black or all white owing to whether the melody note is ♯or ♮"), which casts doubt retrospectively on whether or not the finalized cluster notation (with no accidentals and chromatic type as the norm and black or white key clusters each indicated specifically) was always respected by Cowell as definitive. *Our Sun* (L417) for voice and piano has octave clusters in the accompaniment, next to small fingered cluster chords and "faster" arm clusters in dotted 6/8 rhythm.

Special notice is in order for *Atlantis* (L423), a nine-piece orchestral ballet in which the piano has nothing but clusters to play. *The shooting of the Moon Arrows* has arm clusters throughout, as has *Birth of the Sea Soul* (in stepwise expansion and contraction of dynamics and size). The *Temptation of the Sea Soul by Monsters* has two-arm clusters throughout in one big crescendo, *the Pleasure Dance of the Sea Soul* contains arpeggiated two arm clusters throughout, and the *Combat between Sea and Earth Monsters* has – *ff* and *presto* – arm, fists, two-arm and 4-octave clusters. Finally, the *Triumph of the Sea Monster* (or *Curse of the Sea Monster*) shows off with arm cluster tremolos the likes of which we have not seen since *Antinomy*. In this cluster-filled saga Cowell has treated the piano as a percussion instrument only.

Domnu, The Mother of Waters (L426) is mostly composed with cluster types we have come to know now (arpeggiated palm and arm clusters), but also boasts arm cluster glissandos. (Ex. 3.689.)
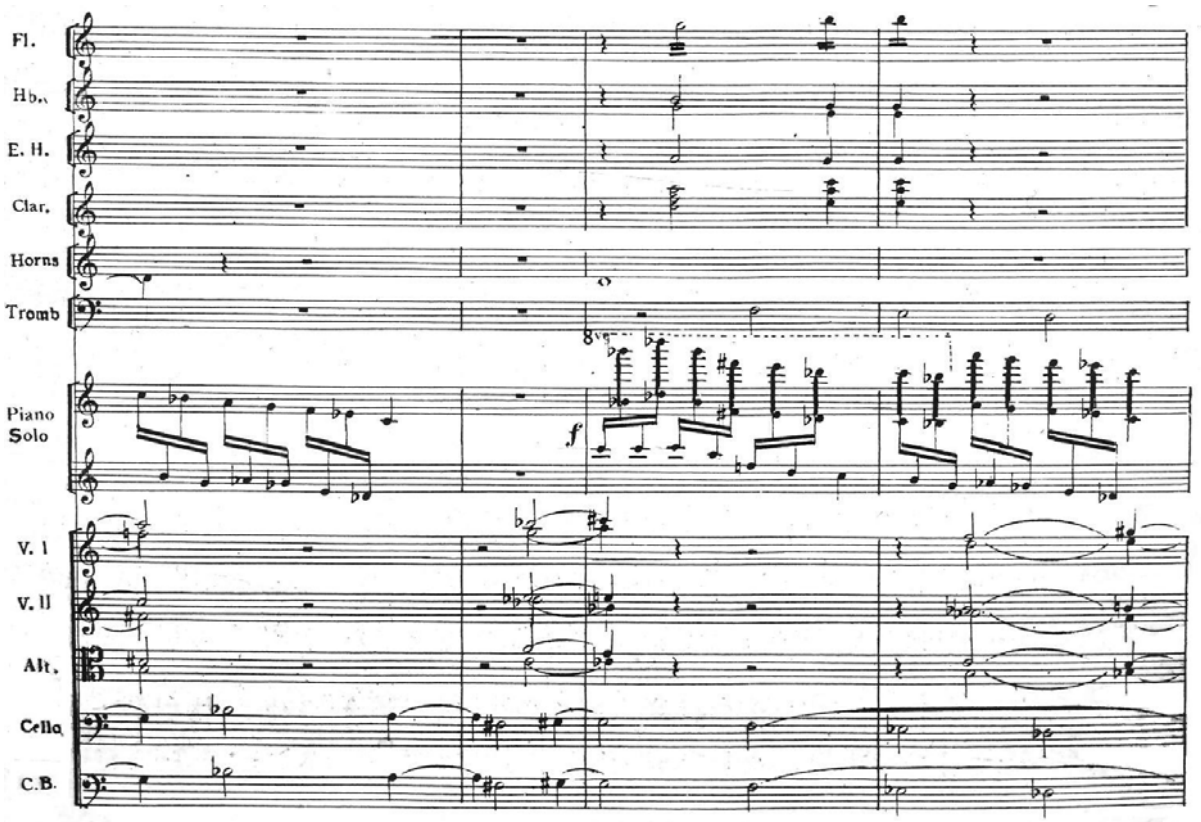


Example 3.689. H. Cowell: *Domnu, The Mother of Waters* (1925), bar 8. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

In the fall of 1926, Cowell mentioned in a letter of having written a *Piece for two string pianos* (L431). The piece did not survive but a page among miscellaneous fragments and sketches in the Cowell estate may fit the description and would ask the pianist to play on the bars with a hard rubber stick and on the strings with a padded stick.[1283] How these little more than 30 bars of percussion techniques were integrated in piano music is not

[1282] Lichtenwanger 1986, p. 109. Midyar (or Mider) was also one of the Irish "good guys" – see *The Birth of Midyar* (219/8) and *The Red Flame of Midyar* (220).
[1283] Lichtenwanger 1986, p. 115.

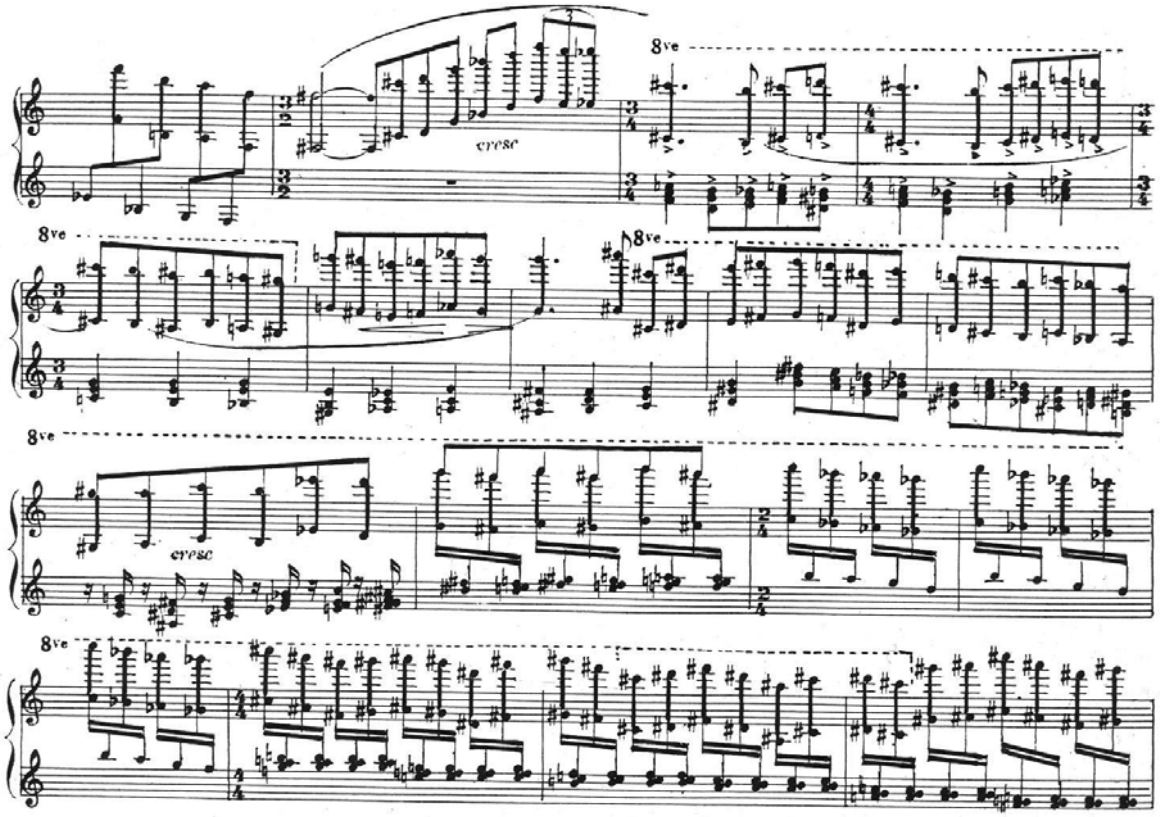
known. Cowell did occupy himself further with the idiom in that autumn, composing *The Sleep Music of the Dagna* (L433), a Varian piece for piano strings that needs plucking and arpeggiating with the nails.
Near the spring of 1928 a *Concerto for Piano and Orchestra* (L440) sees the light. In the light of Cowell's reputation with the cluster, and considering the practical and compositional level at which he had brought its development, nothing less than a full-blown concerto was bound to be written as the nec plus ultra in cluster writing.

The first movement is called *Polyharmony* and its solo piano part consists mostly of either right arm clusters alternating (in 16^{ths} or 8^{ths}) with left hand single notes (ex. 3.690.) or with small clustered chords.
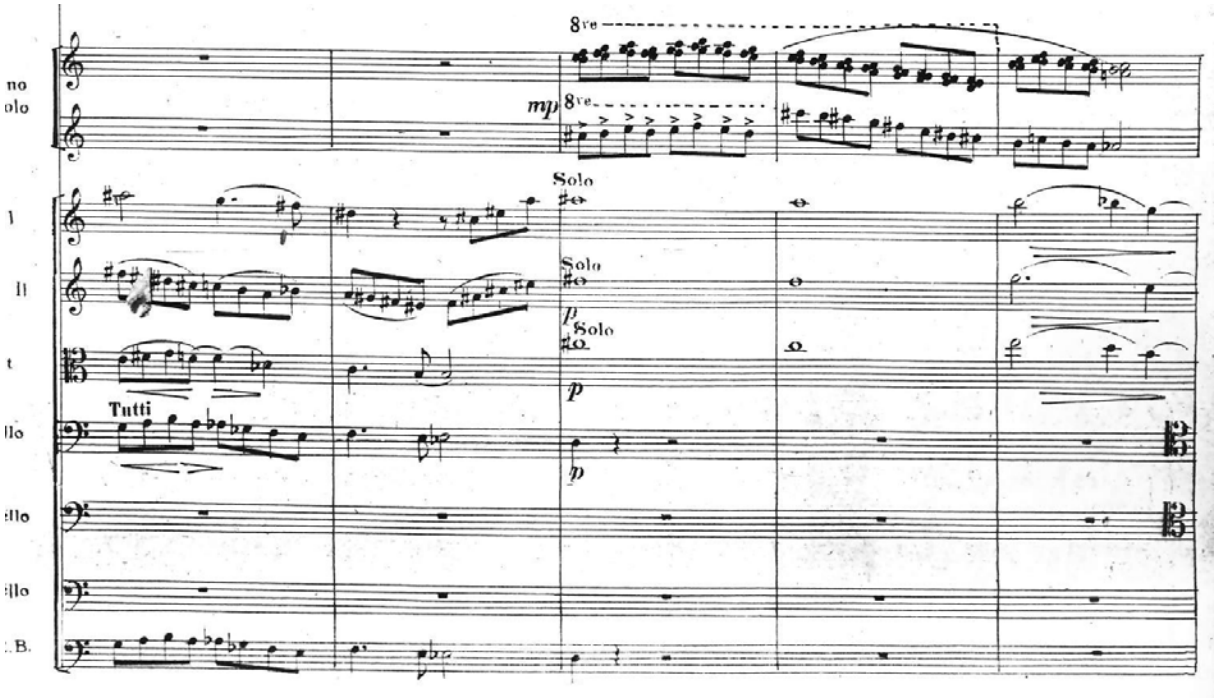


Example 3.690. H. Cowell: *Concerto* (1928), 1st movement *Polyharmony*, bars 44-47. © Editions Salabert.

Only once – in the cadenza – does a right arm cluster melody occur with left hand aggregates in independent rhythm. (See bars 67-63 in ex. 3.691.)
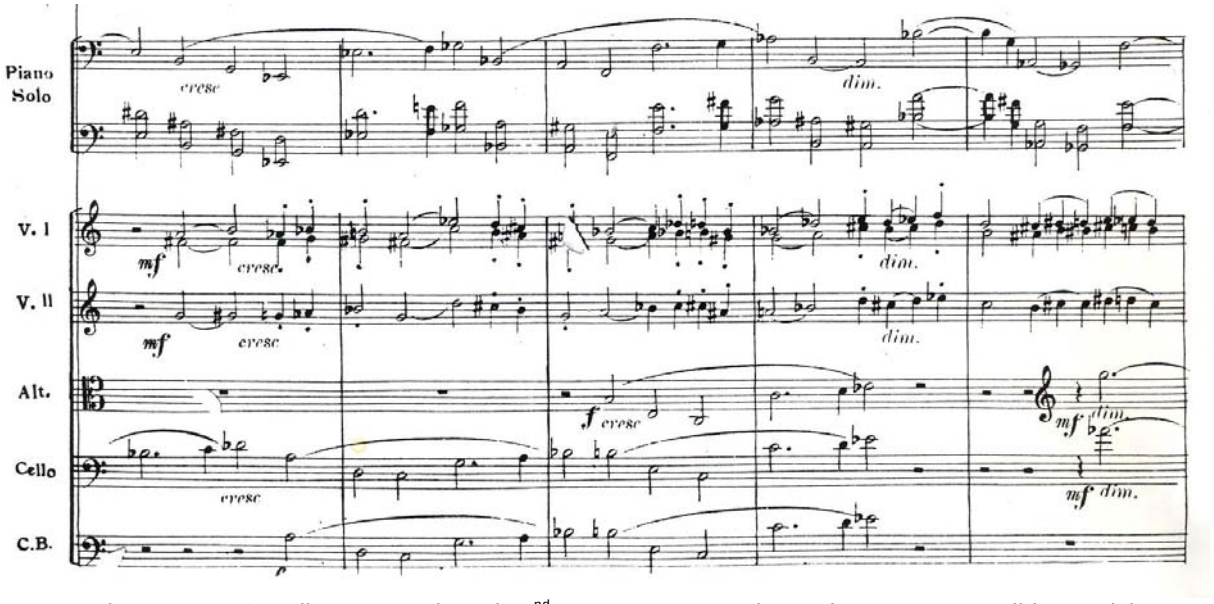


Example 3.691. H. Cowell: *Concerto* (1928), 1st movement *Polyharmony*, bars 65-81. © Editions Salabert.

The cadenza introduces into this first movement a cluster use that has lyrical qualities and is not solely percussive in nature. It is echoed soon afterwards with the only instance containing small clusters as coloration of the melody (ex. 3.692), reminding us of *The Snows of the Fuji-Yama* (ex. 3.507) or *Where She Lies* (ex. 3.682.).



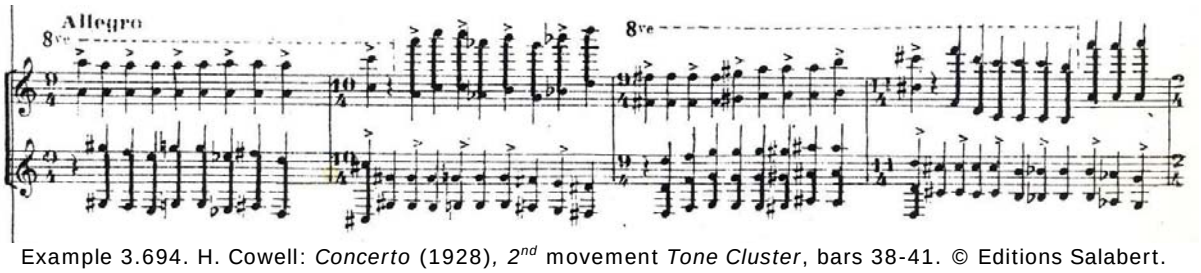
Example 3.692. H. Cowell: *Concerto* (1928), 1st movement *Polyharmony*, bars 96-100. © Editions Salabert.

The second movement is called *Tone Cluster*. An earlier title was *Metropolitan Cross-Currents*, which may explain the program on the top of the manuscript referring to the streets of NY a.m. and the street activities becoming "one huge cluster of intermoving people parked solid against one another, yet each going to som[e] different activity." The difference with the first movement, where the piano already had nothing but clusters to play, lies in the fact that the orchestra now also plays clustered chords. Imitations of the piano's principal melody make the general impression of construction more horizontal than vertical. (Ex. 3.693.)
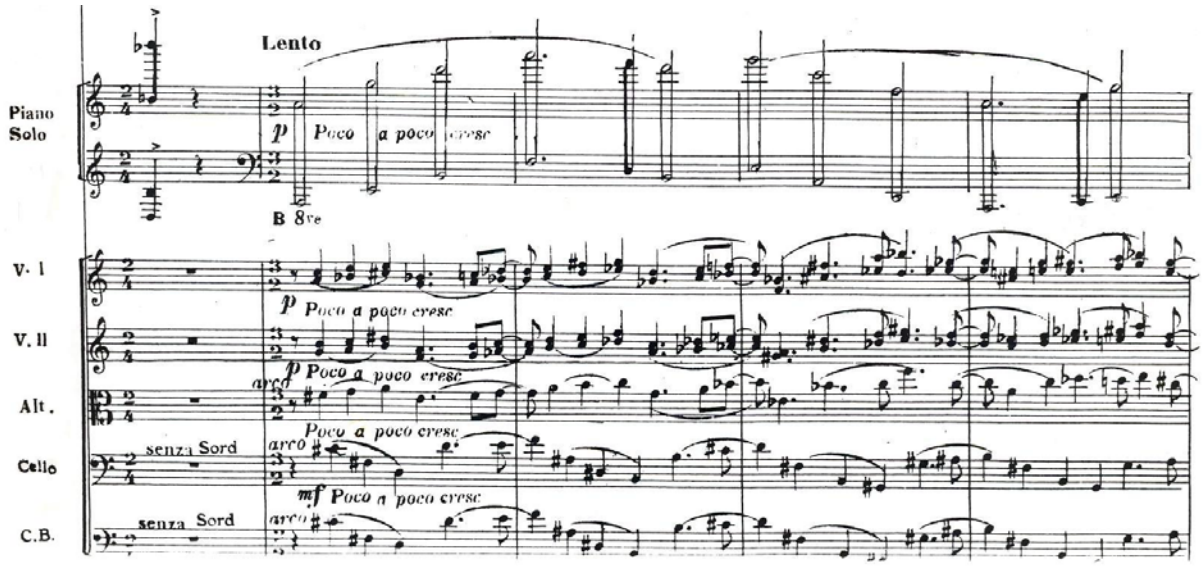


Example 3.693. H. Cowell: *Concerto* (1928), 2nd movement *Tone Cluster,* bars 19-23. © Editions Salabert.

A second subject is fast and repetitive, and when it returns it demands the kind of virtuosity that can only be associated with arm-cluster writing: swift changes of bodily position to switch from arm to arm. Next to regular arm clusters we see some elbow-with-melody clusters. (Ex. 3.694.)
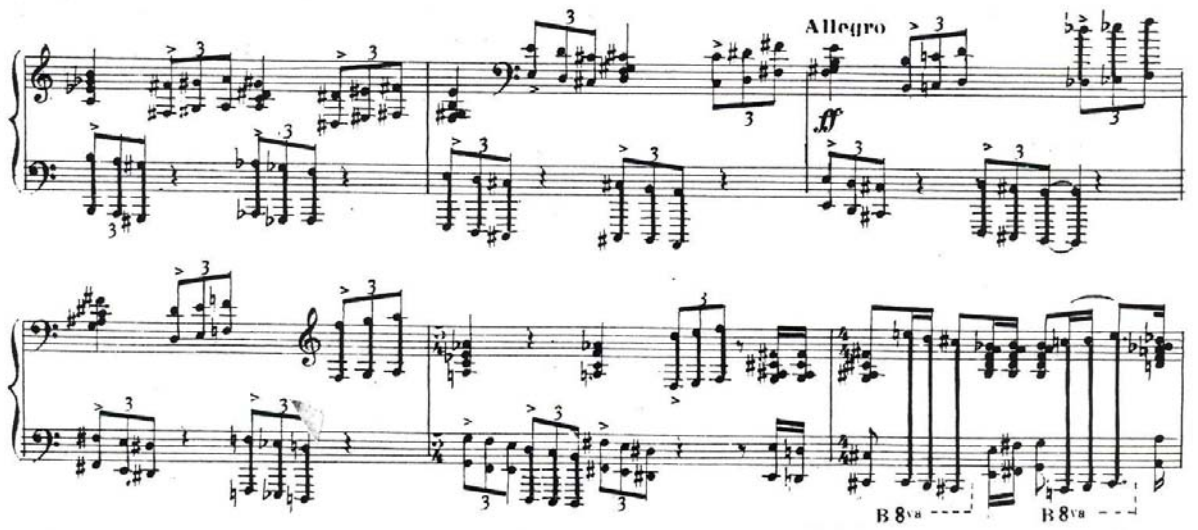


Example 3.694. H. Cowell: *Concerto* (1928), *2nd* movement *Tone Cluster*, bars 38-41. © Editions Salabert.

When the *lento* returns, the string clusters have grown to four or five note width, and the piano now has four-octave double arm clusters. (Ex. 3.695.)
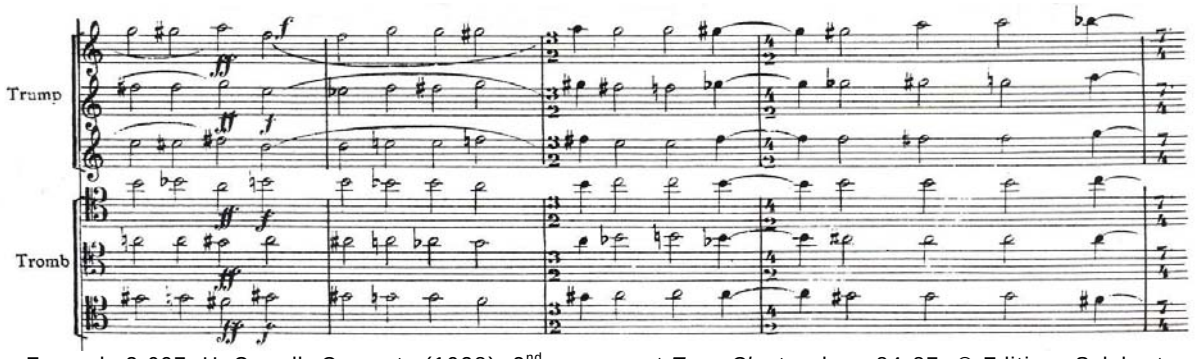


Example 3.695. H. Cowell: *Concerto* (1928), 2nd movement *Tone Cluster*, bars 42-46. © Editions Salabert.

A cadenza again exploits the difficulties arising from alternating combinations of chords and clusters and ends with very fast arm movements. (Ex. 3.696.)
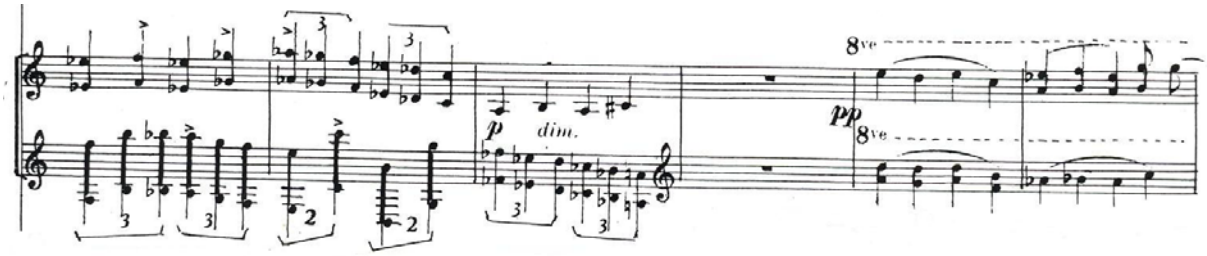


Example 3.696. H. Cowell: *Concerto* (1928), 2nd movement *Tone Cluster*, bars 71-76. © Editions Salabert.

Near the end of this movement, we find the first real orchestral clustered aggregates in the trumpets (in B♭) and Trombones (in C). As they move in outward direction, they become less clustered. (Ex. 3.697.)
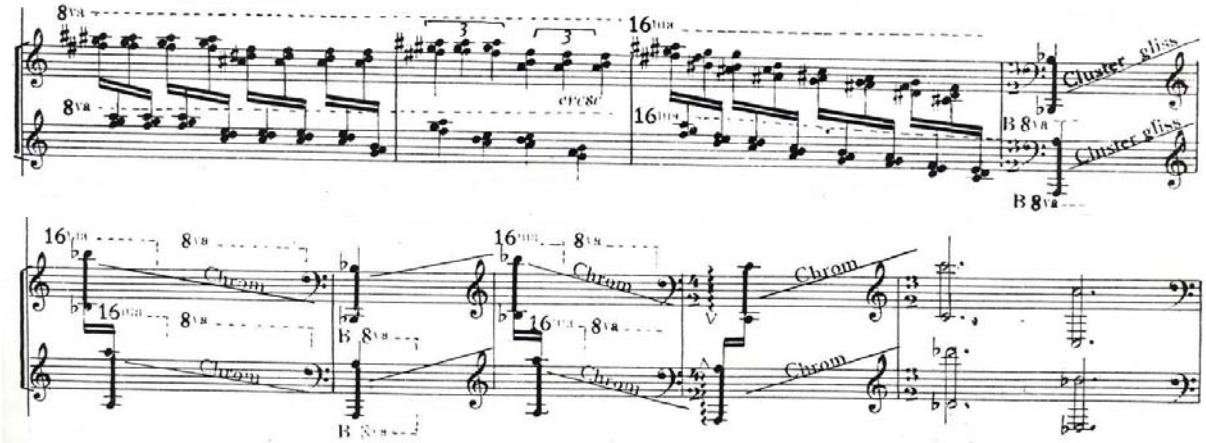


Example 3.697. H. Cowell: *Concerto* (1928), 2nd movement *Tone Cluster*, bars 84-87. © Editions Salabert.

The third movement – *Counter Rhythm* – is really more of the same. Counter rhythms are limited to two against three or simple syncopation. (Ex. 3.698.)



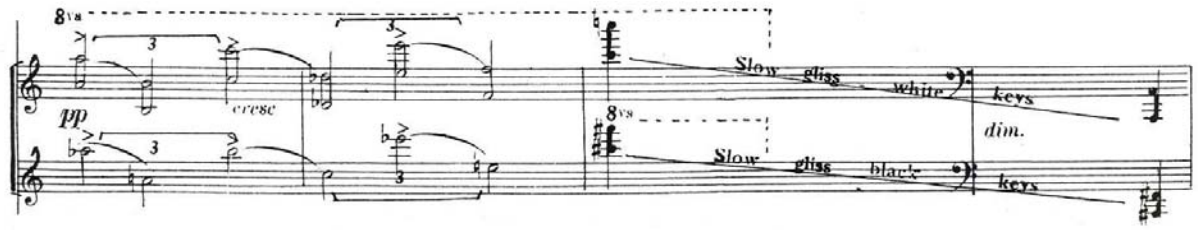
Example 3.698. H. Cowell: *Concerto* (1928), 3rd movement *Counter Rhythm*, bars 34-39. © Editions Salabert.

Next to the clusters that make out the first two parts of the concerto, we find fast alternated fist or arm sequences (in "karate" style) and chromatic arm cluster glissandos. (Ex. 3.699.)



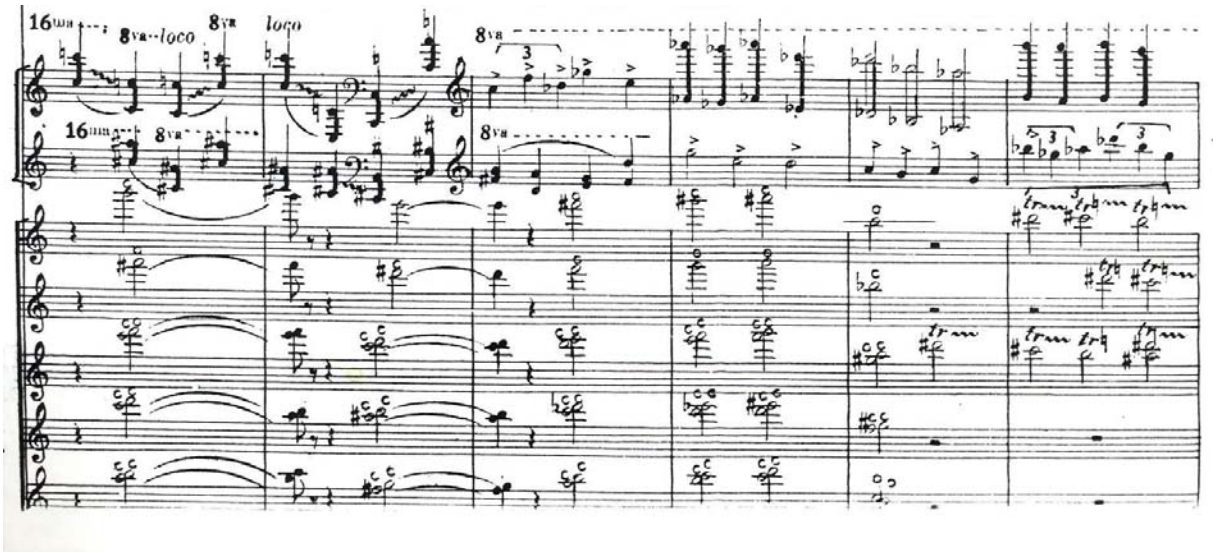
Example 3.699. H. Cowell: *Concerto* (1928), 3rd movement *Counter Rhythm*, bars 53-61. © Editions Salabert.

The slow glissando in chromatic octave clusters is less efficient or effective than it looks, especially compared to the difficulty in executing it. (Ex. 3.700.)
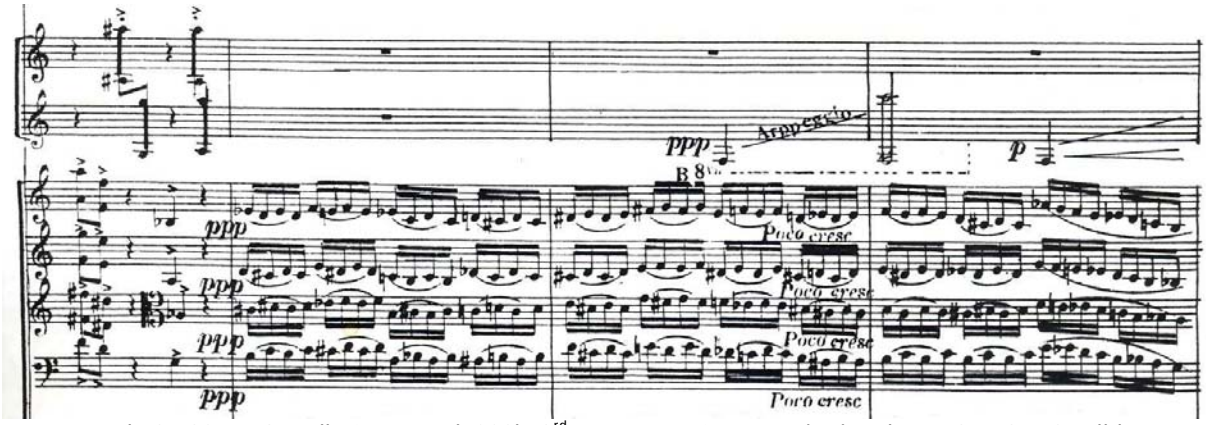


Example 3.700. H. Cowell: *Concerto* (1928), 3rd movement *Counter Rhythm*, bars 78-81. © Editions Salabert.

More octave cluster glissandos follow, faster this time, and accompanied by the densest clustered aggregates of the whole orchestral score. (Ex. 3.701.)
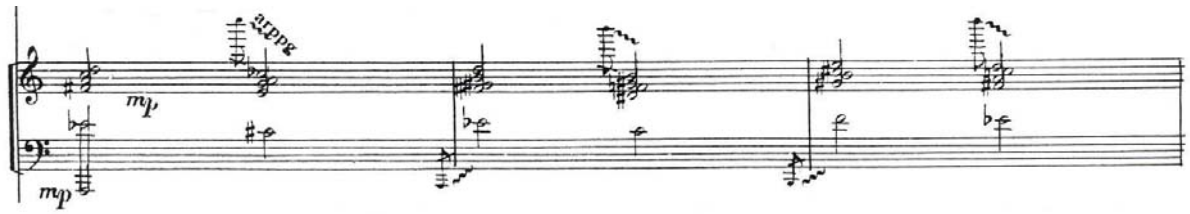


Example 3.701. H. Cowell: *Concerto* (1928), 3rd movement *Counter Rhythm*, bars 82-87. © Editions Salabert.

Slowly arpeggiated arm clusters are accompanied by a bed of clustered trills in the strings (ex. 3.702).
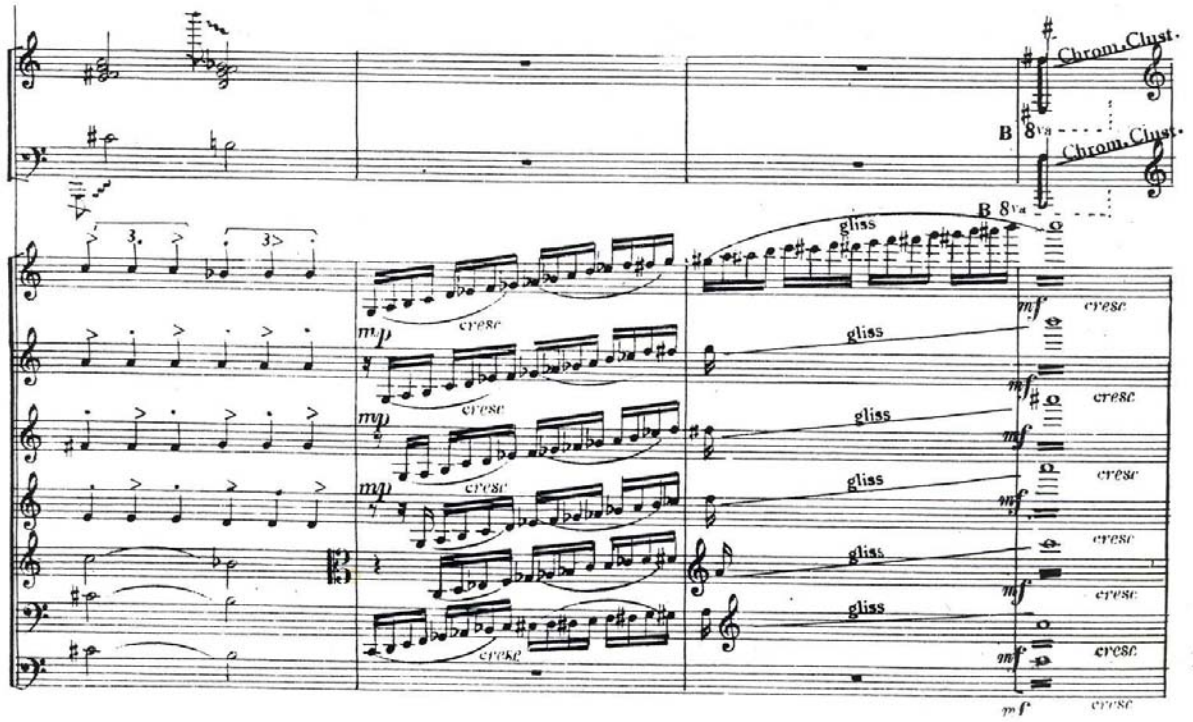


Example 3.702. H. Cowell: *Concerto* (1928), 3rd movement *Counter Rhythm*, bars 104-107. © Editions Salabert.
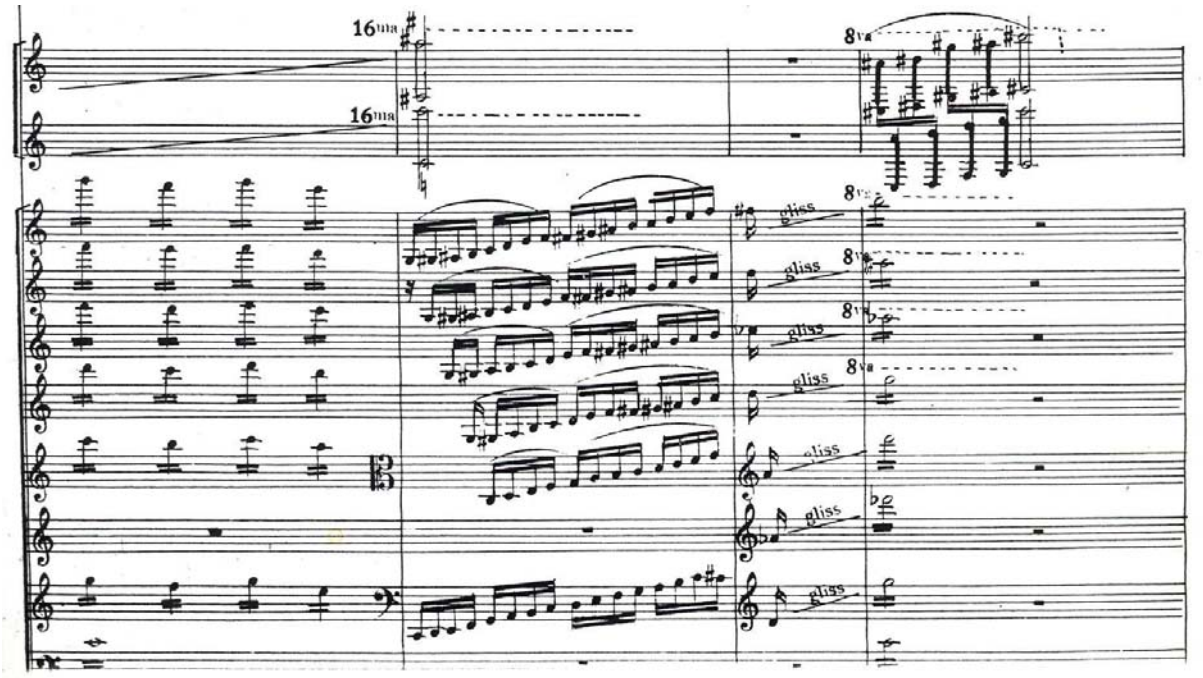
These slow arpeggiated clusters introduce a sequence in which the difference between an arpeggiated arm-cluster as a fast appoggiatura cannot really be distinguished anymore from a glissando. (Ex. 3.703.)



Example 3.703. H. Cowell: *Concerto (1928)*, 3rd movement *Counter Rhythm*, bars 108-110. © Editions Salabert.

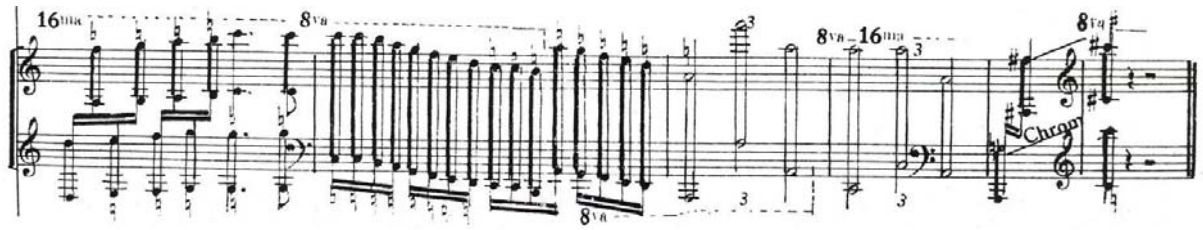
Another chromatic arm-cluster glissando takes off after the strings have moved up in close gliding themselves. (Ex. 3.704.)





Example 3.704. H. Cowell: *Concerto* (1928), 3rd movement *Counter Rhythm*, bars 111-118. © Editions Salabert.

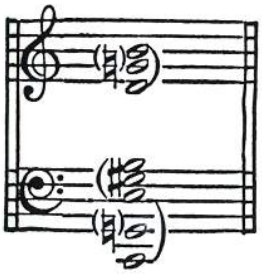
The concerto ends very traditionally, only with clusters replacing what would otherwise be tonal chords. (Ex. 3.705.)



Example 3.705. H. Cowell: *Concerto* (1928), 3rd movement *Counter Rhythm*, final bars. © Editions Salabert.

All three movements of Cowell's *Concerto for Piano and Orchestra* refer to parts of *New Musical Resources*, the book that he had finished in 1919 and for which he decided to want to find a publisher in 1928.[1284] The first movement – *Polyharmony* – is orchestrated along the rules Cowell had devised for compiling harmonies from triads built on tones of the overtone series. Briefly, Cowell's theory departs from a basic triad, e.g. C-E-G, which is formed with the main notes from the beginning of the overtone series on C, and of which each note can be made the basis for another triad through its own position as a fundamental of an overtone series. The resulting chord is a polychord.[1285] (Ex. 3.706.)

[1284] Cowell 1930, p. x: preface by Joscelyn Godwin to the 1969 reprint of the original edition.
[1285] Cowell 1930, p. 22-32.



Ex. 3.706. H. Cowell: *New Musical Resources*, ex. 1, p. 25. Reproduced by permission of Cambridge University Press.

A sequence of such chords results in polyharmony. If the idea of a polychord was original, Cowell worked out the compositional potential by applying the traditional tools from harmony and counterpoint to it: the "inner chords" "move logically to harmonies to which they would naturally proceed of the line was of harmony alone."[1286] Although Cowell names the first movement of his concerto *Polyharmony*, the piano part has no polyharmony, not even a polychord. The whole solo part consists of melody, with clusters as a percussive characteristic. Besides polyharmony, Cowell had further departed on the idea of the overtone series as the basis for harmonic construction to arrive at a system which would be "based on the next higher overtones after thirds (the traditional triad): major and minor seconds."[1287] From this perspective, Cowell had rationalized the cluster in *New Musical Resources*. But just as he had established his polyharmonic theory by replacing the triad with the polychord in an otherwise classically functioning system, so did he apply – in his theoretical writings – classical contrapuntal systems to the cluster.

As we have seen abundantly in the examples from his concerto, Cowell never really used clusters much along the intricate lines he set out in his theory. The closest his piano clusters came to harmonics, was through symbolizing the vertical compression of the overtones of notes in melodies, as in *The Snows of the Fuji-Yama* (ex. 3.679) or *Where She Lies* (ex. 3.682) or in a couple of measures in the concerto (ex. 3.692). Of his many examples of what can be done with clusters, he mainly used the first one in his book: "a running part in clusters may be effective in connexion with chords in other systems."[1288] These "chords in other systems" were then mostly octaves. Of "the many different possible juxtapositions of the triads within larger clusters" (see above in 2.5.2.2.1.2, ex. 2.21) only the diatonic, pentatonic and chromatic cluster remained in Cowell's piano writing. More than the triads that are the basis of all larger clusters, his real clusters were based on ergonomical considerations: the width of fist, palm and arm, and the layout of the keyboard (white / black) were the measure of the cluster harmony. In all fairness, we need to acknowledge that Cowell admitted how "there is less possible variety on the piano than with the orchestra, where clusters are at their best."[1289] But in his concerto, where the second movement – *Tone Cluster* – would be the ideal place to show off all the projected possibilities of the cluster in orchestral setting, rather a minimum is heard of the shifting size of the clusters' interval as they move, both melodically and harmonically[1290]. There is little distinctive use of cluster chords[1291] and only some counterpoint with fixed clusters. There is no trace of the effects of counterpoint with

[1286] Cowell 1930, p. 26.
[1287] Cowell 1930, p. 113-114. See above, 2.5.2.2.1, for Cowell's cluster theory.
[1288] Cowell 1930, p. 118.
[1289] Cowell 1930, p. 120.
[1290] See Cowell 1930, p. 122 for melodic clusters with shifting sizes (i.e. two simultaneous melodies which are related to each other contrapuntally and of which the intervals in between are filled out as clusters – the melodies do not necessarily move in seconds, therefore the shifts of the cluster width can be any size) and p. 126-136 for harmonically shifting cluster width (i.e. the "edges" of a cluster move in steps of seconds).
[1291] Cowell 1930, p. 123. Cluster chords in Cowell's theory are chords of which the individual components are themselves clusters.

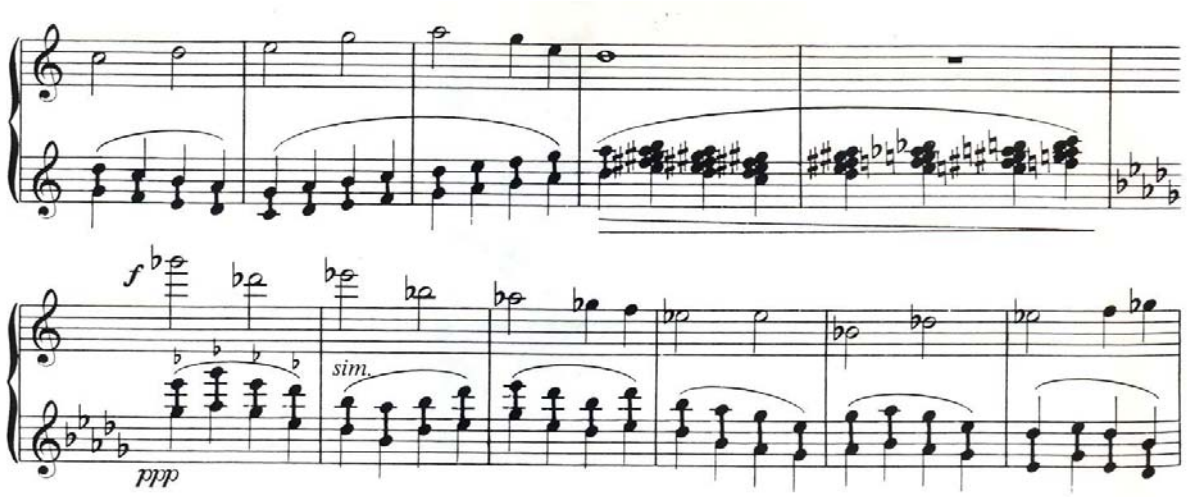
moving clusters, and of the filtering devices that Cowell tried out in *Advertisement* more than a decade before.

Cowell used different types of clusters in the piano part of his concerto, though considerably less than he had developed until then, and not always those most efficient or effective to the pianist or the audience. It seems as if the concerto confirms a doubt that has been nagging for some time, a reservation that he had noted himself in *New Musical Resources* when he promised the orchestra to be the best biotope for clusters. Cowell's piano had never really been up to the theories he had started to develop when under the influence of Seeger, already some years after he discovered the technique. And even the theoretical aspects that did show some promise or could at least have been worked out better or experimented with more – filtering, moving clusters, combinations of clusters with other systems – remained largely unexplored. The value of Cowell's concerto lies in the fact that he nevertheless found ways to give particular meaning to the piano cluster in an environment that was – at least in his own theories – better suited to it than the piano.

Apart from clusters, Cowell did not theorize about the other extended techniques he had used. *New Musical Resources* contains not a word about the inside of the piano, and the silently depressed keys are mentioned only once, when a quick example of how to produce harmonics was needed to explain their acoustics.[1292] The book had been finished well before he wrote his string piano pieces, but in the ten or so years that it took him to decide and hunt for a publisher, Cowell apparently found no need to consider providing the string piano with a theoretical basis. It is possible that he had already realized the unrealistic nature of attempting to build a theoretical basis for an ergonomical performance practice, not seeing any sense in a second trial. Some of those string piano techniques certainly would not have lent themselves all that well for theoretical groundwork: sweeping over the strings of silently depressed keys and simply plucking strings did not yield any possibilities outside of those already conceived of in the chapters on polyharmony or cluster construction.
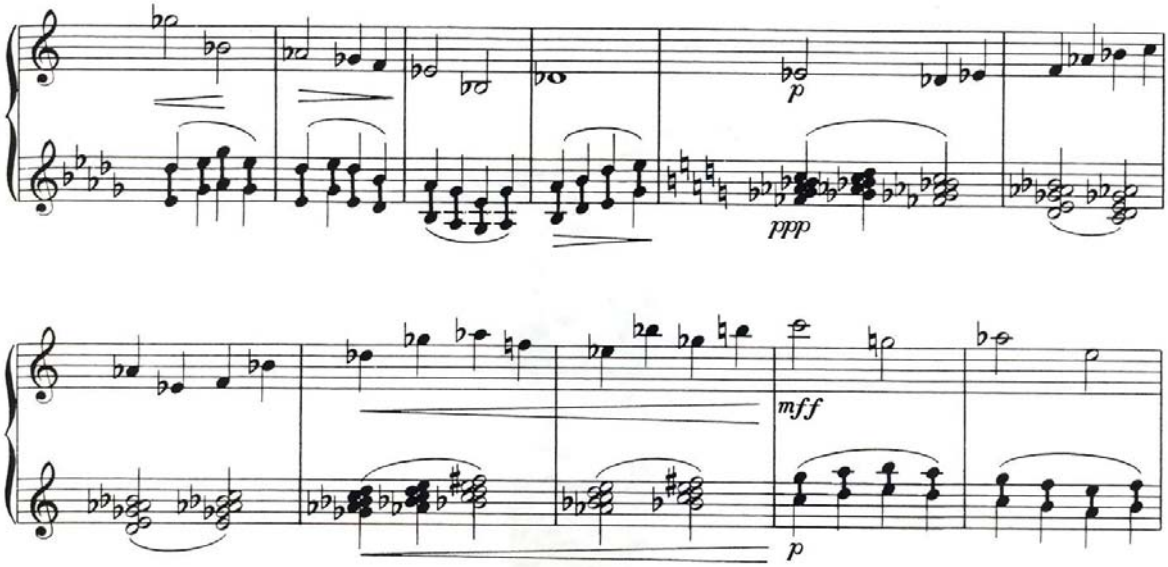
In that same year of 1928[1293] Cowell wrote *The Fairy Bells* (L447) for piano strings. In contrast with his hyperbolic concerto, this short piece is every bit as delicately conceived as the title promises. A simple plucked string melody in C major is accompanied by gently swaying palm size white key clusters. At the end of the classical 16-bar phrase a "discoloring" of the accompaniment by way of clustered chords modulates the melody to a G♭ major environment and the left hand – stretched to a 6th – to the black keys. (Ex. 3.707.)

[1292] Cowell 1930, p. 5.
[1293] Lichtenwanger 1968, p. 121: 2 October 1928 or earlier.



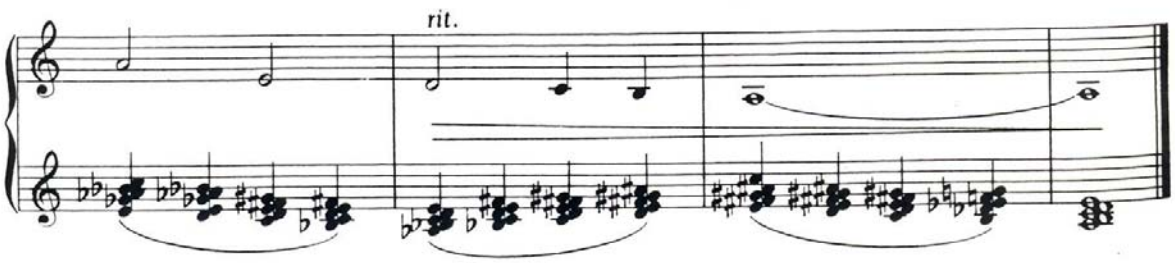
Example 3.707. H. Cowell: *The Fairy Bells* (1928), bar 12-22. © Associated Music Publishers.

A five-bar transition in whole tone chords returns the music to the initial set-up, only now with melodic alterations as if in minor key. (See bars 33-37 in ex. 3.708.)



Example 3.708. H. Cowell: *The Fairy Bells* (1928), bar 29-39. © Associated Music Publishers.

Now the C major/minor melody (with very slight occasional changes compared to the first phrase) is again transported a tritone higher, but the accompaniment stays on the white keys. A coda on whole tone chords brings the piece to a final white key "A minor" cluster. (Ex. 3.709.)



Example 3.709. H. Cowell: *The Fairy Bells* (1928), bar 79-82. © Associated Music Publishers.

This little gem of a piece – with a difficult right hand part – has the Cowell hallmark of simplicity and constraint of ideas: plucked strings and medium-size clusters, playfully metamorphosing between tonal spheres. Noticeably sophisticated are the modulatory parts: the first time from white key to black key cluster type through aggregates that are themselves clustered half-way between diatonic and pentatonic (with a penchant for E major) (ex. 3.707) and the second time with whole tone chords that are another half-way type between black- and white-key aggregates. This is easily the most successful of Cowell's attempts at integrating clusters in tonality. It also shows how Cowell had not yet exhausted the potential for either the cluster or the string piano. Bringing both together as closely as in *The Fairy Bells* was already an evolutionary step away from the simple juxtaposition of effects that we found in *Piece for Piano and Strings* (see above.)

Completed at around the same time as *The Fairy Bells*, *The Leprechaun* (L448) is also for piano strings.[1294] By March 1929, both these and *The Banshee* were rearranged as "little semi-pragmatic pieces" for string piano and chamber orchestra to make an *Irish Suite* (L452), just like he had grouped some of the early cluster pieces (e.g. *The Tides of Manaunaun*) to form the set of *Four Irish Tales* for piano and orchestra (L605).

In Irish mythology, a leprechaun is a type of pre-Celtic male fairy, so it fits well with the other two string piano pieces. Cowell must have thought the performance techniques more important to convey to the audience, however, for in the program of the suite's premiere, he lists "the devices used in the String and Percussion Piano (which is an ordinary piano but operated inside, on the sound board)":

1. Picked strings (with a pick)
2. Plucked strings (with a finger)
3. Swept strings
4. Struck strings (tapped with various implements)
5. The bars, sound board, sound post, lid, and frame tapped with various implements (rubber-headed drumsticks, plectrum, pencil, darning egg)

Cowell here presents us with a new step forward in extending the resources of the piano. Objects are now used to play on the piano as if it were a percussion instrument. Not just the strings, all the other inner parts available to the pianist who is bending over to have clear access to the inside of the instrument.

We do not have to look far for an explanation of the use of these objects. The leprechaun is known as the fairy shoemaker of Ireland and often portayed repairing one shoe. A darning egg is an egg-shaped stone or piece of porcelain, wood, or similar hard material, inserted into the toe or heel of a sock to hold it in the proper shape and provide a firm foundation for repairs. The idea to use objets that refer to tools of a trade – a drumstick

[1294] Lichtenwanger 1986, p. 121: the earliest mentioning of both pieces is in a letter by Cowell to Nicolas Slonimsky.

as a hammer and a pencil as a darning needle – puts the actions of the pianist in a new perspective, while maintaining the link with the other two pieces that also depict characteristic of the fairy world.

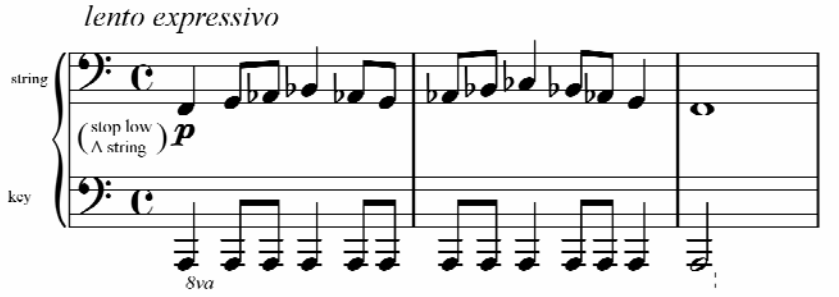
In the summer of 1929, Cowell would write another fairy piece, *The Fairy Answer* (L453) for piano strings. The concept is as follows: "In Kildare there is a glen where, if on plays one's music at one end of it, the fairies will answer by playing theirs at the other end. If you are very materialistic of course you'll think it is an echo. But the fact is, the fairies change the music about just a little, and by that you may know that it is they themselves."[1295] The techniques used in *The Fairy Answer* are mainly those from *Aeolian Harp* and *The Fairy Bells*, with one low muted tone at the end. In the first part, a melody is played in chords on the keyboard, echoed by sweeps over the strings of silently depressed chords. Each time, the "swept" melody is the same as the one on the keys, but the harmonies of the 'echo' lead to different tonal functions from where the next installment of the melody on the keys takes off. A transitional part consists of a descending scale, plucked on the strings with keyboard accompaniment in chords, and of an ascending sequence of solo plucked strings leading back to the reverse of the opening idea of the piece. Now properly played chords echo the swept chords.

On a May 19, 1930 recital in Portland, Cowell played several new pieces, amongst which *Overtones* (L461) and *Sinister Resonance* (L462). The former is lost, but both must be related through more than just the crossed out trial titles *Theme with Overtone Timbres* and *Theme with Sinister Resonance* on a holograph of the latter.

With *Sinister Resonance*, Cowell advances specifically in his experiments with overtones. One new technique is at the basis of the piece: "all of the notes are struck on the keyboard, and the string[s] of the keys that are being played are damped in different ways by the fingers of the other hand." Depending on where and how the string is cut off, different individual overtones will be heard, or complexes of overtones. Given the range of sounds Cowell obtained from such a simple point of departure, and the potential for theorizing about this concrete use of the overtone series on the piano, this would have made a worthwhile contribution to *New Musical Resources*. Only, in January of 1929, Cowell already had an interested publisher for his theories, and in 1930, when Cowell worked out *Sinister Resonance*, the book was already distributed.

The extant drafts of this piece are worthwhile discussing here first, before looking at the score published ten years later.

The opening variant of the technique is the most 'sinister' and produces the least clear overtones. (Ex. 3.710.)
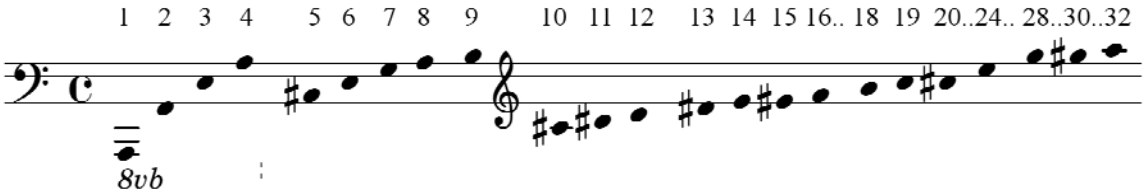


Example 3.710. H. Cowell: *Sinister Resonance* (1930), opening bars of the draft. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

[1295] Cowell 1963, p. 7.

The left hand repeats the same low A while the right hand manipulates the string's sound by stopping it at various distances from the bridge. The F has to be found somewhere toward the middle of the string, the higher tones are produced by pressing the string at points closer to the dampers.[1296]
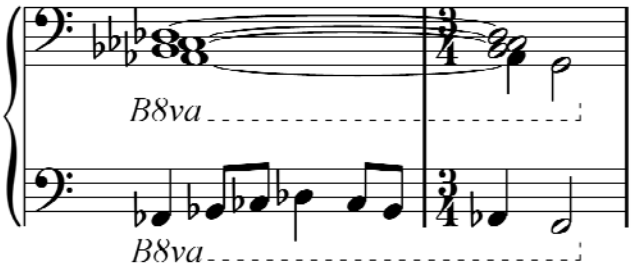
These sounds are not clear harmonics produced by precisely cutting the string in proportions relative to positions in the overtone series. The first overtones of the low A string would be an A an octave above at half the string's length, an E a fifth higher at a third of the length, an A above that at a fourth of the length, etc. The tones Cowell requires at the beginning of *Sinister Resonance* are all situated somewhere between the 12th and 18th overtones of the series with A as a fundamental. (See ex. 3.711.) The *G* and *c♭* in *Sinister Resonance* can also be found closer to the fundamental (i.e. nr. 7 and 9) if one does not take the difference between a C♭ and a B into account.



Ex. 3.711. Overtone series on A.

It is highly unlikely that Cowell intended shifting between positions that are as far removed on the string as e.g. overtone 7 (G – 1/7th of the length of the string) and number 15 (A♭ – 1/15th of the length) when the same tones (or those closely resembling them) are obtained by shifting to nearby positions. This far in the series, however, the overtones are not defined as exactly as the traditional notation allows them to be. Cowell intended to alert the performer about this, as evidenced by the indicated 'inexact pitch' in one of the drafts. Obviously, Cowell first tried out the mechanics of the technique to then approximate in notation those results that were most comfortable ergonomically speaking.

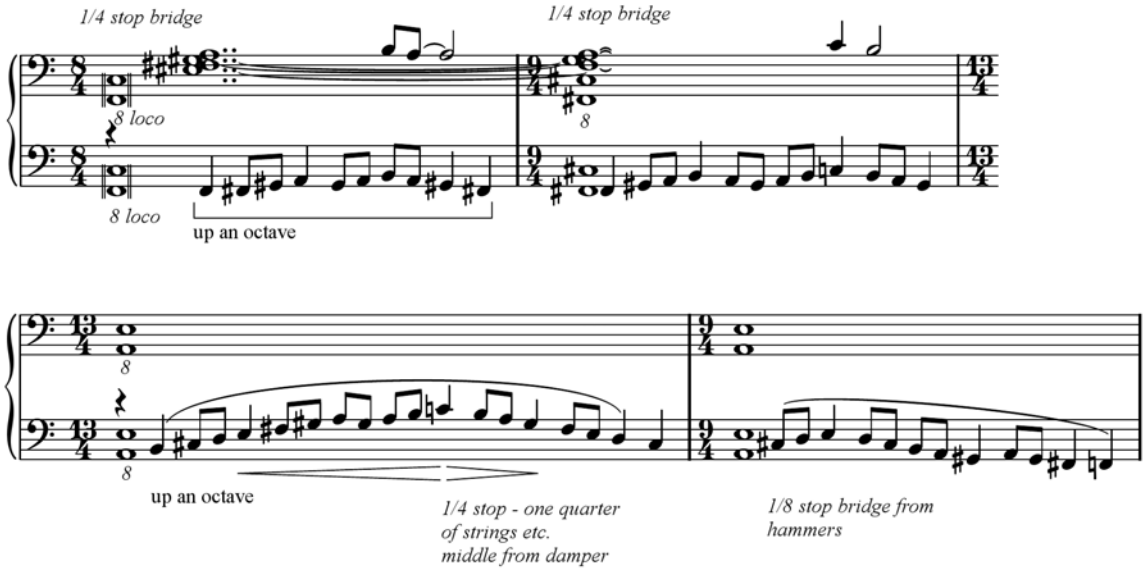
A variant of this technique requires stopping the strings of different notes, each at the same 1/4th of their lengths. The key of each different note has to be played by the left hand, resulting in a sequence of fourth overtones, two octaves above the fundamental. (Ex. 3.712.)



Example 3.712. H. Cowell: *Sinister Resonance* (1930), draft, bars 6-7. The top staff shows the strings that have to be muted at 1/4th of their length; the bottom staff has the notes to be played on the keyboard. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

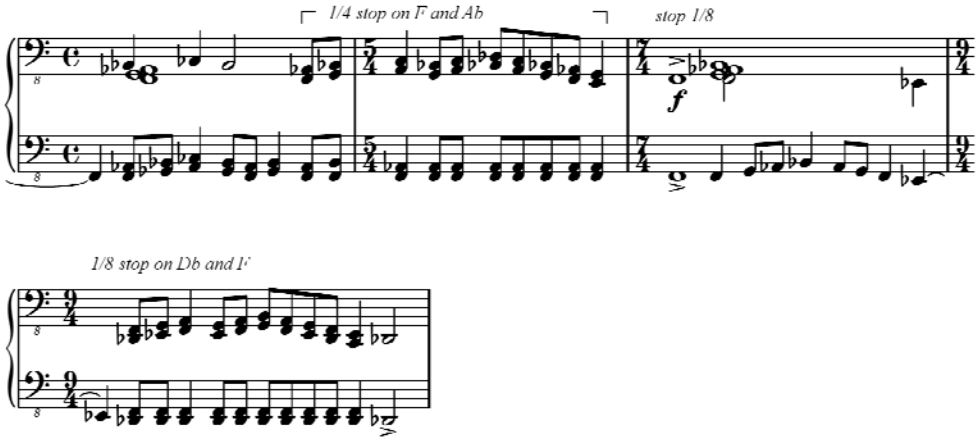
[1296] As in the performance notes published with the 1940 edition.

Cowell also prescribes stops at 1/8, 1/3 and 1/2 of the string, even "at bridge," where dampening the string produces a dry thud rather than any clear overtone. Many of the indications are confusing or incoherent; such as "1/4 stop [from?] bridge," "1/4 middle from damper" or "1/8 stop bridge from hammers." (Ex. 3.713.)



Example 3.713. H. Cowell: *Sinister Resonance* (1930), draft, bars 20-23. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Worthwhile to notice are the double note stops, asked for in defined harmonics as well as muted at the bridge. (Ex. 3.714.) This virtuoso extension of the basic technique is one of several reasons to make the effort of comparing the draft with the edition published in 1940.



Example 3.714. H. Cowell: *Sinister Resonance* (1930), draft, bars 16-19. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.
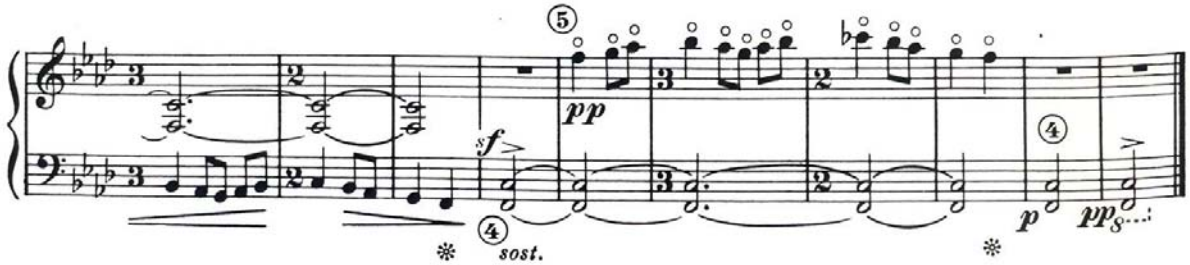
The printed version is remarkably detailed and precise in explaining the performance practical aspect. Cowell makes even more effort to avoid any kind of misunderstanding,

taking as much space to detail the performance notes as is needed for the music itself. He even offers advice on how to adapt to the instrument and the possible problems it may pose.

The basic technique is explained as:

> [...] played by pressing gently with the finger of the right hand just in the middle of the string of the note an octave below that which is written. Each of these harmonics is therefore played on a different string. The tone is produced by striking the keys (an octave below where written) with the left hand, while they are partially cut off exactly in the center by a gentle touch of the right hand finger. Owing to the different lengths of the strings of the piano, the middle of the different strings will not be in a straight line from each other, but lie comfortably close in position so that they are easily reached.

Each variant of this technique is indicated in the printed score by a number. The basic technique – producing the second overtone – is required only at the end of the piece (indicated by Cowell as technique number five) and is notated with the traditional symbol for harmonics. (Ex. 3.715.)
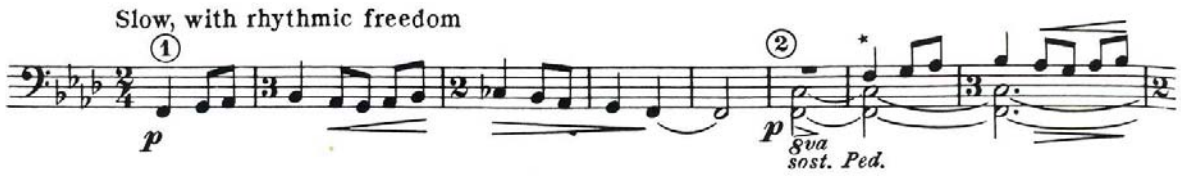


Example 3.715. H. Cowell: *Sinister Resonance* (1930), final bars. © Associated Music Publishers.

The rest of the music requires the other modes of this damping technique. At the beginning, for technique "1," the lowest A string needs to be
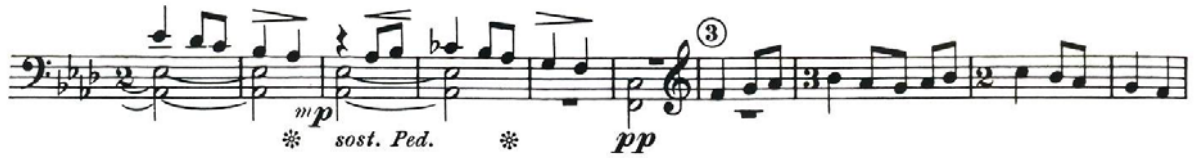
> [...] cut off *firmly* with the finger at a point *toward* the middle [of the string] to sound the F. The finger is then run along the same A string to cut it off at other points closer towards where the performer is, to sound the requested higher notes.

Cowell understood that more words in the performance notes meant less complicated notation for the music: only the number (1) signals that the notes are not to be played *modo ordinario*. (Ex. 3.716.)



Example 3.716. H. Cowell: *Sinister Resonance* (1930), opening bars. © Associated Music Publishers.

Departing from the draft, Cowell sometimes combines the effects of (1) and (5): at (3) the first note is actually the first overtone above the fundamental, as Cowell specifically asks to produce the F by "cutting the F string off just in the middle for the first tone." The succeeding tones are obtained by shifting the finger along the same F string. (Ex. 3.717.)



Example 3.717. H. Cowell: *Sinister Resonance* (1930), opening bars. © Associated Music Publishers.

As in the draft, Cowell requires the pianist to press on the strings of the indicated notes just at the bridge (number (2)), describing the effect as having a "muted quality" and "bearing the same relation to the ordinary open piano tone that a muted violin or trumpet does to an open violin or trumpet."
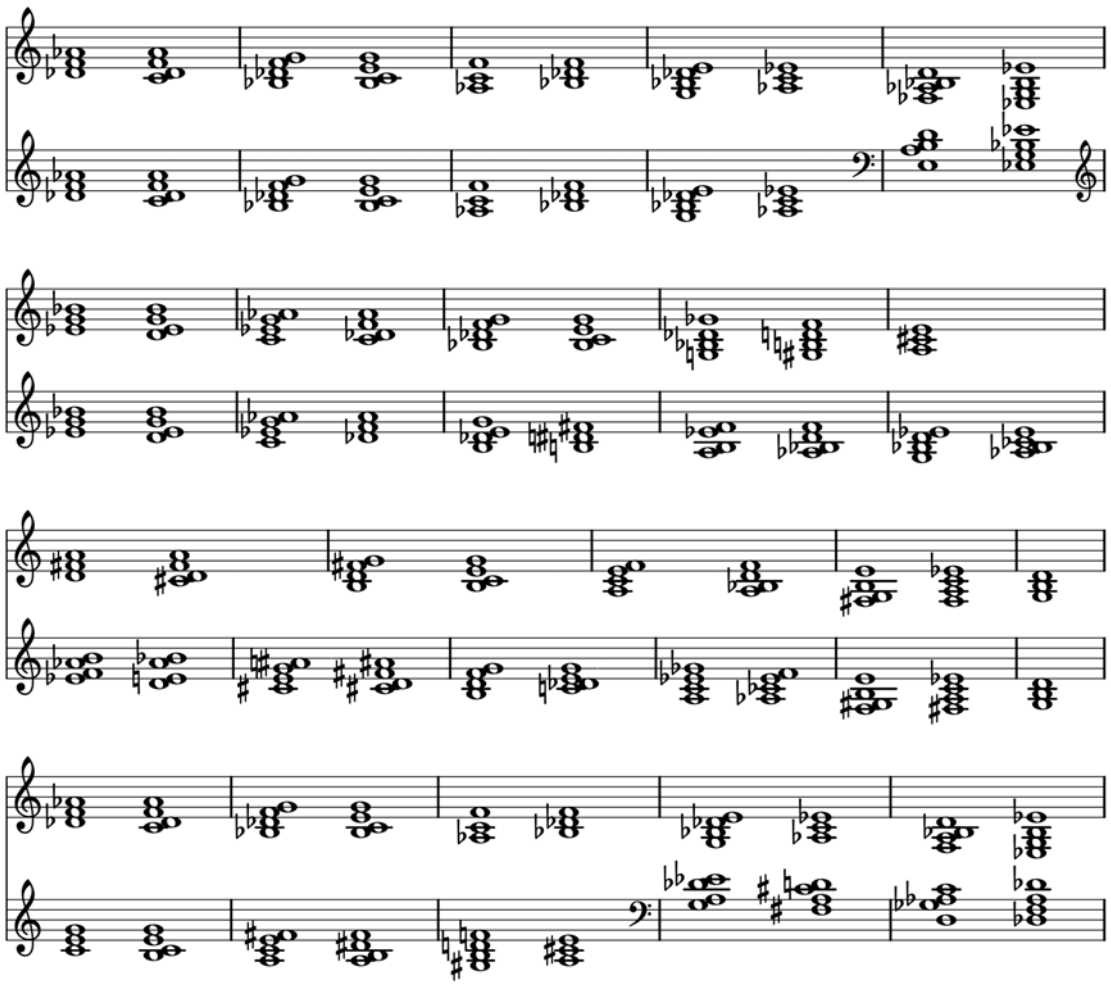
A last technique the printed edition is obtained through again a combination of others. Number (4) is the same as (2), "except that the string, instead of being damped right at the bridge, is damped a little away from the bridge near the dampers, which gives a drier tone and brings out higher overtones." The effect of (4) is therefore a combination of completely muted strings and sounds that are defined more clearly than muted strings but less clearly than harmonics. This must be what Cowell meant when he wrote the confusing indications as in ex. 3.713.

Besides the explanations and clarifications in the printed version, the whole compositional structure is different from the draft. The basic motive is the same, but whereas in the draft he extends it and moves from F minor to A♭ major, E♭ minor and F♯ minor, the edition limits the tonality to F minor, A♭ major or a combination of both. Furthermore, in the draft the motive is sometimes extended beyond the basic stretch of a fifth as in the edition. Finally, the latter contains a more thoughtfully structured and balanced spreading of the different variants of the technique, spending 23 bars on (1), 18 on (3), 4 on (4), 4 on (1), 4 on (5) and 2 on (4), with (2) used continuously for the accompanying fifths (e.g. ex. 3.716). The draft can hardly be called structured, with 16 changes of technique in 33 bars, often once every bar.

Cowell reworked compositions often, sometimes for other instruments, sometimes to incorporate the music into a larger piece. However, the far-reaching revision between the draft and the printed edition of *Sinister Resonance* is remarkable to say the least. We have only encountered it twice more in his output and both pieces were for string piano: *Aeolian Harp* (L370) and *The Banshee* (L405).
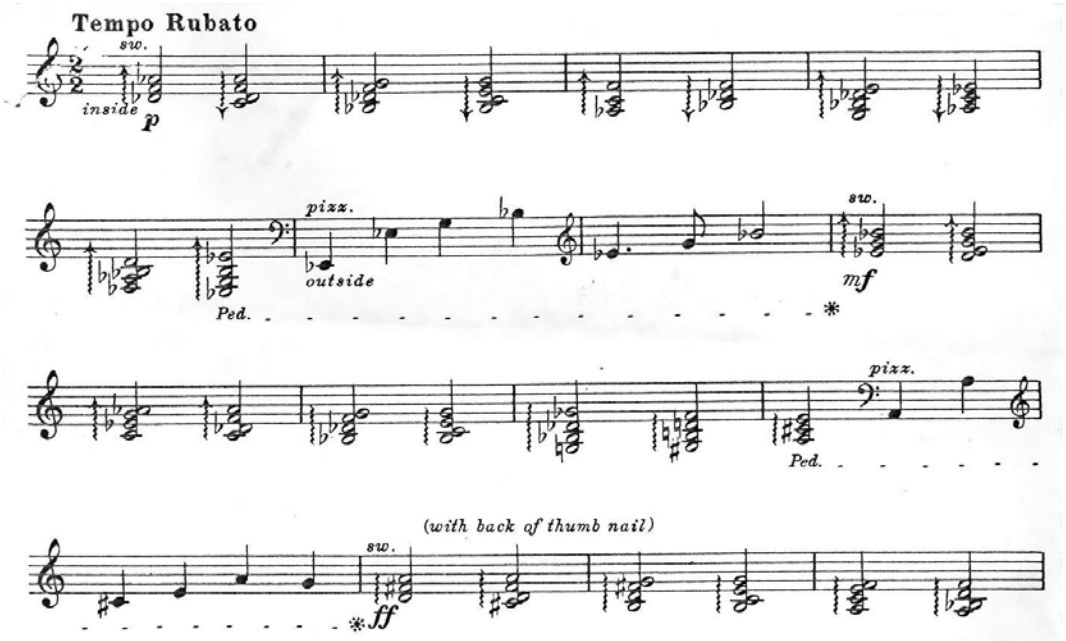
That Cowell reused the 1923 *Aeolian Harp* in 1930-1931 as a background to a melody on which he set a poem written by his father (L477) and afterwards rearranged it again for piano and violin (L477a), is not exceptional. That the 1930 edition of the solo piece differs considerably from the manuscript is significant.

First of all, the direction of the modulation in *Aeolian Harp* is adapted to a more simple and coherent scheme. Even if it still lacks some direction, it is an improvement over the initial tendency in the draft to wander about aimlessly. (Ex. 3.718.)



Example 3.718. Harmonic layout of H. Cowell: *Aeolian Harp*: manuscript version (1923 – bottom staff) vs. edition (1930 – top staff).

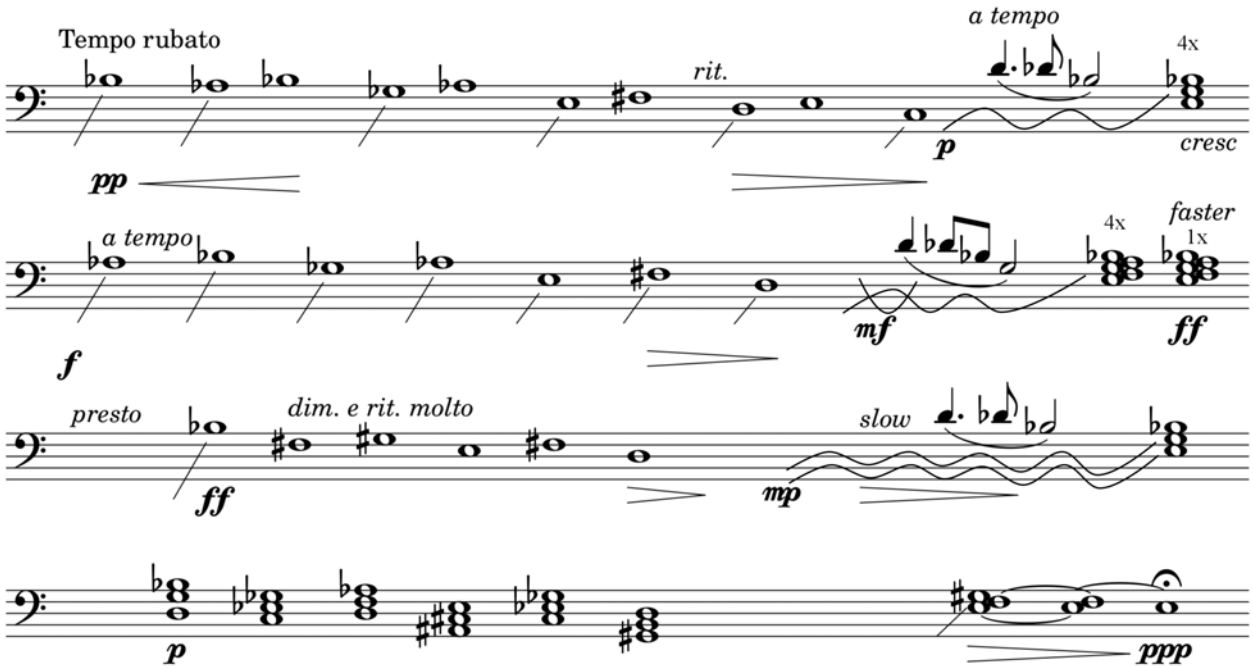
The symbols referring to the extended techniques are explained in such a way that the glissando from bottom to top is suggested to be the norm and the opposite is required if the arpeggio mark is given with a downward arrow, from the top to the bottom of the chord. Unfortunately, in the score itself the alternation between upwards and downwards is only consistent on the first staff. On the second staff all chords have an upwards arrowhead and afterwards no arrowheads are printed. (Ex. 3.719.)



Example 3.719. H. Cowell: *Aeolian Harp,* Breitkopf & Härtel edition (1930). © W.A. Quincke & Company.

Of greater interest, the printed score differentiates between plucking "inside" and "outside": "inside" indicates that the notes are to be played near the center of the string, inside the steel bar which runs parallel to the keyboard across the strings. "Outside" indicates that the notes are to be played outside this bar, near the tuning pegs. In between the draft and the edition, Cowell obviously thought of ways to refine the technique.

The Banshee is the second piece that received thorough revision between the 1925 draft and its 1930 publication. The structure is made stronger by adding a pizzicato motif and by fitting the whole piece into a large crescendo-decrescendo format. The descending whole tone sequence is now developed throughout the piece by subtracting and adding upbeat glissandos as well as notes. The diminished triad and the accompaniment to the pizzicatos change equally progressively. (Ex. 3.720.)



Example 3.720. Structural rearrangement by this author of the published version of H. Cowell: *The Banshee,* (1925).

We need to call attention again to the fact that we do not know when he revised the three string piano pieces – *The Banshee, Aeolian Harp* and *Sinister Resonance*. It may have happened around 1930, when the first two were being published and the third was conceived, but it could have been much sooner after the first drafts. Comparing the scores with Cowell's own playing of these pieces[1297] is revealing, as he plays a clear mix of the drafts and printed editions. He must therefore have been used to playing the music as it was first thought of and written down for too much time to be able to accurately reproduce the later published version. Other pieces on the 1963 recordings offer the same insight: Cowell plays *What's This* like he had drafted it in 1917 rather than the way the piece appeared in print in 1922.[1298]

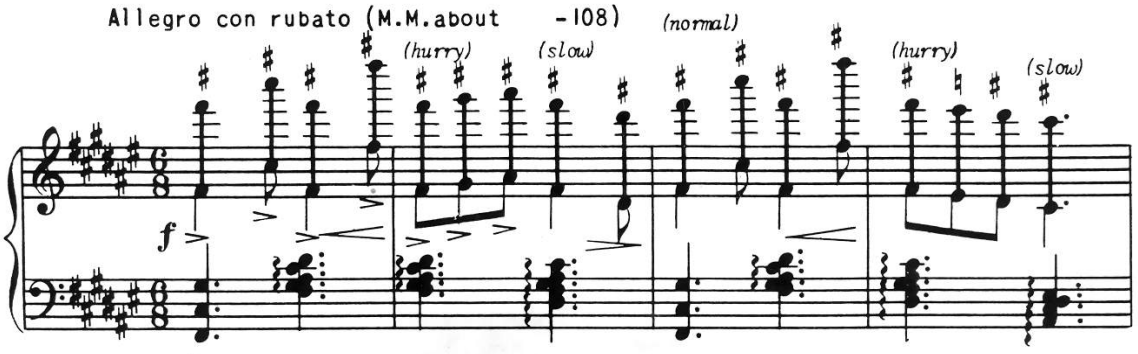
Also in 1930, two Cowell pieces are published in the USSR (L463): *Lilt of the Reel* and *Tiger*, both said to be from 1928.

Cowell himself elaborated only a little on the title *Lilt of the Reel*, saying that it is "a tune whose modal character is borrowed from Gaelic music."[1299] For this particular piece, it is worth going into the meaning of the title a little deeper than that. The reel is a popular tune-type within the Irish dance music tradition, written in 4/4 (as opposed to the Jig, which is in compound meter) and with an emphasis on the third and seventh beats to "push" the tune for the dancers, "bending it forward." This stress – the "lilt" – is subtler and less driving than e.g. the backbeat mandolin chop heard in bluegrass, and is often achieved by ornamentation (usually the triplet on a banjo) rather than an increase in volume. [1300] The term "lilting" is also applicable to singing the reels, making the ornamentations with the voice through vocables like "dai-di-diddley, dum-dididdley."[1301]

[1297] Cowell 1963x.
[1298] On the recording as in the draft, and contrary to the published version, the first six bars are repeated and the rhythm as well as the meter is often different.
[1299] Cowell 1963, p. 5.
[1300] http://www.banjosessions.com/apr06/reels.html, accessed on April 25, 2008.
[1301] Collinson & Cooke 2002, p. 702. "The Scottish equivalent is called 'diddling'."

This gives an idea of how the music should be played, as good "lilters" are said to be able to play for a dance using voice alone.

At first sight, Cowell's reel looks like a jig, but considering the meter as 4/4 over two bars (with triplets) instead of 6/8, we clearly see the lilt ("hurry") on the third and seventh beat. (Ex. 3.721.)



Example 3.721. H. Cowell: *Lilt of the Reel* (1930), opening bars. © Associated Music Publishers.
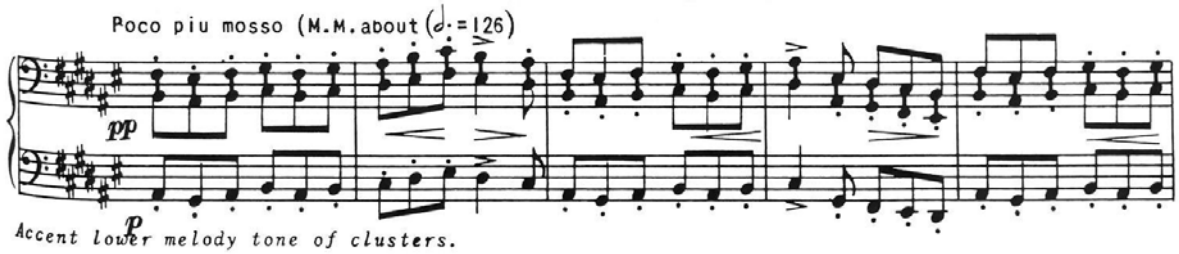
The rubato – "hurry" and "slow" – is Cowell's transposition of the lilting's metrical stress onto the cluster technique.

The left hand accompaniment of the opening consists mostly of black key clusters written out as chords. Cowell accentuates the F# major key by leaving room between the cluster sounds for the characteristics of the tonal cadences: the opening tonic and closing dominant (bar 4) are "dissonated" only so much that their function's most crucial notes can still clearly be heard or stressed. In further terms of cluster playing, a note in the draft explains:

> All clusters are on black keys when the outer limits are on black keys, and on white keys when outer limits are on white keys, except in the staccato passages marked with ++, which are chromatic, including all tones.

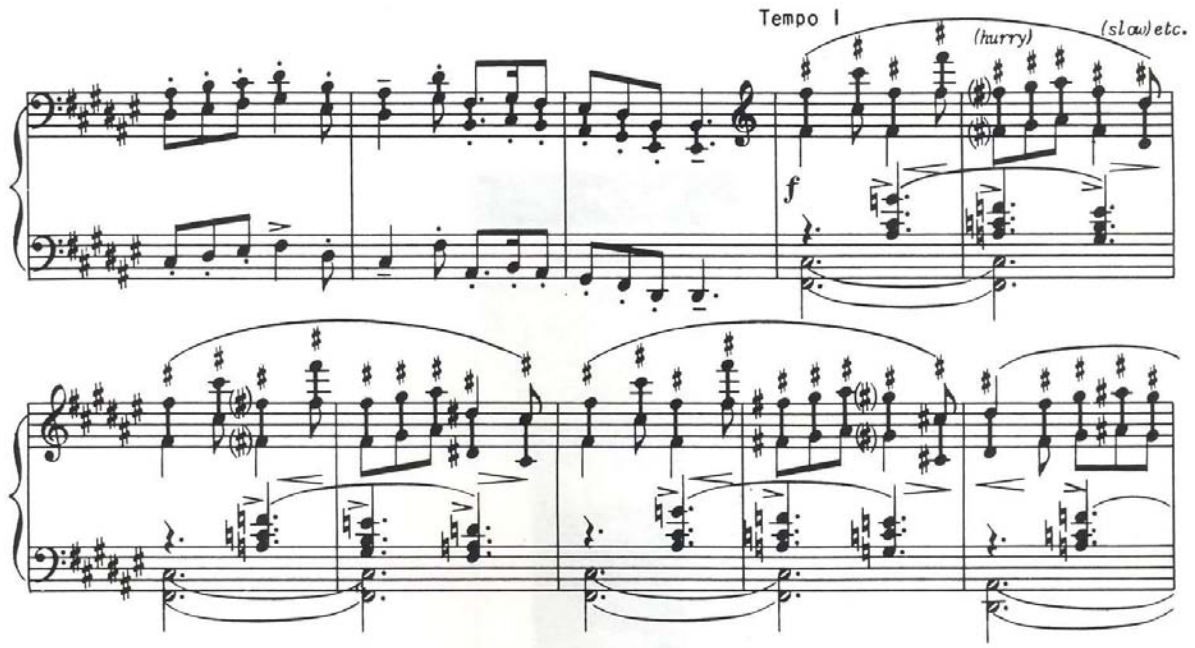
This choice for white or black key clusters for a piece in the key of F# major, shows the ergonomical consideration in deciding which kind of cluster is needed: the melodic clusters on E# are diatonic. (Ex. 3.721.)

Contrasting the arm clusters with the main melody in the thumb, the second part has the left hand carry a tune with the right hand palm clusters in the closest proximity. (Ex. 3.722.)



Example 3.722. H. Cowell: *Lilt of the Reel* (1930), bars 17-21. © Associated Music Publishers.

When the main theme returns (ex. 3.723, bar 20), it is played with the thumb that is also part of the accompanying palm-cluster (as different from a melody at the bottom end of an arm cluster, where more than one finger is in a comfortable position to properly play a note). The difficulty is alleviated by altering the melody and excluding white notes from it. (Ex. 3.723.)



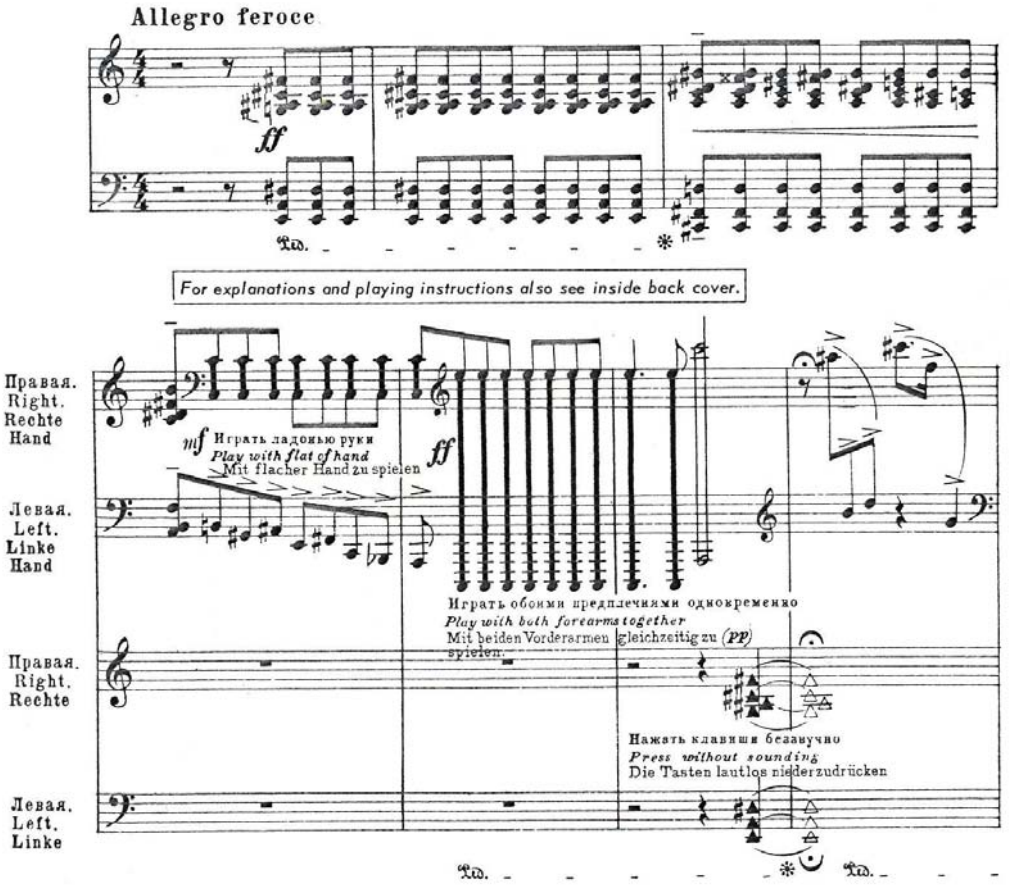
Example 3.723. H. Cowell: *Lilt of the Reel* (1930), bars 54-63. © Associated Music Publishers.

According to the caption of the printed score, both *Lilt of the Reel* and *Tiger* were written in 1928, not allowing us to know how long before they were actually written and what differences there may have been between the draft and the edition. Of *Tiger* we know that its 'pre-natal' history began in 1922 with the unfinished *Conservative Estimate* (see above[1302]), leading to *Dash! Tiger* in 1926[1303], and to first public performance of *Tiger* in 1927[1304] before it was published. The piece – or at least its title – was originally suggested by William Blake's poem *Tiger, Tiger, burning bright*.[1305] Judging the score, the music is very close in concept to the ultra-modernist period in which pieces like *Dynamic Motion* saw the light. Moreover, what Cowell himself wrote about it is similar to his words on the latter (see beginning of 3.4.2.8.2):

> atonal, dissonant style, a set of variations on 2 themes stated in the first few measures[,] on with small intervals, the other with widely separated intervals.[1306]
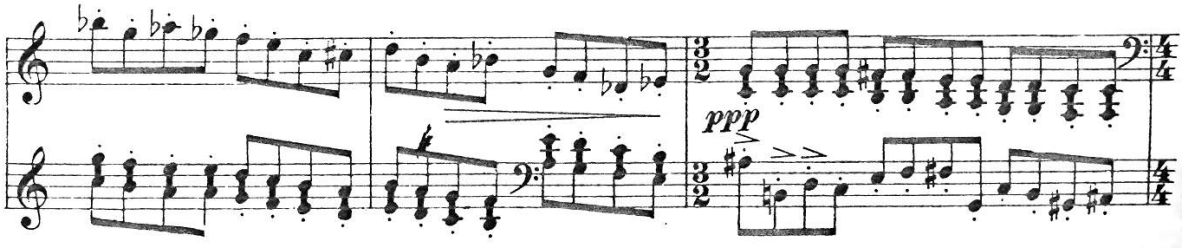
These themes themselves – not much more than some embryonic motives – are as comparable to what constituted *Dynamic Motion* as the way they are developed. *Tiger* opens with dissonant chords evolving through octave clusters to four octave arm clusters, which are then filtered by silently depressed keys above which resonance an atonal melody appears. (Ex. 3.724.)

[1302] According to a 1963 note from Sydney Robertson Cowell (Lichtenwanger 1986, p. 87.)
[1303] According to its place in the Compository Dates list.
[1304] Lichtenwanger 1986, p. 127.
[1305] Cowell 1963, p. 7. *Tyger* is part of Blake's late 18th century collection of poems "Songs of Experience." It consideres the creation of the powerful and dangerous animal and the artist's attempt at expressing this in the industrialized modernity.
[1306] Cowell 1963, p. 7.



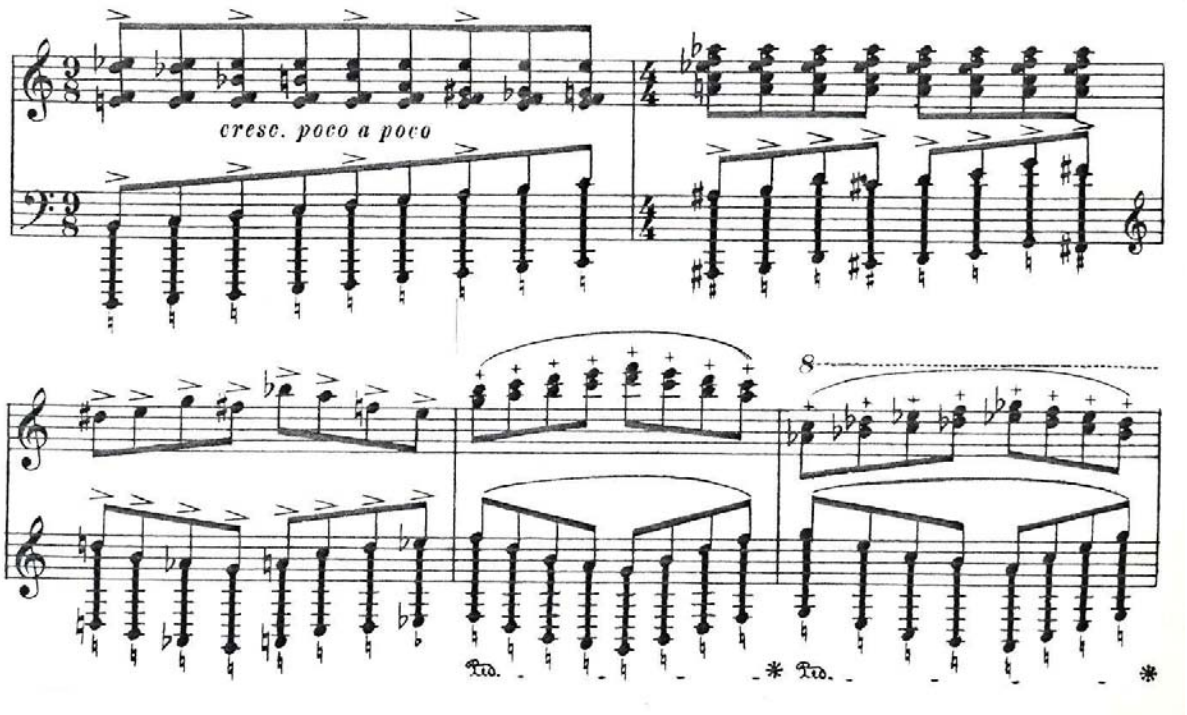
Example 3.724. H. Cowell: *Tiger* (1930), opening bars. © Associated Music Publishers.

Of more recent conception is the descending sequence of 5th clusters closely accompanying a melody. (Ex. 3.725.)



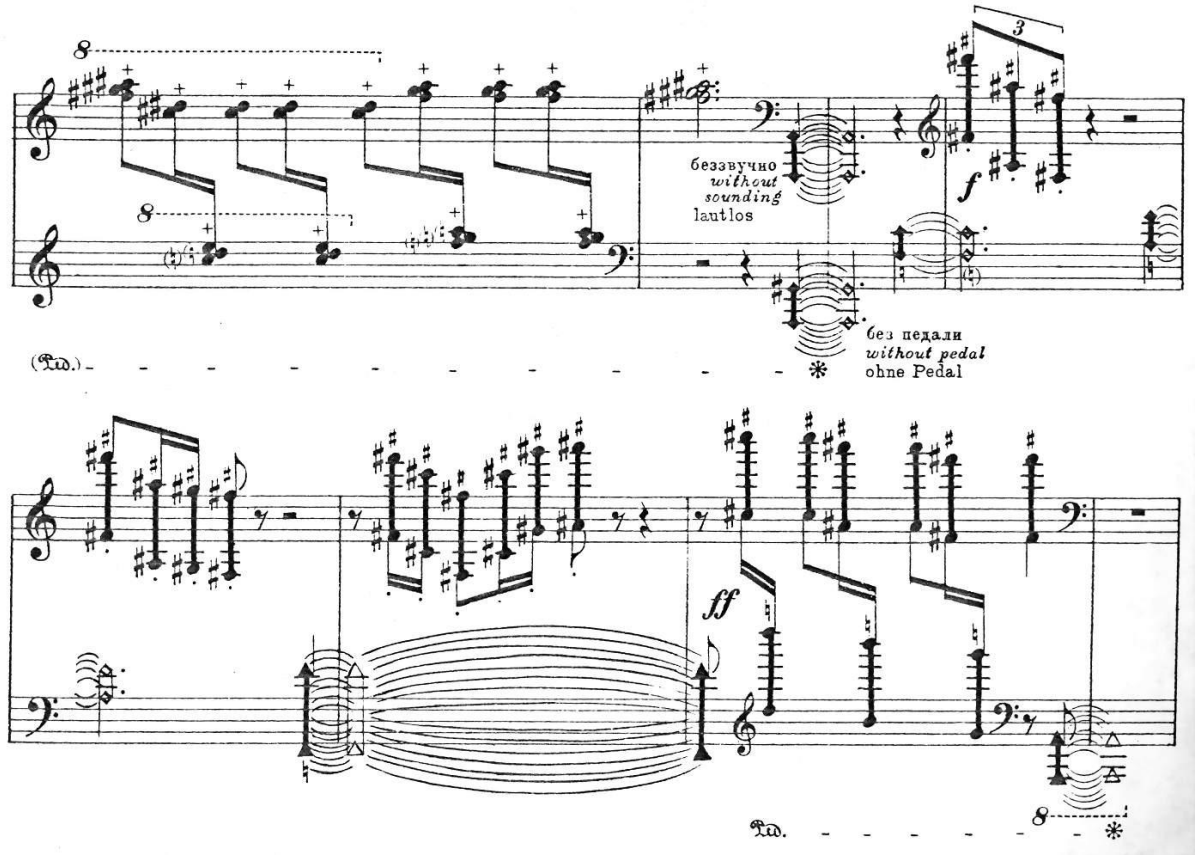
Example 3.725. H. Cowell: *Tiger* (1930), bars 17-19. © Associated Music Publishers.

The smaller clusters lead again to arm clusters and then to the use of fists (indicated by "+" in the score, see ex. 3.726, bars 32-33). As in the encores to *Dynamic Motion* from about a decade earlier, it is not always clear which keys the fist has to cover.
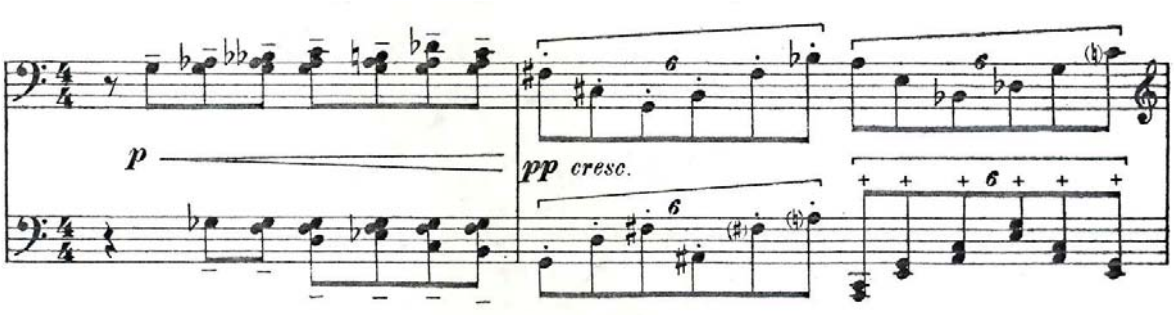


Example 3.726. H. Cowell: *Tiger* (1930), bars 29-33. © Associated Music Publishers.

Silently depressed keys are required again, this time to let us hear the vibrations sympathetic to the black-keyed arm-clusters. (Ex. 3.727.)



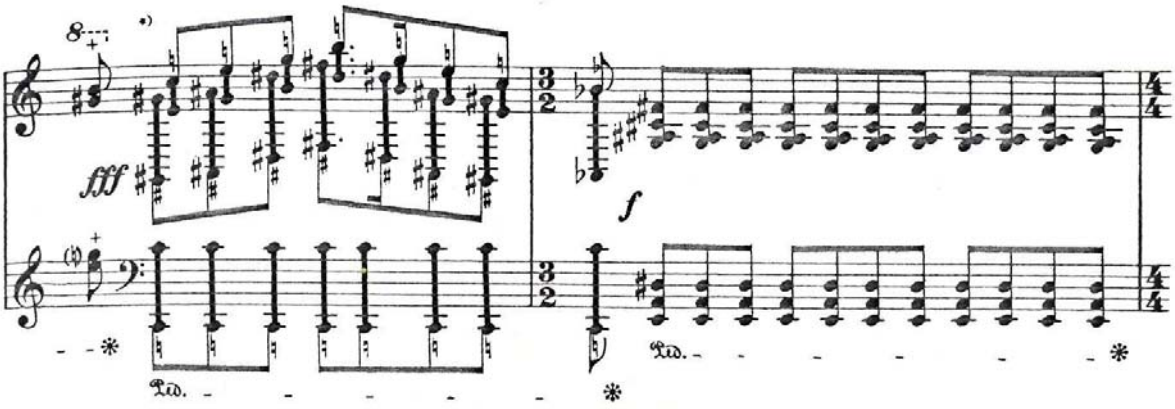
Example 3.727. H. Cowell: *Tiger* (1930), bars 38-45. © Associated Music Publishers.

Out of more clustered chords evolves a passage with both hands playing in the same range, including soft white-key fist clusters. (Ex. 3.728.)



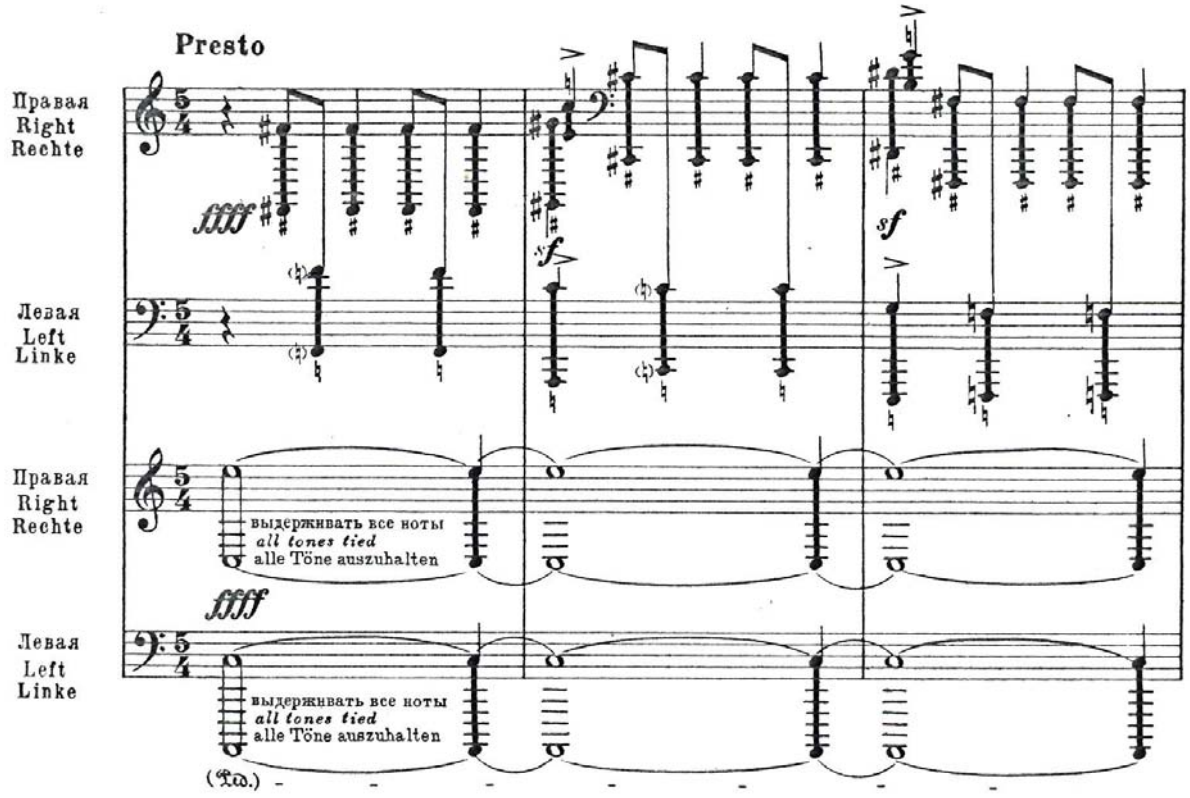
Example 3.728. H. Cowell: *Tiger* (1930), bars 49-50. The "+"-sign indicates the fist. © Associated Music Publishers.

The fist clusters soon come back in both hands, fortissimo and in contrary motion until the black/white key arm/elbow clusters appear again. (Ex. 3.729.)



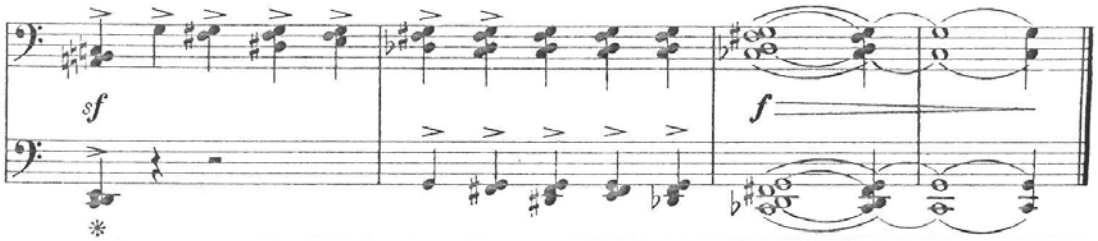
Example 3.729. H. Cowell: *Tiger* (1930), bars 57-58. © Associated Music Publishers.

At the high point of *Tiger*, very fast, very loud and very large clusters all sound in one long pedal stretch. (Ex. 3.730.)



Example 3.730. H. Cowell: *Tiger* (1930), bars 88-90. © Associated Music Publishers.

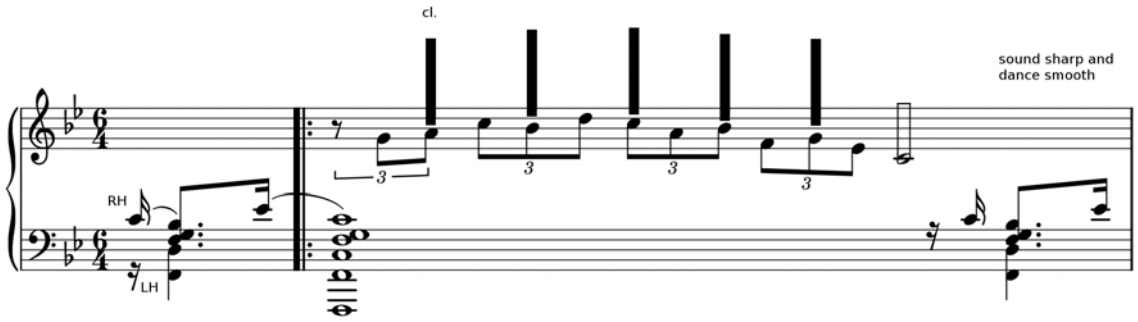
At the end, a form of addition reminding us of the cluster theories in *New Musical Resources* leads to a final filter to stop at open fifths. (Ex. 3.731.)



Example 3.731. H. Cowell: *Tiger* (1930), final bars. © Associated Music Publishers.

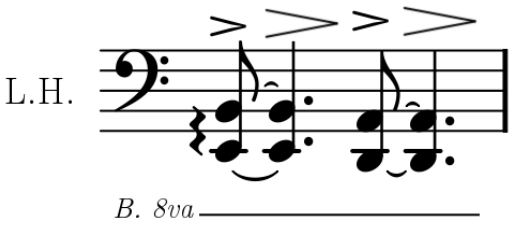
Besides more clusters in the *March of Invincibility* (L469), Cowell produced more music for his "percussion piano" as well in 1930. The *Synchrony of Dance, Music, Light* (L464 – 1930) – retitled *Orchesterstück: Synchrony for Orchestra* – has a part for string piano. The five lowest strings are to be sounded with padded stick. In sketches for a *Sound March* (L471), Cowell further experiments with various means of sounding the piano strings: "with hand," "metal object," "dry," "damp," etc.

New in the piano version of *Dance of Sport* (L482 – 1931) is Cowell's permission, noted in a draft, that "If desired octaves may be substituted for all such [arm] clusters." Other telltale signs of a veteran virtuoso's attitude towards clusters are seen in *Two Appositions: One Movement for Orchestra* (L484b – 1932), in the piano part of which ordinary notes alternate with arm clusters in a fast tempo (♩ = 100). (Ex. 3.732.)

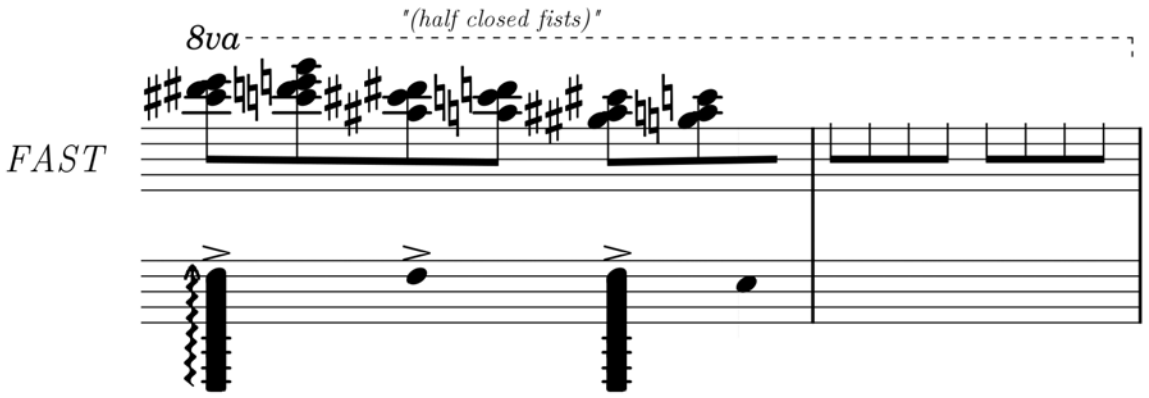


Example 3.732. H. Cowell: *Two Appositions* (1932). Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Move Forward! (L497/3 – 1930-33) for piano is part of a set of "Proletarian" songs and a march for voices, with or without piano. Next to clusters that filter to empty intervals (Ex. 3.733), the piece contains clusters for "half closed fists" on black and white keys. This is the first time Cowell seems to acknowledge that the "fist" as such is not always ergonomically fit for the small three note chords he mostly wrote for this limb. (Ex. 3.734.)



Example 3.733. H. Cowell: *Mover Forward!* (1930-33?), bar 17 of incomplete pencil sketch. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.



Example 3.734. H. Cowell: *Mover Forward!* (1930-33?), last two bars of incomplete pencil sketch. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

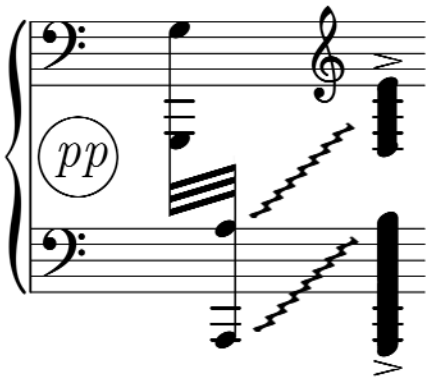
3.4.2.7.4 Extended techniques in late Cowell works

We have now come to the point where our history of the extended techniques takes a turn and our focus is redirected away from Henry Cowell. Other composers took over the pioneering efforts of Cowell to push the development of the extended techniques further into the future. Before we "move forward" to look at their ideas, however, we will glance at what Cowell did with the extended techniques in the rest of his life.

In the 20 years between Cowell's first use of extended techniques and the year we have arrived at here – 1933 – we had found 62 works containing such techniques. In the remaining 32 years of his life, he used them for only 30 different compositions.[1307] Cowell continued to use mostly what he had tried and liked, but in the field of the extended techniques not much was left to satisfy his innate longing for uncharted territories. The impetus for the new – still very much visible in the rest of the output – lead him to explore other interests more fully, such as "hymns and fuguing tunes," the music of the peoples of the world, or even the diversification of the performing forces in his oeuvre. Of the more than 300 piano pieces he composed in his lifetime, merely a third dates from after 1930. Most music for other solo instruments dates from the 1930's and later, as did almost all duos (except violin- or voice-piano), most trios, quartets (except string quartet) and quintets, by far most of the works for larger ensemble or chorus, most concertos and symphonic compositions, and all extant band pieces.[1308]

3.4.2.7.4.1 Clusters
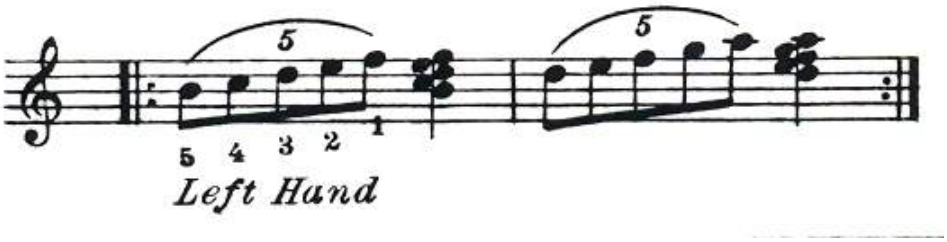
Until about the end of his life, Cowell included clusters in his piano writing. The exhaustive experimenting he had carried out prevented him from coming up with still many novel uses, kinds and combinations, though. Besides the known arm, palm and fist clusters as well as clustered chords, the manuscript of *King Lear* (L606 – 1940) includes an arm-cluster tremolo traveling upwards in pianissimo with the caption "boomerang music." (Ex. 3.735.)



Example 3.735. H. Cowell: *King Lear* (1940), fragment. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

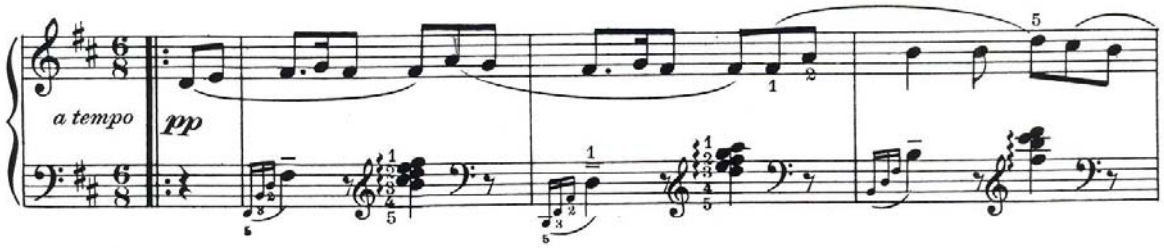
[1307] For details on the method of counting, see 1.2.
[1308] See Lichtenwanger 1986, p. 358-364.

Despite the fact that Cowell had by now tried almost everything with the cluster, or maybe because of it, he included clusters in easier pieces intended for instructional purposes. *The Harper Minstrel Sings* (L514 – 1935) was “A teaching piece using easy clusters” and first performed at a concert of educational music by contemporary composers, together with the piece it was paired to: *The Irishman Dances* (L515 – 1935)[1309]. However, the "preparatory exercises" in *The Harper Minstrel Sings* (printed above the music) hardly show the student how to apply cluster technique. (Ex. 3.736)



Example 3.736. H. Cowell: *The Harper Minstrel Sings* (1935), preparatory exercise. © Associated Music Publishers.

When looking at the cluster usage in the actual music, it becomes apparent that Cowell did not make a real distinction between cluster technique and clustered chords that cannot be played with the palm of the hand. (Ex. 3.737.)



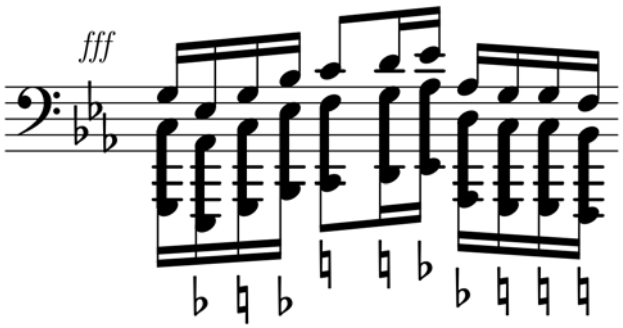
Example 3.737. Henry Cowell: *The Harper Minstrel Sings* (1935), bars 13-15. © Associated Music Publishers.

That Cowell did not distinguish between cluster technique and clustered chords, is not always a problem, as in the "easy grade" *Bounce Dance* (L822 – 1956)[1310] which has the latter without the use of the former. But in the *Amerind Suite* for Piano Solo (L564 – 1939), also "for teaching material,"[1311] it is not clear whether to use the fingers or the palm of the hand. This confusion can exist in Cowell’s music for professionally accomplished performers as well. If, like in *Set of two movements* for piano (L549 – 1938), Cowell talks about clusters, while they can only be played with the fingers, there is not a problem, but other pieces leave the performer in doubt, e.g. *26 Simultaneous Mosaics* for Violin, Clarinet, Cello, Percussion and Piano (L923 – 1963), which does not mention whether or not use the fist for fast three note chords in both hands, alternately on black and white keys. The presto tempo and the precedents (e.g. in the piano concerto) lead us to believe that fists are intended, but confusion remains as Cowell uses clustered chords and chords that can be played with cluster technique indiscriminately in one and the same piece, just like in the second part of *Set of two movements* for piano (L549 – 1938), where filled out fifths are notated as clusters but which do not say which technique to use.

[1309] Lichtenwanger 1986, p. 146.
[1310] Lichtenwanger 1986, p. 263-266: this piece was part of a series of children’s pieces and based on a movement of an orchestral suite commissioned by fifth grade school orchestra.
[1311] Lichtenwanger 1986, p. 167.

Cowell was rarely consistent in his use of the symbolic cluster notation. He would draw thick vertical lines in instances where no cluster technique was possible or even relevant, e.g. in the piano score serving to work out the instrumentation of the orchestral *The Tender and the Wild* (L932 – 1964); on the other hand, pieces like *Signature of Light* for voice and piano (L760 – 1951) show octave cluster chords that could easily have been written in cluster notation but weren't. On the other hand, he can be very specific in his performance practice advise, as in *Set of Two Movements* for piano (L549 – 1938), where – amongst many "elbow clusters" – he advises in the first movement (*Deep Color)*:

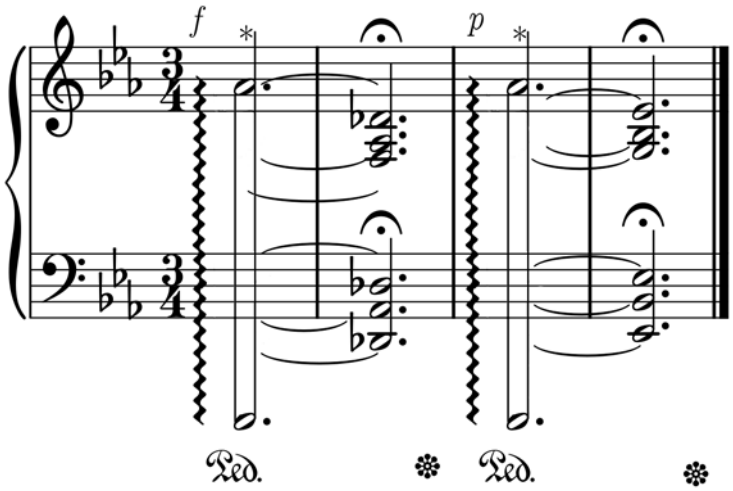
> When there is a melody a 5th above the cluster, bring it out strongly with the 3rd finger, leaving the hollowed hand between the melody note and the cluster in order to omit the interval of a 5th. [Ex. 3.738.]



Example 3.738. H. Cowell: *Set of Two Movements* (1938), bar 83, left hand part. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Interestingly, for the filtering of chords from arm clusters (Ex. 3.739.), he does not neglect to mention the theoretical basis of his intention:

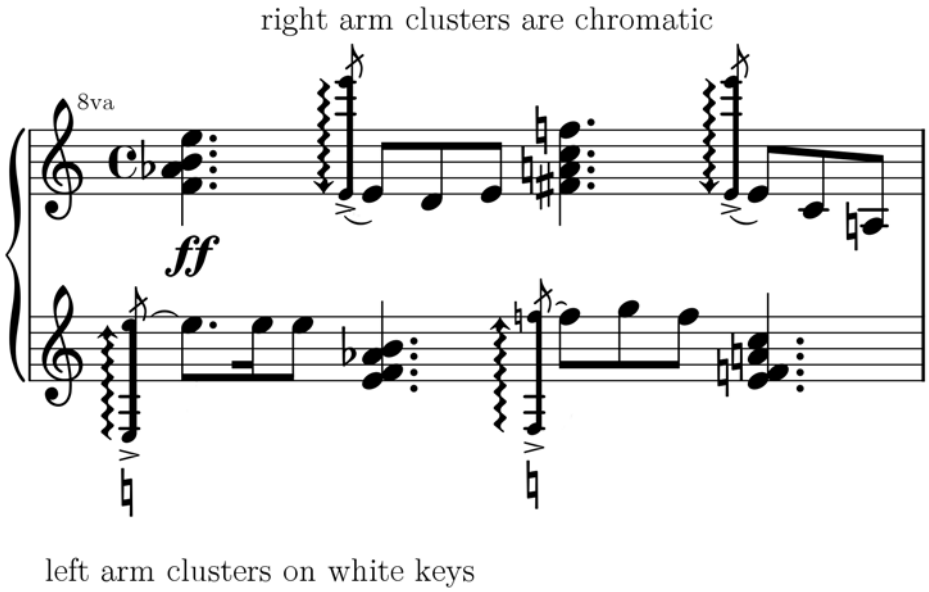
> After sounding the big cluster, and before the pedal is released, press down the following chord without sounding them; then release the pedal and let their overtones sound during the hold.



Example 3.739. H. Cowell: *Set of Two Movements* (1938), final bars. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

In the second movement - *High color* – Cowell details the performance practice of another typical one of his cluster types (ex. 3.740):

> The cluster arpeggio grace-note to be played with a ripping sound – very fast – and let go with both arm and pedal when the final accented note is reached, letting it sound alone. Play the chord in the other hand right with the last note of the cluster (the accented one).



Example 3.740. H. Cowell: *Set of Two Movements* (1938), p. 6. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

We have seen how in one piece, *Dance of Sport* (L482 – 1931), octaves were permitted to be played as clusters. Likewise, in *Fabric Ending* (L654 – 1943?), the "lower octaves may be in form of clusters if desired, first single octave, then two octave arm clusters," though in *Wedding March* (L550 – 1938) "all clusters […] may be played as ordinary octaves instead, if desired."
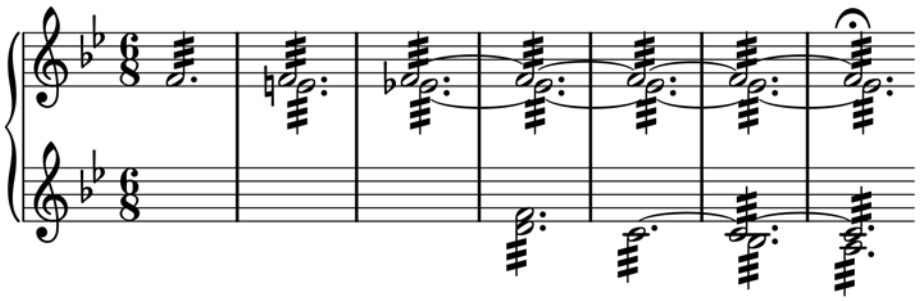
3.4.2.7.4.2 String piano

As for the string piano techniques, Cowell continued to explore them until the 1950's. In *Vocalise* for soprano, flute and piano (L524 – 1936), he simply asks to "press the piano strings next to bridge, damping the tone, throughout the whole work." In other works he can be much more precise: the third movement – *Tala* – of *4 Assorted Movements for Flute, Oboe, Clarinet, Bass Clarinet, Bassoon, Horn & Piano (ad lib)* (L548 – 1938) has an extended footnote specifying that

> it is desired here that all the tones played on the piano should be muted in quality, with more than the usual percussion sound. To do this, it is necessary to use a "grand" piano. Remove the music rack, (which may be placed back on the wing to use in reading the music) and place the fingers firmly on the strings directly, of the tone to be muted, very close to the bridge over which the strings are stretched. Either hand may be used for this; then with the other hand play the notes in the regular way on the keyboard, using a good deal of pedal. A full tone
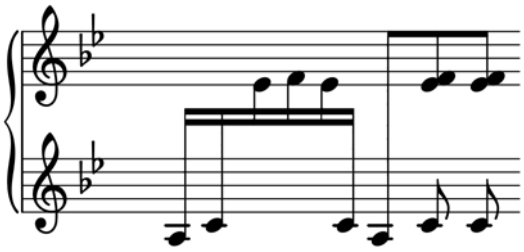
> is produced by damping strings just at the bridge. If they are damped further from bridge, a dryer tone results, which may be desired at times for contrast.

Cowell had begun to explore the string piano at a much later date than the clusters (see above), so he still had ways and manners to discover. In *Mice Lament* for voice and piano strings (L604 – 1940), based on a text by Ella Grainger beginning with "Oh, humans are such stingy beasts," Cowell announces "a new way of piano strings," with "all notes to be tremoloed across the three piano strings back and forth." (Ex. 3.741.)



Example 3.741. H. Cowell: *Mice Lament* (1940), opening bars. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

He also wants "piano strings tapped with fingers (let nail be heard)" in a passage that is otherwise very much reminiscent of proper keyboard technique[1312]. (Ex. 3.742.)



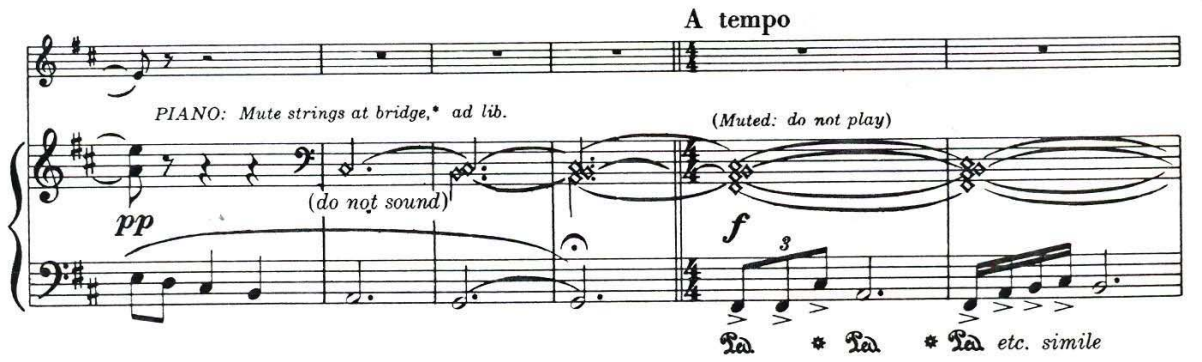
Example 3.742. H. Cowell: *Mice Lament* (1940), bar 29. Excerpt transcribed from the manuscript. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Hamlet, for men's voices and instrumental ensemble (L680 – 1945), has a part for piano strings above two percussion staves (for stopped gong and one for bass drum). In it, many actions are described, often lacking the detail necessary to identify the technique:

- Scrape along coils of string with fingernail, gratingly (no pedal, or very little)
- Strike lowest strings with padded gong stick – dry (no pedal)
- Straight
- Flat of hand one string
- Down one string
- Down one string wiggled sideways
- With darning egg
- With gong stick

[1312] Lichtenwanger 1986, p. 180 erroneously associates the tremolo technique with the tapping of the fingernail.

On an insert, it is certified "the composer or his representative will be glad to show the conductor and the percussion men how to make all of the effects." This, together with the proximity of the stopped gong part to the string piano part in the score, and the indication in the piano part of using a gong stick, leads us to believe that the string piano part was intended for a percussionist. Furthermore, at the end of the string piano part, the bell, medium and large gongs are probably meant to be played by the "pianist." Only once did Cowell confront the string piano with the instrument that is very near to it, one that he had also learnt to play. The *Sonata for Violin and Piano* (L705 – 1946) includes a simple instance of muted tones in the piano. (Ex. 3.743.)



Example 3.743. H. Cowell: *Sonata for Violin and Piano* (1946), 5th movement *Finale,* bars 87-92 (p. 23). © Associated Music Publishers.

Practical consideration is implemented in the score: the strings are muted slowly, step by step and well in advance of the moment at which the muted sounds are required. It makes no difference in sound which order of preparation is followed before the *A tempo*, but it is of artistic value that the pianist can decide the length of the fermate on grounds of musical necessity rather than having to spend time looking for the right strings to mute at the last minute.

Cowell specifies the keys to be played:

> with a rather sharp accent; the resulting tone will be muted in quality, bearing in general the same relation to an open piano tone that muted violin tone bears to the open.[1313]

Again, the advise to move back the music rack is added to the performance note, further considering the upright piano for performance, with the whole front-board removed.

The passage remains the only part of the sonata with violin techniques applied to the piano, but in the *Set of Two For Violin and Piano Strings* (L730 – 1948), there are piano strings muted "just inside bridge," "swept" and "plucked" with and without pedal, and keys depressed "without sounding then sweep strings."

In *Four Trumpets for Alan* for 4 trumpets and *Muted Piano* (L772 – 1952) the only 11 notes played on the piano are muted. In *Changing Woman* (L805 – 1954), a dance accompaniment for piano with occasional drums and harmonium, two pages of typed instructions explain how the piano is to be sounded with fingernails, with a "large wooly gong stick" or a "small hard-headed drum stick," at least some of it played "on bars across strings."

[1313] Footnote on p. 23 of the 1947Associated Music Publishers edition AMP 194550.

For *Homage to Iran* for violin and piano (L845 – 1957) Cowell gives the pianist the odd choice of (not) producing the sound that is "somewhat similar to the sound of an Iranian drum":
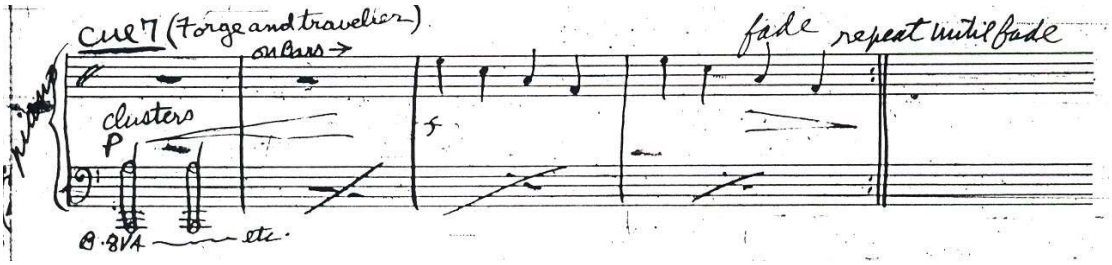
> In the first & third movement, the piano strings may be muted by pressing the strings of the indicated notes near the bridge, while playing the keys.

3.4.2.7.4.3 Combinations of extended techniques

After the 1923 *Piece for piano with strings* (see above), Cowell rarely combined string piano techniques with keyboard clusters in the same composition. More than 20 years later, the *Irish Epic Set* (L703 – 1946) has string piano techniques in the first movement – *Allegro Barbarico* – while the keyboard clusters are limited to the second part, which shows no string playing. In the *Slow Jig* for orchestra (L415a – 1933)[1314], there is a "chromatic glissando" to be performed either with the forearm or with two fingers (one on white, one on black keys) while for a passage with muted strings "a second player or page turner damps all the strings of the notes to be played with by laying the flat of the hand on them firmly." *The Trojan Women* for ensemble (L500 – 1934) has chromatic octave clusters and "plucked string," but the latter only in the sketch and not in the ink holograph piano part.

Only a few pieces contain both kinds of resources. The first movement of the *Suite for Piano and String Orchestra* (L620 – 1941) shows melodic and arpeggiated arm clusters, separated from the plucked and swept music in the second movement for string piano. In the arrangement of this suite, now called *Little Concerto* (L620b – 1945)[1315], the first movement has damped strings (accompanied by pizzicatos *con sordine* in the orchestra's strings) and arpeggiated and melodic arm clusters as well as staccato palm clusters. The second movement shows the requirement of a "string piano," the third part has "chromatic small cluster," a fourth movement mentions "pianostrings," and the last one has chromatic clusters in thirds and indications like "(muted)" or "open."

The incidental music for a radio play, *Derwent and the Shining Sword* for 22 instruments played by 12 performers (L666 – 1944), has music for clusters as well as playing on the metal bars across the strings. The latter is notated on the top staff as if it were a percussion part. (Ex. 3.744.)



Example 3.744. Henry Cowell: *Derwent and the Shining Sword* (1944), cue 7. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.
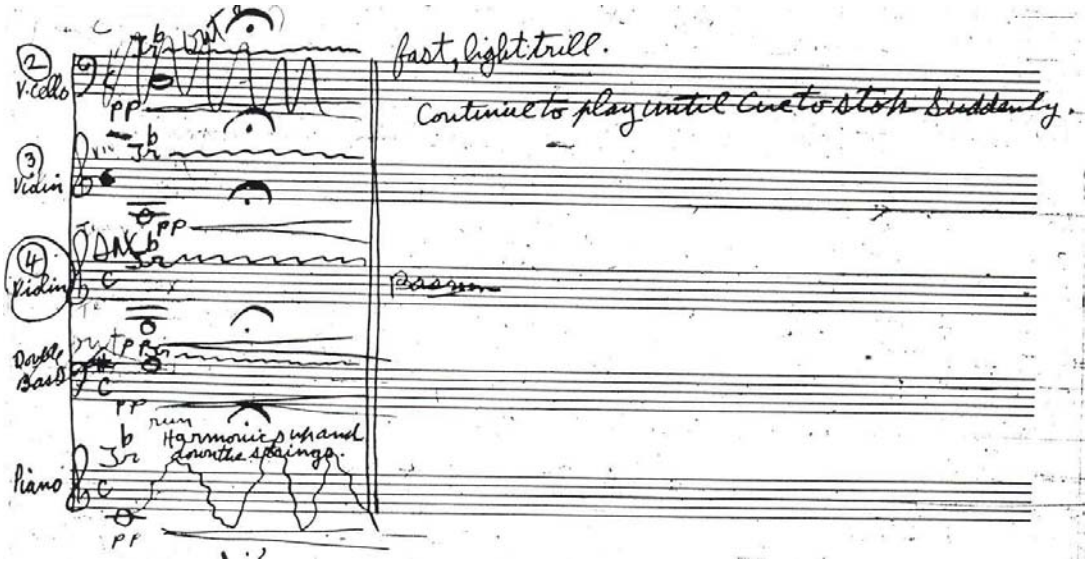
Finally, *Set of Five, for Violin, Piano, and Percussion* (L779 – 1952) is (much more) specific:

[1314] An arrangement – with alterations – of the solo piano piece *Irish Jig* (L415 – ca1925).
[1315] An arrangement for piano and orchestra from the *Little Concerto, for Piano and Band* (L620a – 1942).

> tone cluster arpeggiated with a rocking motion of the forearm and wrist, leading to the accented note with the third finger. Cluster sustained until single tone- the latter sounds alone until time to start next cluster, which is at the last moment before the beat. It is possible, though less effective, to play grace notes as gliss. With thumb nail, crossing to third finger at end.

In the sketchbook pages relevant to this composition, there is the remark "rubato++" with the addition: "ritards at changes of position on strings maybe needed." Cowell's performance practical concern is expressed further: "the piano part may have to be adapted to the particular piano," which is phrased in the score as: "take comfortable time to shift finger positions on strings." More explanations follow: "press firmly on strings of indicated tones," or "LH: trill – RH: glide forward along strings from inside dampers toward piano tail" and "now reverse direction and return, gliding towards dampers." In this passage, the violin plays tremolos and harmonics *con sordine* and *sul ponticello*.

Cowell never went far in searching for combinations of different extended techniques such as clusters and inside piano playing. He did like to try out the piano techniques in combination with other instruments. Of the ten works that include the string piano, only one – the *Irish Epic Set* (L703 – 1946) – is for piano solo. Sometimes he came as close as possible to integrating the string piano in a stringed setting, as in the little instance in the finale of the sonata for violin and piano (ex. 743) or as in *Derwent and the Shining Sword* (L666 – 1944), where the piano plays a *c-d♭* trill on the keys while producing harmonics by gliding up and down the strings (ex. 3.745).



Example 3.745. H. Cowell: *Derwent and the Shining Sword* (1944), cue 20. Reprinted by permission of The David and Sylvia Teitelbaum Fund, Inc. from The Cowell Collection The Library of Congress.

Of course Cowell also tried out the cluster in settings larger than the solo piano. We see them in the piano parts accompanying voice(s)[1316], stringed and wind instruments[1317] or as part of large ensembles and orchestra[1318]. Though he used the piano with percussion

[1316] *Sunset/Rest* (L492 – 1933) for voice and piano, *Relativity* for voice and piano (L507 – 1934), *Six songs on Mother Goose Rhymes* for voices and piano (L538 – 1937), *Three Anti-Modernist Songs* (L542 – 1938), *Signature of Light* for voice and piano (L760 – 1951).
[1317] *7 Associated Movements* for Violin and Piano (L517 – 1935), *Derwent and the Shining Sword* for flute, oboe, bassoon, snare drum, piano (L666 – 1944), *Trio in Nine Short Movements* for Violin, Violoncello and Piano (L941 – 1965).
[1318] *King Lear* for male chorus, piano and orchestra (L606 – 1940), *The Tender and the Wild* (L932 – 1964)

instruments in several works[1319], we only find clusters in the *26 Simultaneous Mosaics* for violin, clarinet, cello, percussion and piano (L923 – 1963), a piece in which "all players start and stop as they please, and choose the order of the movements as they please."[1320] Interestingly, we did not find any evidence of clusters in the works for or including other keyboard instruments, such as the harmonium, organ, harpsichord, and accordion.[1321] No clusters were encountered for instruments on which they nevertheless could easily be played, such as on the harp. Even simple clustered chords in these works are rare.

3.4.2.7.5 Conclusions on Cowell

Cowell's development of the extended piano techniques can be divided more or less roughly into four periods: between1913 and 1914, when he was 17 years old, he first tried out clusters and silently depressed keys; from 1916 to approximately 1920-1922, he mainly developed clusters; from the early 1920's he started writing for the inside of the piano; from about 1930 onwards his attention shifted away somewhat from extended techniques. There remain some problems with dating Cowell's works. His nonchalance in keeping consistent and accurate records was partly to be blamed, but his own efforts to push back dates played a role as well.[1322] The urge to remain the first to have used a certain technique or effect showed how, as a pianist and a composer, Cowell relied heavily on the performance effect of the extended techniques.

The 17-year old autodidact that Cowell had been when first notating clusters should not be blamed for being unclear about whether they are diatonic or chromatic. But Cowell had troubles with accurately communicating performance practical intentions throughout much of his life. That his explanations in manuscripts of how to perform the techniques for playing on the inside of the piano in the 1920's were often inefficient and incomplete should neither be a surprise, nor illogical: before his music was published, Cowell was his own performer and he must not have needed many reminders of how to play what he had invented. When some of his composition were being published, the printed performance notes showed that he wanted not only to inform the pianist about what specific kind of actions to execute, but also to draw attention to details about the timbre to be produced and even to warn him about the problems of different pianos and different string layouts. All the same, in 1930, several publications demonstrated that Cowell had versions of pieces printed, which deviated much from the autographs. Such pieces had apparently evolved considerably between the finished manuscripts and the publication, a period ranging from seven years to a few months.[1323] There is also some doubt as to how much Cowell adhered to his own cluster notation. Moreover, when comparing a recording of his own playing to his scores, it becomes apparent that a degree of improvisation had been a customary ingredient of his personal performance practice in the decades that he took to the stage with these pieces.

[1319] There are at least seven chamber music works that combine the piano with percussion, apart from the pieces for larger ensembles and orchestras, which often have a piano part. See Lichtenwanger 1986 for index of performing forces, p. 358-364.

[1320] Lichtenwanger 1986, p. 307.

[1321] *Ancient Desert Drone* for two harmoniums (L597a – 1940), *Grinnell Fanfare* for Brass and organ (L 729 – 1948), *Introduction and Allegro* for viola and Harpsichord or piano (L857 – 1958), *Iridescent Rondo in Old Modes* for accordion solo (L868 – 1959), *Symphony 14* (L874 – 1960), *Concerto Brevis* for Accordion and Orchestra (L878 – 1960), *Concerto for Harp and Orchestra* (L947 – 1965).

[1322] See Hicks 2002, p. 80.

[1323] *Aeolian Harp* (1923), *The Banshee* (1925) and *Sinister Resonance* (1930) were published in 1930 and differed seriously between their finished manuscript form and the published score.

Cowell's use of clusters was either programmatic or idiomatic. From the beginning, palm and arm clusters often represented the undulations of the sea (especially in settings of texts by John Varian); in the more modernistic compositions, aggressive cluster practices could be associated with the bustling of city life; Irish tune settings typically had clusters as one or other form of accompaniment. In purely abstract compositions, the clusters fitted Cowell's aesthetic of dissonant counterpoint.

Although Cowell's book *New Musical Resources* treated the theoretical building of clusters at length and in detail, he transferred these concepts rarely to instrumental reality. There is hardly any example in his compositions of moving clusters, cluster counterpoint, filtered clusters or orchestral cluster chords. Most of Cowell's real-life cluster use is based on ergonomics and not on harmonic theory. Conversely, many of the techniques used in his compositions did not make it to the book. He had experimented with silently depressed keys long before starting to write *New Musical Resources*, and in between the first draft and the final publication, he had explored innumerable techniques that he did not even mention in the book.

In the first developmental period (+/- 1916 to the early 1920's), Cowell explored cluster types very quickly. Almost any new piece had new cluster types in it. Some pieces lost touch a little with performance practical reality and only very few pieces contained a combination of techniques such as clusters and silently depressed keys. In the next period, when Cowell started working on the inside of the piano, he kept on limiting his pieces to one type of technique, rarely more (e.g. keyboard clusters *and* playing on the strings). His most successful pieces were those that showed compositional constraint in the use of a single idea based on a single type of technique in a small structure. From ca 1920/22 onwards, Cowell developed his string piano (a term he first used in 1926), first writing glissandos across and along strings, finger mutes, hitting strings with the palm of the hand, and pizzicatos. From 1925 onwards he used objects (including percussion beaters) to manipulate the strings, from 1928 he prescribed hitting construction parts of the piano, and only in 1930 did he perfect the technique of producing harmonics on strings. It was in the 1920's that Cowell used extended techniques for the piano in combination with other instruments (chamber music and concerto format). From the early 1930's onwards, Cowell's interest in extended techniques waned. Considering the rate at which he kept producing music with new types of techniques or new angles from which to work with them, his creativity – or the potential of the techniques – must have dried up. But even if it hadn't, his aesthetic outlook changed from the youthful ultra-modernist drive to the more mature interest in "the whole world of music." Cowell began exploring orchestral music, exotic instruments and large classical forms, all of which did not lend themselves much to the extended piano idiom. He nevertheless kept incorporating them. As far as the post-1930 clusters in Cowell piano music is concerned, there is still doubt as to whether or not he distinguished between cluster- and finger-technique to play what may be clustered chords rather than clusters. The notation that he had developed (in three stages, the final one in 1920) was still not always consistent in the later manuscripts and scores. He also kept writing string piano techniques, but the combination of both remained a relative rarity. And if he combined them at all, he never went very far in their development. Finally, it is odd to notice how Cowell did not seem interested in trying out cluster techniques for other instruments on which they could be played, nor did he show any particular preference for the obvious combination of ("percussion") piano and percussion.[1324]

Henry Cowell was a tireless promoter of new music, with many angles of interest simultaneously covered. As a composer, performer, lecturer, pedagogue, author, music editor, publisher, and generally as a musical entrepreneur, his presence in the new music scene was one of prominence. The totality of his influence through his manifold activities

[1324] He did set off the string piano against stringed instruments.

has yet to be fully assessed.[1325] For the extended techniques alone, it is safe to assert that there is hardly a composer after Cowell that cannot be traced back to him, despite his averted interests from ca 1930 onwards. As we have seen, already during his first European tour in the early 1920's, Cowell met Bartók who asked him about clusters to then go on using them in his own way. His teachings in the early 1930's at the New School for Social Research and at Mills College would exert direct influences on the history of the extended piano throughout many decades to come. Cowell's founding involvement with several new music societies lead to connections with other composers the works of whom we will need to discuss in the pages to come. Musically speaking, not only his promotion of performance practical techniques would make lasting impressions on those who knew him or got to know his music. Cowell's practice often took little of his own concepts and theories into account, but his ideas as expressed in *New Musical Resources* were to have a direct influence on composers as diverse and far away as Nancarrow, Kagel, Stockhausen, Boulez and Ligeti. Ideas for which he was (and is) much less well known – e.g. on sliding tones or on compositional structures developed for the dance – have found their ways into some of the most important new directions that our subject's story has taken since then.

[1325] Despite the eminent work of Hicks 2002, which covers the composer's legacy until his incarceration in the second half of the 1930's, and the valuable bibliographic publications by Lichtenwanger 1986, Manion 1982 or Mead 1981 (covering 1925-1936), only Nicholls 1997 presents aspects of Cowell's music that span more than the first two-thirds of his life.

3.4.3 1930's-1950's The piano vs. percussion in the US

At this stage of the extended piano's story, we have to bring in a second subject. A theme that has sounded weakly in the past but has been developing quietly in the background since the beginning of the 20th century and ready to be heard at this stage of the extended piano's chronology. It is about the relation between percussion and the piano.

Apart from the piano's identity as a percussion instrument due to its hammer action, the piano had quickly begun an association with percussion. There were the early clusters: improper for the piano in both sound and technique but properly speaking percussive in nature and effect. Later we encountered the salon pieces for piano and small percussion instruments (tambourine, drum, triangle) by Clementi, Hummel or Steibelt, and of course the built-in Turkish music devices. All this was in the 18th and early 19th century. In about the third decade of the 20th century, the paths on which composers were pushing the evolution of percussion and piano converged at a point where the difference between both would become hazy and even lead to a new instrument: the prepared piano.

3.4.3.1 1930's The extended piano and the percussion ensemble

3.4.3.1.1 The emancipation of percussion

Traditionally, orchestral percussion had served mainly to reinforce rhythmic characteristics and points of structural importance, occasionally fulfilling an evocative or descriptive role, such as the Basque drum in Berlioz' *Le Carnival Romain* (1843-1844), the anvil in Verdi's *Il Trovatore* (1853) or the bells and cannons in Tchaikovsky's *Overture 1812* (1880). Toward the end of the nineteenth century, orchestral percussion was extended to the celesta, glockenspiel, tam-tam, rattle and xylophone, enriching the colours in music by Mahler, Strauss, Debussy, and Ravel.
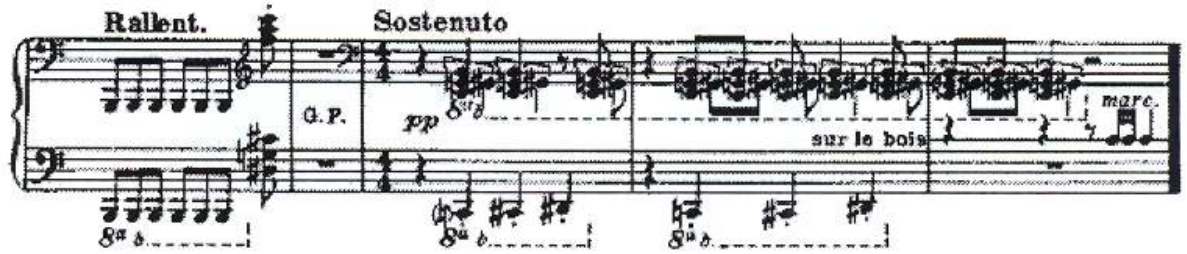
In the second decade of the new century, unpitched percussion was allowed more and more self-sufficiency in orchestral scoring. Alban Berg begins and ends the first of his 1914 *Drei Orchesterstücke* op. 6 with the quiet noise of five "untuneful" instruments (two drums, a cymbal and two Tam-Tams) next to two timpani. In the final Marsch, Berg also prescribed a "nonmetallic" hammer, as had Mahler for his sixth symphony in the decade before.

Between 1915 and 1916, Darius Milhaud used a large force of unpitched percussion to accompany the chorus in several movements of *Les Choéphores,* the second part of a musical triptych based on Aeschylus' Oresteia. In the program notes for its first performance, Milhaud tells us of two scenes "of which the savage, cannibalistic character presented us with one of the most complex problems to solve. The lyrical element in these scenes is not musical. How to set this hurricane to music? It is then that I thought of having the text recited as measured speech, in rhythm and conducted as if it were sung. I wrote spoken chorus parts, supported by an orchestration consisting only of percussion instruments, and, to end, after the murder of Clytemnestra, a massive Hymn to Justice, in which the music reclaims its rights and which is written for chorus and orchestra."[1326] The extensive percussion is all unpitched, including castanets, whip,

[1326] Preface to the edition by Heugel, Paris, 1926/1947 (H.30.244): "[…] deux scènes dont le caractère sauvage, cannibale, nous posait un des plus complexes problèmes à résoudre. L'élément lyrique n'était pas musicale. Comment traduire, ordonner cet ouragan? C'est alors que je pensai à faire parler le texte en mesure, rythmé et conduit comme s'il était chanté. J'écrivis des chœurs parlés, soutenus par une orchestration composée

tambourines, tam-tam, bass drums, and – here also – a hammer with which to strike a wooden plank.

Soon, the percussion's potential was being explored in all kinds of settings and manners. In chamber music, Stravinsky's *The Soldier's Tale* (1918) is remarkable for its ending with a solo for just a few percussion instruments, and the final 1923 instrumentation of *Les Noces* integrates four pianos in a percussion ensemble. Bartók's first piano concerto puts percussion in direct dialogue with the soloist (1926) and at the end of that decade Milhaud wrote the first full-fledged *Concerto for Percussion and Small Orchestra* (1929-1930), leaving the soloist only 4 timpani besides the many unpitched percussion instruments (including: triangle, cymbals, wood- an metal blocks, castanets, whip, ratchet, tambourines, drums, tam-tam, bass drum). That Alexander Tcherepnin could not resist unpitched sounds in 1926-27, is already evident from his orchestral work *Magna Mater* opus 41 (1926-27), which ends with eight bars for the percussion section alone, and the piano piece *Message* opus 39, where he asks the pianist to tap on the wood of the piano (ex. 3.746), much like Langgaard had done a decade before (see ex. 3.609 under 3.4.2.6.1), but the première of Tcherepnin's *First Symphony*, with the work's scherzo scored for unpitched percussion and stringed instruments (tapping the wood of their instruments *col legno* as if they were wooden drums), must have been intriguingly scandalous, for the movement was later published separately.



Example 3.746. A. Tcherepnin: *Message* opus 39 (1926), final bars. © With kind permission by UNIVERSAL EDITION A.G., Wien.

As percussion broke away from its supporting function to explore characteristics that belonged exclusively to itself, so did dance leave behind its typically 18th and 19th century mimetic to aspire to a new ideal. Both found each other in Germany, with Mary Wigman and her colleague Rudolf Laban achieving a breakthrough towards dance that "speaks through movement alone". Laban challenged the eurhythmic interdependence of music: movement could be performed to the accompaniment of speech, percussive sound, or silence.[1327] Wigman had set her debut choreographies to silence and throughout the early and mid 1920's the opening and closing dances of her solo programs were set to preexisting piano music while the dances in between were often accompanied by silence or an original percussive score using gongs, drums, whistles and cymbals.[1328] In 1924, Wigman became dissatisfied with preexistent musical compositions altogether and started long and close collaborations with specific composers, leading through cooperative improvisation to scores for piano and percussion.[1329]

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uniquement d'instruments de percussion, et, pour finir, après le meurtre de Clytemnestre, un massif Hymne à la Justice, où la musique reprend ses droits et qui est écrit pour chœur et orchestre." (Translation as in the preface.) In the score, the "Hymne" (*La Justice et la Lumière*) is number 6, the percussion movements are 4 (*Présages* - prophecies), 5 (*Exhortation*) and 7 (*Conclusion*).

[1327] Manning 1993, p. 55.

[1328] Manning 1993, p. 60, 65, 69, 71, 125, 128. Such piano music would be e.g. a Hungarian Rhapsody by Brahms or Liszt (p. 67-68, 116)

[1329] Manning 1993, p. 108, 144. First Will Goetze (a student of Paul Aron) was Wigman's "musical assistant," from 1929 Hanns Hasting took the position.

In another musical culture, percussion music grew independent from its traditional supporting function as well. Cuban composer Amadeo Roldán y Gardes had already integrated Afro-Cuban percussion instruments into symphonic compositions, in 1930 he wrote several *Rîtmicas*, amongst which two that were scored for percussion ensemble: the *Tiempo de son* (Nr. 5) and *Tiempo de rhumba* (Nr. 6). Both use classically western percussion (orchestral timpani) as well as instruments typical for their use in the Afro-Cuban musical tradition, such as claves, quijada (jawbone of a donkey or horse), cencerro (cowbell), guiro, maracas, bongos, marimbula and Cuban timpani.

By the end of the 1920's, percussion had moved up the ladder of instrumental status to claim a spot in the limelight. With the piano already often appearing in close proximity of or even among percussion instruments, it was only a question of time before some of the piano's more percussive extended techniques would find a new and fertile biotope.
The idea of considering the piano as a percussion instrument, at least when used in orchestral instrumentation, was not new, even goes back to Berlioz. In his dream orchestra of 467 musicians, amongst whom 53 percussion players, the piano did not yet have a place, but he did write that a "metallic orchestra of percussion consisting (in addition to 30 pianofortes) of six sets of small bells, twelve pairs of ancient cymbals, six triangles (which might be tuned, like the ancient cymbals, in different keys), and four *pavillon chinois*, would supply joyous and brilliant accents and the mezzo forte tint."[1330]
To actually integrate the keyboard instrument in a percussion ensemble by treating it as percussion is a novelty we have to ascribe to Varèse.

3.4.3.1.2 Edgard Varèse

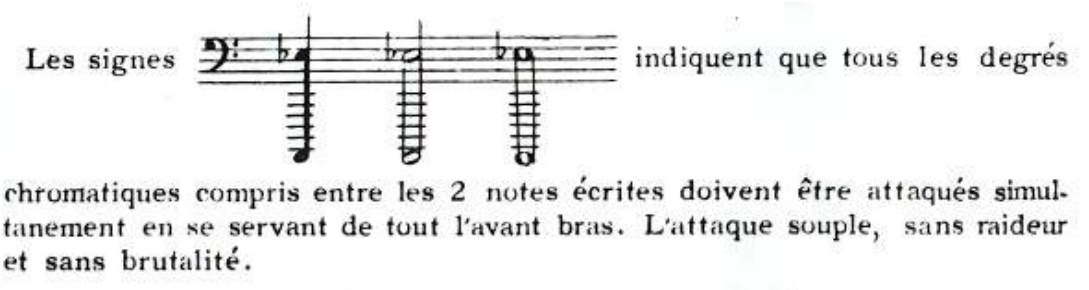
For all of his life, Edgard Varèse (1883-1965) was interested in new sounds. Forced by his father, he entered an education as an engineer, which undoubtedly sparked or at least sustained a life-long interest in technology as a means of enriching music with new sounds. His enthusiasm in 1906 for Busoni's essay on a new aesthetic was the start of a life-long adherence to the idea that the well-tempered system was hampering musical evolution and that the piano was held responsible for this status quo.

In the late 1920's Edgard Varèse left the US – whereto he had emigrated from France and where he had received citizenship – to stay in Paris until 1933. He "was soon involved again in the artistic milieu," resulting amongst others in sketches for a stage work scenario concerning an astronomer who makes contact with the inhabitants of a distant solar system, the replacing of the siren in his *Amériques* by the newly invented Ondes Martenot for the French première of this work in 1929, and planning the inclusion of two Theremins in *Ecuatorial* (1932-34).[1331]

On November 13, 1931, before he left Paris for the US again, Varèse had also finished *Ionisation* for 13 percussionists. It has been reported that Varèse had already written music for percussion in connection with the chorus he had conducted in Berlin between 1907 and 1913.[1332] Almost all of his music from that period was lost in a fire, so there is no way of assessing its significance in this context. In other compositions of Varèse, like *Amériques* (1920-21), *Offrandes* (1921), *Hyperprism* (1922), *Intégrales* (1924) *and Arcana* (1925-27), the percussion section could require up to 12 percussionists, but it is with *Ionisation* that our story takes a turn towards a new perspective on the extended piano. The instrumental nomenclature in the score of *Ionisation* shows that the piano is

[1330] As quoted from Berlioz' 1843 *Traité de l'instrumentation et d'orchestration modernes* in Blades 1970, p. 282.
[1331] Griffiths 2002, p. 274.
[1332] Fulton 1999, p. 22. "These pieces require special percussion instruments that Varèse himself collected and were often played by singers rather than by trained percussionists."

part of the percussion group and is to be played by the thirteenth performer, who is also designated the Slapstick, Triangle and Sleigh-Bells. Some performance notes, adding explanatory or advisory remarks regarding the instruments and their performance practical requirements, include a note for the thirteenth musician:

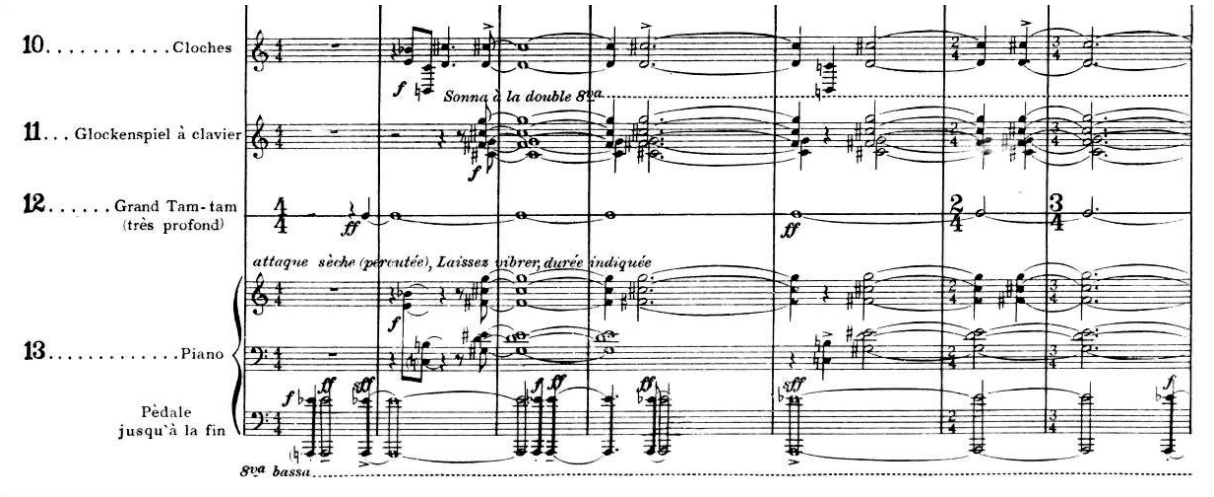


Example 3.747. E. Varèse: *Ionisation* (1929-31). © Max Eschig.[1333]

In a piece specifically written for a group of percussionists, such a performance note suggests that the part for the piano was intended for a percussionist: to ask for the clusters to be played "supply, without rigor and without brutality," is as much as asking for basic pianistic rather than percussive attitude towards the instrument. Looking at the score, where the piano in fact only enters the composition for its 17 bar long coda (ex. 3.748), one could imagine a percussionist playing that part: aside from the clusters, only two different combinations of hand positions are needed for this whole piano part. The advice regarding the cluster technique could be imagined to extend to the chords in the rest of the piano part, so that a percussionist with a basic understanding of the keyboard layout could be thought of as playing this part. The alternatives would either be to have a pianist as the thirteenth musician, also playing the triangle, the Sleigh Bells and the Slapstick, or two players (a percussionist and a pianist). The latter seems unlikely, as there is also a "glockenspiel à clavier" (percussionist 11 –playing the castanets and the Guiro as well), which would total the number of musicians to fifteen. Clearly, percussionists were asked to play keyboard instruments or pianists were asked to perform on a few percussion instruments next to their keyboard instrument (piano and Glockenspiel).[1334] Either way, the left hand clusters and the right hand doubling of the bells shows how the piano itself is here treated as a percussion instrument.
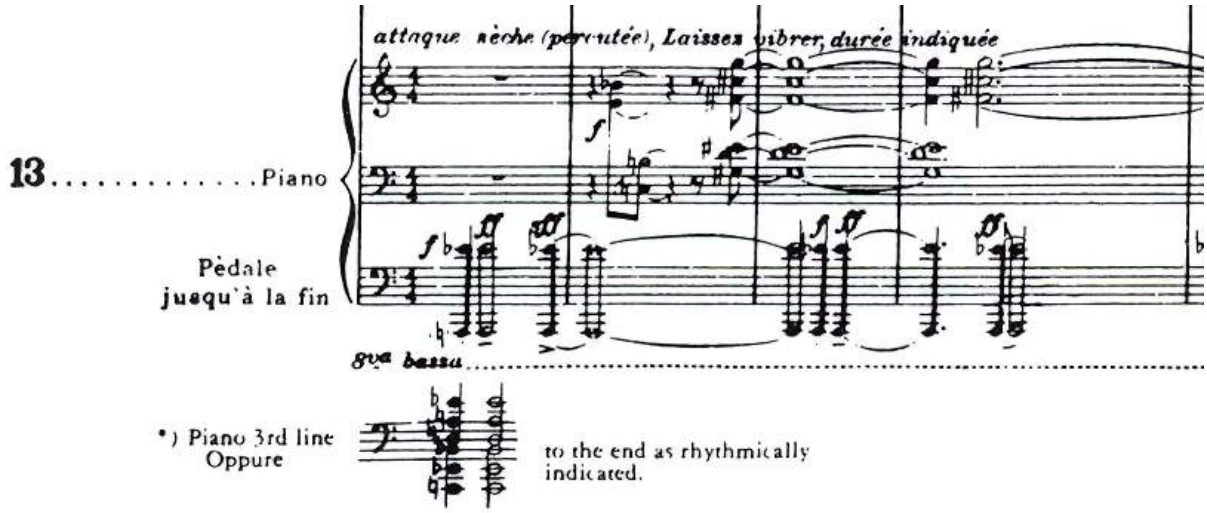
[1333] In the more recent American edition by Colfranc Music Publishing Corporation New York, the note is translated as “The symbol [staff with clusters] indicates all chromatic intervals between the two notes and must be played simultaneously making use of the forearm. The chord is to be played without stiffness and without brutality.”

[1334] In Blades 1970 (p. 311, fn. 3), the piano is considered "undeniably an instrument of percussion," but, "Like the celesta, it is not included in the percussion section of the orchestra. Strictly speaking, the keyboard instruments differ from those struck with mallets inasmuch as the sound from the former is produced indirectly through the medium of the keyboard mechanism. The piano-action glockenspiel and keyboard xylophone fall into this class, and it is not usual for them or the celesta to be played by the orchestral percussionists."



Example 3.748. E. Varèse: *Ionisation* (1929-31), bars 75-81 (rehearsal number 13). © Max Eschig.

An American edition provides an ossia at rehearsal number 13, where the piano part starts, showing an alternative to the forearm clusters in the shape of the typically Varèse type chords consisting of two stacked fifths. (Ex. 3.749.)



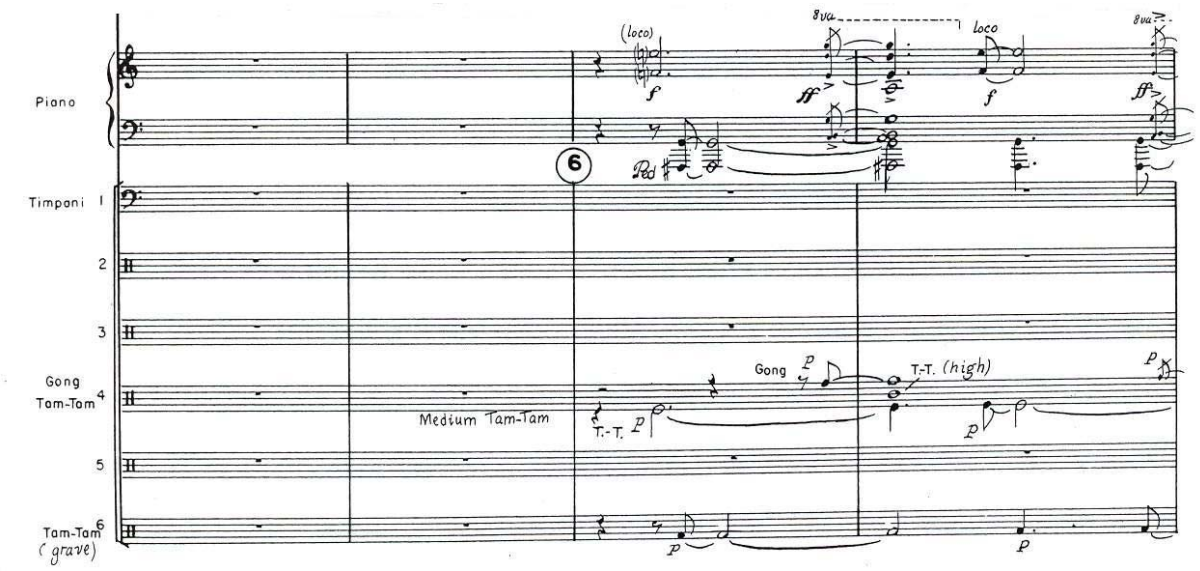
Example 3.749. E. Varèse: *Ionisation* (1929-31), bars 75-78 (rehearsal number 13). © Colfranc Music Publishing Corporation.

These alternate chords may seem to be the reason for which the chromatic clusters go from A^2 to e♭, admittedly a rare interval for a cluster (most arm-length clusters we have encountered – chromatic or not – are contained within intervals of white or black notes, not white to black or black to white). Nevertheless, when trying out the cluster, it is very obviously modeled on the way the forearm and fingers rest on the keys when starting from the lowest note on the piano: the D is more ore less where the thumb lies, and the rest of the fingers easily fit the E♭ key. The palm is in excellent position to adapt its resting place to the D as well as to the E♭. This means the cluster is compositionally determined on the basis or ergonomics, and the alternative chords are modelled on that cluster in as far as that is possible (same interval, smaller stretch). The only conceivable

reason for the alternative chords must then have been the anticipation on the part of the publisher of possible resistance by performers to use improper piano playing.[1335]

The musical reason for the clusters is similarly obvious: the chords in the piano part are doubled in the other pitched instruments (Glockenspiel and Bells) and the rhythm of the clusters in the third piano staff is doubled in the Tam-tams (high, low and for most of the coda also the very deep Tam-tam) and the Gong. The piano clusters are meant to fit the timbre of unpitched percussion instruments with which they are synchronous, as the chords in the main piano part are doubled in pitch and rhythm with the other pitched instruments, which are all - except for the indefinitely pitched siren but including the very deep Tam-tam - kept quite until the coda. From this perspective, the alternative chords in the piano part do not make much sense and would be a poor, if not counter-effective alternative.
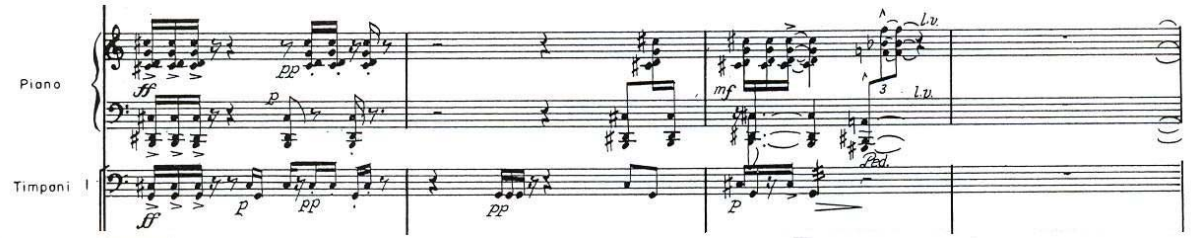
Ionisation was premiered a few years after it was finished: on March 6, 1933 in New York. Before this first performance, and also during his five-year stay in Paris, Varèse wrote another composition: *Ecuatorial*, for 8 brass, piano, organ, Ondes Martenot and percussion. Varèse based this work on a text taken from the sacred book of the Maya Quiché and "conceived the music as having something of the same elemental rude intensity of those strange, primitive [pre-Colombian] works."[1336] The piano part is worked out as a percussive coloring instrument more than in *Ionisation*, with rhythmic and harmonic doublings of, or timbral additions to percussion as well as other instruments' parts, rather than any kind of traditional piano idiom such as scales and arpeggios. (Ex. 3.750, 3.751, 3.752.)
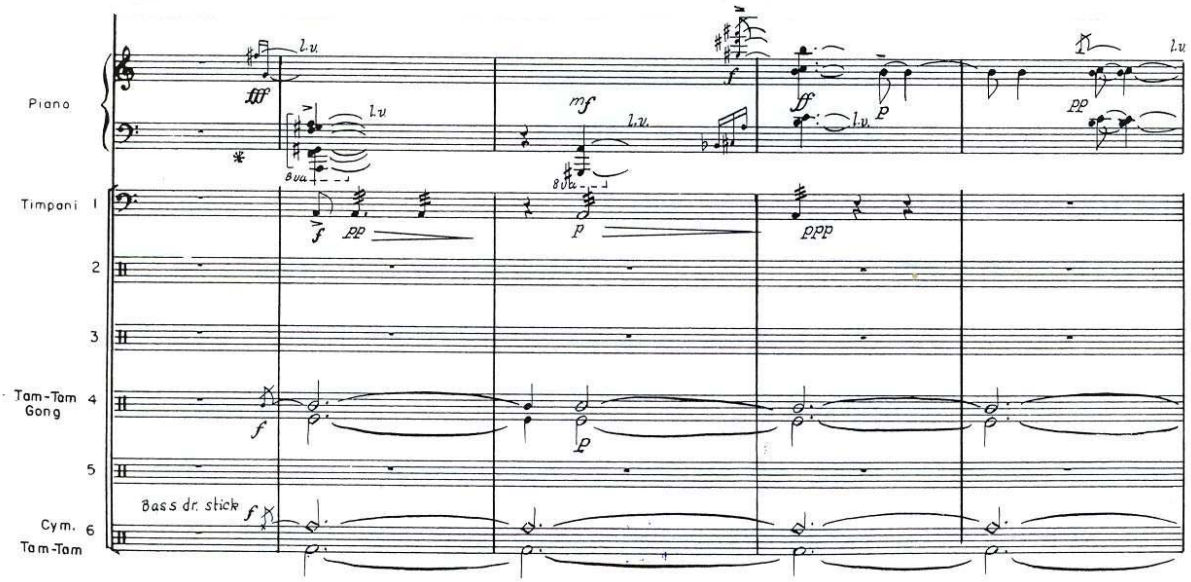


Example 3.750. E. Varèse: *Ecuatorial* (1932-34), bars 70-73 (rehearsal number 6). © Colfranc Music Publishing Corporation.

[1335] This American edition was prepared at least in part by the famous New York percussionist Morris Goldenberg, instructor of Percussion at the Juilliard School of Music at the time of this edition. At Goldenberg's suggestion, a chart for the disposition of the percussion ensemble and elaborate drawings and diagrams for the layout and identification of the individual percussion instruments were included in the score. Finally, an analysis of Ionisation by Nicolas Slonimsky is included. It is not clear who inserted the alternative to the clusters, and although Varèse was still alive, it is hard to imagine that he would have been responsible for it.

[1336] From Varèse's foreword in the 1961 New York Colfranc Music Publishing Corporaton edition.

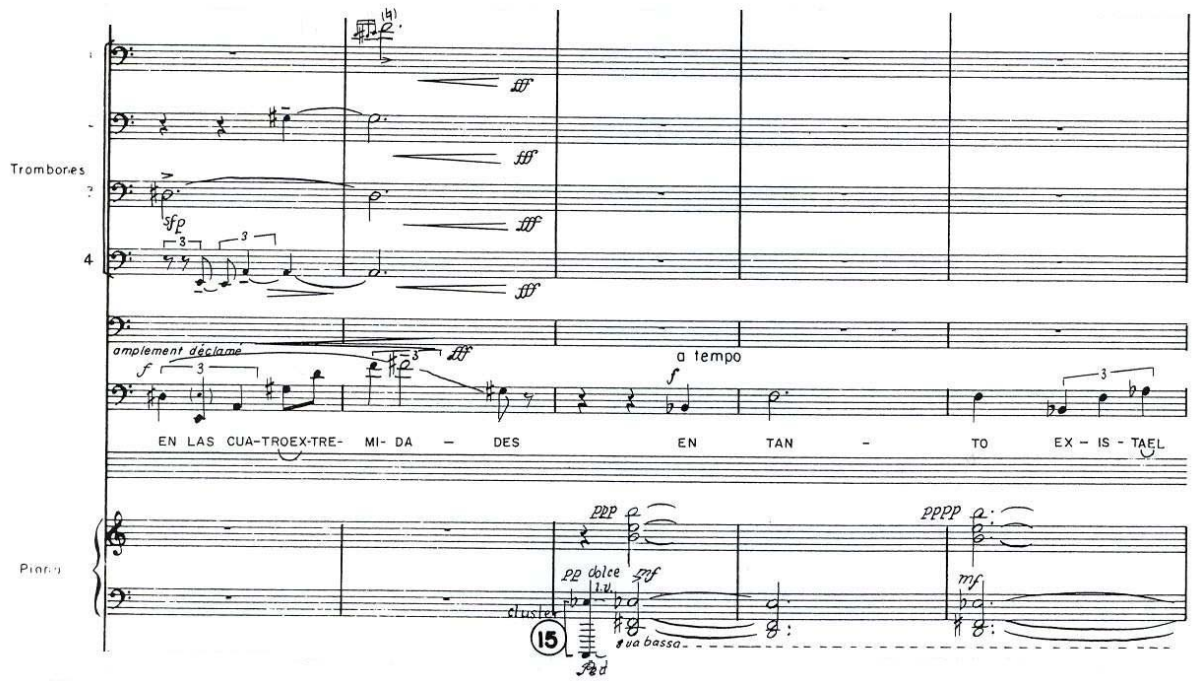


Example 3.751. E. Varèse: *Ecuatorial* (1932-34), bars 85-88 (1 bar past rehearsal number 7). © Colfranc Music Publishing Corporation.



Example 3.752. E. Varèse: *Ecuatorial* (1929-31), bars 177-181 (5 bars past rehearsal number 12). The piano plays together with the Tam-Tam, the gong and the cymbal. © Colfranc Music Publishing Corporation.

Further on we find the exact same left forearm cluster as in *Ionisation*, only this time “pianissimo dolce.” (Ex. 3.753.)



Example 3.753. E. Varèse: *Ecuatorial* (1932-34), bars 229-233 (2 bars before rehearsal number 15). © Colfranc Music Publishing Corporation.

A louder chord in the middle of the cluster's range immediately adds color to the sound of the cluster (and is already sounding in the organ part since the beginning of the bar) and a very soft right hand chord looking like it is meant to amplify overtones. The cluster's entrance right after a *fff* climax in the brass and solo voice makes it hard to hear. The technique is here obviously intended as a coloring effect much like the gong and tam-tam it is doubling at this moment.

In *Equatorial*, Varèse was not concentrating on developing the cluster. Much more creative attention was given to the part of the voice, with glissandi, quarter-tones, mumbling, humming and meticulous instructions such as "in one breath with mouth open", "close mouth abruptly after attack."

3.4.3.1.3 William Russel
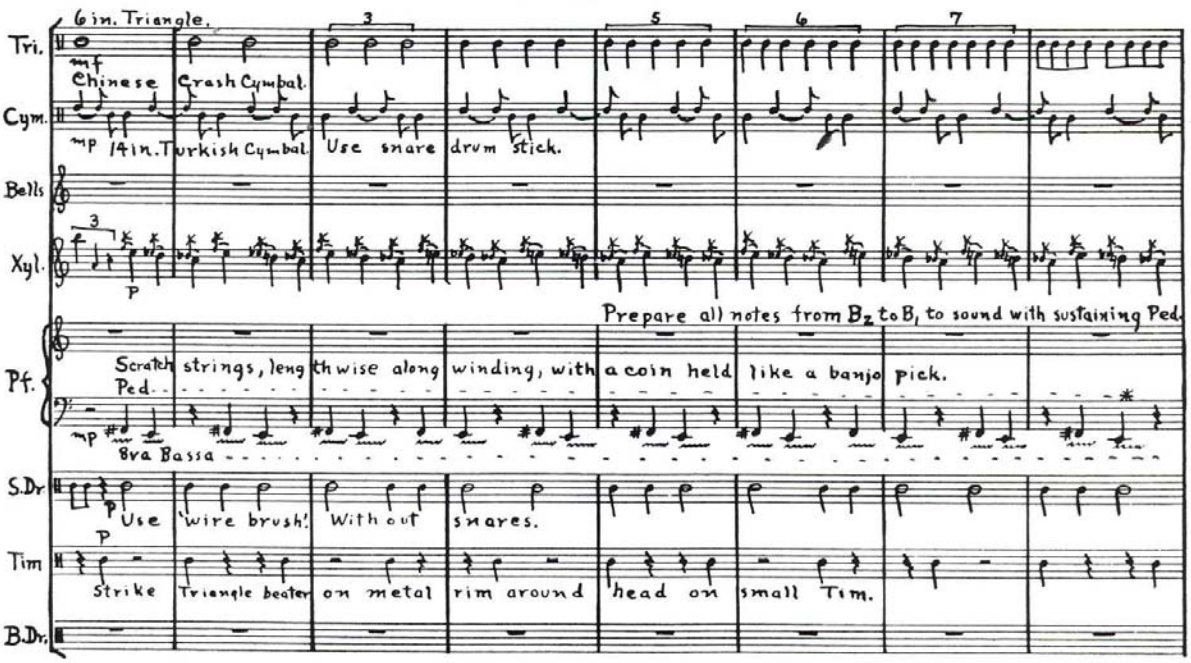
The program of the concert with the premiere of Varèse's *Ionisation*, on March 6, 1933 at Steinway Hall in New York, also featured works by Cowell and William Russel.
Russel (1905-1992)[1337] was a violinist by training and taught music in New York during the Depression era. Between 1934 and 1940 he played Chinese percussion instruments in a group that performed Chinese shadow puppet plays. It was in this period that Russel composed all of his eight compositions and shifted his attention towards New Orleans jazz. In 1940 he moved to New Orleans, playing a major role in promoting and archiving early jazz.

His *Fugue for eight percussion instruments* (1933), premiered together with *Ionisation*, was Russel's most classical composition, and in it he goes much further in the use of
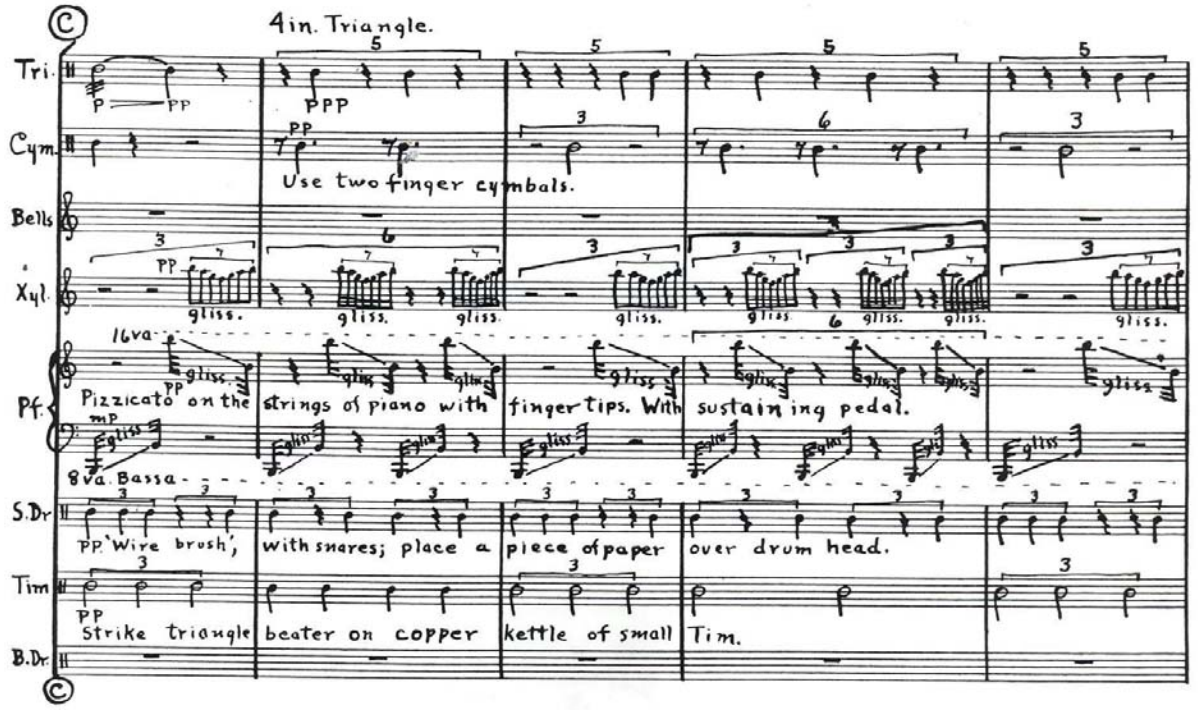
[1337] Born William Russell Wagner in Canton, Missouri, he decided to become a classical music composer and dropped his last name due to its associations. All biographical information here taken from Kennedy & Wood 1992.

extended piano techniques than Varèse had done. There are also clusters, small two-note ones (ex. 3.757) as well as palm and arm clusters (ex. 3.758 and 3.759) but they come in only towards the end of the big build-up. Most of the piece entails string piano techniques for the keyboard player: scratching strings with a coin (ex. 3.754), lateral glissando on the strings with the fingertip (ex. 3.755) and fingernail, striking strings with rubber ball mallets (ex. 3.756) and muting strings near the bridge with the palm of the hand (ex. 3.758).
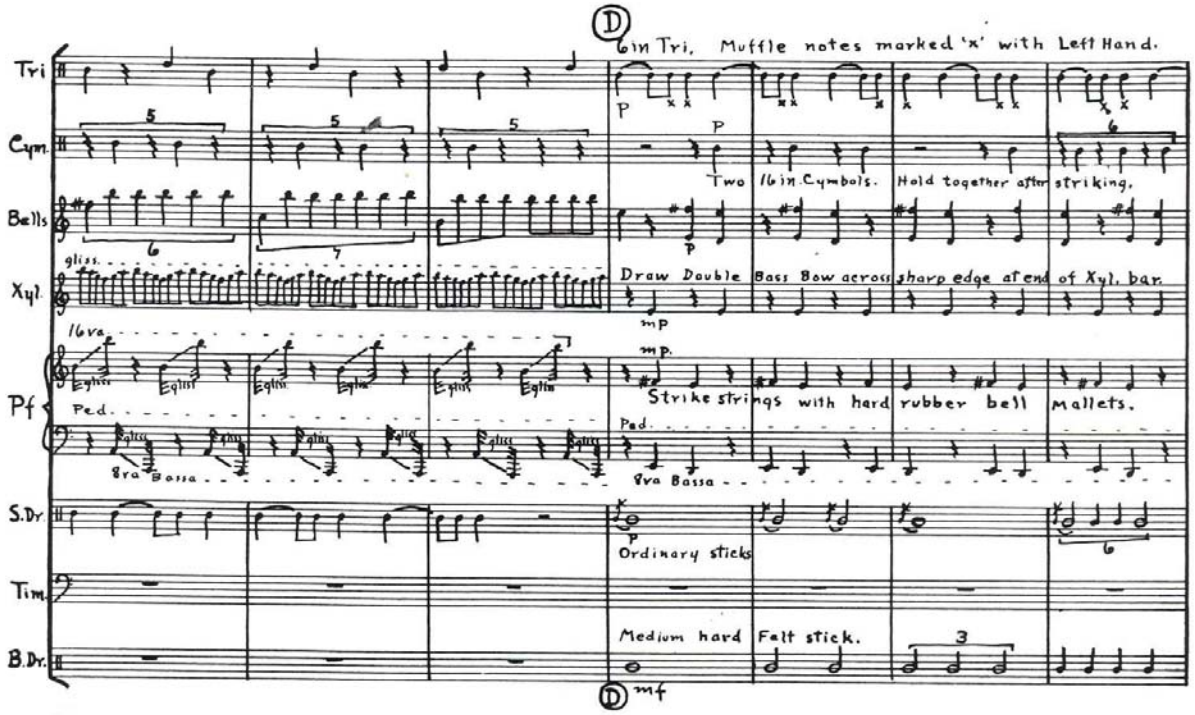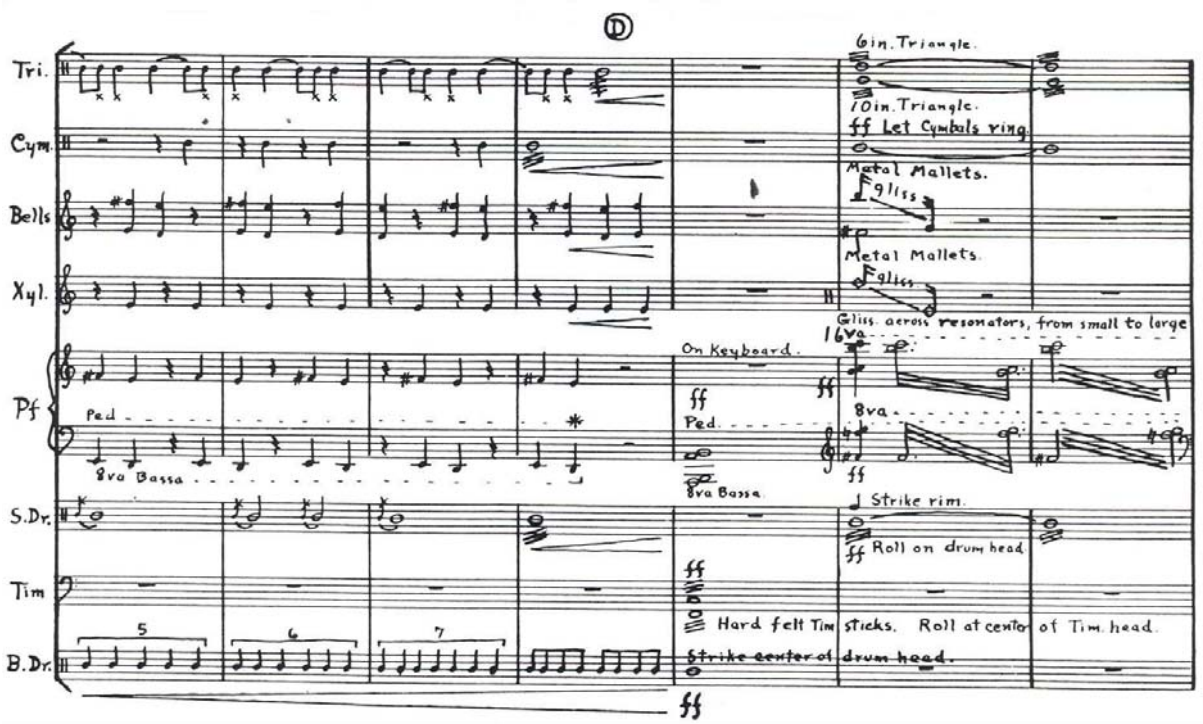
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Example 3.754. W. Russel: *Fugue for eight percussion instruments* (1933), bars 47-54.



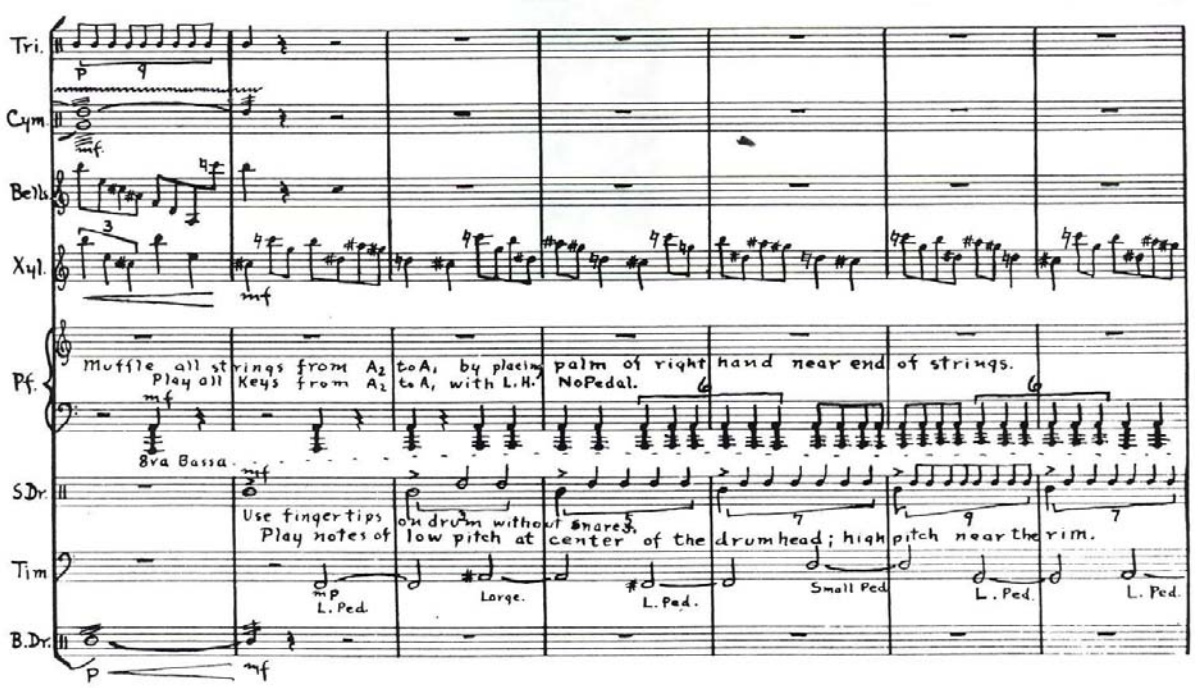
Example 3.755. W. Russel: *Fugue for eight percussion instruments* (1933), bars 55-59.
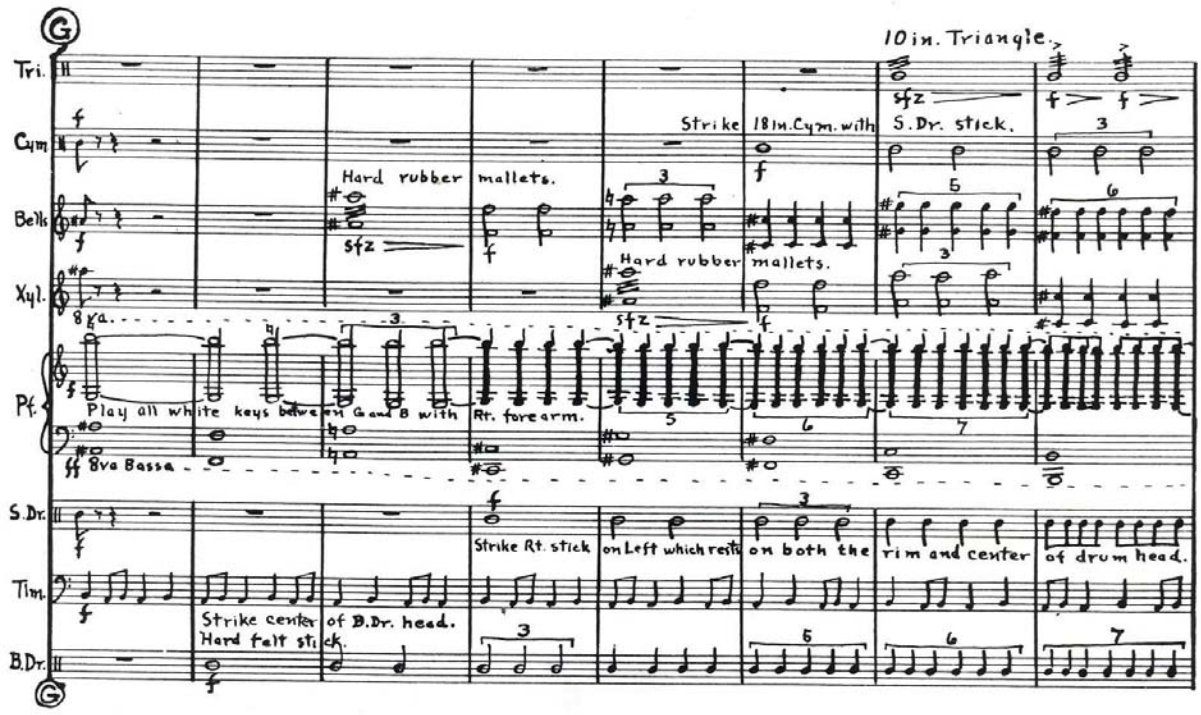


Example 3.756. W. Russel: *Fugue for eight percussion instruments* (1933), bars 67-73.



Example 3.757. W. Russel: *Fugue for eight percussion instruments* (1933), bars 74-80.



Example 3.758. W. Russel: *Fugue for eight percussion instruments* (1933), bars 100-106.
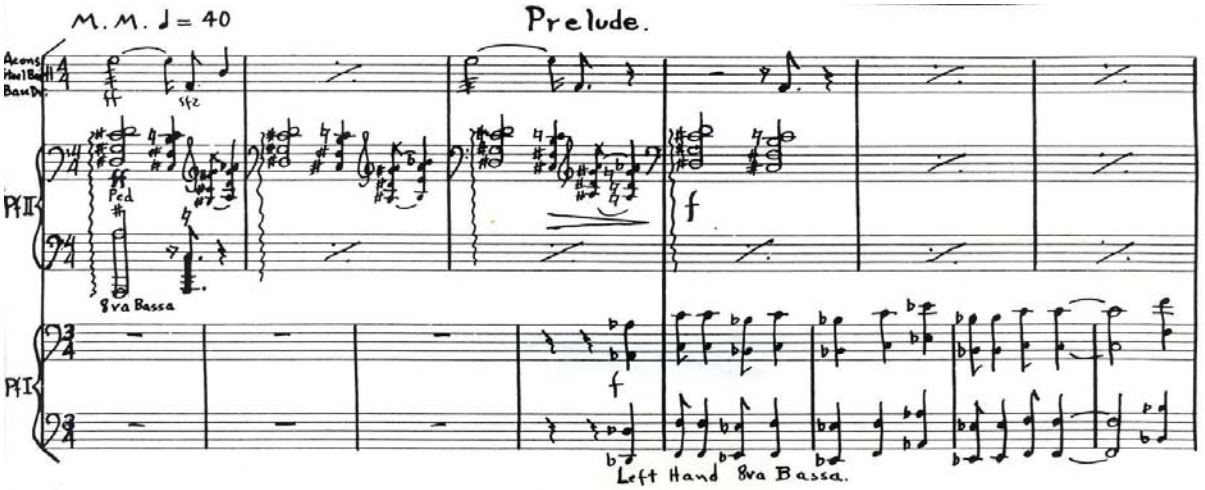


Example 3.759. W. Russel: *Fugue for eight percussion instruments* (1933), bars 123-130.
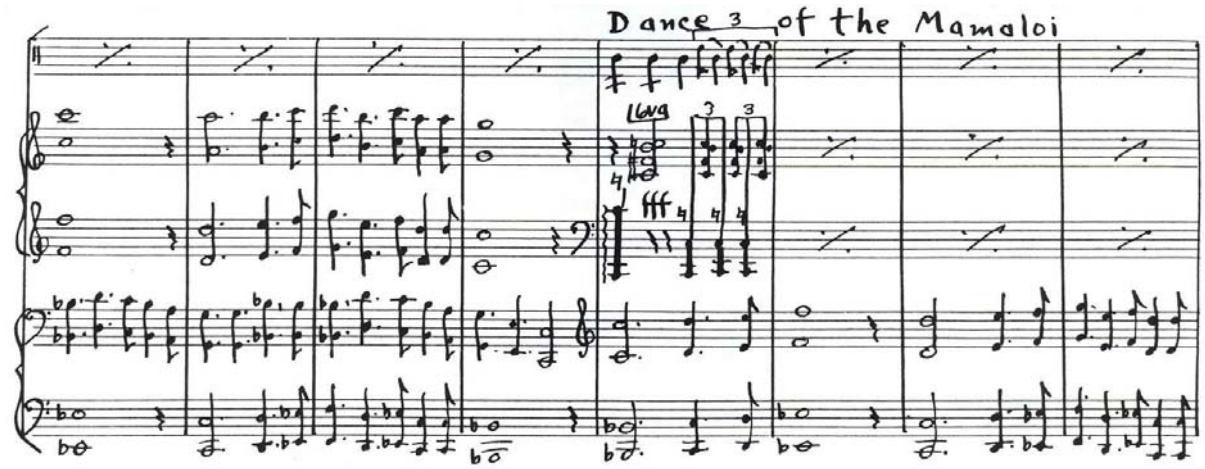
In *Ogou Badagri*, a "ballet based on the voodoo rites of Haiti"[1338] written between 1932 and September 1933, we find Russel using arm clusters and palm clusters for coloration of chords (ex. 3.760), for rhythm (ex. 3.761 and Piano I in ex. 3.763), for harmonic

[1338] The title is the name of a Haitian God.
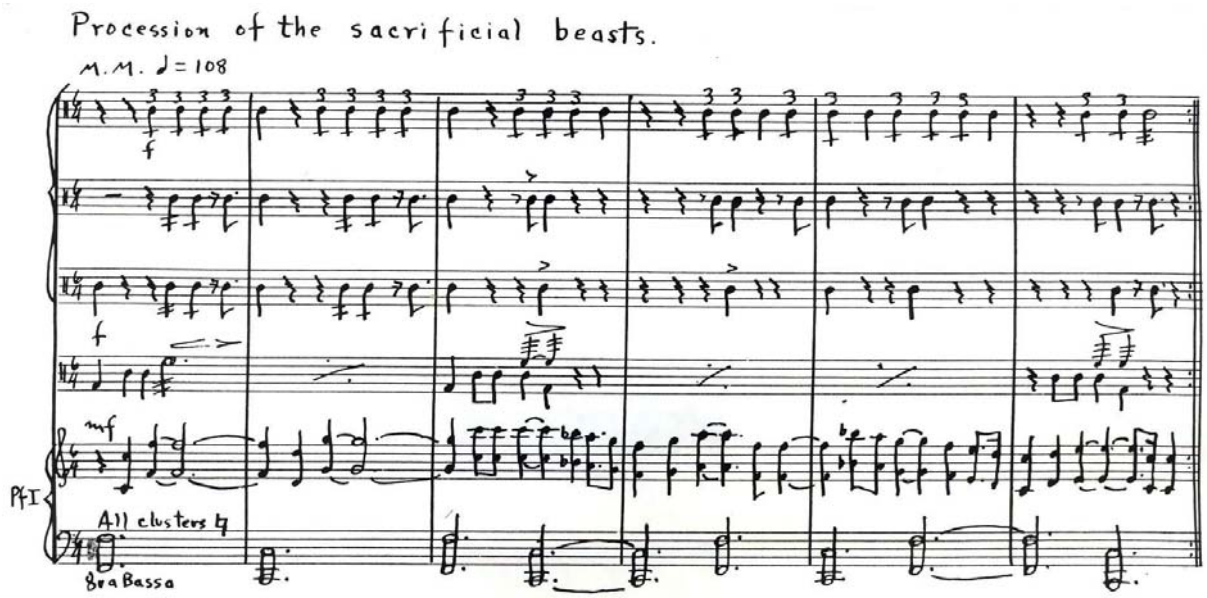
functions (dominant-tonic as in ex. 3.762), and for melodic accompaniment (piano II in ex. 3.763) in black, white and chromatic versions.
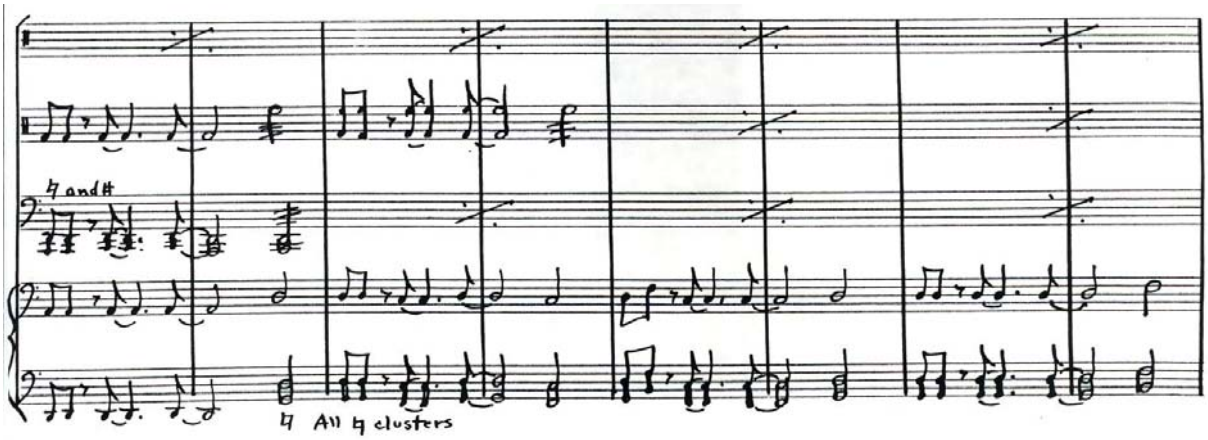


Example 3.760. W. Russel: *Ogou Badagri* (1933), opening bars.



Example 3.761. W. Russel: *Ogou Badagri* (1933), bars 17-24.
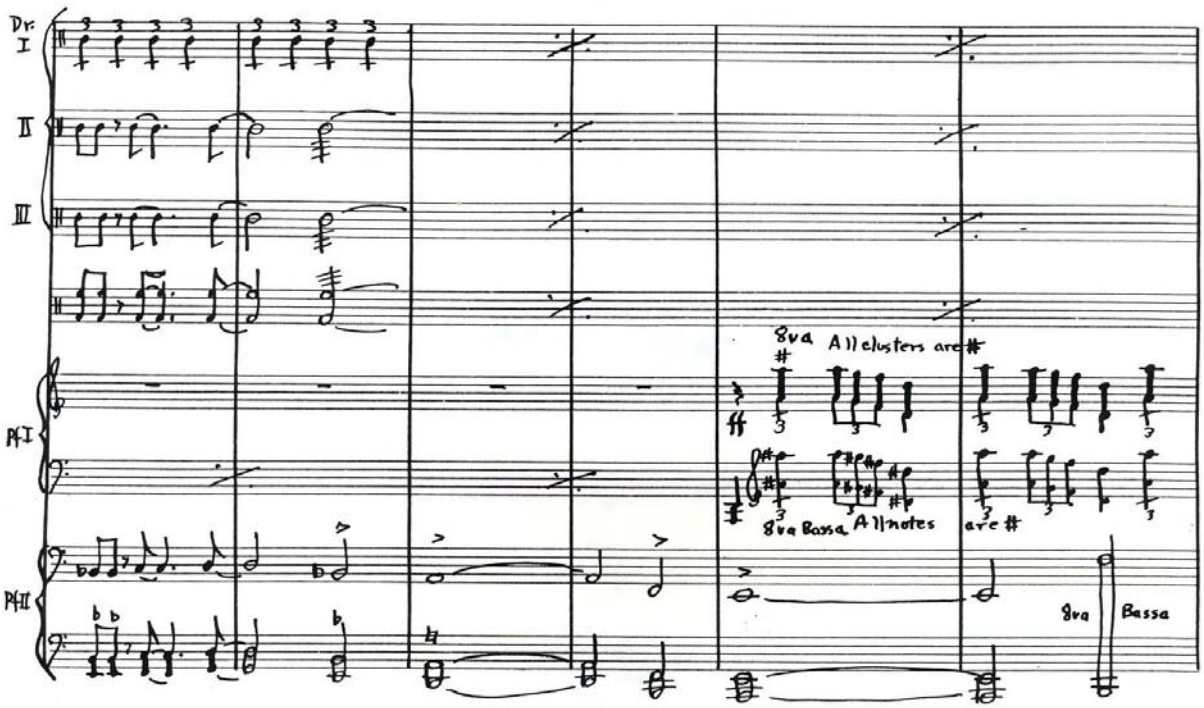


Example 3.762. W. Russel: *Ogou Badagri* (1933), *Procession of the sacrificial beasts,* bars 1-6.

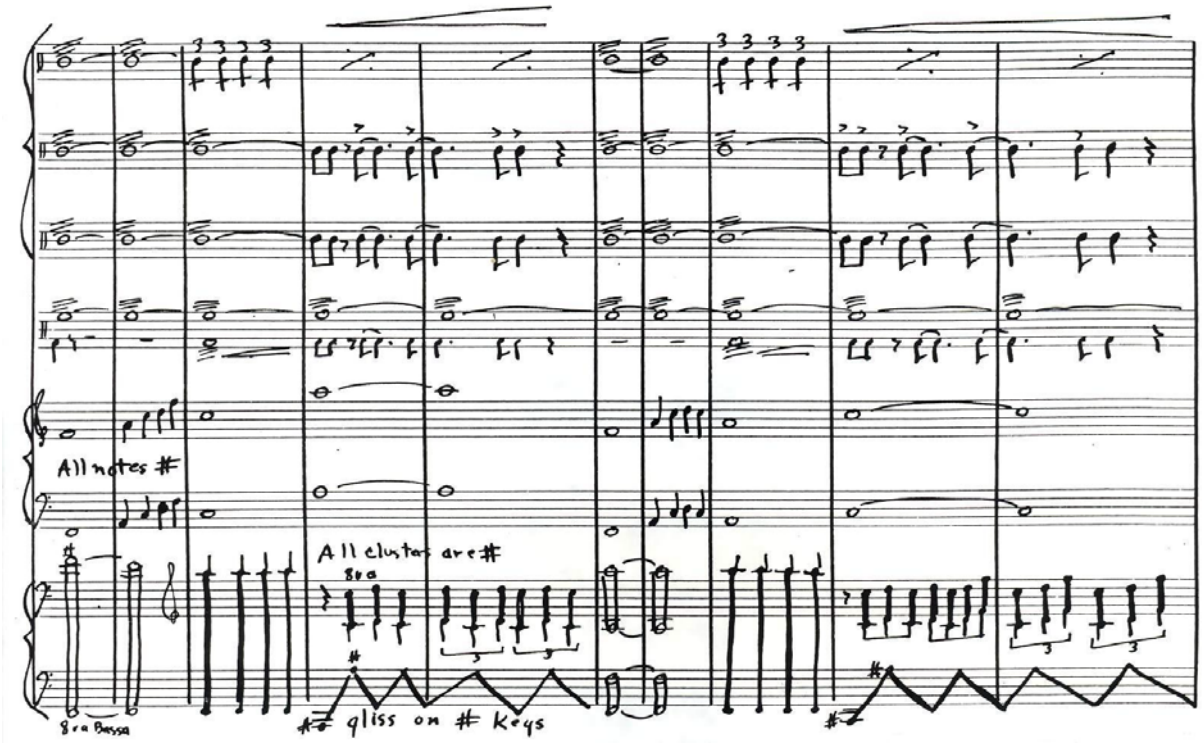


Example 3.763. W. Russel: *Ogou Badagri* (1933), *Dance of Purification,* bars 17-24. The third staff is for piano I, the fourth and fifth staves are for piano II.

Not all clusters seem to be written on the basis of the length of a performer's palms and arms, however. The melodic black key clusters in ex. 3.764 are not easy to perform without large hands, and the black key double forearm clusters near the end of the piece (ex. 3.765) are to big for one forearm and not large enough for two forearms to fit in line on the black keys: some of the medium range keys will have to be hit by part of both forearms, for which there is not all that much space on the black keys. Some of the cluster writing is somewhat theoretical in yet other aspects: the fast repetition in bar 18 of piano I (ex. 3.763), the clusters of an exact fifth wide in bars 18 and onwards in piano II (ex. 3.763) are not the most comfortable due to their size, which does not easily match the palm of the hand. Finally, the combination of the right hand octave clusters on the black keys and proper octaves in the left hand (ex. 3.765) in that high register is not very idiomatic in terms of the position of the hands and the symmetry of the body, and some of the left hand glissandi (ex. 3.765) are rather short to be easily executed on the black keys.



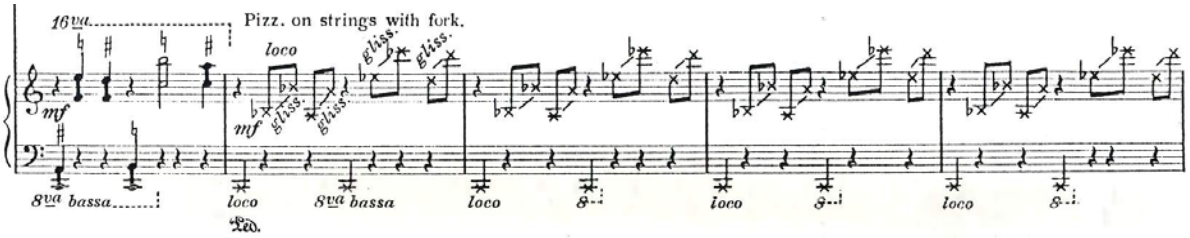
Example 3.764. W. Russel: *Ogou Badagri* (1933), *Dance of Purification,* bars 25-30.



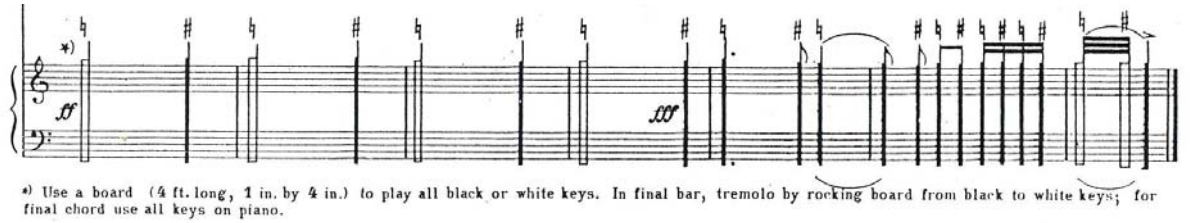
Example 3.765. W. Russel: *Ogou Badagri* (1933), *Dance of Purification*, bars 37-45.

The *Three Dance Movements* (April 1933) were premiered with Henry Cowell on piano and published by Cowell's *New Music Orchestra Quarterly* in a 1936 edition dedicated to percussion repertoire. In this work, percussionists have to strike at and draw across cymbals with a saw, hit and break a bottle, play with a dinner bell and hammer on an anvil. In the *Waltz* (in 7/4) the pianist plays keyboard clusters ranging from three notes

to an arm's width, and plucks strings as well as glides over them with a fork. (Ex. 3.766) The most noteworthy technique, however (at least in this context here), is found in the second movement, a *March* in triple meter, where the player must work with a 4ft board to play diatonic, pentatonic and chromatic clusters, even in a black-and-white tremolo. (Ex. 3.767.)

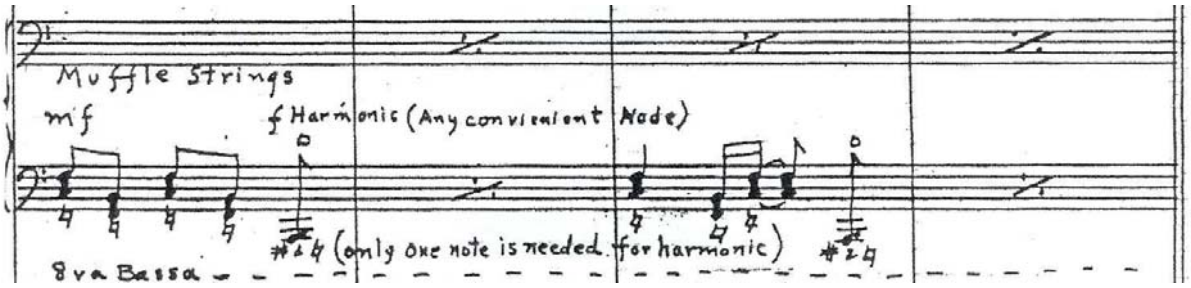


Example 3.766. W. Russel: *Three Dances* (1933), *Waltz*, bars 12-16.

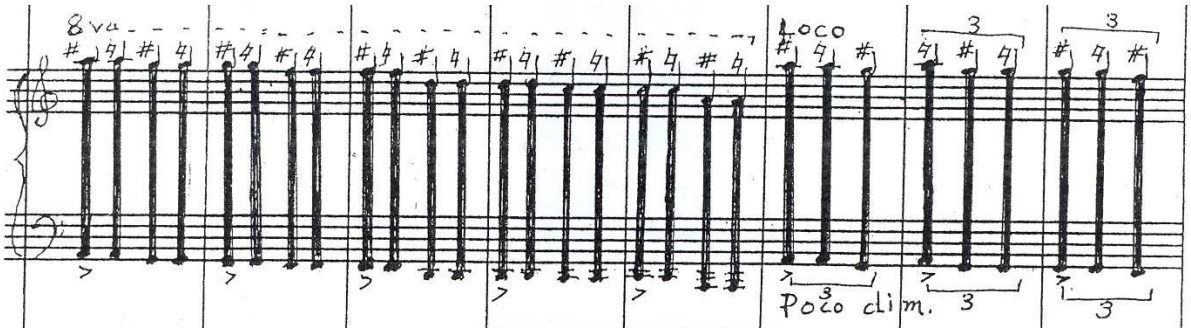


Example 3.767. W. Russel: *Three Dances* (1933), *March*, bars 30-36.

In the five movements of the *March Suite* (1933-36), we find "muffled strings" and harmonics (Ex. 3.768) as well as arm clusters, some of which are arpeggiated. In the first movement – *School March* – both arms are prescribed in a repetitive downward sequence of alternating black and white clusters, growing evermore slow and quiet. (Ex. 3.769.)

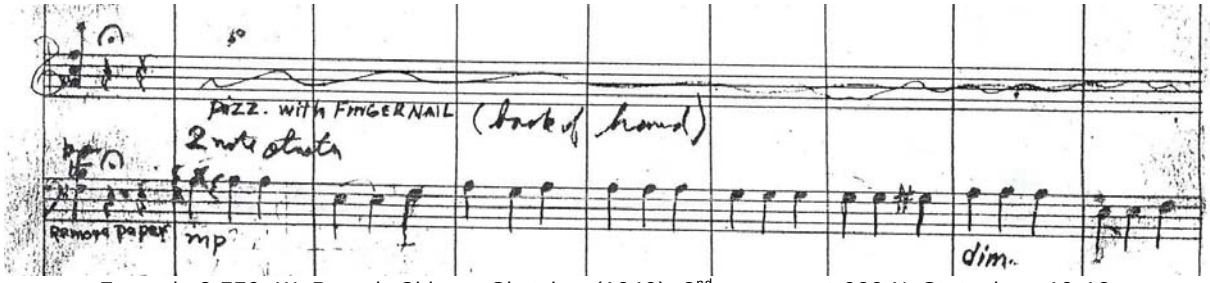


Example 3.768. W. Russel: *March Suite* (1933-36), *Hunger March*, bars 11-14.



Example 3.769. W. Russel: *March Suite* (1933-36), *School March*, bars 8-15.

Not all of Russel's piano writing for percussion ensemble contained clusters. What is constant, however, is the lack of precision with which he indicated what had to be done. In the *Fugue for eight percussion instruments*, the piano part has an indication "prepare all notes from B^2 to *B*, to sound with sustaining pedal" (see ex. 3.754) but it is not at all clear what he meant. Musicians that worked with Russel on this piece[1339] asserted that this range of keys had to be silently depressed with a board (in one hand, while the other scratches the strings) so that they can be locked with the sostenuto pedal, ready for the glissandos in the next bars. This is wholly unnecessary, however, as the much simpler use of the damper pedal would achieve the same effect of letting the necessary strings ring freely. In the second of the *Chicago Sketches* (1940), the piano part has "pizz. with fingernail (back of hand)" but the graphic notation leaves much to be imagined. (Ex. 3.770.)



Example 3.770. W. Russel: *Chicago Sketches* (1940), 2nd movement *222 N. State,* bars 10-18.

The imprecise notation and performance practical indications could be due to the fact that Russel was not a pianist. His training as a violinist may have contributed towards his continued interest in the string part of the piano. As for the cluster, he clearly liked its harmonic and melodic qualities, despite the percussive potential in the setting of a percussion ensemble.

3.4.3.2 1940's-50's John Cage I: the prepared piano

3.4.3.2.1 Towards the prepared piano: Cowell, percussion, dance and Cage

John Cage's own account of how he invented the prepared piano is known in several versions, all representing more or less the same basic facts, differing only in length.[1340] The most well-known ingredients of the plot are the facts that he needed to write music for a dance suggestive of Africa, that he wanted to use an ensemble of percussion instruments but that he had to confine himself to the piano because of the size of the stage, and that – within a few days – he discovered through experimentation how to

[1339] E-mail correspondence between John Kennedy and author (July 2009). Percussionist and artistic co-director of the American ensemble Essential Music, John Kennedy worked with Russel on the recording for Mode Records of Russel's complete works (CD Mode 34).

[1340] *A composer's confessions* (Cage 1948 – published for the first time in the 1992 Spring issue of the magazine *Musicworks*), *How the Piano Came to Be Prepared* (1972 - written as the introduction to Bunger 1973, appearing afterwards in Cage 1979) and *An Autobiographical Statement*, delivered in Kyoto in November 1989, further delivered at Southern Methodist University in 1990, and appearing again in print in the *Southwest Review*, 1991.

manipulate the sound of the piano so as to make the music suitable. The shortest version of the story leaves it at that, suggesting that it was a rather simple and almost self-evident idea to place objects between strings so that the piano could be used as a percussion ensemble. The earliest version, incorporated in "the story of how my musical ideas and my ideas about music developed," sketches aspects of his previous development as they more or less lead up to the prepared piano. Still, it is a condensed and, above all, lineairly constructed chronology, almost the kind of "simplification with regard to the event and what really happens" that he himself thought we should be preserved from.[1341] In actual fact the invention of the prepared piano came at an intersection of several roads that had been converging for a while until they connected with Cage for this historical event. These roads had been leading the American interest in percussion, modern dance, non-western music and noise, and the driving force pushing them towards the idea of the prepared piano had been Henry Cowell. The importance of being able to evaluate the prepared piano's historical position and performance practice demands that we stand still at this intersection to review carefully the interplay of influences. We will look at what happened with modern dance in America and how it coincided with percussion music and with the lives of Cowell and Cage. When we left the trail of Cowell in 1933 (see 3.4.2.7), Varèse's and Russell's works discussed above were not the only ones for percussion ensemble brought to the stage. According to Cowell, "Up to this year, in my experience as a music publisher, I have never been offered any work for percussion instruments alone. This season I have been offered fifteen."[1342] Next to publishing such scores - Russell's *Fugue,* Varèse's *Ionisation* in 1933 and others in 1936 – and besides actively promoting such music in concert - having facilitated the première of *Ionisation* in NY and playing its piano part[1343] - Cowell actively shared the interest in percussion instruments as a composer as well. During the rest of this decade, he wrote *3 Dances of Activity* for flute, percussion and piano (L495 – December 1933), *Ostinato Pianissimo* (L505 – 1934) for 8 percussion players, including 2 string piano parts, *Ritual of Wonder* for piano and percussion (L539 – 1937), part of the incidental music to Jean Cocteau's *Les Mariés de la Tour Eiffel* for piano and percussion (L563 – 1939)[1344], *Pulse* (L565 – 1939) for percussion group and *Return* (L566 – 1939) for "3 percussers and 1 wailer." In some other pieces the influence of having percussion on his mind is shown in reference to keyboard clusters, such as the "drum thump accompaniment" (octave cluster on 1st and 3d beat, triad on 2nd and 4th) in the [Untitled Jig] for piano (L540 – ca1930-1937), or the words "bring in your drums" at the passage with the fist clusters in *Three Anti-Modernist Songs* (L542 – 1938).

But to Cowell, music for percussion was not just a question of participating in a trend. In a 1934 article on the historical relation between music and dance, he proposed a return to the musical practice in " primitive" dance, which he understood to be "the first step toward including the proper rhythmical urge which finally bursts into bodily expression. For in all ceremonials the drums begin beating first." [1345] For Cowell, dance should be accompanied by percussion instruments: "Only in association with the dance will modern music be prevented from decay," he proclaimed.[1346] As we have seen, the idea of

[1341] Cage 1981, p. 80
[1342] Cowell 1933, p. 153.
[1343] According to Slonimsky 1994, p. 355 (lemma *6 March 1933*).
[1344] The first three movements are for piano solo, the finale is for percussion group.
[1345] Levitz 2005, p. 126.
[1346] Levitz 2005, p. 126. The historical aspect was not Cowell's only argument: he rejected dance that depended on music "for practically everything – structure, form, rhythmic pulse and mood" and preferred dance and music to remain autonomous in their own right while complementing each other in an integrated artistic whole. "He found Russian ballet too conventional, Stravinsky too complex, Duncan too disconnected from the beat and too dependent on classical music masterpieces, which overwhelmed the dance and sought a more immediate connection between physical movement and sound." To him, "A well-turned phrase on an oboe, violin or flute is a thing of perfection in itself" and does not add to the dance. Hence, he thought that "a set of highly varied and

percussion accompanying dance had been known in the works of German dancer Mary Wigman. Wigman's course of study in her school in Dresden included training in percussion instruments[1347], and through her US tours in the early 1930's she brought the practice of combining dance and percussion to America[1348]. Amongst the works presented during Wigman's 1930 tour was *Totenmal*, with a speaking choir accompanied by a percussion orchestra as well as a color organ that coordinated sound and light effects. A commentator described how "Many cymbals, and drums of widely different tone and volume, and even the sustaining pillars of the theater were arranged as mammoth cymbals by being covered with brass. In moments of great crisis the pillars were beaten by the dancers, making the whole place vibrate with rhythmic sound." [1349] Wigman seemed to have been a revelation in the US, and "her appearances prepared the way for the development of American modern dance over the next decade." [1350] During the thirties the debate in the United States on American modern dance grew towards the consensus that it should take a distinctly American form as defined by the choreographers associated with the Bennington Festival – the "four pioneers."[1351] New York dance critic John Martin championed Wigman in a published series of lectures delivered at the New School of Social Research during 1931-1932. He considered Wigman's dance as "in effect the modern dance in its purest manifestation."[1352] Not surprisingly, Henry Cowell was tuned to the latest in all things modern, and thorough in what he could contribute. He lectured on modern dance at the New School for Social Research in New York, taught at the Bennington School of the Dance and theorized about music and dance in journals[1353]; in January 1934 he starts a "rhythm course" at the San Francisco dance studio of Mundstock – a student of Wigman's teacher Rudolph von Laban[1354] - and in 1935 he begins teaching percussion for dancer Hanya Holm[1355] and for Tina Flade, two Wigman students, the former the founder of the New York Wigman School, the latter one of the four pioneers and teaching at Mills College in Oakland.[1356] Cowell wrote music for all "big four."

Cowell's concrete interest in researching non-western music goes back to his trips to in Berlin in fall 1931 and fall 1932, when he studied the musics of India, Indonesia, Singapore, Central Africa, African Pigmy, New Guinea, Java, Bali, Colombia, Brazilian Indians, Carolina Islands and Greenland Eskimos through the recordings of indigenous music at the Phonogramm-Archiv, and from whence he brought hundreds of recordings back to the US.[1357] He then wrote on "The 'Sones' of Cuba"[1358] and played the records of the "peoples of the world" during lectures.[1359] His 1934 course "Primitive and Folk Origins

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deliberately rough or incomplete tonal gamuts for each instrument" would be more effective where it was highly desirable not to have the music too complete. (Levitz 2005, p. 126.)

[1347] Miller 2006, p. 59-60.

[1348] Wigman toured the States in 1929-30, 1931-32 and 1932-33. See Levitz 2005, p. 143, fn. 11

[1349] Manning 1993, p. 153.

[1350] Manning 1993, p. 165. During Nazi rule in Germany, Wigman's aesthetic changed. Following policy of the Cultural ministry, dance had to be accompanied by music, not silence or percussive sounds. (Manning 1993, p. 209.)

[1351] Manning 1993, p. 256: "In the postwar period the history of American modern dance was written as the story of the "four pioneers," as the title of a [1966] documentary film termed the Bennington choreographers." The four were Martha Graham, Doris Humphrey, Charles Weidman and Hanya Holm.

[1352] Manning 1993, p. 262.

[1353] See Levitz 2005, p. 125-126.

[1354] Miller 2006, p. 59. Mundstock came to San Francisco in 1926 from Germany, opening her own studio in 1932. By 1936 she offered classes in dance technique, dance composition (taught by Welland Lathrop), Laban choreography (Mundstock) and "percussion study" (Cowell). (Miller 1998, p. 8).

[1355] Miller 2006, p. 59.

[1356] Miller 2006, p. 61.

[1357] Miller 2006, p. 53-56.

[1358] Before 1931, Cowell had written mainly about American music, occasionally publishing on Czech or Irish folk music. See Saylor 1977, p. 3-8.

[1359] Levitz 2005, p. 5.

of Music" at the New School for Social Research in New York promised to show "the beginnings of music and its slow development through folk music, Oriental cultivated music and early European cultivated music into our present system." The lessons included units in "Primitive music" (musics of the Eskimos, Bushmen, Indian tribes, South Sea Islanders, African), "Oriental music" (ancient Indian, Chinese, Japanese, Siamese, Balinese and Javanese musics), "Folk Music" (a "hybrid between primitive and cultivated systems") and "European cultivated music" ("how it grew from Oriental and folk sources and its development from Palestrina to the modern era"[1360]).

One of the students enrolled for this course in the fall of 1934 was John Cage, who was then also studying with Adolph Weiss (1891-1971) as a preparation to lessons with Schoenberg. We don't know how much Cage heard or studied of the music said to be included in the 12 lectures of Cowell's course, but he was in Cowell's proximity more than just as a student, apparently sitting in on all of his courses, playing bridge with him and the Weiss couple regularly and becoming "kind of an assistant" to Cowell. [1361] At the end of that year, both drove back to California together, a trip long enough to discuss everything and anything that could have been of interest to them at that time.[1362] Cage had first seen Cowell play the piano in 1928 or 1929 when still in college[1363], and had later – towards the summer of 1933 – sought his advice for an intended career as a composer. Cowell had answered his request by recommending him to study traditional harmony and composition privately with Weiss in New York as a preparation for studies with Arnold Schoenberg in Los Angeles.[1364] Cage's studies with Schoenberg in 1935 and 1936 were frustrating, with the famous criticism by Schoenberg and Cage's determined remark explaining the problem as well as the solution for it.[1365] When Schoenberg claimed that a composer without feeling for harmony would always encounter an obstacle, with Cage vowing to devote his life beating his head against that wall[1366], neither knew that Cage would not need much time to break down that wall. Most of the tools he had at his disposal to do so, would be developed through his intellectual interaction with Cowell.

In a 1937 letter, serving as a real answer to Cage's 1933 probe for career advice, Cowell expressed encouragement and ideas that sent Cage in directions largely by-passing his studies with Weiss and Schoenberg:

> [...]
> I was pleased to hear that you are interested in percussion developments. I was just on the point of trying to form a sort of symphonic percussion ensemble in SF and another in NY before my arrest, and so of course heartily approve of your move in the direction in LA. [...] I am sure that the value of study with Schoenberg is now past for you. It has great value [...] He would never, never, permit you to create, ever. Now is high time for you to do so.
> [...]
> I honestly believe, and formally predict, that the immediated future of music lies in the bringing of percussion on [the] one hand, and sliding tones on the other, to

[1360] Miller 2006, p. 53-56.
[1361] Cage 1975, p. 4-5. See also Miller 2006, p. 52-54: there seems to be no evidence of Cage reportedly having studied with Cowell "for a season" before the New York period. The course "Music of the World's Peoples," mostly referred to by commentators as the one Cage had taken, was similar but not identical. Other courses Cowell offered at the school that year – "Contemporary American Music," "New Possibilities in Piano Playing" – but there is only evidence that Cage was enrolled for "Primitive and Folk Origins of Music."
[1362] See Cage 1975, p. 6-8. According to Cage there was a third person on the trip: poet and painter Donald St. Paul (a.k.a. Don Sample, Cage's mentor and partner during his European sojourn in 1930-1931).
[1363] Cage 1975, p. 13.
[1364] Miller 2006, p. 51.
[1365] For more on Cage's studies with Schoenberg, see Hicks 1990.
[1366] Cage 1963, p. 114.

> as great a state of perfection in construction of composition and flexibility of handling on instruments as older elements now. [...] Work on the constructing of new percussion instruments, and arrange so that many can be controlled by one player. I am sure that with limited finances, grand and astonishing percussion instruments can be developed. I think a craft shop for drum-making would be a commercial success, also. All dance studios want them. [...] Try making a water drum – shaped like tympani, a little water in lower kettle part, either tone is struck, circle water gently for glissandi. [...][1367]

By this time, Cage had already composed percussion music – a *Quartet* and a *Trio*[1368] – to be performed by the amateur musicians in the Santa Monica bookbinder's group of which he and his wife Xenia Andreyevna Kashevaroff were members.[1369] Besides continuing and elaborating his experiences with percussion in composition and performance, Cage would soon follow up on Cowell's prediction regarding sliding tones and his advice on building new instruments to be controlled by one player, on doing so with limited finances, and on the link with dance.

Cage's engagement with dance began in December of 1937, when he started teaching at the University of California at Los Angeles for some five months. With his aunt Phoebe (his first piano teacher) he taught a course "Musical Accompaniments for Rhythmic Expression" for the experimental elementary school, and for the Physical Educating Department he received his first commission, for an underwater ballet. This is when Cage experimented with dipping a large gong into water to produce sliding tones, resulting in the "water-gong," a new instrument he would use in several of his compositions to come and not unlike the Indian water drum of which Cowell had explained the workings in his 1937 letter.[1370] At the end of spring 1938, Cage left for San Francisco to look for work and – on the instigation of Cowell – introduced himself to Lou Harrison. From an occupational point of view, Cage and Harrison were soul mates: Harrison had taken private lessons from Cowell as well as his course in world music[1371], wrote percussion music and had started to work for the Physical Education Department at Mills College in Oakland as a dance accompanist to Tin Flade's class, improvising on piano or percussion.[1372] For the college summer session, during which Harrison taught "elementary instruction in the technique of percussion composition" and "advanced problems for percussion composition," dancer Bonnie Bird was brought down from Seattle. Her composer-accompanist Ralph Gilbert had decided to leave her class and move to NY to accompany Martha Graham, but when she offered the job to Harrison, he declined and recommended Cage. Apparently, Cage accepted the position when Bird described to him a "closet full of percussion instruments," among them a collection of Chinese gongs, cymbals, tom-toms, and woodblocks belonging to German dancer Lore Deja, who – as a former assistant to Mary Wigman – had used the "primitive" instruments as an "unusual feature [...] for dance accompaniment."[1373]

In September, 1938, Cage joined the faculty of the Cornish School in Seattle, Washington. As a composer and accompanist for the classes in modern dance taught by

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[1367] The complete March 23, 1937 letter is reproduced in Miller 2006, p. 103-104.
[1368] The *Quartet* is dated 1935, but Miller 2006 (p. 59) suggests that it may have been composed in 1936. The *Trio* is from 1936.
[1369] Hines 1994, p. 90.
[1370] Hines 1994, p. 90. Fetterman 1996, p. 2 states that the 1936 *Trio* "marks the first appearance of the water gong," but this is not substantiated by the score.
[1371] Cowell gave lessons on both coasts at the same time. Harrison took his courses through the University of California Extension in San Francisco. (Miller & Lieberman 1998, p. 9.)
[1372] Miller & Lieberman 1998, p. 85-86. Flade had come to Mills in 1934, had been trained in Dresden as a concert pianist and had changed her focus to dance after watching a performance by Mary Wigman.
[1373] Levitz 2005, p. 126. These instruments were available during the 1938-1939 year but were sent to New York the following year. When Deja quested their return, Cage campaigned for funds to replace them, spent money to buy brass gongs, brass cymbals, tom-toms, woodblocks from the China Trading Company.

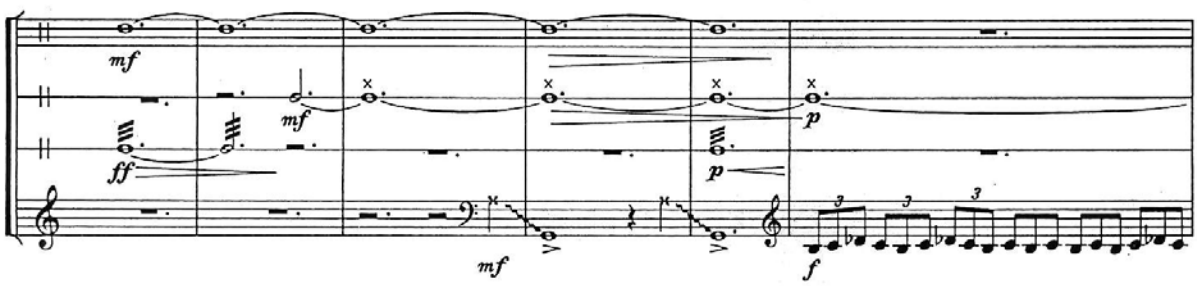
Bonnie Bird, he was responsible for "Creative Composition and Percussion Instruments." This rather vague job description in fact resulted in an array of functions and responsibilities, entailing the accompaniment of Bird's dance classes during the academic season as well as courses for children ("Creative Music") and adults ("Experimental Music") at the summer session, and accompanying Bird's dance classes for 8-10-year-olds at the Bush school.[1374] Assessing the compositions that are extant from that period, Cage either wrote little for dance during the two years he was at Cornish, or much is lost. It can be deduced that he used a lot of improvisation and classical piano music during the different levels of dance lessons.[1375]

3.4.3.2.2 Fixed mutes for the string piano

The first piece we know about that Cage conceived for Bird's dance class at Cornish was the *Imaginary Landscape 1,* written in March of 1939. The idea for the dance was the question "as to what would be the nature of an audience's response to seeing only isolated parts of dancers" bodies moving in a time-free spatial "conversation." Large geometrically shaped stage props were used to hide the dancers' bodies behind, with only faces, arms and legs visible. Cage composed the music, a "piece of proto-musique concrète"[1376] for records of constant and variable frequency, large Chinese cymbal and string piano. There was no tape music yet, but records with test-tones and sound effects were then available for audio research and radio play production, such as in the radio studio that had been established at the Cornish School in 1936.[1377] Earlier, in 1930, when Cage had been in Berlin, he had witnessed compositional use of phonograph records while attended a concert with Hindemith's *Grammophonplatten-eigene Stücke* and Ernest Toch's *Gesprochene Musik*, music that includes effects created by changing turntable speeds.[1378] Later, Cage acquired hands-on experience with turntables from helping Cowell with his New Music Recording project in New York in 1934.[1379] Changing the speed of a turntable while a recording of a constant frequency is played, results in a sliding tone not unlike that of the sirens Cage had heard in Varèse's *Ionisation*. At Cornish, now, working as an accompanist for dance teacher Bonnie Bird, Cage had the chance to experiment with technology for the purpose of creating sliding tones for his own composition, thereby following up yet again on a piece of Cowell's advice, to bring this effect "to as great a state of perfection in construction of composition and flexibility of

[1374] Levitz 124-125.
[1375] David Vaughan, archivist of the Merce Cunningham Dance Company and student of Cunningham at the School of American Ballet in New York in 1950, which had John Cage as official accompanist to the class, recalls how Cage "knew three tunes, as I remember, *Three Blind Mice,* what I thought of then as *God Save the King*, and another which I forget. That is probably what he did when Bonnie Bird engaged him as musician for the dance department at the Cornish School." Vaughan adds that little has changed in dance teachers (e.g. Cunningham) using for their classes in dance technique "what I suppose I should call conventional music for class, with strong rhythm," ranging from songs by Gershwin to Mozart to improvisation. (e-mail Vaughan to author, 19.V.2008.)
[1376] Cage 1958, p. 14. Early electro-acoustic composing goes back to Respighi's *Pini di Roma* (1924), in the score of which (during almost eleven bars before the fourth part *I pini della via Appia*) the composer prescribes pre-recorded sounds of birds as found on the recording *N° R.6105 del "Concert Record Gramophone: Il canto dell'usignolo."*
[1377] See Miller 2006, p. 84: "33 1/3 rpm was not available for home use in this era, but radio stations needed the long-play speed to record full programs for delayed broadcast."
[1378] Miller 2006, p. 85 states that Toch's piece was originally for recorded spoken voices. Toch immigrated to the US in 1933/34, taught at the New School of Social Research in the fall of 1934 (when Cage was there) and later at UCLA in 1936 (when Cage was there). (Oechsler 2002.) Cage would champion the *Geographical Fugue* (third part of *Gesprochene Musik*) for many years to come.
[1379] Miller 2006, p. 57.

handling on instruments as older elements now." [1380] By manually controlling a turntable's speed, Cage effectively created a new musical instrument for producing "atonal" sounds, the second after the "water gong." The characteristics of the test-tone manipulations are unique to the variable speed turntable and its use for performance: for smoothness of execution and sound the mechanically induced glissandos depend on the clutch mechanism, on the stability of the speed of a turntable's motor, and on its potential for quick adjusting to a new speed.[1381] The handling of the arm to lift and drop the needle onto the record so as to play the morse-like staccato's requires an instrument-specific technique and leaves room for interpretation. Existing acoustic instruments could not realize these sounds in the same "imaginary" way to accompany the surrealist images Bonnie Bird created on stage.[1382] But Cage did not limit himself to extending the potential of the test records. Next to the improper use of turntables, the piano is used for extended techniques only. A soft percussion mallet is required to produce downward sweeps on the bass strings (articulating the arrival note only), a technique combining sweeping over the strings with fingers or the palm of the hand and striking strings with a beater, both – though not the combination – found in Cowell's music as early as the 1920's[1383], the latter technique also in Russell's *Fugue for eight percussion instruments,* which Cage had heard in 1933 together with Varèse's *Ionisation.* In the alto range of the piano part of *Imaginary Landscape 1*, (Ex. 3.771 – lowest staff) three notes (*b*-*c*^{1}-*d*♭^{1}) are muted by the player's hand on the strings[1384], again found in many Cowell works and in Russell's *Fugue*. The cymbal rolls are the only "proper" use of a "proper" instrument in *Imaginary Landscape 1*. The proximity of its sound to that of the gong beater's glissandos across bass strings (with the dampers lifted by the pedal) encourages Cage to play with it, bringing the piano closer to its percussive identity.



Example 3.771. J. Cage: *Imaginary Landscape 1* (1939), cue D. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

The first performance of *Imaginary Landscape 1* was recorded by John and Xenia Cage and two faculty members[1385] and the recording was afterwards used to accompany the dance.[1386] Apart from *Imaginary Landscape 1*, Cage's early percussion music seems to

[1380] Cowell had already touched upon theoretical aspects of the sliding tone in *New Musical Resources*, but covered the phenomenon extensively only in his unpublished treatise *The Nature of Melody*. In practice, he had used sliding tones in *Atlantis.* See Rao 2005 for a detailed overview.
[1381] See Miller 2006, p. 85-90 for the specifics of the historical record formats and the materials Cage had used.
[1382] With the Ondes Martenot or the theremin these sounds could be made as well, but those are not acoustic instruments.
[1383] See above: *Piece for two string pianos* (L431 – ca 1926, playing on the bars with a hard rubber stick; playing on the strings with a padded stick), *The Leprechaun* (L448 - strings are tapped with various implements), *Synchrony of Dance, Music, Light* (L464 – 1930, the five lowest strings are to be sounded with padded stick), sketches for a *Sound March* (L471 – ca 1930, various means are used to sound the piano strings, amongst which a metal object).
[1384] According to the performance notes.
[1385] Vaughan 1997, p. 19.
[1386] See Miller 2006, p. 87.
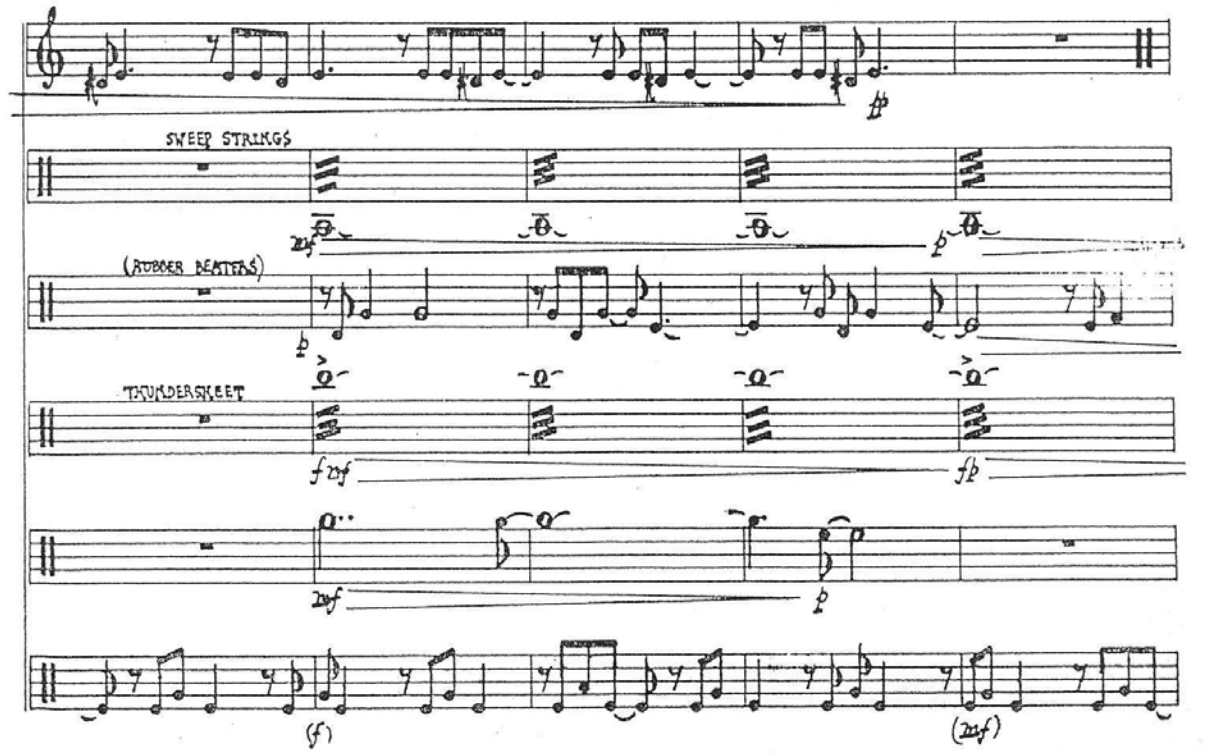
have had little to do with the dance.[1387] Responsible for "percussion," he did "teach the dancers to compose, using percussion instruments,"[1388] but since no such music is left to us, the main visible percussion activities at Cornish remain the concerts Cage arranged for his percussion group. Some of the music performed by his group was his own (*Trio* and *Quartet*), other pieces were taken from Cowell's new music publications (e.g. William Russell's *Dances*), more music was commissioned. Over Cage's two-year stay at Cornish, the repertoire was extended considerably, sponsors were attracted and the percussion ensemble grew from four to seventeen players.[1389]

In November 1939 Cage added his own new *Construction in Metal,* subsequently named *First Construction (in Metal)*, to the repertoire of his group*. Imaginary Landscape 1* had no specific instrumental dedication as a percussion ensemble piece, but the new composition is decidedly for "percussion sextet with assistant." There is no mention of a pianist but one of the parts is for string piano. The "note" on the title sheet of the published score, containing a little information on the structure of the work, followed by the list of percussion instruments per performer, also contains crucial information for the piano part:

> string piano (Henry Cowell's term for an ordinary grand piano, the strings of which are performed upon) with assistant (the assistant applies a metal rod firmly on the strings used, producing harmonics; ^ and v indicate slow slides of the rod away from or toward the center of the string's length, producing, respectively, ascending and descending siren-like sounds; any jangling sound is avoided by increasing the pressure on the strings; if, because of the piano construction, the tones notated do not permit the free use of the rod, use other tones that do.) (The 2nd player plays at the keyboard, except as in "G," when he sweeps a gong beater across the bass strings.)

Just like in *Imaginary Landscape 1*, the player of the string piano uses a mallet to produce glissandos on the bass strings, but Cage now uses percussion notation, with one 'note' indicating the action rather than the sound. (Ex. 3.772 – the string piano is notated on the second staff.)

[1387] Pritchett 1993, p.22 states: "there are only two surviving percussion works for dancers. *Credo in US* (1942) and *Forever and Sunsmell* (1943)." This is not taking into account *Imaginary Landscape 1*, which Pritchett obviously does not consider a work for percussion, even though Cage performed it with the members of his percussion group.
[1388] Vaughan 1997, p. 17.
[1389] Miller 2006, p. 72. The third Cornish concert (December 1939) features twelve players, the second concert at Mills in July 1940, when Cage left Cornish, listed seventeen performers. The repertoire grew from a few pieces to about 50 in 1940. (Cage 1948, p. 33.)
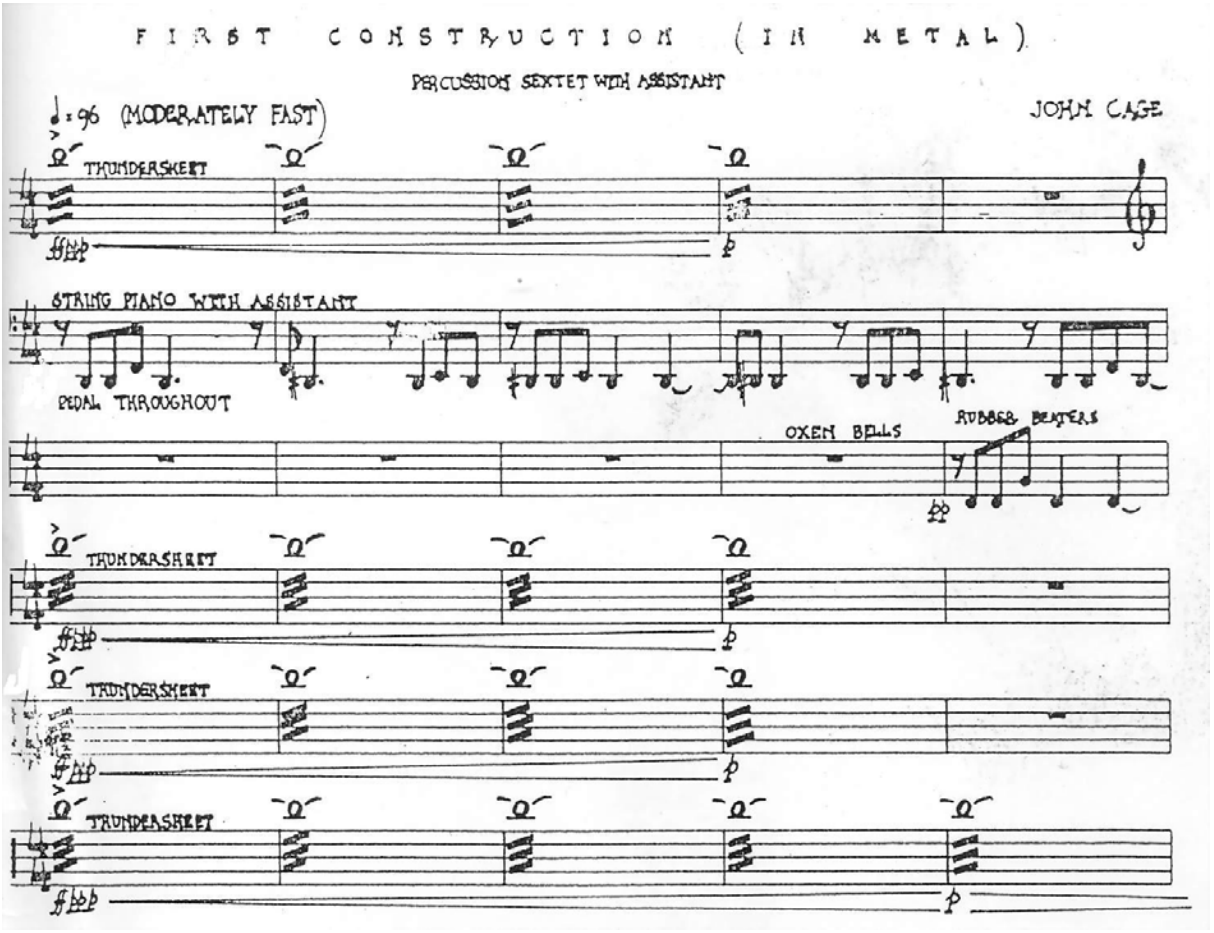


Example 3.772. J. Cage: *First Construction (In Metal)* (1939), from 8 bars before cue F. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

This notation maybe more efficient for the composer to write out the part, it leaves much to be desired by the performer, though, such as the relation of the sweeping's speed to the 32nd repetition symbol above the note, the width of the sweep, and the exact range on the strings in which to sweep them.[1390]

Equally unclear – at least at first – is the opening of the music in the piano part. (Ex. 3.773.) The rhythmical sequence, consisting of in total all eight notes between D and A (only four are seen in the excerpt) reoccurs regularly in the rest of the piece but has no specified performance technique indicated other than the words "pedal throughout" and "string piano with assistant" on the first page of the score.

[1390] Throughout the different parts percussion notation "notes" are used to differentiate between instruments, not range. E.g. all 5 graduated thundersheets are notated by means of one and the same high "B" note in all parts.



Example 3.773. J. Cage: *First Construction (In Metal)* (1939), opening bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

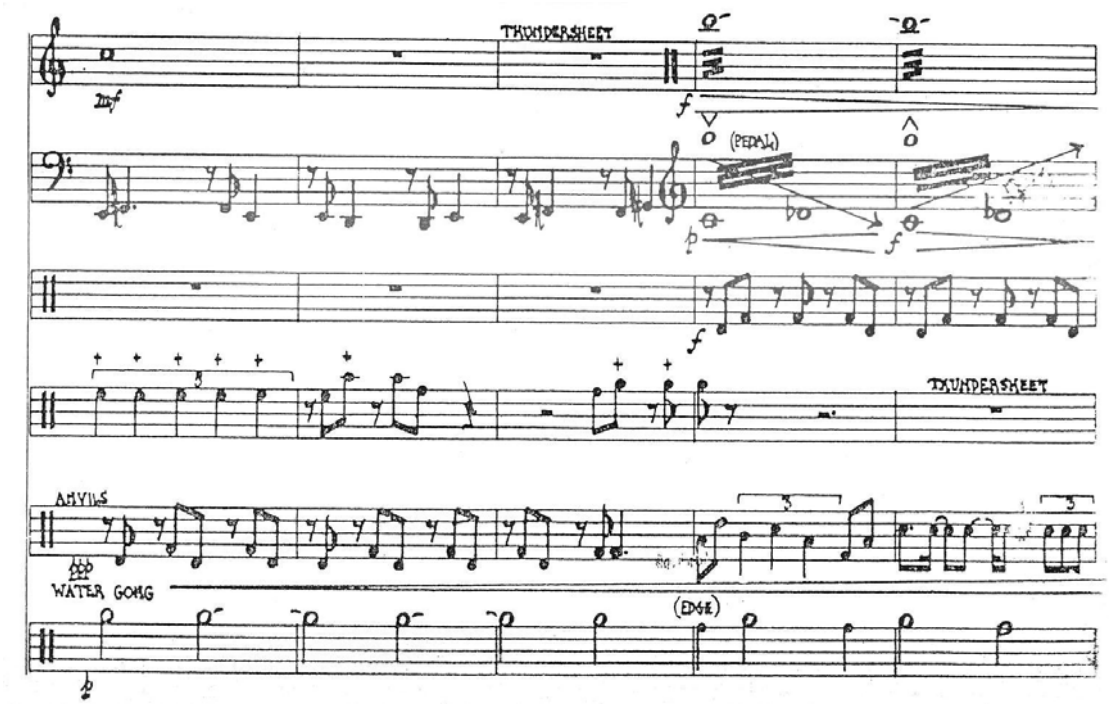
Since Cage did not mention muting strings using the fingers anywhere in the score or performance notes, and since that would be difficult given the number of different notes and the width of the choruses at this range, Cage must have meant for these tones to be muted with the metal rod. On the 1958 recording of *First Construction (in Metal)*, in which David Tudor played the piano and Merce Cunningham assisted, one can clearly hear some jangling at times. This is the effect Cage warned against in the performance note, and results from not pressing the metal onto the strings hard enough. The string noisily vibrates against object instead of releasing only pure harmonics. It is again unclear which harmonics he wanted, although his mentioning of the middle of the string when explaining the sliding technique (to which we shall turn presently) may have been intended for the static use of the rod as well. More problematic is that the range indicated in the score coincides with metal bars dividing the inside of the piano construction in many models of pianos, preventing the use of one cylinder to cover all necessary strings.

Fortunately, the manuscript contains two sheets of typed instructions for *First Construction (in Metal)*.[1391] They are not included with the published score, and they indicate no further specifics on the gong beater technique, but there is a lot more on the other techniques. First of all, "all the tones notated in the bass clef are played on the keyboard, one octave below the note written." This is the opening sentence for the second player's instructions, meaning all the notes in the entire part that are written on the bass clef staff notation. This corrects the problem of the conflict between the frame of the piano and the range if the notes to be muted. The fact that Cage immediately

[1391] These are at the New York Public Library. Copies are at the John Cage Trust.

continues to explain the application of "a heavy metal cylinder firmly to the strings, producing harmonics" is proof that the beginning is in fact to be muted by the metal cylinder and not by the fingers. On the manuscript score itself Cage had originally written "brass cylinder," later crossed out and replaced by "metal cylinder." Brass is more resonant than other metal, but copper may either have been too expensive to demand from performers or it may have proven to soft to apply enough pressure and make sure that no jangling occurs.

Besides the mallet-glissando and the muted strings, a third technique is the sliding tone production by rolling the rod over the strings while the pianist plays a trill on the keyboard. (Ex. 3.774 – second staff.)
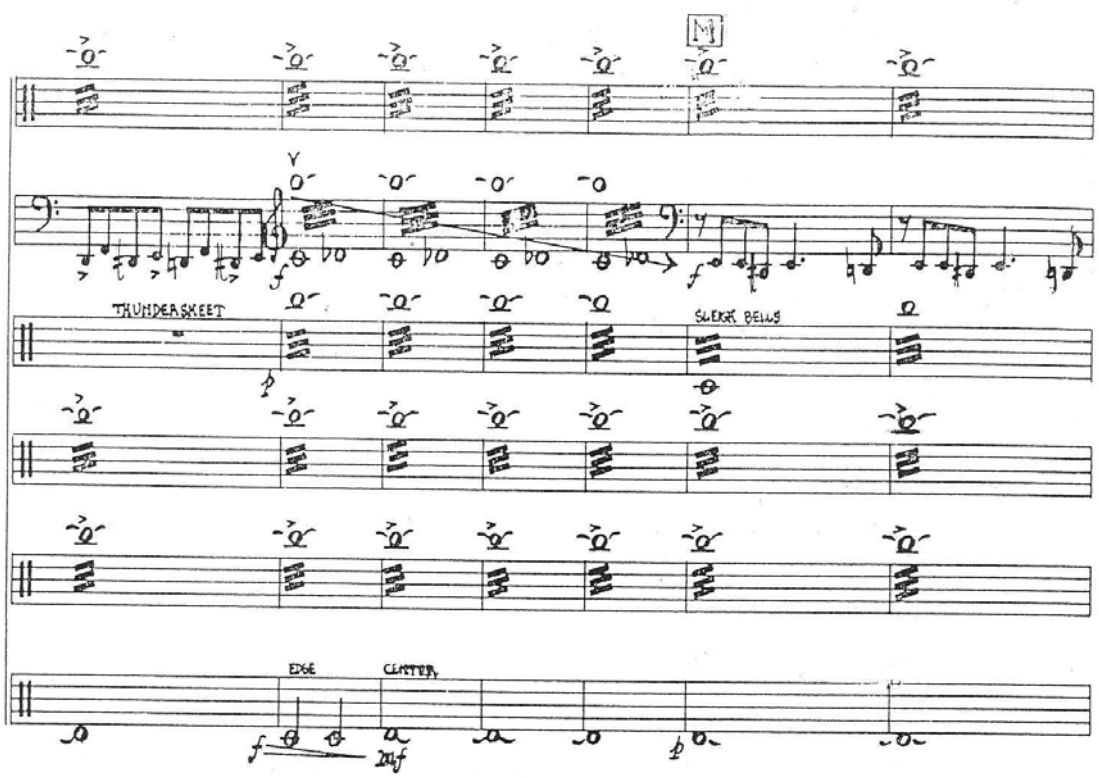


Example 3.774. J. Cage: *First Construction (In Metal)* (1939), from 5 bars after cue B. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

The change of frequency to be achieved by the rolling is indicated by the upward and downward symbols above the bars, the direction in which to roll the rod is indicated by the long arrows across the staff (downwards equals moving away from the keyboard). As we have seen in the theory of muting strings, pressing on a point of the string divides the string in two parts, each vibrating according to their length. When rolling over a string while muting it, the lengths of both parts change inversely proportional to each other. Hence, when one part becomes shorter, its frequency ascends, while the other part becomes longer and its pitch lower. This way, the resulting sound is a combination of two glissandos, each in opposite direction. As such, it is theoretically useless to notate the sound's slide by one arrow showing one direction. The double glissando can be avoided by simply muting one part of the string by pressing a finger at for instance the end of the string on the side opposite of the dampers. In view of how several aspects of the cylinder-techniques are missing from the notation, it is doubtful that Cage was aware of the possible choice of single or double glissandos in the slide. In practice it is easily discovered that this differentiation provides us with the clue for the performance practice: the only way to achieve a downward gliding sound with this technique, is by rolling it away from the damper toward the other end of the string. This is confirmed in the performance directions added to the manuscript: " when the angle above the note
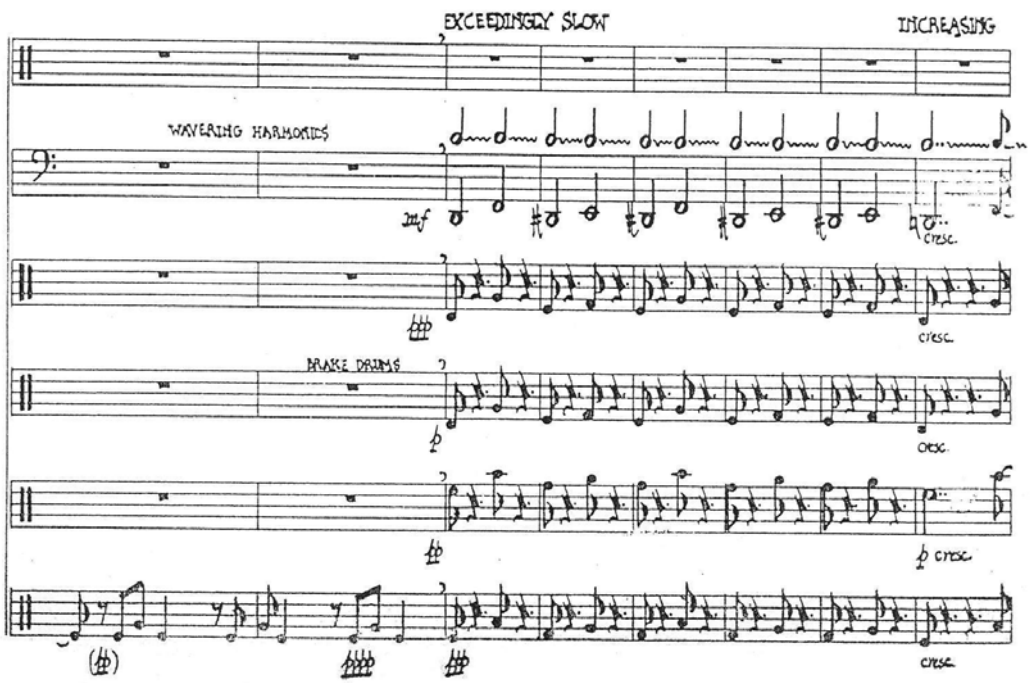
points down, the cylinder must slide away from the keyboard, producing a descending siren-like sound." The speed of the glissando is not shown, but their duration varies between one and four bars throughout the composition (e.g. ex. 3.775), so either the speed is the same in every instance (and the length of the string covered by rolling over it with the rod becomes longer as the duration of the slide gets longer) or the speed of the gliding sound depends on the duration (in which case the rod is rolled at constant speed and over one an the same distance from and to the keyboard). The manuscript directions are inconclusive in this matter: "the length of the slide is determined by the notation," meaning that either the arrow notation or the duration is determinant. However, the length of the arrows in the score is always the same, regardless of the duration, leaving us with the length of the slide to be determined by its duration. That the pedal is to be depressed during the trills is only mentioned in the manuscript directions, not in the published score.

Interestingly, in the manuscript directions Cage specifically mentions a "small metal cylinder" when discussing the rolling technique, whereas for the opening he had written "a heavy metal cylinder." This may point towards the idea of using two cylinders that rest on the strings when not used, instead of switching between string areas, risking to make noise when applying the cylinder to the strings. The smaller cylinder may also be specifically handy for the trill section when the piano model leaves little room in that section of the inside construction, as is often the case compared to the bass string area.
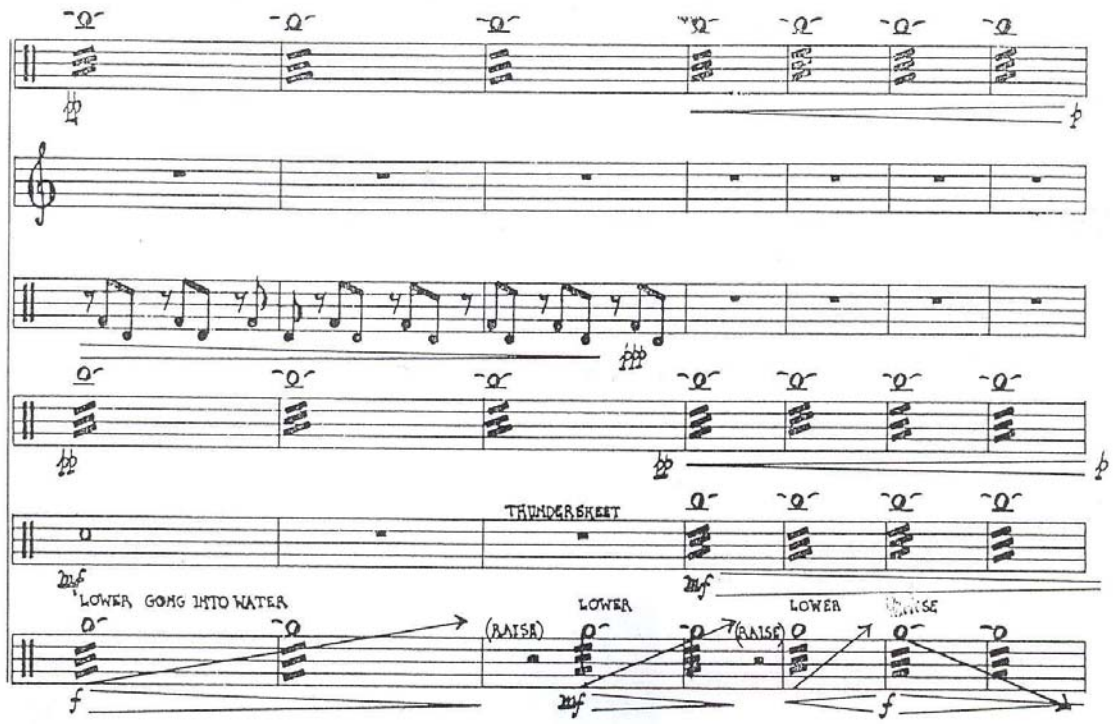


Example 3.775. J. Cage: *First Construction* (In Metal) (1939), from 5 bars before cue M. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

The fourth and last technique in *First Construction (Metal)* is used in a sequence of long low notes accompanied by the indication "wavering harmonics." (Ex. 3.776.) In technique and notation this effect is directly related to the sliding metal rod action, so here again some doubt remains as to exact width and speed of the "vibrato." The manuscript directions only mention "a small range" for the rolling action.



Example 3.776. J. Cage: *First Construction* (In Metal) (1939), from 3 bars after cue F. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

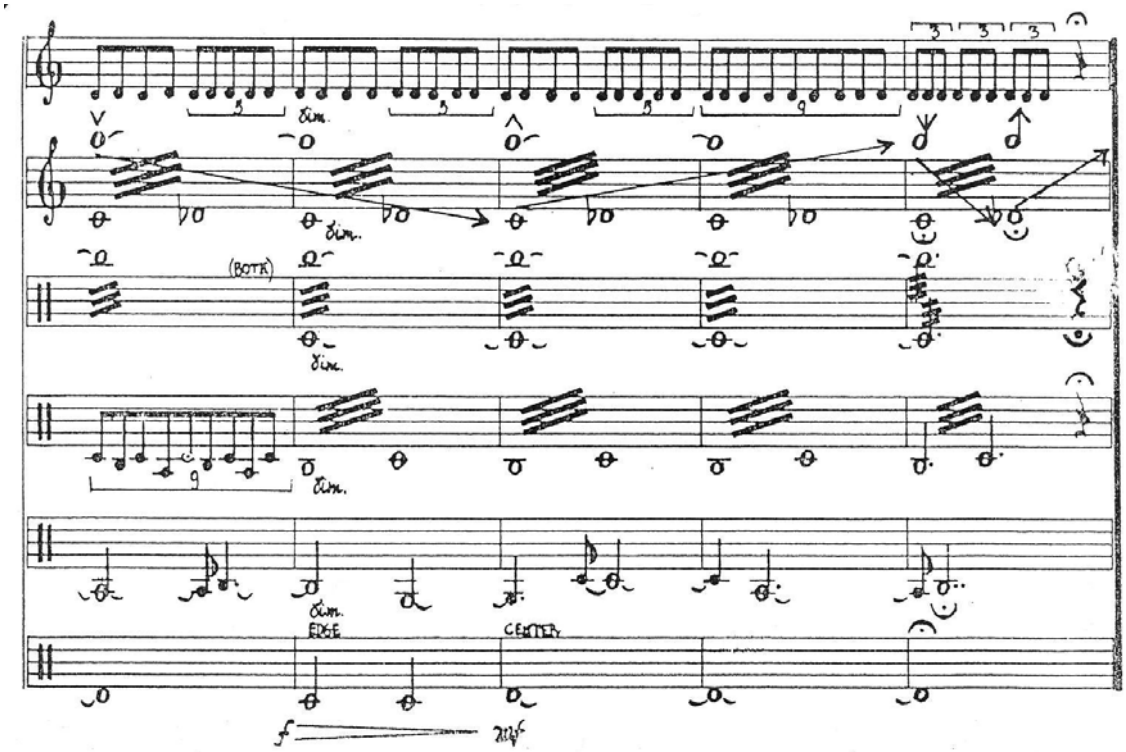
Cage also used the water gong in *First Construction (in Metal)*, using part of the notation for the string piano's sliding technique. (Ex. 3.777.) Not once in the composition are the water-gong and the metal rod used at the same time.



Example 3.777. J. Cage: *First Construction* (In Metal) (1939), from 7 bars before cue C. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

The balance between the piano slides and the other instruments is not an easy one to fine-tune. Sometimes the quietly delicate siren of the piano has to compete with

thundersheets that are intrusive by nature. At the very end, though, Cage decided to leave the listener with a clear impression of the piano slide. When the orchestral bells, the second highest thundersheet, the sleigh bells, Japanese temple gongs, Chinese cymbals and the tam-tam have decayed or stopped, the upwards rolling of the metal rod can distinctly be heard. (Ex. 3.778 – the piano part is written on the second staff.)
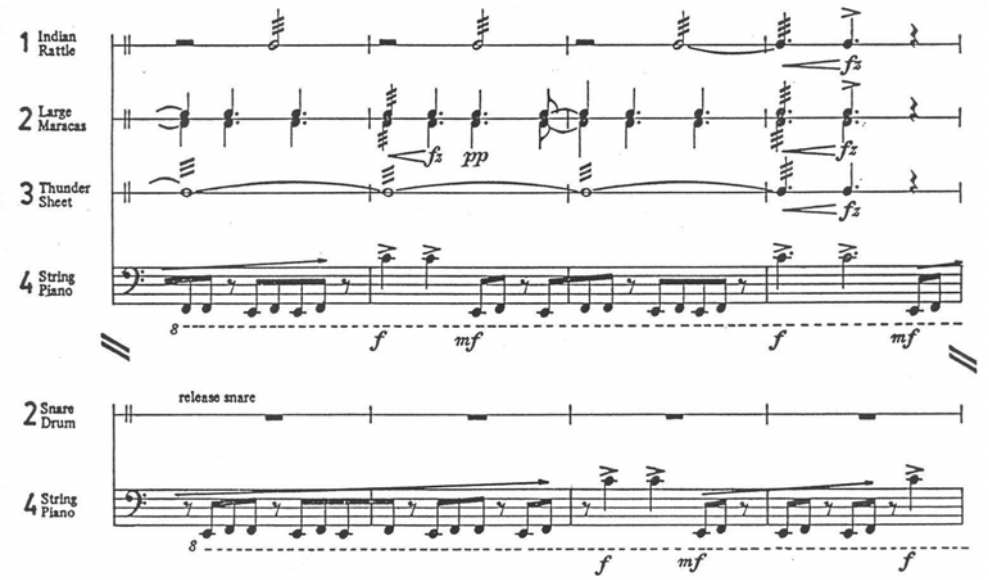


Example 3.778. J. Cage: *First Construction* (In Metal) (1939), final bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

The program of the concert at Cornish during which Cage premiered the *First Construction* featured a quotation of Cowell's 1937 prediction about bringing percussion and sliding tones to perfection, in compositional construction as well as in instrumental performance flexibility. Cage's "siren-like sound" and the technique to produce it are related to what Cowell had introduced in the third part (for string piano and string quartet) of *A composition* (L406-1925 – see above). There, the performer was to "bend" a note by way of applying a metal object onto the strings while repeating the note at the keyboard. Cowell's notation also left much to be desired, perhaps the reason for Cage's (superfluous) attempt to indicate both sound and movement of the slide's direction. Because Cowell was not precise in explaining the shape and form of the "metal object," we do not know whether he had actually intended "siren-like" sounds or merely small pitch-bends like the "wavering harmonics." If the object is a cylinder, the performer can keep on rolling and bending the pitch until he reaches the end of the string. In any other shape, the object would have to be scraped along the string to achieve more than an inflection, producing a scraping noise along the way, which may not yet have been considered as qualifying for musical use at that time. We also do not know whether Cage knew *A Composition* but there is a story of how Cage may have come to use the rolling rod independently of Cowell's use for it. Bonnie Bird has recalled how she was working on the choreography of *The Marriage at the Eiffel Tower* (premiered together with *Imaginary Landscape 1* on March 24th of 1939), thinking of her dancers coming down long poles, like firemen. Shopping around for such poles, she was disappointed to find that they were too expensive for her budget. She had gotten a brass sample, however, brought that into the dance class and left it with Cage.

> John put this on the tray on the piano that would hold the music. […] That was a very wobbly tray, and as he started to play the piano for class, it fell of onto the strings, and rolled up the strings that he was playing – in the bass, as I remember it. Well, he was so intrigued with this sound that he got totally involved in rolling this thing up and down and playing with sound.[1392]

Be it through Cowell's example or accidental experimentation, the rolling of a cylinder over strings activated from the keyboard enabled Cage to achieve on the piano the sound of tone slides he was experimenting with on the turntables for *Imaginary Landscape 1*, but without the drawback of needing expensive machinery and a set-up that is hard to get outside of radio studios. More importantly, this is the first time Cage used an object to manipulate the piano string's sound. Both the static and rolling use of the metal cylinder produce sounds very different from finger muting. Because of the metal not absorbing the vibrations like the fingers, the static pressing of it against the low bass strings sounds is richly resonant like gongs. The rolling over strings gives an intervallic timbre that slides in opposed directions. Both effects give off more sound than the finger mute, which actually "stops" the sound.
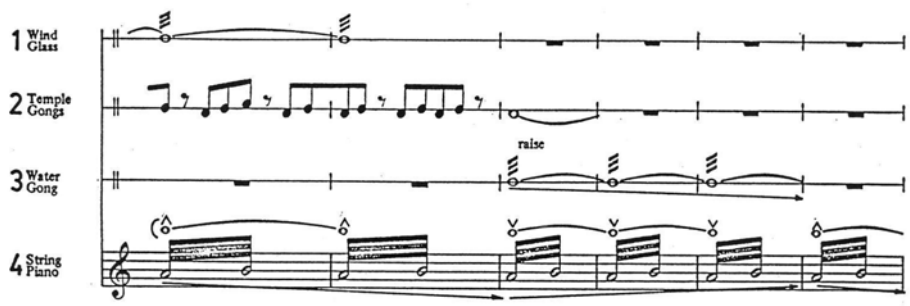
In January1940 the Cage Percussion Players toured in three Pacific Northwestern states with his new *Second Construction* on the program. Once more, there is a part for string piano. As in previous pieces, a gong beater is used to produce "glissandi" in the bass by sweeping the strings, but the rest of the techniques are significantly different from before. According to the performance notes, the pianist is to play the E^1 and F^1 on the keys with the right hand while muting the strings with two fingers of the left hand, sometime (but not always) sliding along the strings. (Ex. 3.779.) The technique is reminiscent of Cowell's *Sinister Resonance* (L462 – 1930), though, like in *First Construction (in Metal)*, Cage notates the action rather than the expected sound as Cowell had done. (See above.) As with Cowell's problematic notation, the consequences of Cage's score are considerable: in the *Second Construction* we cannot deduce how far away on the string the tone should be deviated from, whether or not clear harmonics should be aimed at each time the rhythm makes a moment of the sliding action audible, and at which point of the string the muting should begin.



Example 3.779. J. Cage: *Second Construction* (1939-1940), from 8 bars before cue 4. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

[1392] Fetterman 1996, p. 8. See also Miller 2006, p. 81, fn. 92, to whom the story was told by Bonnie Bird's daughter in a private conversation.
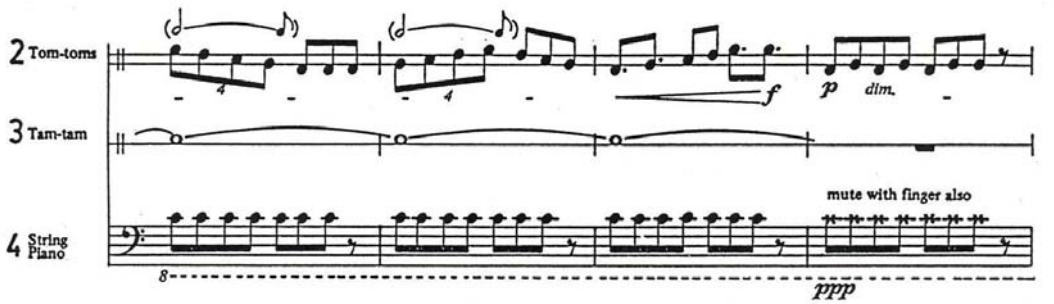
Next to gliding over a string to shift between nodal points and their more or less audible harmonics, sliding tones are produced "through the use of a metal cylinder which slides along the strings (manipulated by the left hand) while the right hand trills on the keyboard." The assistant, whom Cage judged necessary in the *First Construction (In Metal)* to carefully place and manipulate the metal rod in different areas of the piano's inside, is here left out. The symbol in the score for the direction of the slide's movement is now reversed: when the arrow referring to the sound goes down, the little pointer above the staff denoting the direction of the rolling on the strings points in the opposite direction. The required effect is still that of the arrows underneath the notes, but the difference in use of the little pointers is confusing compared to the *First Construction*. (Ex. 3.780.)



Example 3.780. J. Cage: *Second Construction* (1939-1940), from 7 bars before cue 15. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

The two remaining extended techniques in the string piano part of Cage's *Second Construction* are entirely new: "In the treble clef, the tones between A and E♭ are muted with a piece of cardboard" and "C is muted by an ordinary screw placed between the strings." There is no information as to the kind of cardboard (size, thickness and weight will influence the sound), how and where it should be applied (fixed on beforehand by a dead weight or by weaving it through the strings, or pressed upon the strings manually), or what kind of screw should be used and where its should be put (at which point of the string's length, in between which of the three strings). At any rate, this is the first example in music by Cage of prepared piano tones.
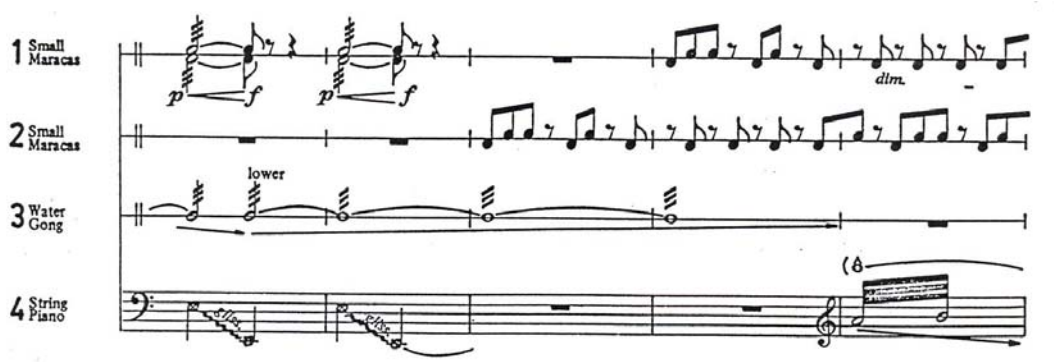
At one point the prepared tone must at the same time also be muted by hand. (Ex. 3.781.)



Example 3.781. J. Cage: *Second Construction* (1939-1940), from 8 bars before cue 7. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
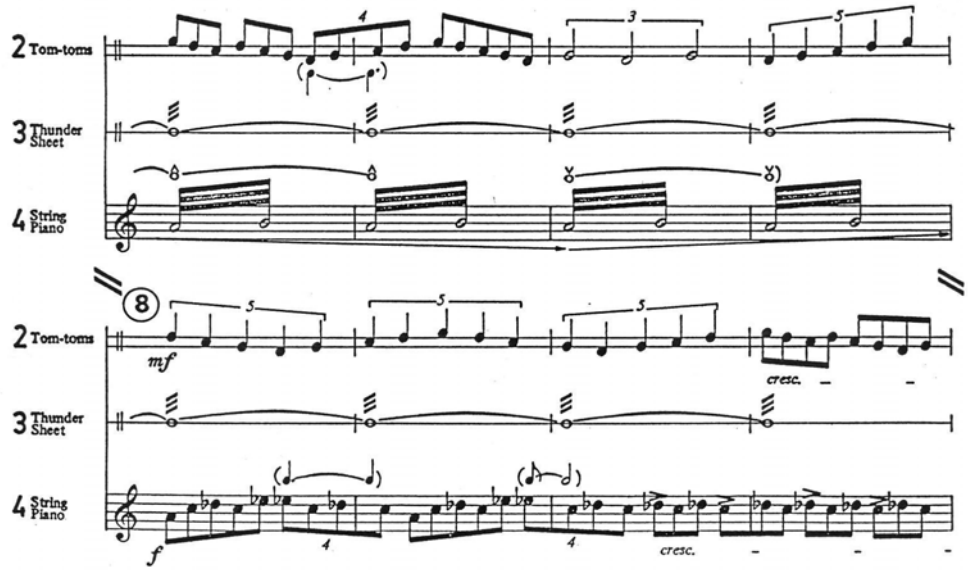
In the *Second Construction* Cage diversifies the technique of sweeping a mallet over strings: most of the notation shows what was indicated in *Imaginary Landscape 1* (see

ex. 3.771), but in the last section the exact pitches of both beginning and ending are prescribed, indicating that they are to be articulated when sweeping the strings. (Ex. 3.782.)



Example 3.782. J. Cage: *Second Construction* (1939-1940), from 6 bars after cue 13. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

At most instances where the pianist needs to change technique, Cage allows for time (e.g. leaving empty bars to put down the gong beater, take the metal cylinder and put it on the strings – ex. 3.782) or for the sequence of techniques to be such that e.g. the right hand plays on the keyboard while the left hand can grope for the mallet to sweep over the bass strings in what follows. Only at one point there does not seem to be enough time to do exactly what is required. (Ex. 783 – at the transition to cue 8.)



Example 3.783. J. Cage: *Second Construction* (1939-1940), from 4 bars before cue 8. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

The only way to execute exactly what is notated would mean that the cardboard is fixed, so that the cylinder can be held in the left hand after the trill and while the right hand plays the prepared tones. But then the B is muted by cardboard when the rod has to be rolled over it to create the slide, which interferes with the sound of the slide as that slide also needs notes from the same range. The slide is only effective through continuity of sound production, hence the fast trill. A trill alternating between a proper piano sound and a muted sound would spoil that effect. The alternative method would be to mute the

strings with cardboard on the spot, i.e. only when needed, but then time is needed to put down the cylinder, take the cardboard and put that in place – all with the left hand if the right hand is to remain on the keyboard so as not to have to search blindly for the right notes to play.

The different performance practical and compositional aspects of the extended techniques in these early compositions of Cage show how he struggled taking the different considerations into account. Once the pianist has to carry out all the required actions, silences must be composed in the piano part to accommodate the performer in preparing the different changes of technique. With an assistant the change from rolling the rod to muting the same notes with a piece of cardboard becomes a different practical issue. The placement of a screw between strings for the duration of the piece would not even have been an issue if an assistant to the piano part had been required. We cannot reconstruct the causal relationship between Cage's choice of the number of players and his prescribed extended techniques. He may have wanted the techniques as they are, regardless of the possibility of an assistant. On the other hand, he may just as well have taken into account the fact that he would only have four people for the premiere (there had been twelve players for the first performance of *First Construction*) and adjust his writing accordingly to do without an assistant and devise a prepared screw mute.

By any definition, the piano in the *Second Construction* is prepared, even if only the screw (and not the cardboard) is inserted before the performance. That Cage never mentioned this piece when commenting on the beginnings of the prepared piano, consistently introducing that part of his compositional history with *Bacchanale*, has led to speculation as to the chronology or as to possible revised versions of both the *Second Construction* and *Bacchanale*.[1393] It is possible that Cage retrospectively considered his prepared piano to be an instrument in its own right, consisting of fixed preparations only. In such logic, the piano in the *Second Construction*, with fixed as well as "mobile" preparations and hand-mutes, is an Extended Piano, even an Extended String Piano, but not yet a Prepared Piano. That may have been the way he thought of it in 1948, when the prepared piano's story was first told[1394], and when he had not yet combined fixed and mobile preparations again. Another explanation is more rapidly satisfying: Cage always (wrongly) remembered having composed *Bacchanale* in 1938, and *Second Construction* in 1940. That his memory had faltered was not found out until long after his recollections about the first piece for the prepared piano had been widely distributed in print.

If there are discernable reasons for Cage to have prepared the piano for *Second Construction*, they can be found in performance practicalities. Trying on different pianos to manually mute the seven tones between A and E♭ in the middle register can be confrontational for any pianist. The layout of the metal framework often leaves little room to maneuver in comfort and the unevenness of the human palm can hardly guarantee to actually and properly mute every single one of the 21 strings involved – one piece of flat material to cover the stretch would be much more efficient. Finding such a mute could have been what Cage tried when he "went to the kitchen and got a pie plate and put it and a book on the strings."[1395] There is another such story of a rod rolling onto the piano strings during one of the dance classes at the Cornish School[1396], which may have led Cage to find out about how to achieve on the piano the sound of tone slides like he had on the turntables in *Imaginary Landscape 1* but without the drawback of needing expensive machinery and a set-up that is hard to get outside of radio studios.

[1393] E.g. Pritchett 1993, p. 206, fn. 15.
[1394] Cage 1948.
[1395] Miller 2006, p. 82. Quoted from Stephen Montague, *John Cage at Seventy: An interview,* in *American Music 3* (1985), 209-210.
[1396] Miller 2006, p. 81, fn. 92. The story was told by Bonnie Bird's daughter in a private conversation with Miller and is also related by Bird herself in William Fetterman *John Cage's Theatre Pieces: Notations and Performances*, Amsterdam: Harwood Academic Publishers, 1996, p.8.

At this point in time, spring of 1940, the roads that have been converging towards the prepared piano come to intersect. The multifarious influences of Cowell's mentorship, the acute relationship between percussion and modern dance leading to Cage's work at Cornish School, this "flux of events" so crucial to Cage's development as a composer, meets with one more string of the prepared piano's historical DNA. That string is made up of Cage's particular adaptability to situations where what is proper is not possible, and his ability to appropriate the improper. To produce sounds from the piano unlike its proper sound was not new and had appeared in percussion ensemble music with works of Russel, Cowell and Cage himself. The leap Cage now made, from improperly playing the piano (e.g. on the strings) to extensively modifying the construction of the piano's sound production system itself for the duration of its use, is something else. He was not the first to experiment with such alterations, but leaving out the proper piano sound altogether was new.[1397] However, the idea had been maturing for a while, as Cage had displayed a habit of improper use of objects for musical purposes for quite some time.

He had written of his *Quartet* (ca 1935):

> I had no idea what it would sound like, not even what instruments would be used to play it. … we used whatever was at hand: we tapped on tables, books, chairs, and so forth. When we tired of these sounds, we invaded the kitchen and used pots and pans. Several visits to junkyards and lumberyards yielded more instruments: brake-drums from automobiles, different lengths of pipes, steel rings, hardwood blocks. After experimenting for several weeks, the final scoring of the Quartet was finished: it included the instruments that had been found, supplemented by a pedal tympani and a Chinese gong which lent to the whole a certain traditional aspect and sound.[1398]

The pedal tympani may have been chosen purposefully, but they were not to be taken for granted as they were generally too expensive to buy or rent[1399] and Cage "never had any money until 1959."[1400] The consequences of the 1930's Great Depression were certainly a reason for looking at cheap way to obtain new instruments, but other practicalities had entered the practice of using found objects as well. Cage had already experienced difficulty in trusting professional musicians to perform his new music. Once he had set up a group of amateur musicians like the bookbinder's students performing his *Quartet*, the leap towards playing on non-professional instruments is not far-fetched. Futurist theories on inclusion of everyday noise into musical composition and practice had been spreading artistic circles for twenty years and had not only reached Cage's ear. Russell's *March Suite* (1936) has parts for metronome and alarm bell, his *Made in America* (1937) prescribes automobile brake drums, pipes, tin cans, a suitcase, washboard kit, lion's roar, a drum kit made of found objects, and a mechanical device producing rhythmic ticks.[1401] Cage performed such music with his percussion group. On some of the program notes, he indicated his interest in the "unrelated noise of life" by quoting the expression of pride in having "mastered" and "subjugated" it:

The composer had taken this hated thing, life, and rigged himself into power over it by his music. The offence had not been held, cooled, vanished over, but annihilated, and life itself made thereby triumphant. This is an important difference. By hearing such music, seemingly so much noise, when I actually came upon noise in reality, I found that I had gone up over it. (W.C. Williams)[1402]

[1397] See above, 3.4.2.6.2. Maurice Delage only prepared one note. In the case of Satie we don't know exactly in how far he had actually prepared the piano.
[1398] Cage 1948, p. 31-32.
[1399] Miller & Lieberman 1998, p.130.
[1400] On Cage's poverty, see Cage 1975, p. 15-16.
[1401] The "Baetz' Rhythm Rotor" was similar to the Rhythmicon Cowell had asked Theremin to build.
[1402] Miller 2006, p. 72. Programm for the concert on 9 Dec 1939.

By 1940 Cage himself had amassed over 160 percussion instruments for performances with his percussion group, a high number for any individual collector or performer, even today, and of an astonishing diversity.[1403] Though the majority of the instruments were crafted to be used in music and could be found in traditional orchestras and "trans-ethnic" groups, about a third where of the "junkyard" species, from forks to anvils and even a washtub.[1404]

Cage's first jobs in music often entailed working with children. In the elementary class he taught with his Aunt in 1938, "every source of sound entered the musical accompaniments […] – from balloons squeezed with wet fingers or jiggled with rice inside to radiators struck with tynes."[1405] No doubt, when he accompanied Bird's dance classes for 8- to ten-year-olds at the Bush School, and when he taught "Creative Music" for children the summer session of the Cornish School, mastering professional instruments would have been the least of the requirements.

Even Cage's interest in working with dancers has been linked to the use of noise. One of his recollections tells of how modern dancers were grateful for any sounds or noises that could be produced for their recitals.[1406] In his article *Goal: New Music, New Dance*, published in *Dance Observer* in December 1939, Cage had already written:

> At the present stage of revolution, a healthy lawlessness is warranted. Experiment must necessarily be carried on by hitting anything – tin pans, rice bowls, iron pipes – anything we can lay our hands on. Not only hitting, but rubbing, smashing, making sound in every possible way…[1407]

In February 1940 Cage delivered his "Future of Music" lecture at the Seattle Artists' League[1408]. Three months after his first published goal, representing a "stage of revolution," he went one step further and dreamed out loud of using for musical purpose "any and all sounds that can be heard." Not just the ones that were readily available by hitting, rubbing or smashing, but going as far as actually liberating the "entire field of sound" by gaining "complete control of the overtone structure of tones available in any frequency, amplitude and duration." If need be, sounds would be constructed from zero. And as much as "the present methods of writing music, principally those which employ harmony and its reference to particular steps in the field of sound, will be inadequate for the composer who will be faced with the entire field of sound," [1409] the tonal instruments would also be inadequate and atonal music would require "new instruments proper to it."[1410]

From his encounter with the Bauhaus abstract filmmaker Oskar Fischinger, who is said to have introduced Cage to the idea that each object has its own spirit that can be released through its sound[1411], to devising new instruments altogether, Cage continuously explored ways to produce sonorities on any materials available to him. But hitting an automobile drum brake with a mallet or sounding an electrical bell in a particular rhythm constitutes misappropriation of an object only on a low level: their identity is not

[1403] I thank Deborah Campana for providing me with a copy of this list. The original can be found at the John Cage Collection at Northwestern University Music Library, Evanston, Illinois.
[1404] Is those instruments from outside the Western classical culture that are themselves of the junkyard type (e.g; quijadas and rice bowls) are included in the count, that type is even more present in Cage's collection.
[1405] Hines 1994, p. 90 Tyne is an alternative spelling of *tine*, the branch of a deer's antlers or prong of an implement such as a fork or a pitchfork. (Levitz 2005, p. 145, fn. 39.)
[1406] Cage 1968, p. 86.
[1407] Reprinted in Cage 1968, p. 87-88. Cage's article was part of a series in which contributions by Cowell and Russell also appeared
[1408] Cage 1968, p. 3-4. For the dating of this lecture, see Miller 2000, p. 230.
[1409] Cage 1968, p. 3-4.
[1410] Cage 1948, p. 31.
[1411] Cage 1948, p. 31.

compromised, only their proper environment is changed towards a musical one. Immersing a gong in a tub filled with water or changing the speed of a turntable without stopping the motor is another matter. Such actions exploit improperties to the level of a musical instrument with its own instrument-specific performance techniques. Cowell's string piano was the first western musical instrument Cage learnt to know on such a level of extension. After twice developing one on his own accord – the water gong and the musical turntable – Cage now turned to the piano to change the more than 200 year old concept of its sound and its handling once more. Cage now extended the string piano.

3.4.3.2.3 Cage's prepared piano

3.4.3.2.3.1 Inventing the prepared piano

On 28 April 1940 Syvilla Fort was scheduled to perform her final recital and graduate from Bonnie Bird's class. She had been admitted to the school eight years earlier as its first African-American student and had taken classes with Hanya Holm and Martha Graham at the Mills summer academy.[1412] Her training had included ballet, Caribbean and modern dance. At Cornish, she had already explored her African heritage in the mid-1930's[1413] and at the turn of the decade she danced a "spiritual" and "Haitian Rhythms" to music now lost but composed and performed at the piano by Cage.[1414] For her graduation, Fort decided to dance a *Bacchanale.* A reconstruction of this dance shows how Fort's multi-faceted background resulted in a "formalized series of movement sequences," mixing modernist bodily stance with classical expression and "Africanist" gestures.[1415] Undoubtedly the latter was the reason for Cage later remembering the "primitive" dance to be about Africa. The ethnic connotation must have easily led him to think of percussion for the accompaniment he was to provide for the dance. But the recital was to be performed at the Repertory Playhouse in Seattle, where there was not enough room for a percussion ensemble. Forced, then, to write for the piano while still wanting the sounds he thought fit for the dance, he thought of manipulating the proper piano sound so as to emulate percussion by inserting objects between the strings of twelve notes.

Of this decisive step Cage took, to extend the piano as he did, two aspects are remarkable in their novelty. First, all the tones that were needed in the piece were muted together, and secondly, the manipulation was fixed before the performance and for the entire duration of it. The contextual influences we have discussed, together with the way they came together at this point in our story, may explain why he would have been prone to percussion sounds, why he thought of manipulating strings and why he didn't hesitate to use household materials for doing so. But these motivational circumstances do not explain how Cage came to think of the particular manner of preparing the piano for a performance. If the space was too small for percussion ensemble but big enough for a (small) grand piano, he could have written for one or two percussionists without piano. On the other hand, if the piano was already there and not to be moved, he could have used any of the other extended techniques he had already composed with or heard in Cowell pieces. To change all the notes in the same manner and towards almost one and the same sound – in this case using weather stripping for eleven out of the twelve notes – points towards a sound ideal based on an existing instrument or homogenous ensemble.

[1412] All information on Syvilla Fort is taken from Levitz 2005.

[1413] Levitz 2005, p. 11. The US occupation of Haiti ended in 1934 – its African cultures were understood as more purely preserved than in the US

[1414]. See Levitz 2005, p. 10-11 for more on the social position and struggle of African American dancers in the 1920's and 1930's.

[1415] Levitz 2005, p. 131 and fn. 48.

Different theories have circulated to pinpoint the source of this ideal. The most well known is not really a theory, rather a bit of lore, but tenacious to say the least: the prepared piano as an imitation of the gamelan (or "gamelang") ensemble. As early as 1945, Virgil Thomson wrote how "the effect [of the prepared piano] in general is slightly reminiscent, on first hearing, of the Balinese gamelang orchestras."[1416] If Thomson was still careful in his assertion ("general," "slightly," "first hearing"), the association would eventually become stigmatic.[1417] Bonnie Bird herself recalled Fort's dance having "an almost oriental quality to it" and Cage's exclamation "I have to have a gamelang orchestra,"[1418] but this was recollected a good 50 years after the fact. Even if in 1939 Cage's friend Lou Harrison had experienced for the first time a live Balinese Gamelan at the Dutch East Indies pavilion during the Golden Gate Exposition on Treasure Island[1419], Cage himself has clearly stated that "it wasn't until after the war […] that I became seriously interested in Oriental thought" and "if there were any [Javanese, Balinese, African] influences, I was not conscious of them."[1420] Like Harrison, Cage may also have heard recorded gamelan music in Cowell's class, but his own percussion collection – so ardently and tenaciously put together – includes nothing of that kind. He had prescribed Balinese button gongs once in his *First Construction*, but only as a substitute to graduated oxen bells.[1421] All in all, Cage did not show any particular interest in or knowledge of the gamelan in 1940.

A second attempt at finding an instrumental connection to the early prepared piano, puts it in association with the Marimbula, the Cuban thumb piano.[1422] Cage had one such instrument in his collection, no doubt to be used in the pieces he had performed with his percussion ensemble.[1423] He may also have learnt about it and its music in some of Cowell's classes in New York.

A third instrument that can be considered to been an influence on – or at least a conceptual link to – the development of the prepared piano is the tack piano. The name "tack piano" refers to the thumbtacks inserted in the hammer felt at the point where the hammers hit the strings, giving the instrument a tinny, more percussive sound. Around the middle of the 20th century this prepration was used to make the "honky-tonk" or "ricky-tick" style piano sound, emulating the poorly maintained and worn-out pianos they were associated with the earlier ragtime aera.[1424] Besides rigging the piano with thumbtacks, a honky-tonk piano is also conventionally tuned apart from one of the three strings of each note: the tempered scale is in tune but the individual notes are out of tune with themselves. The single bass strings are usually not detuned and the tacks only extend from about an octave below middle C on upwards in order to not weaken the tone of the bass octaves by the metallic impact. Conceptually the tack-piano is close to the prepared piano: the sound effect is homogenous and some of the method is similar. The detuning of one of the three strings in a chorus, resulting in beating frequencies, resembles the mix of timbres in the equally partly prepared choruses of the prepared

[1416] As quoted in Fetterman 1996, p. 8.
[1417] A quick internet search for the prepared piano in connection with the gamelan reveals a multitude of "positive" results.
[1418] Fetterman 1996, p. 7, based on an interview by Fetterman with Bonnie Bird in 1991.
[1419] Miller & Lieberman 1998, p. 20. Harrison had heard recordings of Balinese compositions via Cowell and through a friend who had brought back a collection of gamelan records from Indonesia in 1932-33.
[1420] Cage 1981, p. 75.
[1421] In the *Second Construction* there are also graduated oxen bells, but no mentioning of Balinese button gongs.
[1422] Levitz 2005, p. 134-135
[1423] E.g. Roldán's Ritmica 5, performed by the Cage percussion group in December 1939.
[1424] Part of good piano maintanance is opening and losening the felt striking surface of the hammer, a delicate job called "voicing" and done by the experienced tuner with proper tools. If this is never done, the felt ages and compacts through use and become hard and cause the piano to yield a metallic sound. It is ironic that this sound is sought to be mimicked by pressing the pin of the thumbtack into the felt to hit the string with its metal surface, a technique very similar to – though nowhere near as good for the felt as – the voicing procedure.

piano. In both cases, the tempered scale is audible through the timbral disturbances. Finally, the metal of the tacks produces sounds that are closest to the screws that Cage used for his earliest prepared piano pieces (see below 3.4.3.2.3.2.1).

Tack pianos were apparently already used before the ragtime revival, as is witnessed by the tap dance scene *Bojangles of Harlem* in the 1936 movie *Swing Time*, with Fred Astaire paying tribute to the African-American tap dance performer Bill "Bojangles" Robinson (1878-1949). Tap dance had developed in the US during the nineteenth century from – amongst others – traditional northern English clog dance (sometimes only accompanied by the noise of the shoes), Stomp dancing (with the sound of objects used to enhance the stomping sound of the foot), the Spanish Zapateado (with nails hammered into the heel and the front part of the dancers' shoes to hear the rhythm of the steps), and possibly the rhythmic foot stamping of African dances. By 1925 all these and more are thought to have merged to form tap dance. Metal taps were attached to shoe heels and toes, and made the performer not just a dancer, but also a percussive musician.

We may never find out whether or not Cage had seen this movie, even if he lived in Los Angeles when it came out there. But there is quite some circumstantial evidence that he knew of the tack piano. Certainly tap dancing was part of Syvilla Fort's heritage: it was one of the few dances that African-Americans could make a career out of and Bill Robinson was a pre-eminent and pioneering proponent of it. And if the composer of the movie's soundtrack – Jerome Kern – combined tap dancing with the tack piano, it must have been a common association at least to those who new anything about African American dance and music. Cage's friend William Russell, who was then already a specialist of early jazz, may well have known the tack-piano first hand and talked about it to Cage. Russell promoted hot jazz drumming among dance composers[1425] and wrote his *Chicago Sketches* specifically for Cage's percussion ensemble. It is not certain that Jimmy Yancey – on whose music the first movement of the *Chicage Sketches* is based – had as much to do with the tack piano as has been supposed[1426], furthermore the suite was premiered after the first performance of *Bacchanale.* But Cage himself referred to altered piano sounds "effected by hot jazz musicians in New Orleans by placing paper between the strings."[1427] In the same breath he mentions Bach societies that, lacking a harpsichord, "had placed thumb-tacks on the hammers of small uprights in order to simulate the sound they needed."[1428] Whether Cage confused the perported habit of simulating a harpsichord sound through paper preparation[1429] with the thumb-tacks of the hot jazz pianists, or whether he was thinking of devices such as the "orchestra pedal" (lowering metal-tipped felt or leather strips between the hammers and the strings) or the "Mandolin Rail" (a pedal operated extra set of small hammers[1430]), he clearly new of the precedent of preparing a piano with thumbtacks.[1431]

[1425] In *Percussion Music and its Relation to the Modern Dance: 2. Hot Jazz and Percussion Music*, an article in *The Dance Observer* (October 1939), the magazine in which Cowell and Cage also published articles on dance (in the same series).
[1426] Levitz 2005, 135 states that Russell "re-created Yancey's tack piano sound through the instruments of a small percussion ensemble" in the *Chicago Sketches*. We do not find any evidence of this re-creation in the score or the music of the *Chicago Sketches*.
[1427] Cage 1948, p. 36.
[1428] Cage 1948, p. 36.
[1429] See also 3.4.2.5.3.
[1430] Both devices were available on pianos from e.g. the New York builder Win & Son.
[1431] Levitz 2005, p. 135 arguments that the connections between the marimbula and Africanism, Russell and Cage on the one hand, and symbolic interchangeability of Africanist sources on the other hand led Cage to conflate timbres of Chicago, New Orleans, the Carribean and the Orient, composing "his own version of what Cowell called neoprimitivist music."

Like with the Gamelan and Marimbula, there is no real proof that Cage was thinking of the tack-piano as early as 1940, when working out his idea of the prepared piano.[1432] It is very possible that Cage had none of these instruments in mind when solving the *Bacchanale* problem. The son of an applied engineering scientist later stressed the pragmatic aspect of his situation in the spring of 1940: "composing for the prepared piano is not a criticism of the instrument. I'm only being practical."[1433] This points to one direct influence that hasn't been taken into account yet: the performance practical comfort gained from altering the piano's sound through fixed prepration. A factor that may actually carry more weight in this issue than the mere comparison with the sound and concept of the three instruments dealt with just now. From Cage's experiences with his percussion ensemble, he had several techniques at his disposal for mutating the piano sound. Each was unique in its technique – muting tones with fingers, gliding across strings with mallets, bending pitches by rolling metal rods over strings, etc. – but one technique had a singular advantage over the others. Fixing an object in between strings before the performance allowed for improper piano sounds without having to reach for the inside of the piano while playing at the keyboard. It also allowed for many notes to be muted at once without having to change technique or tool in mid-performance. Until now Cage had used extended techniques only in the context of an ensemble, where other instruments could take over when the pianist needed time to prepare for the next manipulation of his strings, or where an assistant performer could be relied upon. The comfort of having that screw in between the C strings in his *Second Construction*, compared to the complications the other extended techniques in that piece brought with them, must have stuck to Cage's mind. Preparing like that the muting of *all* notes that would be required in one composition would allow for a virtuosity that had hitherto lacked all music based on manipulation of the piano strings. Fixing the mute on beforehand would enable him to write a piece without many long silences or without it being in slow tempo only. And he could contemplate writing with tone rows, a compositional technique he had not been able to use in his works for percussion. Of the different extended techniques that he had tried out, only that of the prepared mute provided enough versatility to be used on its own on a solo instrument.

3.4.3.2.3.2 Overview of Cage's prepared practice 1940-1954

Of 35 compositions for or including the prepared piano, written between 1940 and 1954 (including the lost pieces *Shimmera* and *Lidice*), 20 pieces were "for the dance" and 2 (*Music for Marcel Duchamp* and *Works of Calder*) were intended to accompany a film. Two more – *Three Dances* and *Music for Marcel Duchamp* – were later (resp. 1947 and 1999) also used for a choreography by Cunningham. Most of the dance accompaniments were for in fact for Cunningham, but throughout the 1940-1952 period Cage composed for other dancers as well: Syvilla Fort (*Bacchanale*), Wilson Williams (*Primitive*), Valerie Bettis (*And the earth shall bear again*), Pearl Primus (*Our spring will come*), Jean Erdman (*Daughters of the Lonesome Isle*), Merle Marsicano (1st *Pastorale*) and Louise Lippold (*Waiting*). Furthermore, *Our spring will come* was conceived as a piano part to a dance-melodrama, since it's manuscript included empty bars in which a poem by Langston Hughes was to be recited.

We can divide the 1940-1954 span into three periods based on number, diversity and complexity of the preparation practice: early (1940-42), middle (1943-44) and late (1945-54).[1434] (Tables 3.3, 3.4, 3.5.) We here consider the early period to start with the

[1432] That he mentioned the thumbtacks in 1948 could have been an association that was formed after *Bacchanale*.
[1433] Cage 1958, p. 8
[1434] Other divisions are possible, of course, certainly when regarding the music on the basis of its aesthetic aspects or of its historical place among other works by Cage. Excellent studies in this regard are Fürst-Heidtmann 1978 and the chapter on the prepared piano in Pritchett 1993 (p. 22-35). However, such analyses

Second Construction (1939-40), even though Cage himself always recounted the history of the prepared piano from *Bacchanale* onwards. There is no evidence that – in the Spring of 1940 – Cage considered the approach towards the piano in *Bacchanale* to be any different than what is in the piano part of the *Second Construction*, and like the latter, several works after *Bacchanale* have non-prepared sounds (proper or by way of other extended techniques) or are part of an ensemble work.[1435] It is not possible to sharply define the beginning of the middle period. *Amores* (January-February 1943) contains two solos for prepared piano that were the first to be published (in July of 1943) and to be called "for prepared piano,"[1436] and the first to include performance practice notes for preparing the piano, both facts showing a change in attitude towards the prepared piano. However, the piece's manuscript still calls it to be for the "string piano" and it is not clear whether those elaborate performance practical notes were actually added to the score before the publication date. *Our Spring Will Come* (first performed in April of 1943) was also still called "for piano with mutes placed between the strings," so the name "prepared piano" must have been chosen between April and July of that year, when *Amores* was published. *A Room* could be another candidate to mark a new period in Cage's development of the prepared piano, since he started prescribing exact measurements for the mutes' placement along the strings and because he began to experiment with the double preparations. Unfortunately, neither *A Room* nor *She is Asleep* have been dated more precisely than by the year 1943. We cannot just rely on the logic that more complex and precise indications by the composer would be typical of a later date than pieces that are evidence of a less evolved state, since *Tossed as it is Untroubled* is dated at the end of 1943 and is less complex and less diverse than either *A Room, Our Spring Will Come* and *Amores*. We have decided to take *Amores* as the beginning of the middle period since it is the first piece where Cage denies the performer the choice of screws or bolts for the metal preparations. The late period – by far the longest – distinguishes itself by more diverse and more complex preparation practices and materials but, at the same time, some more crystallized preferences for materials. We consider 1954 as the final year for this overview. The pieces *34'46.776"* and *31'57.9864"* are titled "for pianist" and the preparation positions are only valid for the beginning of the piece, after which they are mobile. Inclusion of these compositions here nevertheless completes the picture of Cage's evolution in types of materials and their position on the piano's pitch range.

Although Jean Erdman has recollected that Cage put thumb tacks into the felt of the piano hammers on the first performance of *Credo in US*[1437], there is no sign of this practice in the score or manuscript, nor is there any confirmation in any other source. Erdman may have confused the practice of the tack-piano with that of the prepared piano[1438], but given the way both practices are related (and the fact that Cage may have known of the tack-piano from his friend William Russel – see above) it is possible that Cage in fact had considered the tack-piano practice at one point. However, it is one thing to gain access to the hammers on an upright piano where access to the felt of the

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have little to do with the development of the preparations themselves, which is why we will here consider the preparation practices foremost.

[1435] Pritchett 1993 (p. 206, fn. 15) sees a problem in the fact that Cage never mentions the *Second Construction* in the stories of how the piano became prepared. However, Cage's reference to the beginnings of the prepared piano came no sooner than 1948, when he had written 14 pieces for prepared piano that contained no other sounds, and when he surely had come to consider the prepared piano as an instrument that does not produce other sounds than prepared ones.

[1436] The first performance program (February 7th, 1943) still listed "string piano" among the instruments used for *Amores* (see a reproduction of the program in Kostelanetz 1991, illustration 6 between pages 78 and 79) and the manuscript of the later *Our Spring Will Come* (first performed in April of 1943) still says "for piano with mutes placed between the strings." The surviving manuscript of *Amores* nevertheless has "prepared piano," and it (or its instrumental dedication) probably dates from between April and July, when *Amores* was published.

[1437] In an interview with William Fetterman in 1989. (At about 10:30 into the interview.) I thank Laura Kuhn of the John Cage Trust for letting me hear the recording of the interview.

[1438] It would not have been the only unstable memory of Erdman in the interview.

hammer is a mere question of taking of the front cover of the piano. On a grand piano one would have to take away the strings of at least all the relevant notes to have access to the hammers and put tacks in their felt. There is no proof that Cage played on an upright piano for the first performance of *Credo in US* and, if he tried it on a grand, he must certainly have needed a piano technician whom he would consequently have angered with his intentions. We therefore did not include this work in the overview.

The following tables were put together on the basis of the published scores, with the exception of *Imaginary Landscape 2 (1st version),* which is unpublished at this time. The order of the pieces is established on the basis of known dates of composition and/or first performance.[1439]

[1439] For the dates Van Emmerik 1996.

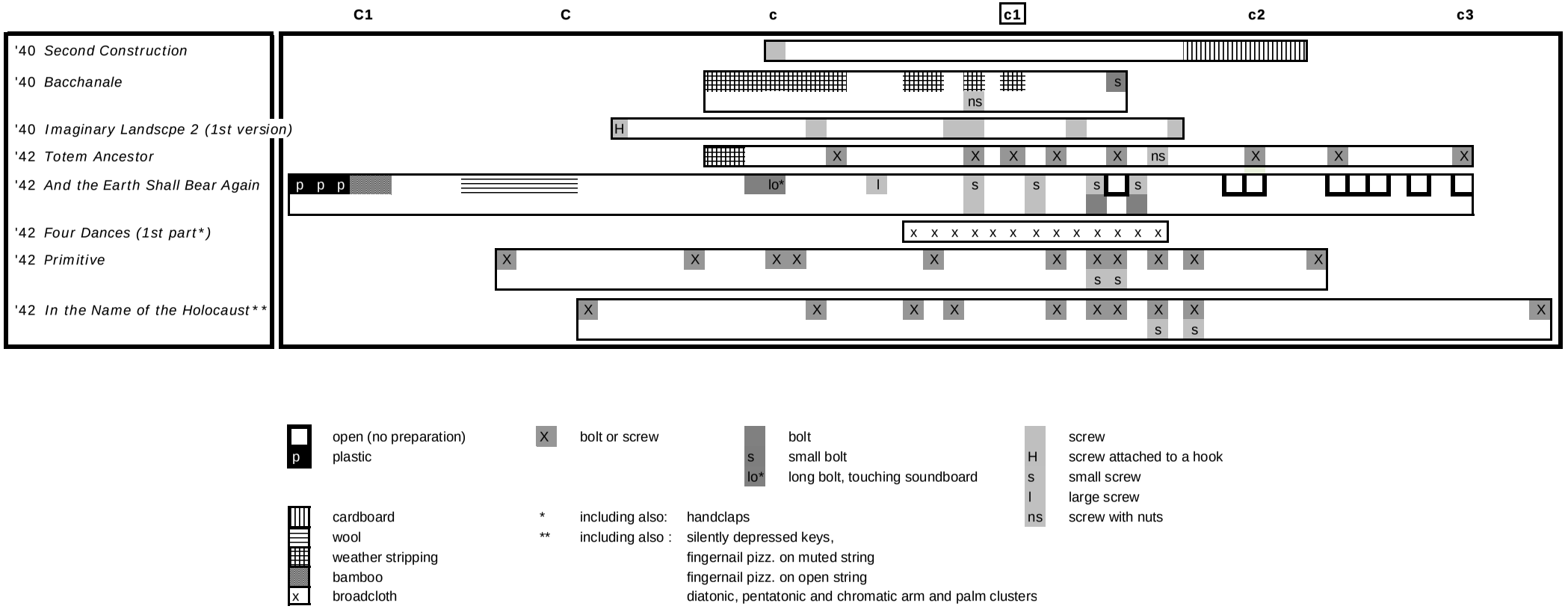


Table 3.3. John Cage: overview of preparation materials - early period

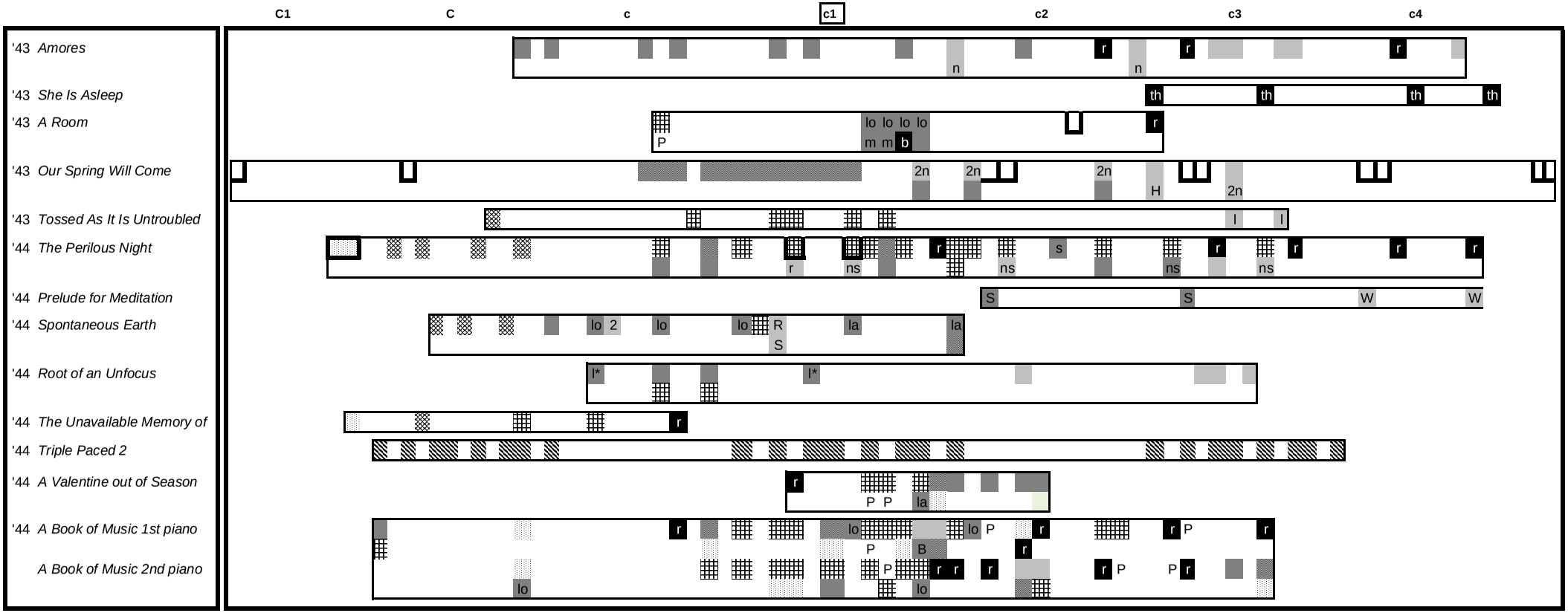
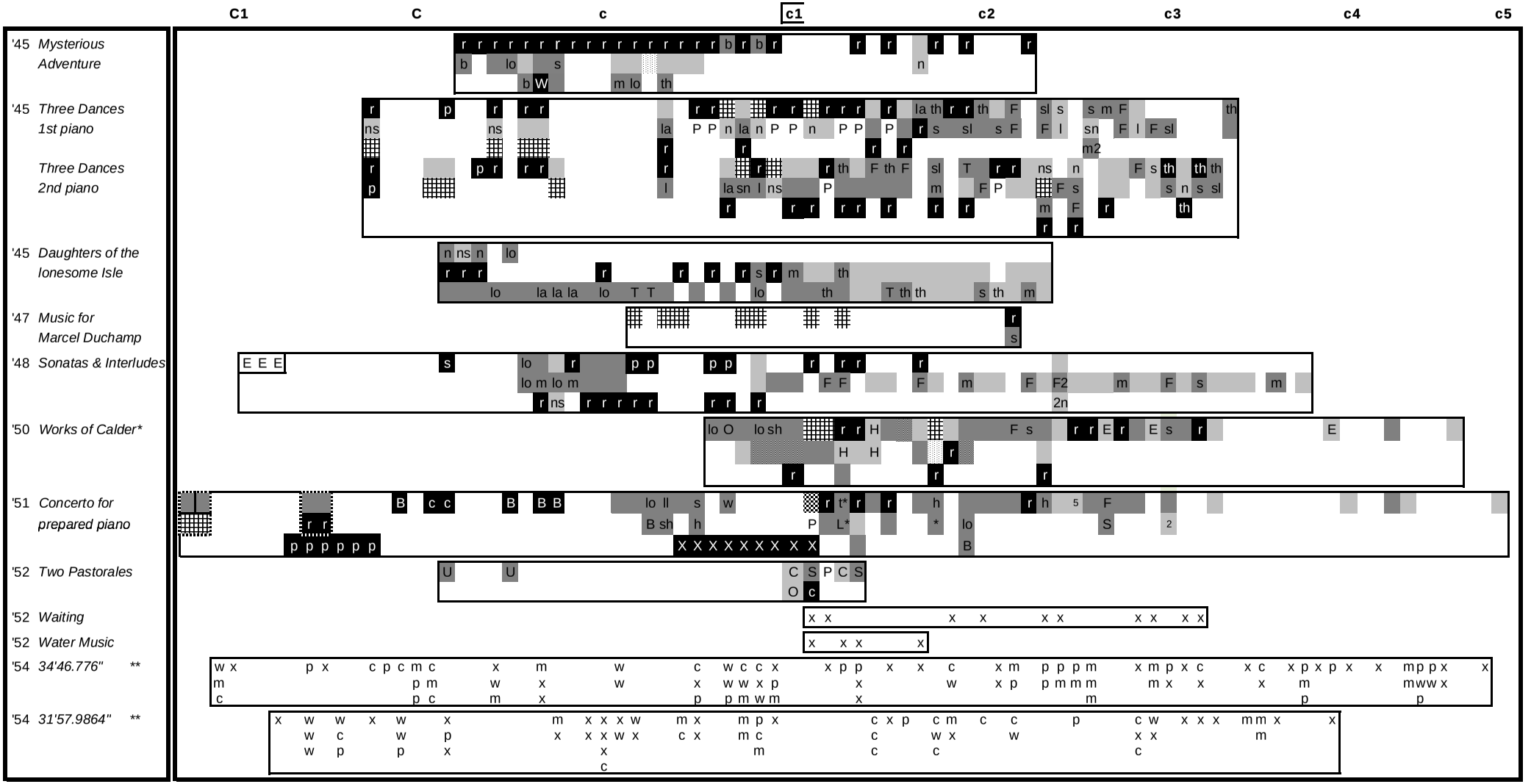


Table 3.4. John Cage: overview of preparation materials - middle period



	in between the strings of two notes		bolt	F2	furniture bolt with 2 nuts		screw	P	pennie
p	plastic	b	big bolt	T	typewriter bolt	s	small screw	E	eraser
r	rubber	la	large bolt	U	U-bolt	l	large screw	X	prepare at pleasure
s	screw + rubber	lo	long bolt	m2	medium bolt + 2 nuts	th	thick screw		
c	canning rubber	ll	long and large bolt	*	bolt on wood on soundboard	n	screw with nut	m	metal
th	thin rubber	m	medium bolt	L*	large bolt on weather stripping, touching touching sounding board near end of string	sn	small screw with nut	w	wood
B	rubber bolt	s	small bolt	t*	thinner bolt on weather striping, touching touching sounding board near end of string	ns	screw with nuts	c	cloth, fibre or rubber
W	Rubber-wrapped wood with bolt	sl	small long bolt	w	bolt resting in wood (of plastic bridge)	2n	screw with 2 nuts	p	plastic, glass or bone
X	plastic bridge	sh	short bolt			H	hook screw	x	other and free
		th	thin bolt	*	includes "pluck string 1/2 length"	E	screw eye		
	felt	h	headless bolt	**	includes non-prepared notes and other extended techniques	O	oval head machine screw		
	weather stripping	B	black bolt			C	Cup pt. Set Screw (slotted)		
	bamboo	F	furniture bolt			5	screw, 5th ring down		
	wood	O	Octagonal bolt			2	screw, 2nd ring up		
		S	stove bolt						

Table 3.5. John Cage: overview of preparations materials - late period

3.4.3.2.3.2.1 1940-42 The earliest pieces and the problem of distorted chronology

The early period is characterised by 2 to 3 different preparations per piece on average (*And the Earth Shall Bear Again* being the exception), mostly leaving the choice of "bolt or screw" up to the performer. Most pieces are prepared mono-chromatically and, except for *Four Dances,* of which the first movement requires the strings of *g-g*^{1} to be prepared with "broad cloth,"[1437] each preparation table consists of one main material and one or two notes that are differently prepared to be audibly distinguishable from the rest of the sounds. Despite the small average of preparations, they are spread over three to four octaves.

In this period, one piece stands out as being highly experimental in comparison with the compositions for prepared piano before and afterwards. *And the Earth Shall Bear Again* uses the longest stretch of the keyboard, a surprisingly diverse and elaborate preparation practice with some unusual materials (e.g. woollen material) and even specifically unprepared notes. The odd place of such complex preparation practice brings to light an underlying problem with the chronology that is perceived in table 3.3. Although the dates of the *premiere* and most of the dates of *composition* of these works are known, there is some serious doubt as to the chronology of the *preparation practices.* When looking at other details, we find that Cage appears to have been precise in his advised measurements from the dampers (*Bacchanale*), then leave them out altogether (*Imaginary Landscape 2, 1st version*) only to return to the practice (*Totem Ancestor* and *And the Earth Shall Bear Again* – precise to a 16th of an inch) after which to forget about them completely again (*Primitive, In the Name of the Holocaust*) until the 1943 *A Room,* onwards from which the distances become increasingly precise again. The listed chorus positions (indicating whether an object is inserted between the 1st and 2nd or between the 2nd and 3rd string) seem to follow the same illogical evolution. Yet, the simple *Primitive* and *In the Name of the Holocaust* were written on resp. 24th and 26th of December 1942, while the more complex and more informative preparation tables of *And the Earth Shall Bear Again* and *Totem Ancestor* are believed to have been used for their first performances one week (December 17/18) resp. two full months earlier (October 20).

The solution to this problem of chronology is found in a letter from Cage, admitting:

> Originally I knew where the preparations for Bacchanale should be placed and what they were, and so I didn't write them down. As time passed and I no longer played it, my memory faded, etc. When the piece was prepared for Peters, I tried it out on some piano (I haven't had on of my own since 1954) and wrote down what I thought was o.k. Then when Jeanne made the recording, we had a different piano, and so made the preparation that seemed suitable for it.[1438]

Cage here referred to Jeanne Kirstein, who recorded *Bacchanale* and other prepared piano pieces in New York in 1969.[1439] Nine years before, when Cage signed up with publisher C.F. Peters, the company acquired all of the rights to Cage's work and indicated copyright for all the music up to then as "1960." But the C.F. Peters catalogues from the 1960's did not list *Bacchanale* as for sale yet.[1440] The earliest reference to *Bacchanale* in the C.F. Peters catalogues is from 1976. All in all, there are three historical preparation practices for this piece: what Cage had used in 1940, the version that he came up with together with Jeanne Kirstein for the 1969 recording and the version that he submitted to

[1437] The manuscript shows this preparation requirement, though, unexplained, C.F. Peters does not mention it in the 1991 published version.
[1438] Message from John Cage to Richard Bunger on December 6, 1979 (in the John Cage Archive at Northwestern University – I thank Deborah Campana for having turned my attention to it.)
[1439] Columbia M2S 819 (2 LP's).
[1440] I am grateful to Gene Caprioglio, Vice President for New Music and Rights at C.F. Peters Corporation, for furnishing with these facts and insights. (Caprioglio 2009.)

C.F. Peters after that. The two known versions are very different from each other: in the recording there is no audible evidence of the weather stripping that the published score prescribes, rather all the notes are prepared with metal. In trying to establish the original 1940 preparation practice by comparing it with the later two versions, it must be assumed that Cage not only let himself be influenced in the 1960's by his experiences with the prepared piano in the past 20 years (representing dozens of pieces and preparation practices) but also by his changed views on how strict an original preparation table is to be adhered to. In 1948, he still believed that "very exact measurements must be made as to the position between the strings" and that, "in order to repeat an obtained result, that particular screw or bolt, for instance, originally used, must be saved."[1441] At least by the early 1970's, he had lost faith in a detailed preparation table for practical as well as philosophical reasons. He had let go of the idea to "possess sounds" in favor of letting chance have a say in it, and realized the futility of prescribing highly detailed preparation measurements and material characteristics for use on pianos that may not match the one the measurements where made on and by pianists that may not find the right materials.[1442] On the other hand, playing combinations of several prepared piano pieces (each with its own unique preparation practice that is incompatible with the others) during one dance program with mostly only one piano at hand must have made Cage aware of the necessity to be flexible in interpreting his own preparation prescriptions. The difference between the recorded and published preparation materials for *Bacchanale* shows that Cage was in fact not afraid to apply such flexibility. It is not known why and when exactly Cage changed from the metal preparations in the recording to the weather stripping in the published version, or vice versa[1443], and nothing in them reveals which version might be closest to the 1940 preparation materials. For this, we have to scrutinize the preparation practices that are more contemporary to *Bacchanale*, and to the way these can be trusted to be original themselves.

One of the manuscript preparation tables that survive – for *Totem Ancestor* – shows the process of revision in revealing detail. The original preparation table consisted merely of "screws or nails," with pencil additions "suggested preparation" and "bolt" (to replace "nails"). Underneath the lowest two notes on the accompanying staff originally stood "maybe rubber washers," while above them was added in pencil "double weather stripping best," with an arrow in color leading away from these notes to point to two more additions in color: "double weather stripping" and "under 1 & 3" / "over 2." Originally, the g^2 was annotated as "preferably metal washers on screw between screw-head and strings"; in color, a screw is drawn with two nuts around its thread and the words "screw with nuts (free to rattle)." Also in color was written "screws or bolts" with arrows to point to all the remaining notes. The sheet ends with a pencil addition "distances circa 2 inches." Evidently, the original preparation materials for *Totem Ancestor* were all metal, like those for *Primitive* and *In the Name of the Holocaust*. That Cage had initially thought of nails as preparation objects is in accordance with his own story of how he experimented early on in the process of developing the prepared piano's concept.[1444] The pencil and color additions show not only how he had progressed in his exploration of the potential of different materials. The addition "suggested preparation" is evidence of practical experience at different pianos and the insight that his ideas would work in every situation. Such progress and experience is logically from a later date than the time in which only the most basic preparations were established. Comparing the original preparation table of *Totem Ancestor* with those of *Primitive* and *In the Name of*

[1441] Cage 1948, p. 36-37.
[1442] Cage 1972.
[1443] The published score was "print-on-demand" at that time and could fairly easily be revised. Even if a printed publication existed, Cage could have made changes and requested a new edition at any time. (Caprioglio 2009.)
[1444] Cage 1972. Cage here makes a link between the switch from nails to screws (the former slipping down between and lengthwise along the strings) and the experiments before writing *Bacchanale* in 1940. Since the manuscript preparation table for *Totem Ancestor* (1942) still lists nails as an alternative, he must either have been tricked by false memories or continued to believe that nails might somehow be usable.

the Holocaust (both of the latter were not changed in between their known manuscript version and their 1977 C.F. Peters publication), it is obvious that the preparation table for *Totem Ancestor* is older (no double preparation yet, no small screws to "give a metallic rattling sound") and more akin to the screw preparation for the 1940 *Imaginary Landscape 2 (1st version)* while its final version is younger (weather stripping and loose nuts to give the rattling sound).

Reconsidering *Bacchanale*, it is unlikely that its original preparation table would have contained weather stripping, a small bolt and loose nuts on a screw: *Imaginary Landscape 2 (1st version)*, completed three days later, only has unspecified "ordinary screws" and one hook-screw. Since we can discount the published preparation table of *Totem Ancestor* – it is listed in the 1962 C.F. Peters catalogue as "publication date Fall 1963" but the lack of a price for it in the 1969 catalogue would indicate that it was not yet for sale and the 1976 catalogue is the one to show the piece as available[1445] – the screw-with-nuts starts appearing only in 1943 (*Our Spring will come*). Before that (in the manuscript version of *Totem Ancestor* and in *Primitive* as well as *In the Name of the Holocaust*), Cage prescribed less evolved ways to get a rattling sound: metal washers on a screw or small screws that are not held tightly by the strings. If we ignore *And the Earth Shall Bear Again* (this piece does not appear in any C.F. Peters catalogue before 1976) and the final version of *Totem Ancestor,* then specified types of bolts and weather stripping also start appearing only in 1943 (*A Room*). More evidence against weather stripping in such an early piece is the fact that Cage repeatedly wrote about metal objects when remembering the early preparation practices, and never any other type of material. That Harrison prescribed screws for his second prepared piano piece in October of 1941 (see below[1446]) further shows how nobody had yet thought of preparing the piano with anything but metal. Finally, like the "medium sized nail" in the manuscript preparation table of *And the Earth Shall Bear Again*, the "woolen material" for this piece is likely the kind of unsophisticated preparation specification typical of early pieces in a newly found idiom, perhaps the generic term for what later became the favored weather stripping. The original preparations for *Bacchanale* were most likely of the same type as the 1940 *Imaginary Landscape 2 (1st version),* i.e. mostly screws, except for two notes that would be prepared differently (but still with metal) to give a sound that makes them stand out.

Unlike *Bacchanale, Totem Ancestor*'s was part of the Cage and Cunningham dance repertoire and was performed at least four times in 1950 alone. It is only logical to assume that Cage would have used the experiences with preparations that he had accumulated during the 1940's when needing an older piece. *Totem Ancestor*'s final preparation table may therefore date from in between 1943 and 1950. It is not even certain that the first entries on the manuscript version of the preparation table for *Totem Ancestor* dates back to 1942: the annotations "maybe rubber washers" and "preferably metal washers [...]" may indicate that they were written down after *Primitive* and *In the Name of the Holocaust*.

Reconsidering the chronology of the early pieces based on a more likely original preparation practice, the two pieces *Primitive* (December 24th, 1942) and *In the Name of the Holocaust* (December 26th, 1942) would be more representative of the first solo prepared piano pieces than the published versions of *Bacchanale* and *Totem Ancestor*. (Table 3.6.) The *Imaginary Landscape 2 (1st version)* (May 1st, 1940) and *Four Dances* (December 7th, 1942) are then the more logical intermediary pieces between the *Second Construction* and the couple formed by *Primitive* and *In the Name of the Holocaust*. As for *And the Earth Shall Bear Again*, there is not enough information to assess in how far its diverse and complex preparation is likely in its context. The notated content is

[1445] Caprioglio 2009.
[1446] The first of Harrison's compositions for prepared piano – *Something to Please Everybody* (July 1940) – is lost.

certainly akin to the pieces that precede and follow it in the official chronology. Its preparation practice may either have been a sudden experiment, perhaps a little out of proportion in its context but still possible, or it may have been an evolved version dating from as late as 1944/45, when the other pieces are found with plastic, bamboo and long bolts touching the soundboard.

The point of a revised chronology is not to correct the official dating of *Bacchanale, Totem Ancestor* or *And the Earth Shall Bear Again*, nor is it to bring down Cage for having revised his own music. The musical content of these pieces remains linked to the dates that they were composed on. But the sounds that he had had in his mind and his ears originally were not those that we have come to know. With music for the prepared piano, the sound structure is as much, if not more, the essence of the composition than is the time structure, and, in the case of the prepared piano, the sound structure is not that of the pitches written out on the music staves, but that of the preparation table.

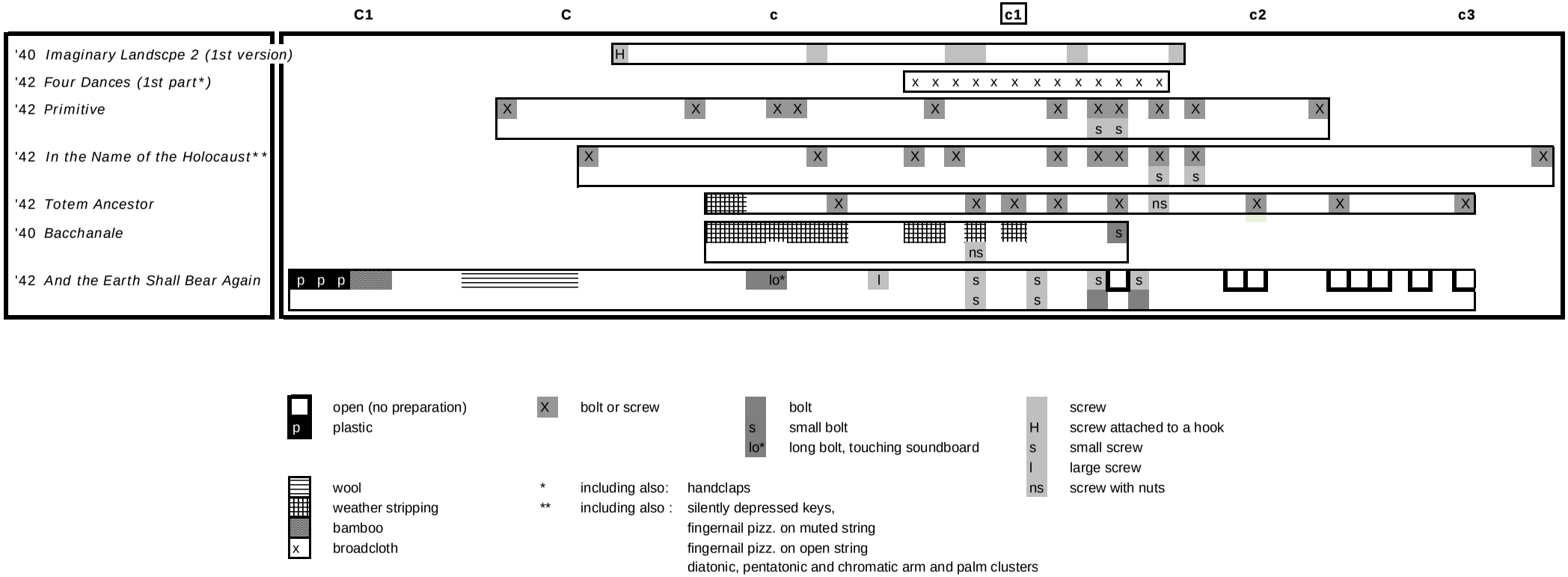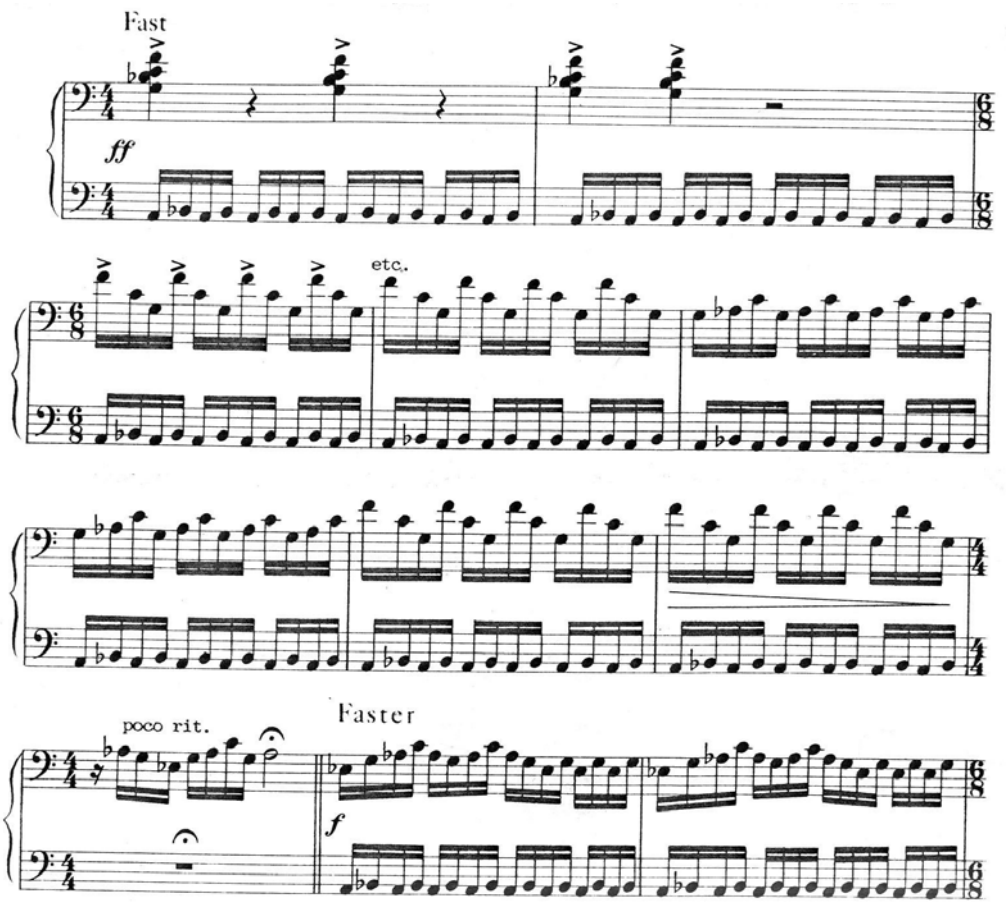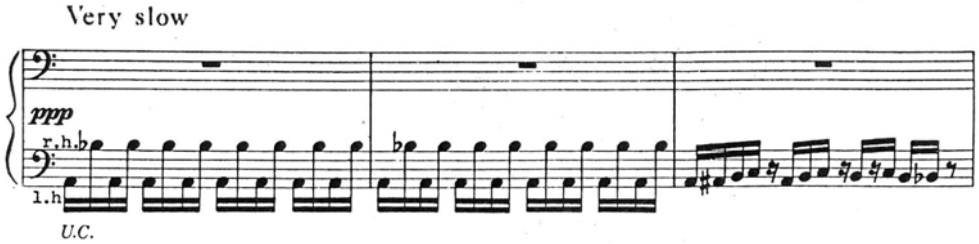


Table 3.6. John Cage: reconsidered chronology of Cage's early preparation practice

In this early period, where much of the prepared piano's potential remained unexplored (as much as Cage remembers "the excitement of continuous discovery"[1447]), it is the practice of including a few double preparations and one or more singular materials among a predominantly monochrome preparation timbre that shows best how Cage composed with the preparation table in mind. An early piece like *Bacchanale* follows the structure of the dance[1448]: much of its material – repeated motoric patterns – typically allows improvising dance accompanists to accommodate the flexibility that the dancer needs when articulating the choreographic structure. The fermatas at the end of many of Cage's phrases (e.g. bar 9 in ex. 3.784) follow the choreographic full stops of the dancer's freezing movements[1449]. But Cage found ways to compensate for these constraints and for the monochrome predisposition of the instrument (compare to the more diverse sounds of his percussion ensemble) by allowing for differently prepared notes to stand out from among the other, uniformly prepared sounds. Excepting the *g-b♭-c¹-f¹* chords as we can see them in the opening (ex. 3.784), the *b♭* (the only note with a loose nut) is reserved for the slow section, where it is put in the spotlight of the very slow tempo. (Ex. 3.785.) Especially the fast 7- to 9-note runs in the last section – benefiting from a homogeneous preparation – conspicuously lack that rattling *b♭*. (Ex. 3.786.) In *Totem Ancestor* Cage also waits until after the first part (i.e. from bar 49 onwards) with the specially prepared *g¹* (rattling metal) and the two lowest bass notes *B♭* and *A* (originally "maybe rubber washers" / later weather stripping). When they make their entrance, it is only in specifically composed characters, e.g. the *B♭* shows up in only one passage, where it alternates with the only note (*A*) of the same preparation. (Ex. 3.787.) In the later *Primitive* and *In the Name of the Holocaust,* the doubly prepared notes (two adjacent pitches in each piece) are used almost exclusively together, as heavily accentuated dyads. (Ex. 3.788.) In *And the Earth Shall Bear Again*, the rattling sounds made by the small (slightly loose-fitting) screws and the objects that touch the soundboard are the ones that Cage exploited for grabbing the attention. (Ex. 3.789.) In the same piece, Cage's use of unprepared notes comes as a complete surprise when these proper sounds enter the percussive atmosphere. (Ex. 3.790.)
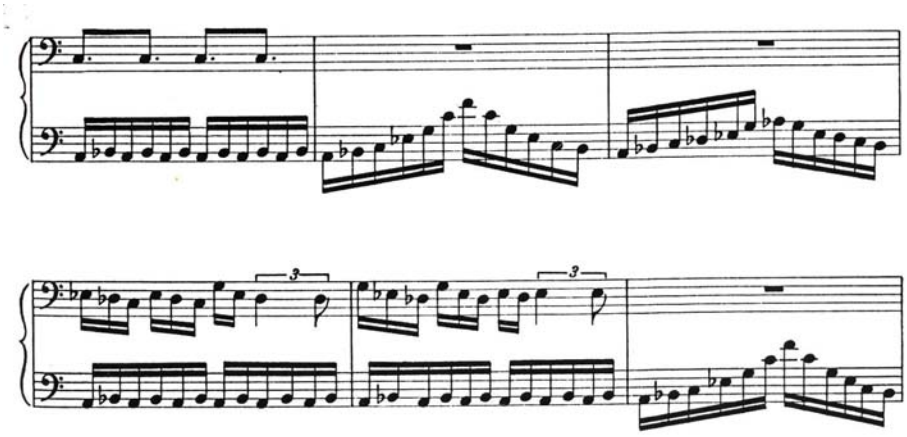
[1447] Cage 1948, p. 37.
[1448] Levitz 2005, p. 138.
[1449] Levitz 2005, p. 138.
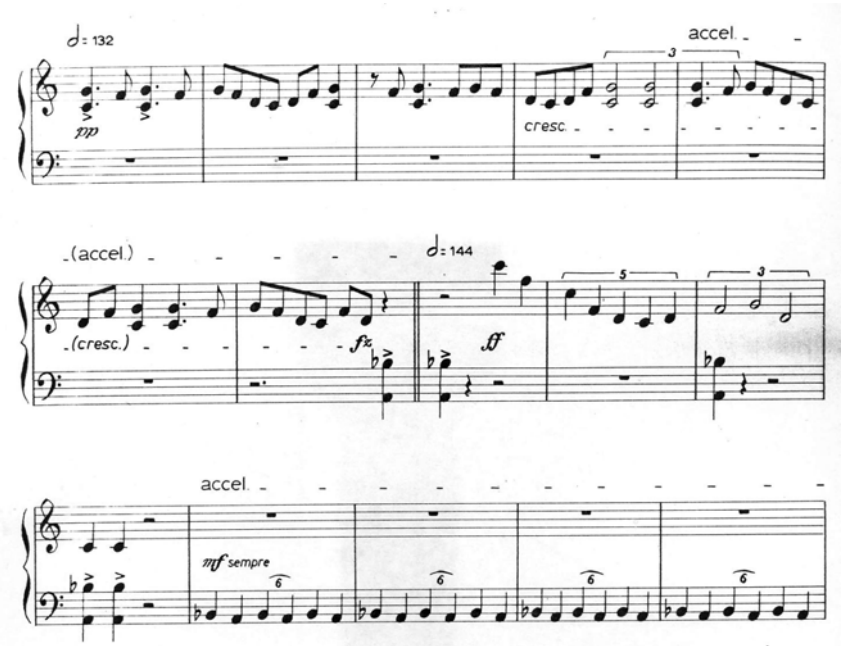


Example 3.784. J. Cage: *Bacchanale* (1940), opening bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
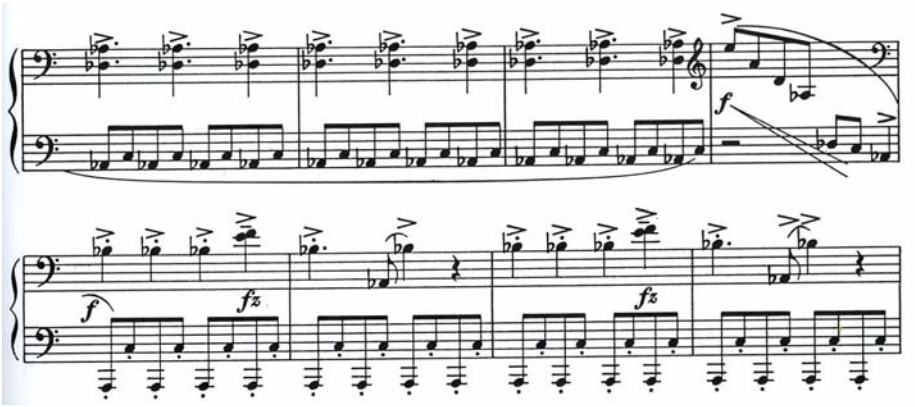


Example 3.785. J. Cage: *Bacchanale* (1940), bars 74-76 Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
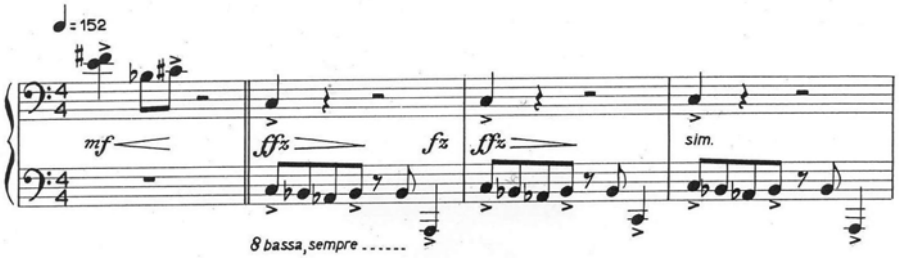


Example 3.786. J. Cage: *Bacchanale* (1940), bars 154-159. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
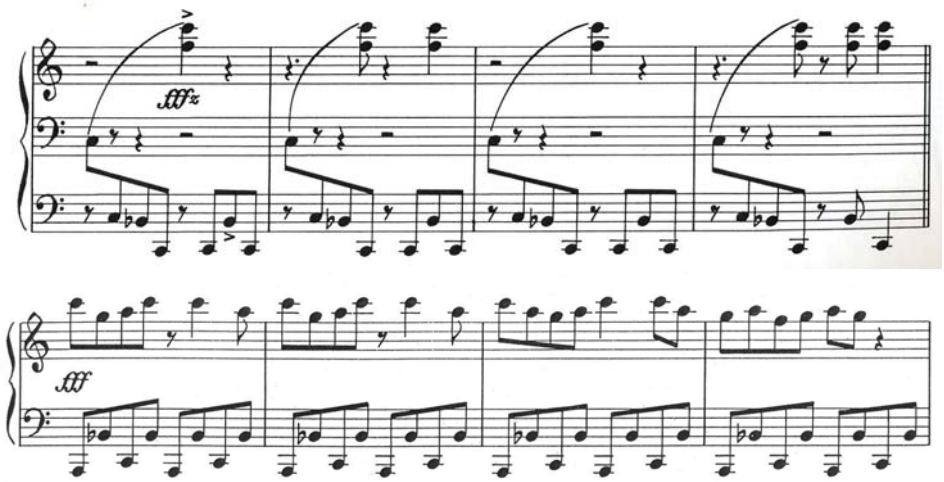


Example 3.787. J. Cage: *Totem Ancestor* (1942), bars 49-63. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.788. J. Cage: *Primitive* (1942), bars 56-63. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.789. J. Cage: *And the Earth Shall Bear Again* (1942), opening bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.790. J. Cage: *And the Earth Shall Bear Again* (1942), bars 57-64. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

One other noteworthy detail is the use of the una corda pedal. This pedal has the unique ability of moving the keyboard and the action to the right so that the hammers do not strike the first (left) string of the triple choruses. In case of a single preparation, the una corda effect depends on where the object is inserted. When a preparation is inserted in between the 2nd and 3rd string, leaving the 1st string to sound properly, the tre corde sound will be a mix of prepared and unprepared sounds. With the una corda pedal depressed, only the prepared sound is heard. If the object sits in between the 1st and 2nd string, depressing the pedal will only result in a quieter sound as the mix of prepared sound (the 2nd string) and proper sound (3rd string) is still in effect. In case of a double preparation (an object in between the 1st and 2nd second string, an one between the 2nd and 3rd string), the una corda pedal makes the difference between a complex and a less complex preparation sound: when all three strings sound, the 1st string produces the preparation sound particular to the left object, the 2nd string is influenced by both the left and right objects, and the 3rd string sound is only altered by the right object. With the pedal depressed, the left object's mutation is still heard through the 2nd string but the specific 1st string sound – unique to that chorus – is gone. The difference is audible dependent on the kinds of objects. If all three strings are prepared with the same object (e.g. the exact same bolt or one piece of rubber woven through all three strings) there will only be a difference in volume (since only two of the three strings produce a sound). Surprisingly, *Bacchanale* is the only piece from this period that has una corda indications in the score. If the published positions of the preparations along the strings in the published versions are indicative of the original, the una corda pedal makes little difference: most of the preparations are prescribed for the 1st and 2nd string so that the sound of only the 2nd and 3rd string is the same as in tre corde. But the small bolt and the screw with nuts are to be put between the second and third string, so that the una corda pedal does have an effect. Cage furthermore prescribes the una corda pedal in such ways that the difference in sound of the notes with metal preparations is audible, proving that he is aware of the effect. (Although the senseless indication of gradually releasing the una corda shows that he does not yet fully understand the technique.) But the idea that Cage would have attained such a sophisticated level of preparation practice so early on, only to discard it for the next six pieces until *Amores*, makes one wonder if the una corda pedal practice had really been part of the original *Bacchanale* and not an addition for the 1970's Peters edition.

This early period shows that, for Cage, the purely prepared piano was not a major interest yet. Not only did he wait two and a half years after *Bacchanale* and *Imaginary Landscape 2 (1st version)* before returning to that concept: of 22 works written between those two pieces and 1943, only 7 are for prepared piano (one lost work: *Shimmera*). Of

those 7, three pieces demonstrate the continuing experiments with combinations of proper and improper use as we found them in the earlier chamber music works, with Cage trying out combinations of prepared sounds with proper piano sounds (*Four Dances*, *And the Earth Shall Bear Again*), of preparation techniques and playing on the strings as well as clusters (*In the Name of the Holocaust*) or other percussion techniques (handclapping in *Four Dances*). Cage furthermore wrote as many pieces for the proper piano (with and without extended techniques) as well as for percussion ensemble. In fact, Cage had not even thought of his invention as the "prepared piano": all the surviving original sources for the relevant compositions in this early period are titled "for string piano." Cage did not think of his invention as a new instrument, but rather as yet another new way to use the piano, like in the two *Constructions* and the *Imaginary Landscapes.*

3.4.3.2.3.2.2 1942-43 In search of the prepared piano's properties

If 7 out of 22 compositions, written between *Bacchanale* (1940) and the end of 1942, were for or included the prepared piano, the shorter period of 1942-43 leaves more than half (13 out of 22) of his output for this medium. Only 8 compositions were for piano, including *A Room* (which is optionally for prepared piano) and the *Crete* and *Dad* pieces, which are possibly from after 1944. Cage clearly had become interested in the prepared piano more than any other instrument or instrumental combination.

The pieces for prepared piano now have up to 11 different types of preparation materials. There is no more choice of "bolt or screw": either is now specified, if not in its generic form, then in a surprisingly wide variety of types, sizes and combinations. In this period Cage shows his love for experimenting: screws are tried out with one or more nuts, materials are meant to interact with the vibrations of the sound board, different types of materials are combined (metal and porous / metal and rubber), new materials are introduced (a penny woven through the strings, rubber, wood) and ways are explored to make the porous materials mute the strings more by doubling their amounts. Despite the diversity, some pieces are still monochromatically prepared, e.g. *She is Asleep, Prelude for Meditation* and *Triple paced 2.*

In the first period, the double preparation almost always involved a small screw that was to sit loosely in between the strings so as to make a rattling sound. Now Cage continues this habit only for the first half of the period (*Amores*, *Our Spring Will Come*, and *Perilous Night*). From *A Room* onwards, he tries out different combinations of materials for double preparations on a single chorus. The double and triple preparations are not only more diversified, the combinations of preparations now also cover multiple choruses.

Except for *And the Earth Shall Bear Again*'s preparation table (the 1942 date of which can be doubted – see above), all preparation tables until and including *She is Asleep* lack exact measurement for the preparation's position along the string. In the earliest pieces this was not indicated (*Primitive*, *In the Name of the Holocaust*) except for the published (and therefore later) versions of *Bacchanale* ("by experiment") and *And the Earth Shall Bear Again* (precise to a 1/16th of an inch). Now only *Amores* has "by experiment," there are no measurement indications for the cloth in *Triple Paced 2*, and we find "near bridge" in *She is asleep*. For the rest, from *A room* onwards, the measurements become increasingly exact, with some scores, e.g. *The Perilous Night,* specifying them to a 1/16th of an inch. Most measurements refer to the distance between the damper and the preparation but in many pieces there are distances to be measured from the bridge (*She is Asleep* ("near bridge"), *Root of an Unfocus* (end of string), *Our Spring Will Come*, *Prelude for Meditation*, *Book of Music*) and a few times the preparation is to be put between the damper and the keyboard (*Spontaneous Earth*).

Amores was the first of Cage's pieces with prepared piano to be published.[1450] Judging the extensive performance practice notes in the score, he considered this occasion – in July of 1943 – ideal or perhaps even necessary to take stock of the issues that he had learnt to deal with since *Bacchanale,* to communicate these to performers and to introduce the name "prepared piano." It is revealing to read how Cage elaborates on the preparation procedures by describing the sounds he wishes. With *Amores*, Cage decided that he disliked the metallic buzz sounds created by screws that are too small, even though he specifically prescribed those for *Primitive* and *In the Name of the Holocaust* to obtain a rattling sound. Cage now asserts that screws should produce a resonant sound, rich in harmonics, and that the rattling sound is to be realized by loose nuts on "somewhat smaller" screws (i.e. small enough to allow for the nuts to be loose, but not too small to give a metallic buzz). He adds that the loose nut also serves to shorten the duration of the sound as it stops the vibration of the strings by coming to rest on them. Cage reveals that he uses bolts for the lower strings because their greater diameter (than that of screws) is necessary in muting the longer strings to achieve – again – a resonant sound, rich in harmonics and free of any metallic buzzing. As for the rubber, he suggests that it "may be pushed into such a position along the strings that it will produce harmonics," even if such sound will naturally be more dull, thud-like than rich. Rubber may be substituted by absorbent paper or cloth, folded several times. He even warns against the reflex of trusting the notated duration, which may be longer than realistic in the case of rubber muting. Cage defines the prepared piano according to the "total desired result" of the preparation, i.e. according to the sound quality of the preparation, allowing the pianist to play the instrument
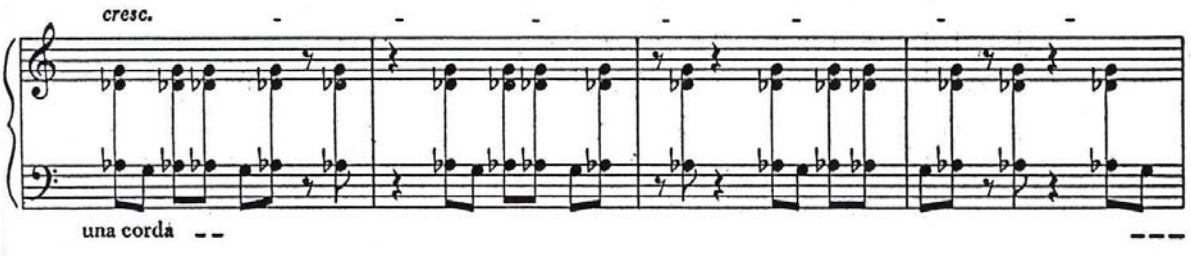
> without sensing that he is playing a piano, or even a "prepared piano." An instrument having convincingly its own characteristics, not even suggesting those of a piano, must be the result.

The size and position of the mutes are to be determined "by experiment" – the dimensions that he gives for the strip of rubber are probably meant to explain the procedure of weaving the material in between three consecutive strings – and he even lets the performer choose in between which of the strings (1st and 2nd or 2nd and 3rd) the object is inserted. The latter is important to connect to Cage's use of the una corda pedal in *Amores.* In the performance notes he asks the pianist to observe the pedal indications in the fourth part of the composition, "for, on a good instrument, the sounds will change accordingly, particularly in their amplified overtone structure." Cage does not explain the particular effect that the una corda pedal can have on the preparation timbre, although he prescribes that pedal for much of the last movement (the first does not contain any pedal markings and the second and third movement are for percussion instruments). This is remarkable since he also lets the performer choose the strings between which to insert the objects. A pianist that does not realise the potential of the una corda, will not think to take this into account when choosing the chorus position of the mutes. If the performer puts his objects consistently in between the 2nd and 3rd strings, the una corda will have only a small effect. The same goes for the double preparations: the effect of the una corda depends much on where the screw with the loose nut is placed. (As in previous pieces, only two notes are equipped with these.) At any rate, also for double preparations the effect is minimal (see above). As for *Bacchanale,* one has to wonder whether Cage really consciously composed with this una corda effect.
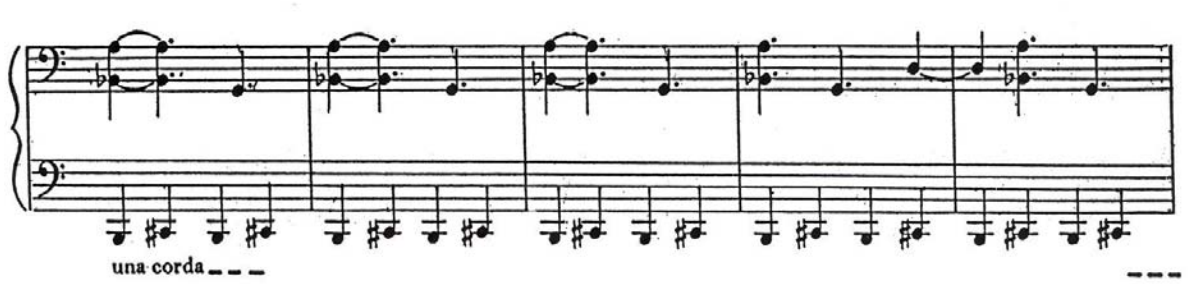
In all of this second period, 6 out of the 13 pieces have una corda prescribed. Besides *Amores,* there is *A room*, but for this piece the una corda pedal has to be depressed from beginning to end, so there is no differentiation. In *The Perilous Night*, only two of the six movements have una corda indications. The effect is no more then a slight change in volume, as all except on note have preparations that affect all the strings of the chorus.

[1450] In *New Music: A Quarterly of Modern Compositions* 16, no. 4 (July 1943).

(The lowest notes have one preparation but these notes are supposed to have only two strings pr chorus.) The *d♭*[1] has a small bolt between the 2nd and 3rd string, potentially allowing for a marked difference between tre corde (prepared and unprepared sound together) and una corda (only prepared sound). But Cage did not take this in any particular account, as witnessed by the facts that this note does appear much in the passages with una corda, and that, when it does appear, there is no indication that an effort was made to exploit the effect. *Spontaneous Earth* is actually the first piece in which Cage demonstrates that he consciously composed with the una corda pedal. The una corda is used for two types of passages: one in which the pedal makes only a difference in volume because all the notes are doubly prepared (ex. 3.791) and one pattern where the una corda makes sure that the unprepared sounds of the *g*, *a♭* and *d♭*[1] (three out of the four notes with single preparations between the 2nd and 3rd strings) cannot be heard. (Ex. 3.792.)

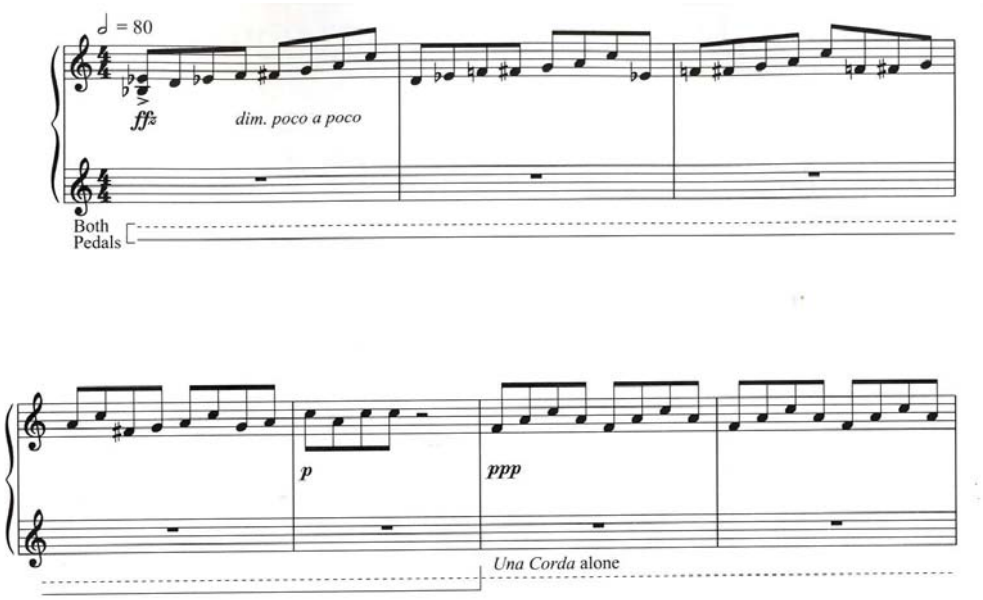


Example 3.791. J. Cage: *Spontaneous Earth* (1944), bars 28-31. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

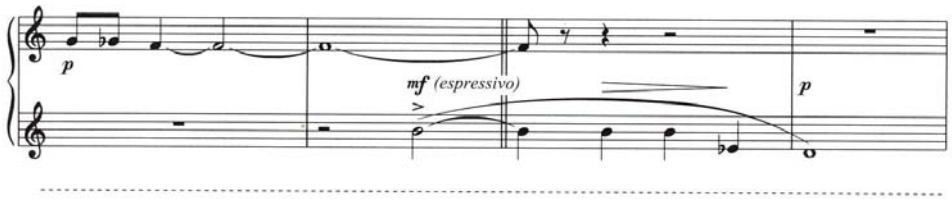


Example 3.792. J. Cage: *Spontaneous Earth* (1944), bars 73-77. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

A Valentine out of Season also shows Cage specifically working with the una corda effect. Four notes have only one preparation, of which three have an object between the 2nd and 3rd string. Cage only indicates una corda in the final movement, but from its beginning to its end. The musical material consists mostly of running eight notes, from which one note is conspicuously left out: the *b*[1], prepared with a bolt between 1st and 2nd string so that the 3rd string is unprepared, regardless of a depressed una corda pedal. Because this 3rd string would always add a proper piano sound to the timbre of the *b*[1], Cage did not want it in this running eight-note pattern, which therefore sounds consistently as a collection of prepared timbres. (Ex. 3.793.) At one moment in the movement, a melody appears – "mf (espressivo)" – and here the *b*[1] makes its surprising entrance. (Ex. 3.794.) This note is used in the first movement also, but there Cage did not use any una corda and the *b*[1] does not stand out any more than the other three notes with their mix of bolt and unprepared sounds.
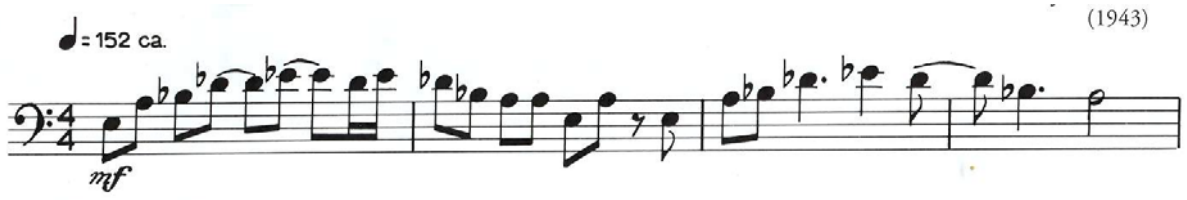


Example 3.793. J. Cage: *A Valentine Out of Season* (1944), 3rd movement, opening bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
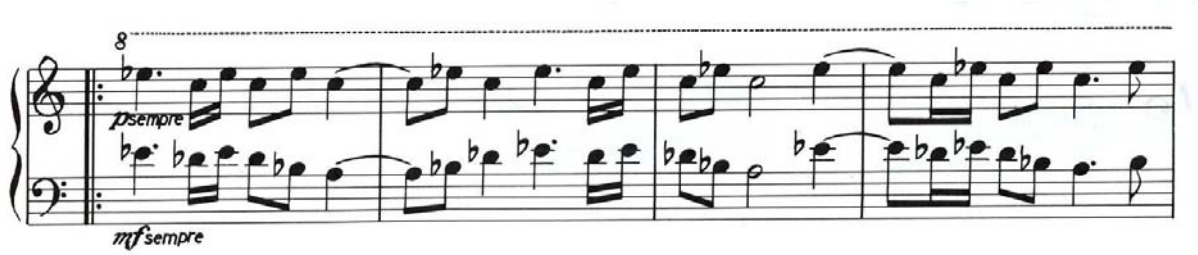


Example 3.794. J. Cage: *A Valentine Out of Season* (1944), 3rd movement, bars 16-19. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Many of the pieces in this two-year period still have the rhythmic, repetitive, motoric type of materials that connect the prepared piano to ensemble percussion music, but the potential of the prepared piano to produce a *Klangfarbenmelodie* gains prominence in the years to come. At first the melodic material had been basically monochromatic, as in the metal preparations of *Primitive* and *In the Name of the Holocaust*, although each piece had two notes with an extra rattling sound, and the pianist was free to vary the sounds by choosing between types of bolts and screws as well as deciding the placement of the objects along the strings so that differently sounding nodal points could be activated. Cage now searched for new ways to explore the colouring possibilities of the prepared piano. In *Tossed as it is Untroubled* he divided the available range into basically two parts: low and middle strings are prepared with weather-stripping while the treble has double metal preparations. Most of the piece consists of a single one-hand line with the weather stripping tones (ex. 3.795) – the metal preparations are only used twice, in a careful dynamic balance, to add overtone-like colorations as if it were a combination of registers on an organ (ex. 3.796).
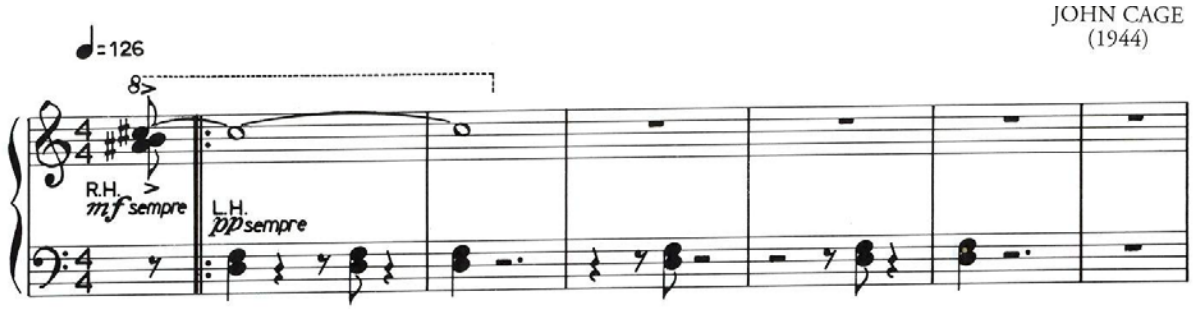


Example 3.795. J. Cage: *Tossed as it is Untroubled* (1943), opening bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
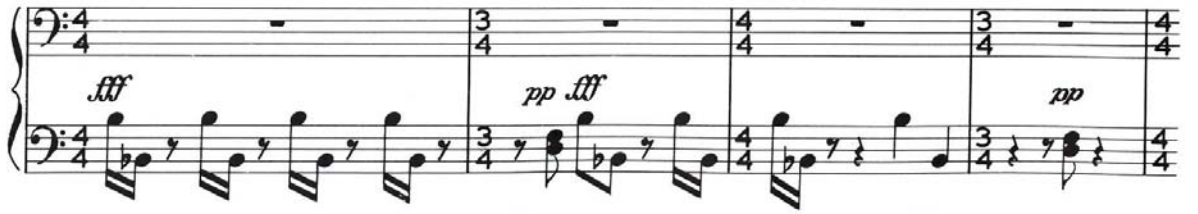


Example 3.796. J. Cage: *Tossed as it is Untroubled* (1943), bars 70-73. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
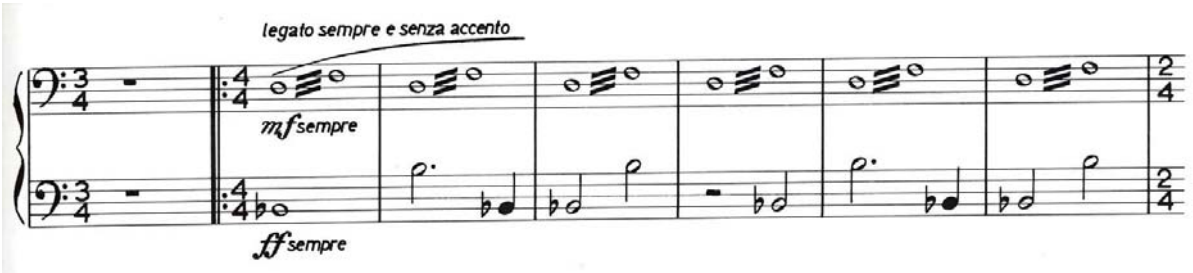
In *Root of an Unfocus* three ranges are sharply defined by preparation type: the top notes have screws, *f* and *d* have a double preparation (weather stripping and bolt), and the *b* and *B♭* each have a long bolt that touches the soundboard. The whole piece is composed of different types of content tailor-made to the characteristics of the preparation materials. (Ex. 3.797-3.799.)



Example 3.797. J. Cage: *Root of an Unfocus* (1944), opening bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



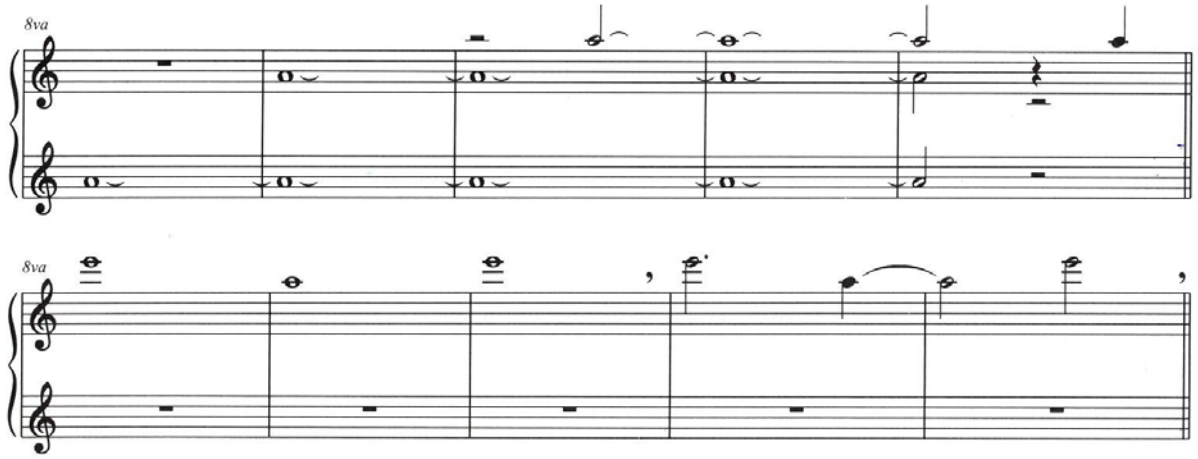
Example 3.798. J. Cage: *Root of an Unfocus* (1944), bars 49-52. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.799. J. Cage: *Root of an Unfocus* (1944), bars 66-72. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
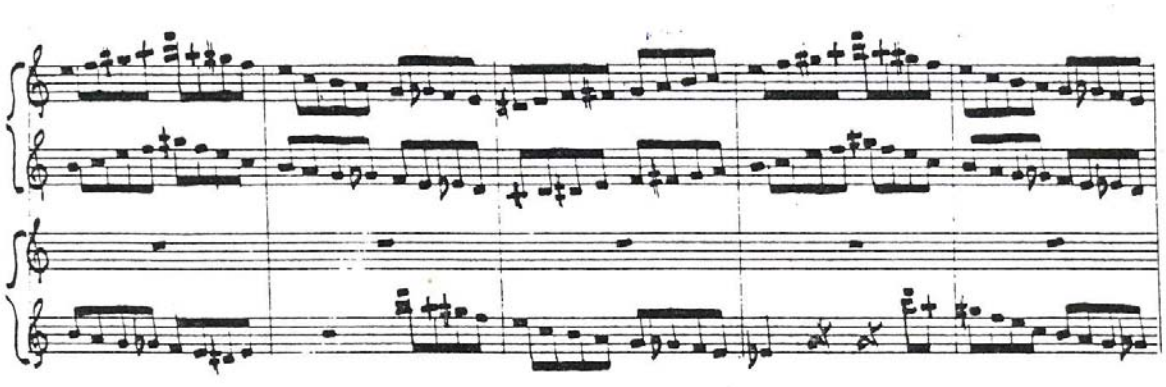
Probing for the prepared piano's capacity to produce colours, Cage sought the extreme with *Prelude for Meditation,* a small, quiet and slow composition built on four notes that provide hardly any rhythmic or melodic qualities. The preparation materials are simple but carefully positioned to produce four different bolt- and screw-sounds, which are

allowed their full natural decay by way the pedal being held all the way to the end of the piece. (Ex. 3.800.)



Example 3.800. J. Cage: *Prelude for Meditation* (1944), bars 6-15. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

At the other side of the spectrum, Cage examined how the prepared piano would hold up in large-scale structures and sustain a type of virtuosity that had been typical of the monochromatic piano but which Cage himself could not attain. *A Book of Music* for two prepared pianos was written for a professional piano duo (Robert Fizdale and Arthur Gold) and the ambitious composition combines Cage's interest in scale-patterns[1451] with propulsive rhythms and high speeds to the point that the individuality of the preparation timbres cannot be distinguished anymore. (Ex. 3.801.)



Example 3.801. J. Cage: *A Book of Music* (1944), part II, from 9 bars before cue 23. 𝅗𝅥 = 176. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

[1451] Cage 1948.
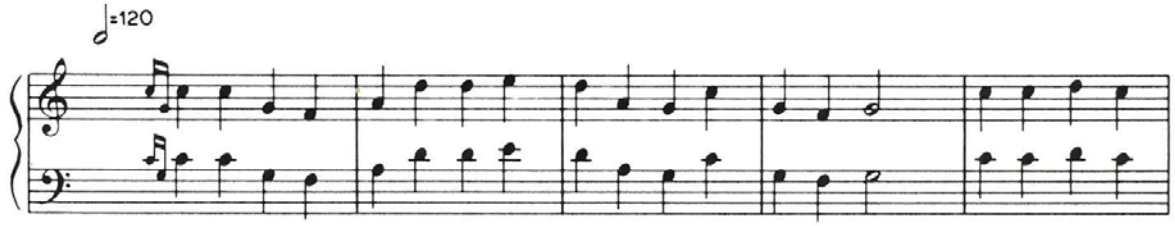
3.4.3.2.3.2.3 1943-52 Towards exactitude and back

The decade between 1943 and 1952 shows Cage at the height of his prepared piano adventure. The pieces are diversely prepared with 3-26 different objects (not counting the two pieces with free preparations). For metal alone, there are up to 7 types of bolts with a total of nine sizes and 4 types of screws in 3 different sizes.

If the two pianos of *A Book of music* were still modestly prepared, from *Mysterious Adventure* onwards there are many triple and complex preparations with a distinct preference for the dry thuds produced by rubber mutes. The *Concerto for Prepared Piano and Orchestra* is the high point of the repertoire, with the largest, most diverse, sophisticated and demanding preparation practice. New techniques were developed, such as preparing single stringed bass notes by inserting the object in between the strings of two neighbouring notes, or a second bridge that is to be pressed in between strings and soundboard to shorten the speaking length of the strings. Cage even prescribes at which ring of the thread a screw is to be inserted. After the concerto, an urge to leave decisions up to the performer is immediately visible. For the two *Pastorales*, only *types* of bolts and screws are prescribed, both whistle-pieces define the preparation materials only according to the broadest categories, for *Water Music* and *Waiting* the preparations are chosen entirely freely, the latter piece even being “for prepared or unprepared piano.”

Before the *Sonatas and Interludes* (1948), Cage was specific about the positions of the mutes along the string to an 8th of an inch, counting from the damper or the bridge. In between the *Sonatas and Interludes* and the *Two Pastorales* (1952) he specified to a 16th or even to a 32nd of an inch (for the *Concerto*). For the *Two Pastorales* he even noted the dimensions of the preparation objects. Sometimes he distinguished between distances from the damper, from the bridge, alternated positions, measurements to the edge of the object or to its center (for the penny), from the bridge to keyboard side (*Works Of Calder*). For the *Sonatas and Interludes* and the *Concerto* he indicates the specific distance from the damper to the bridge on the strings of one note so that the pianist may calibration his measurements. After the *Pastorales,* all measurements abruptly disappeared and freedom in choosing materials was introduced.
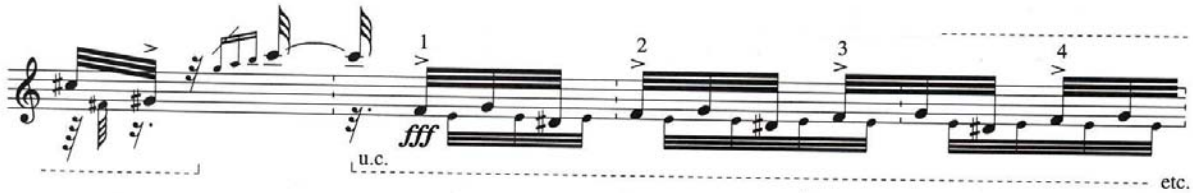
Except for *Mysterious Adventure* and *Water Music,* all pieces in this period have una corda indications. In *Three Dances* the left pedal is only rarely deployed to avoid the proper sound of notes that only have their 2nd and 3rd string muted. The una corda mostly serves to dampen the sound, as demonstrated by the many una corda indications where the pedal makes no great difference. *Daughters of the Lonesome Isle* is for most part with una corda, leaving no proper pitches audible. Only the center part is noticeably composed in such a way that all the right hand sounds are muted and those in the left hand (except middle c which has rubber woven through all three strings) have a proper component. (Ex. 3.802.)
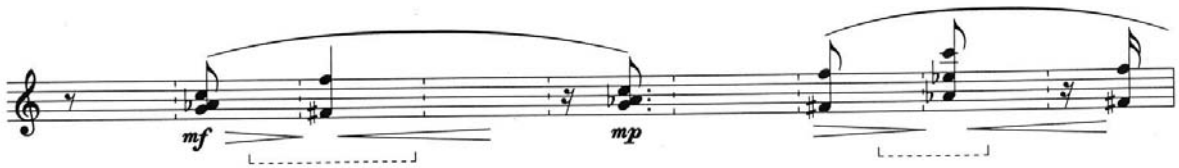


Example 3.802. J. Cage: *Daughters of the Lonesome Isle* (1945), bars 433-437. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

For *Music for Marcel Duchamp* the una corda pedal is depressed throughout so Cage did not compose with its potential for differentiation. Almost every preparation mutes all

strings of the chorus, except the note that has a bolt between the 2nd and 3rd string. Cage could easily have prepared that note with two bolts so that no proper piano sound could be produced. That means that the una corda pedal is here used for softness of tone. It is with the *Sonatas and Interludes* that Cage proves to really master the resources of the una corda pedal. The preparation practice of this set of sixteen *Sonatas* and four *Interludes* includes 47 prepared notes, of which 26 only have their 2nd and 3rd string muted. That Cage exploited the pedal's capacity for adding timbres to the preparation table's palette is shown in his general directions for preparing the instrument to play the *Sonatas and Interludes*. Here he states the use of the pedal to "result in a decided change of timbre in the case, particularly of the following notes," then listing 25 of those notes that have their 1st string unprepared.[1452] It is clear that Cage prefers to use the una corda pedal to switch between fully- and half-prepared sounds and not so much between different nuances of doubly prepared notes. Proof of purposeful use of the una corda pedal for timbral differentiation is easily found in the score: the second *Sonata* has a *forte* passage for una corda; the first *Interlude* is composed with many of the 26 half-prepared notes and is to be played completely with una corda except, for a few bars where the majority of the notes have a proper pitch in their timbre; the fourth *Sonata* is in una corda except for a few melody notes that have their 1st string unprepared or are completely unprepared. Sometimes una corda is used merely to soften the dynamic level and some pieces have the left pedal depressed fully from beginning to end so that no differentiation is possible. *Works of Calder* also has una corda throughout, except for short whiles where, for instance, a tre corde passage is followed by a *fff* sequence in una corda (ex. 3.803), or where the left pedal is used for a single chord in between tre corde chords, showing Cage's interest in sharply juxtaposing completely prepared timbres with partly pitched sounds. (Ex. 3.804.)



Example 3.803. J. Cage: *Works of Calder* (1945), bar 41. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

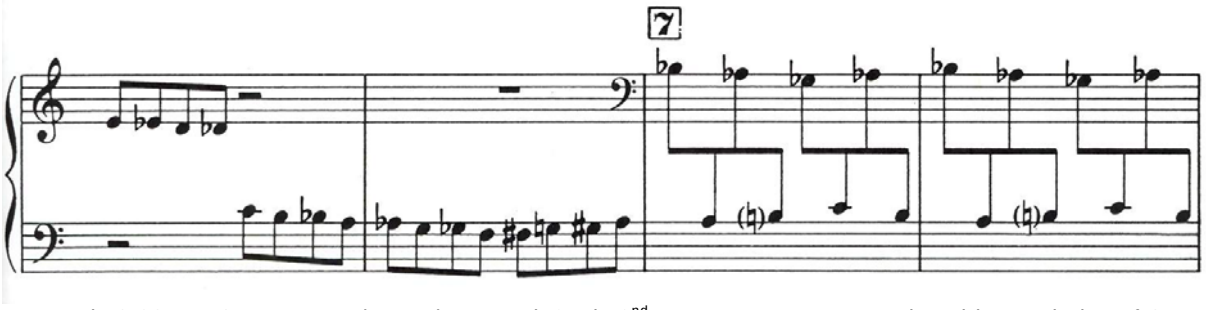


Example 3.804. J. Cage: *Works of Calder* (1945), bar 58. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

For the *Concerto* 18 of the 53 prepared notes have an unmuted 1st string, but Cage only uses a little over 100 of those sounds in the whole work. Obviously, he is not very much interested in half-prepared sounds. In the *Two Pastorales* – where the prepared notes are also few and compete with many non-prepared ones as well as sounds produced by other extended techniques (see also below, 3.4.4.1) – there is no discernable application of the
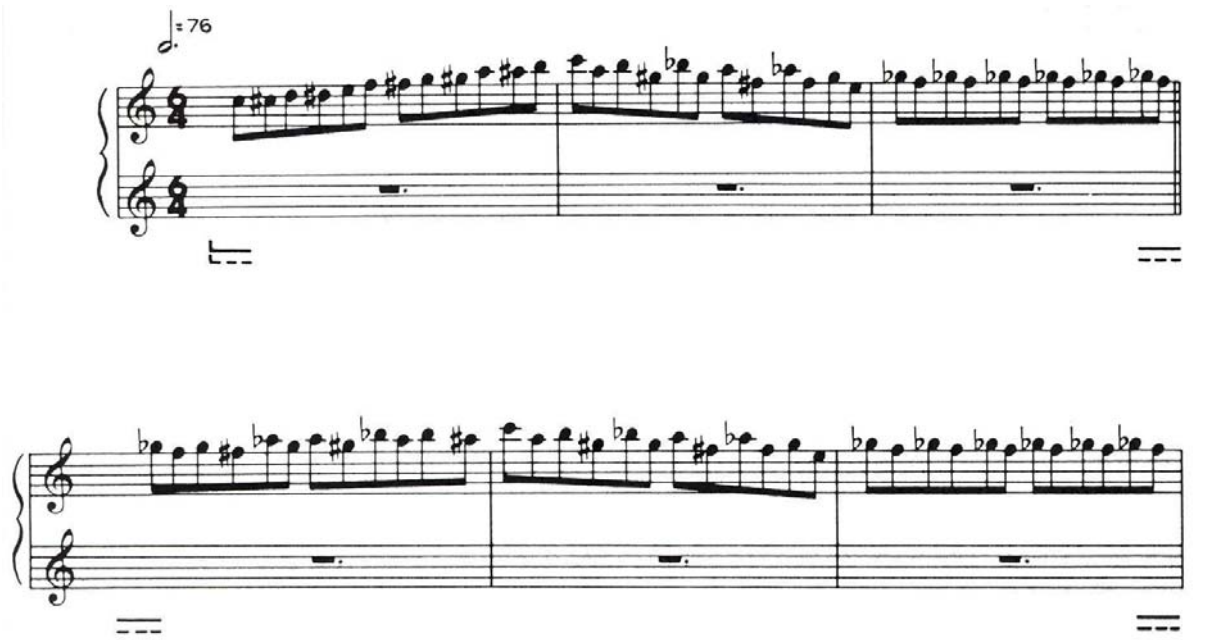
[1452] The list contains one note that is doubly prepared and does therefore not belong in the list, while missing two other notes that do fit the profile of the half-prepared notes. These general directions are typed on a page that came with the boxes of preparations for *Sonatas and Interludes* that Cage assembled to be sold together with the published score. Two such boxes (one of which was recovered by the author at Richard Lippold's home in 1998) are in the care of the John Cage Trust.

una corda pedal's particular timbral effect. For *34'46.776* and *31'57.9864* the pedals are at the discretion of the performer. (For these latter pieces, see also below, 3.4.4.3.2.) Akin to the "Klangfarben"-scales in *A Book of Music* (see above), the *Three Dances* were also written for the Gold-Fizdale piano duo. Many fast runs look like strings of adjacent tones on paper but sound like very fast sequences of different and often contrasting timbres. Cage uses such strings of sounds also in *Mysterious Adventure,* where the lack of polyphony and polyrhythm makes the piece sound like a high-speed monodic line. (Ex. 3.805.)



Example 3.805. J. Cage: *Mysterious Adventure* (1945), 2nd movement, cue 7. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
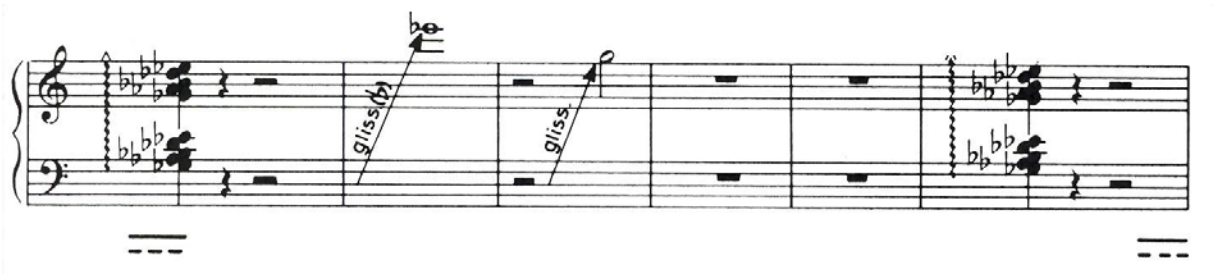
This idea is taken to an extreme in *Daughters of the Lonesome Isle* (ex. 3.806), of which the preparation table consists entirely of chromatically adjacent notes. In contrast to the early prepared piano pieces, the score of *Daughters* does not only look "chromatic" (cf. the earlier ex. 3.784, 3.787, 3.790), the preparation practice also allows for a very fast succession of timbres and gives the prepared piano a unique characteristic.



Example 3.806. J. Cage: *Daughters of the Lonesome Isle* (1945), opening bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

In contrast to the above pieces, the *Music for Marcel Duchamp*'s hypnotising relaxed patterns allow for the savouring of individual timbres. For *Works of Calder* and the *Concerto* Cage stuck to the practice of preparing a dense range of notes. In this respect, it is interesting to note that he included keyboard glissandos in *Daughters of the Lonesome Isle* and the *Concerto*. In the former, the glissandos start on an unspecified key but all the notes in the piece are prepared, so the sound effect is not so much a

glissando over adjacent pitches as an extremely fast sequence of different types of timbres, like the arpeggiated black-key chords in the same passage. (Ex. 3.807.)



Example 3.807. J. Cage: *Daughters of the Lonesome Isle* (1945), bars 338-343. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

The glissandos in the *Concerto* have one unprepared note in the middle – impossible to hear amongst the 17 notes that are produced in about a quarter of a second[1453] - but end on the b^2, which is not listed in the preparation table.

Several pieces in this third period of Cage's prepared piano development contain notes that are not prepared at all. In the early *And the Earth Shall Bear Again,* such notes were indicated in the preparation table; in *A Room* and *Our Spring Will Come,* as well as in the *Sonatas and Interludes*, they appear in the score unannounced.

3.4.3.3 1940's-50's Lou Harrison and the tack piano

After having written *Bacchanale* in Seattle in May 1940, Cage moved back to San Francisco where he teamed up again with Lou Harrison (1917-2003), whom he had met there in 1938 (see above 3.4.3.2.1). Besides getting back into organising percussion ensemble concerts together, Cage demonstrated his ideas on preparing a piano to Lou Harrison, who is said to have exclaimed "I wish I had thought of that." By early July of that same year, Harrison had tried out the new instrumental idiom himself, with the (now lost) music for the revue *Something to Please Everybody*, scored for prepared piano, percussion and recorder.[1454] Cage did not return to the prepared piano for more than two years, but Harrison wrote a second piece in October of 1941: *May Rain* for voice and prepared piano. The preparation practice is identical to what we can assume Cage had developed for *Bacchanale* (see above): for each of six specified pitches, Harrison asks for a screw to be inserted in between two of their three strings to produce "harmonics and a gong-like resonance."

Contrary to Cage, but much in the vein of the West-Coast percussion music culture that both composers were part of at that time, Harrison incorporated the prepared piano in a chamber music environment that included percussion instruments. It is not known what type of percussion he had wished for in *Something to Please Everybody,* but in *May Rain* the pianist only uses one hand to play the prepared piano part – the other hand operates a deep-pitched tam-tam seven times. The simplicity of the accompaniment is mirrored in the prescription for the voice to "sound almost untrained." The limited prepared sounds, the percussion part, and the performance note for the voice all anticipate Cage's *The Wonderful Widow of Eighteen Springs,* written a year later in 1942 (see below).

[1453] The two glissandos at cue 63 each have the duration of an 8th-note in a tempo of ♩ = 54.

[1454] Miller & Lieberman 1998, p. 87.

Harrison used the prepared piano once more, again in combination with percussion, in the music dedicated to the dancer Katherine Litz *A Glyph for Katy Litz* (1951) for prepared piano, two bells, claves, pitchfork and two gongs. But before this composition, he had already discovered what would become his own take on a modified stringed keyboard instrument. The 1949-50 *Solstice* is for a chamber music ensemble without percussion but with tack piano. According to Harrison, he made his first acquaintance with this instrument in New York sometime in the 1940's, when he saw a tacked grand piano serving as a substitute for a harpsichord.[1455] Apparently, the piano with thumbtacks in the felt of its hammers had found its way from the hot jazz and honky-tonk practices (cf. 3.4.3.2.3.1) to the classical scene, becoming the American version of the paper-prepared piano that early 20th century Paris is rumored to have used to mimic a harpsichord. (Cf. above 3.4.2.5.3.) This story may also throw further doubt on the report that Cage would have used tack piano for his Credo in US in New York in 1942. (See above 3.4.3.2.3.2.) Cage and Harrison were close friends there and then, so it is unlikely that Cage would experiment with tacks and Harrison would not know and later remember. Based on Harrison's comparing his use of the tack piano to the fact that "in certain musics metal hammers enhance the tone"[1456] he clearly knew of built-in piano devices like the mandolin rail (see above, 3.4.3.2.3.1).

Around that time Harrison explored clusters and playing on the inside of the piano (e.g. in the 1951 *Io and Prometheus* for two dancers and one pianist) but most of his continued interest in the extended piano went to the tack piano: in *Alma Redemptoris Mater* (1949-51), *Suite for Violin, Piano, and Small Orchestra* (1951), *Rapunzel* (1952), *Simfony in Free Style* (1955) and *Incidental Music for Corneille's Cinna* (1955-57). Later, Harrison would use the instrument for his *Concerto in Slendro* (1961) and later works. Often, Harrison combined the tack piano with celesta and sometimes the harp, calling these the "gamelan" section of the ensemble.
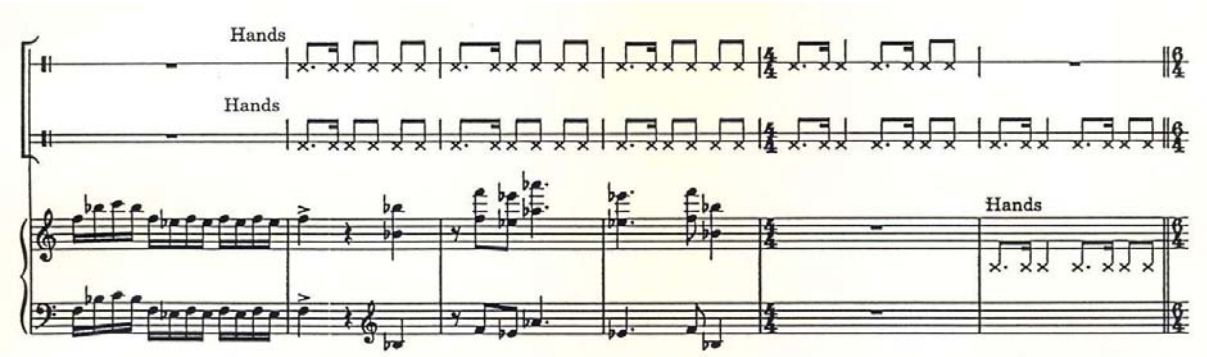
The ordinary tack piano does not offer the same potential diversity in timbre as the gamelan or as Cage's prepared piano. The prepared piano allows all types of materials to be put at virtually any nodal point on the string, whereas the tacks – then only in metal – can only strike the string in the one place that the hammers are designed to hit. But Harrison's tack piano did evolve beyond the metallic version of the homogeneously designed proper piano sound. At the end of the 1940's he became heavily interested in just intonation and soon the piano was not only tacked but also re-tuned to highly calculated specifics. As a single composition for or including the tack piano was written in a tuning devised specifically for that work, the re-tuned tack piano could sound almost as rich as prepared piano pieces that used different materials.

For his 1957 suite *Incidental music for Corneille's Cinna*, Harrison went even further. As it turned out, just intonation on a piano sounded better when choruses only had one instead of two or three strings (which also made it easier or quicker to change the instrument's tuning). But leaving out strings from a chorus requires restringing all the double and triple choruses of the piano, since one piece of steel wire is used for two strings. Restringing may be feasible at home, but to expect such a service from a concert organiser is asking for trouble. Therefore, Harrison stated that he "had in mind a small grand piano with one string to a tone" but offered a preparation technique as an alternative: "to effect an approximation of this ideal instrument, felts may be so woven among the choruses of an ordinary small grand piano as to leave but one string of each chorus sound."
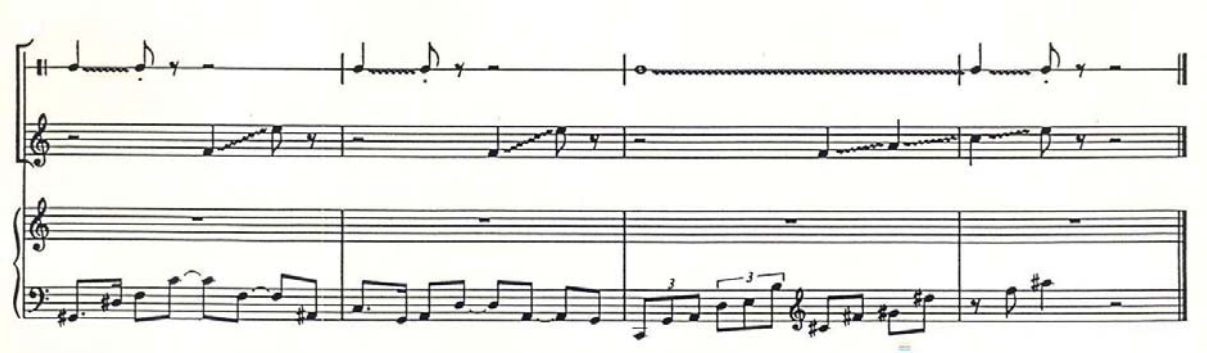
[1455] Miller & Lieberman 1998, p. 136.
[1456] Harrison 1957.

3.4.4 1950's-1963 John Cage II: synthesis and beyond
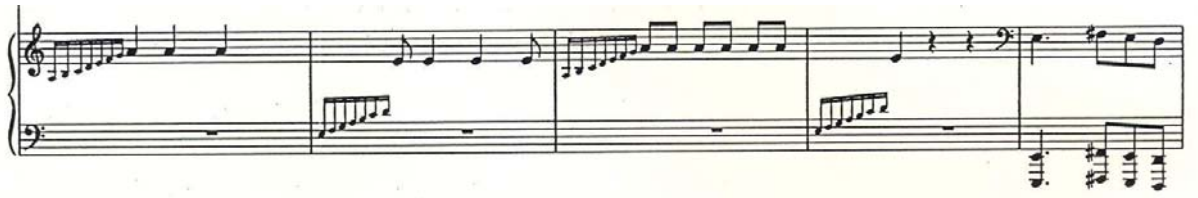
Cage may be much better known for his prepared piano than for any other music he wrote for the instrument, the fact is that he has been at least as important to the development of any of the other piano extensions. More than Henry Cowell even, Cage was responsible for the complete compositional emancipation of any sound production at the piano. His level of integrating extensions into proper piano playing had not been conceived of. The consequences of his relentless quest for new materials and methods to compose with even led to the piano be extended beyond all of its characteristics. All this was accomplished in the course of about a decade, between the Spring of 1951 and the 1963. Before that decade, Cage had of course already used extended techniques other than the prepared piano. Besides the pieces that precede *Bacchanale,* as discussed in 4.3.2.2, Cage continued his interest in non-prepared extended techniques until the beginning of 1943. In *Fads and Fancies in the Academy* for piano and four percussion players, written shortly after *Bacchanale*, he prescribes some of the very techniques that had characterized the first *Imaginary Landscape* and the two *Constructions*, like sweeping back and forth with a gong beater along bass strings. But Cage does not just stick with what he knows and continues to explore, either by elaborating on what he had already thought of before (again prescribing a metal cylinder but this time asking for it to be dropped on the strings) or by adding new ideas: the pianist claps his hands (ex. 3.808) and one of the percussion players glides over the piano's strings with a fork (ex. 3.809). In the third movement some keyboard glissandos seem to appear, demonstrating how Cage was perhaps not yet familiar with all the traditional ways to notate improper piano techniques (ex. 3.810).



Example 3.808. J. Cage: *Fads and Fancies in the Academy* (1940), 1st movement *Axioms*, 1a *The pupil is eager to learn,* bars 8-13. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
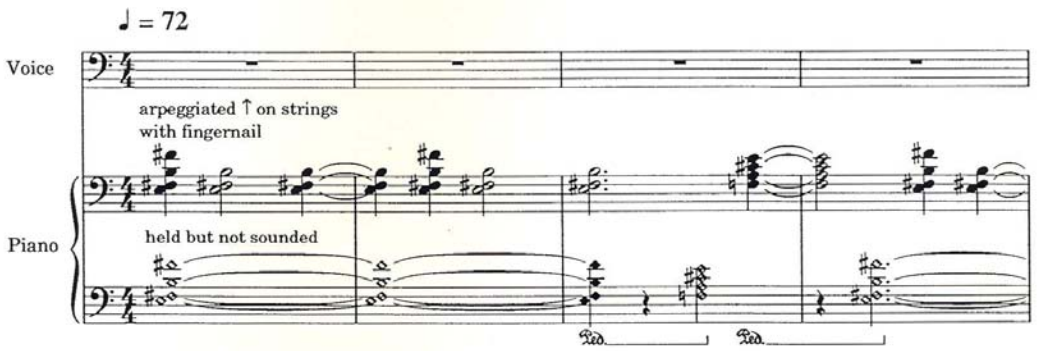


Example 3.809. J. Cage: *Fads and Fancies in the Academy* (1940), 1st movement *Axioms*, 1b *The pupil is constitutionally lazy,* final bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.810. J. Cage: *Fads and Fancies in the Academy* (1940), 3rd movement *Vistas of the Future*, 3a *Pessimist,* bars 49-53. In the manuscript, the stems and beams of the small notes have a diagonal line across them, as to indicate these runs to be fast ornaments. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
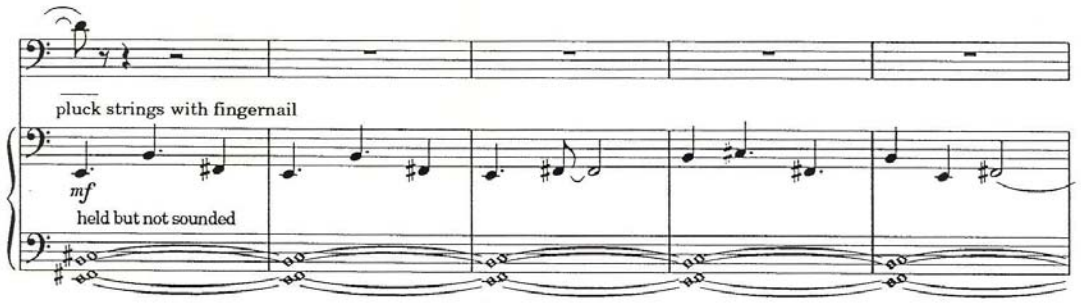
The use of the piano in *Fads and Fancies* is in keeping with what Cages wants the percussionists to do, e.g. hand claps, rubbing the snare of the drum with a drum stick, blowing on whistles, hitting brake drums, the inside of a metal wastebasket, or the corrugated bottom of an upside down bath-tub with metal beaters. In the unpublished *Music for the City that Wears a Slouch Hat* (1942) the pianist operates a whistle, buzzer, telephone, metronome ("at 76"), rattle, and sweeps as well as strikes low, medium and high bass strings with the gong beater.

In his *Four Dances* for piano, percussion and voice (1942-43) the first dance (for piano and percussion) is written almost exclusively on the white keys that are to be muted with cloth (see also 3.4.3.2.3.2.1) and asks for the pianist to clap his hands. For the second dance (for voice and piano), the cloth is removed and keys are silently depressed to open strings over which glissandos are played (ex. 3.811).
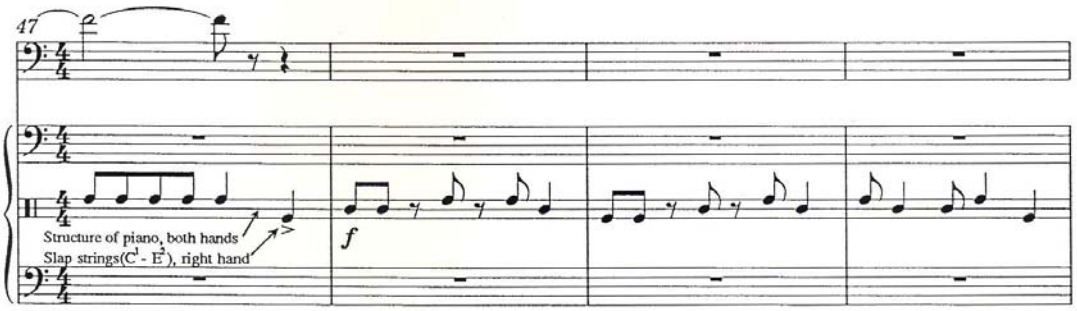


Example 3.811. J. Cage: *Four Dances* (1942-43), 2nd movement, opening bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

The fingernail is required to pluck strings that are also opened up by silently depressed keys. Either Cage did not realize yet that the sustaining pedal would amount to the same effect, or he purposefully wanted no other strings to vibrate sympathetically. (Ex. 3.812.)
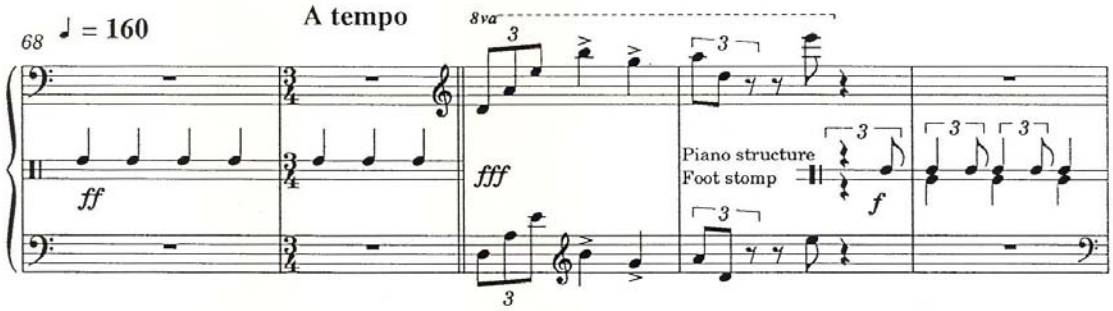


Example 3.812. J. Cage: *Four Dances* (1942-43), 2nd movement, bars 27-31. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

There is again handclapping in the second dance, but also hitting the structures of the piano with the hands, "slapping" a cluster on the strings, and foot stomps. (Ex. 3.813 and 3.814.) The latter of course remind us of the ragtime pieces from earlier in the 20th century. (See above, 3.4.2.4.) Cage may not have thought of any particular such piece, but his acquaintance with William Russel, and the often jazzy stylistics of these dances (as well as of *Fads and Fancies in the Academy* and other pieces), are enough to demonstrate his affinity with the improvising scene.
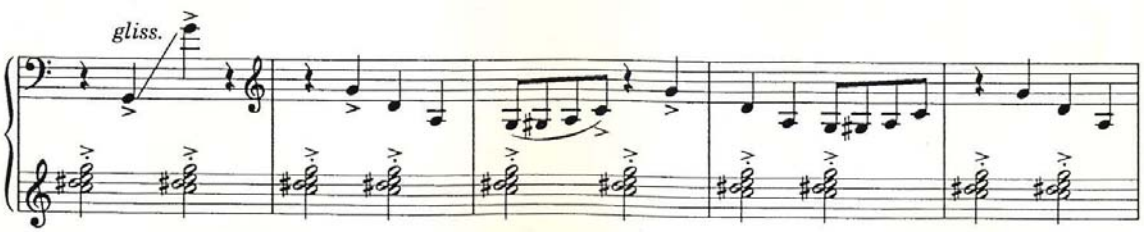


Example 3.813. J. Cage: *Four Dances* (1942-43), 2nd movement, bars 47-50. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.814. J. Cage: *Four Dances* (1942-43), 2nd movement, bars 68-72. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
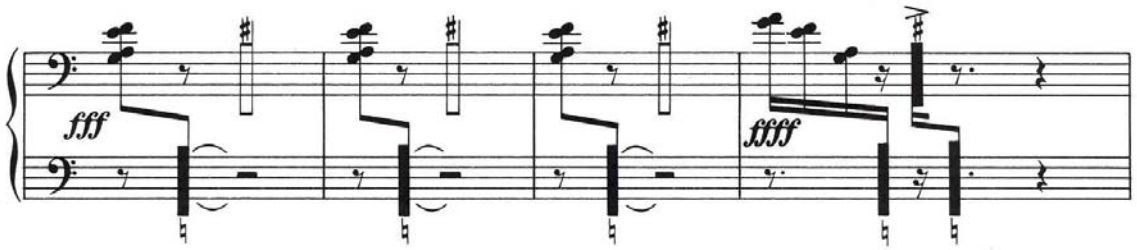
The 4th dance contains white-key glissandos, some of them played with the right hand in the left hand register. (Ex. 3.815.)



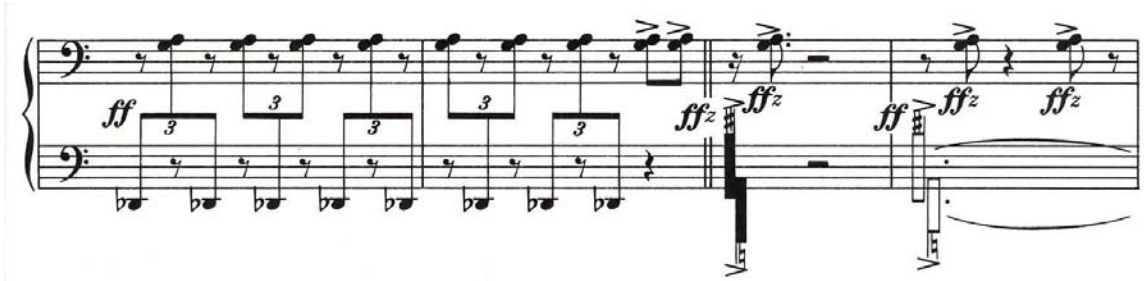
Example 3.815. J. Cage: *Four Dances* (1942-43), 4th movement, bars 46-50. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

While writing for the prepared piano in the 1940's, Cage did try out some other extended techniques in solo pieces as well. *In the name of the Holocaust* (1942) has silently depressed keys, plucked strings and clusters. Particular about the clusters is that they are indicated by their notation type to be either black- or white-key (not chromatic) and

either for the arm alone (ex. 3.816) or for a combination of arm and palm (ex. 3.817).[1457]

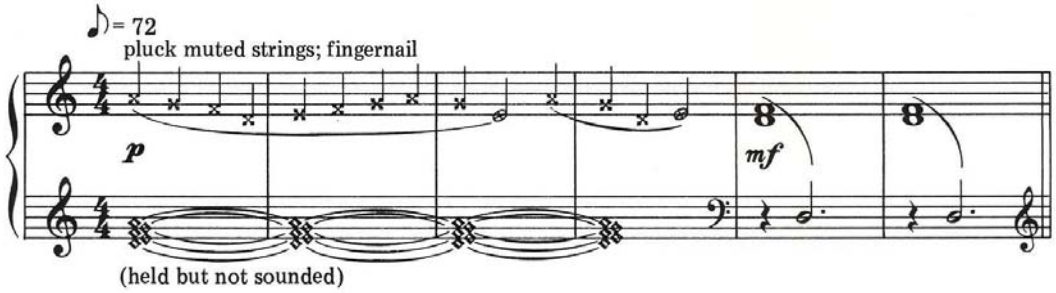


Example 3.816. J. Cage: *In the Name of the Holocaust* (1942), bars 77-80. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.817. J. Cage: *In the Name of the Holocaust* (1942), bars 65-68. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

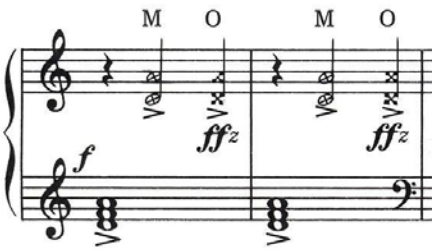
More importantly, the strings that the pianist must pluck with his fingernail are either open or muted. The latter indicates that the silently depressed keys must be held with the sostenuto pedal so that both hands are free to mute and pluck the strings. (Ex. 3.818.)
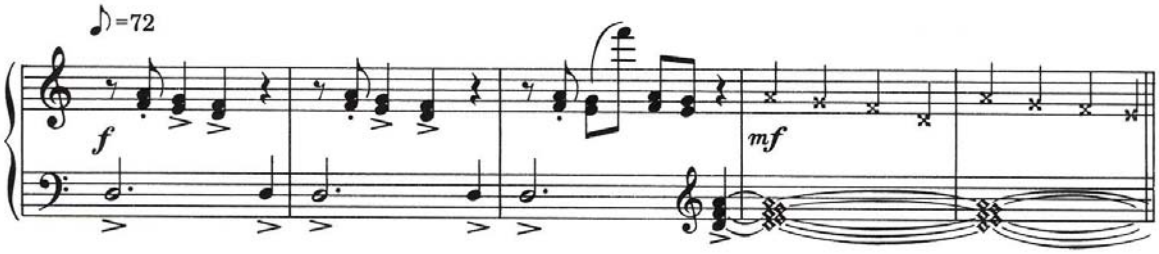


Example 3.818. J. Cage: *In the Name of the Holocaust* (1942), opening bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

It is far from clear what Cage really wanted with plucking muted strings that are opened by properly played notes (ex. 8.819). Muting the d^1 and a^1 blocks their sound right before they are plucked. Equally awkward in sound is the plucking of strings that have been activated by proper playing only just before. (Ex. 8.820.)

[1457] According to the performance notes.



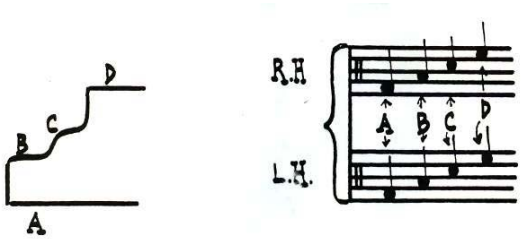
Example 3.819. J. Cage: *In the Name of the Holocaust* (1942), bars 14-15. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



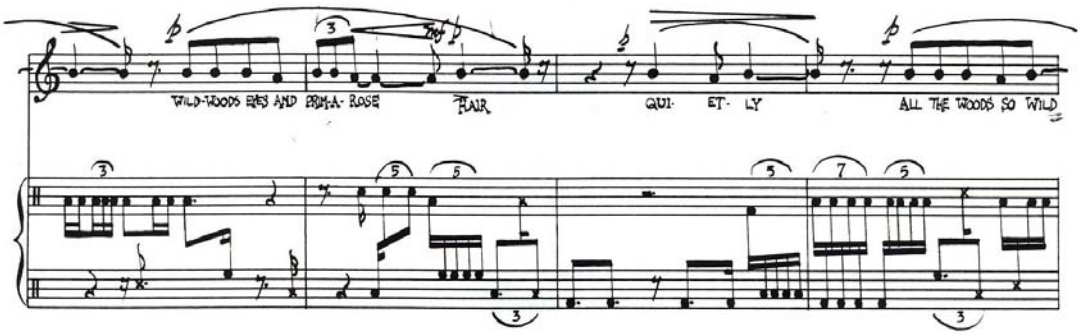
Example 3.820. J. Cage: *In the Name of the Holocaust* (1942), bars 19-23. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

By 1942 Cage was already well trained in performing improper techniques on the piano. But preparing the piano or playing on the strings is not always without practical problems when touring. Pianos do not always have a favorable inside design and concert organizers may be skeptical about performers that arrive with a box of screws and bolts. Two of Cage's compositions meet the most challenging conditions by only requiring the casing of a piano. Two pieces for voice and closed piano may have been Cage's way to produce prepared piano sounds without preparing a piano. Both pieces – *The Wonderful Widow of Eighteen Springs (*1942) and *A Flower* (1950) – remind us strongly of Lou Harrison's 1941 *May Rain* for solo voice and prepared piano (see above 3.4.3.3).

In *Wonderful Widow of Eighteen Springs* the voice uses only 3 pitches and sings without vibrato like in folksong. In the piano part a percussion staff indicates for the pianist on which of four places on his (completely closed) instrument to tap with finger or with the knuckles of the closed hand: under side of keyboard, on the front part of keyboard lid, on the "back and higher" part of keyboard lid, and on top of the piano. (Ex. 3.821.) The piano part is to played *p* or less, the voice mostly *p*, rarely *mf.* Most of the pianist's sounds are made with the fingers: only 12 out of 415 hits are made with the knuckles (indicated with an "X" – see ex. 3.822).

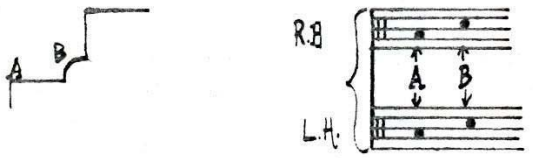


Example 3.821. J. Cage: *The Wonderful Widow of Eighteen Springs* (1942), from the performance notes. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
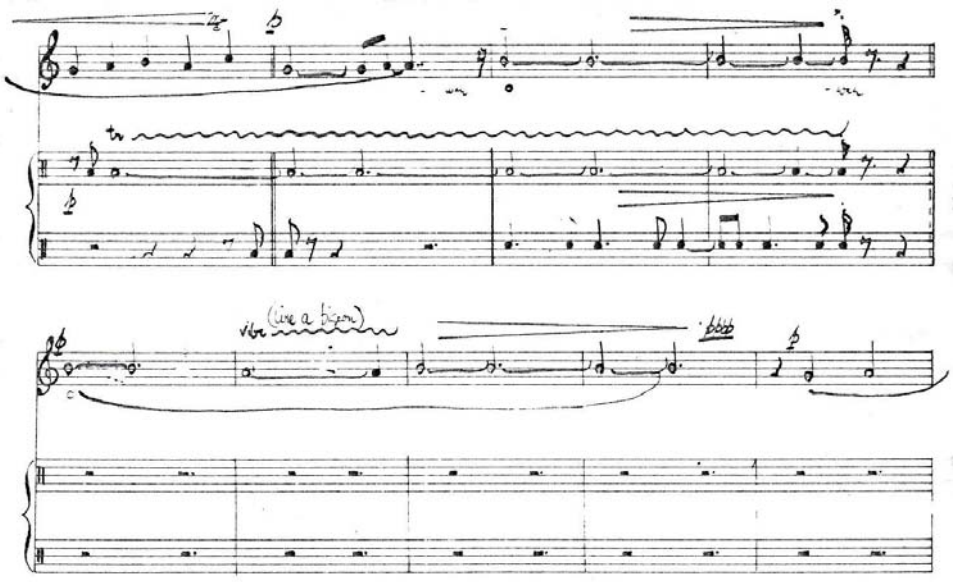


Example 3.822. J. Cage: *The Wonderful Widow of Eighteen Springs* (1942), bars 5-8. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

After *The Wonderful Widow of Eighteen Springs*, Cage's *Duet* for voice and prepared piano from *She is Asleep* (1943) is clearly influenced by the closed piano piece: it has four pitches prepared with rubber near the bridge (giving a rather dry and colorless tone) and is written on one staff much like percussion notation with a dynamic level mostly *p* or less (occasionally *mf*). The singing is prescribed to be mostly without vibrato. In *A Flower* (1950), the singer should again vocalize mostly without vibrato.
Again, there are two ways for pianist to play: with fingers or with knuckles of closed fist, this time on only two places, both on the keyboard lid. (Ex. 3.823.) The writing is much sparser than in *The Wonderful Widow of Eighteen Springs*: of 50 bars, the pianist only plays in 22 (upbeats not counted). (Ex. 3.824.) Trills anticipate the few instances where there is vibrato in the voice. Out of 152 hits (and 5 trills), the pianist uses the knuckles only 6 times. Again, all is *p* or less (the voice also when with the piano).



Example 3.823. J. Cage: *A Flower* (1950), from performance notes. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.824. J. Cage: *A Flower* (1950), bars 25-33. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

One other work of Cage's reminds us of the prepared piano: the 1948 *Suite for Toy Piano* with its limited gamut of tones used in the score (five to nine white keys). The *Suite* and the two works for voice and percussion-piano show how Cage sought the timbral aspects of the prepared piano without having to confront the practical problem of preparing one. After the *Concerto for Prepared Piano and Orchestra* (February 1951), he set his mind firmly to the other, non-prepared, extended techniques.

3.4.4.1 1951-52 Integration: *Music of Changes* and the *Two Pastorales*

Music of Changes (1951) is of great interest in assessing Cage's evolving interest in extended techniques and in considering the piano as an extended instrument because it consists of four "books" that were composed resp. in the spring (May 16), summer (August 2), autumn (October 18) and (almost) winter (December 13) of 1951. There are no preparations in this large (+/- 43') composition, but over the almost seven months it took to complete the work, a very clear increase in the use of improper techniques can be noted.

Cage composed the music using charts that listed sounds and silences, dynamics, tempos and durations. Each chart had 64 cells that he related directly to the 64 hexagrams of I Ching. The way the parameters ended up combined, superimposed and timed in the score was realized by throwing dice, but the choice of the content of each chart was still very much determined by the composer. This choice, together with the fact that the mere method of throwing dice for each of the pitches, durations and dynamics in the score was tediously time consuming, allows us to look at how Cage's taste evolved from proper to improper. Deconstructing the score to determine how many improper versus proper sounds Cage had conceived for inclusion in the charts is impossible. There were eight sound charts but half of them were "mobile," i.e. Cage erased sounds when they were used and replaced them with new ones. On top of that, one "sound" could be a complex combination of different improper (and possible proper) sounds, so that we cannot reconstruct how Cage related proper to improper sound events.[1458] Fortunately, the relation between the number of proper versus improper incidents in the score is not crucial to assessing Cage's taste for the improper. The increase in the number of types of techniques and the number of incidents containing them suffices to draw conclusions.[1459] (Table 3.7.)

[1458] I am grateful to James Pritchett for explaining these details to me. (Mail to author August 8, 2009.)
[1459] There is the possibility that the increase is merely accidental: the extended techniques might have come up more in the later books because of the way the dice fell. Given the clear rise in numbers of types, this seems unlikely, however.

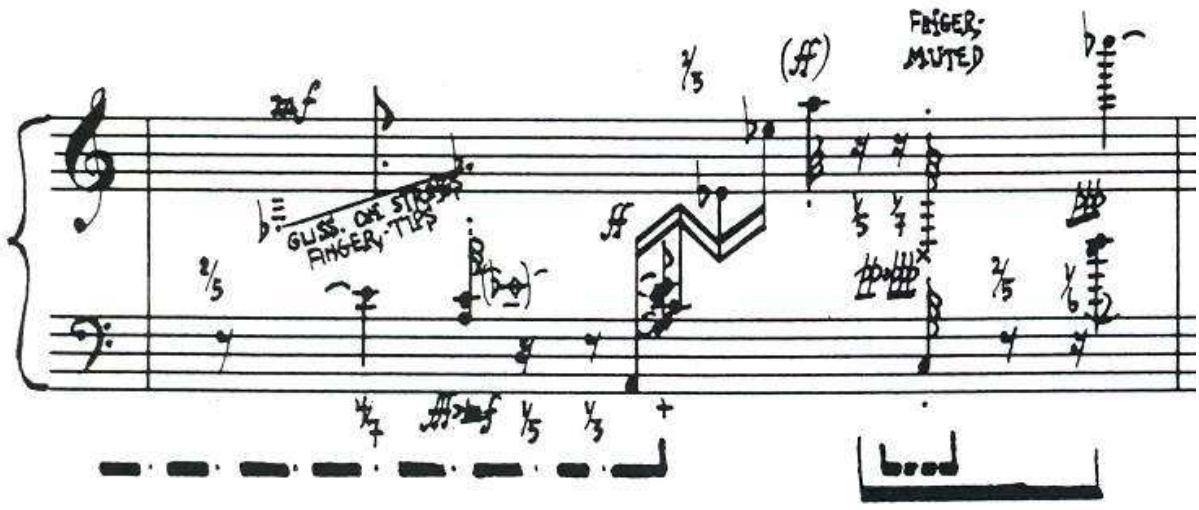
	1st book (May 16)	2nd book (August 2)	3rd book (October 18th)	4th book (December 13)
Keyboard glissando	1			
Sudden short use of Una Corda		2	1	
Nearly not sounded		2	1	
PEDAL				
½ depressed damper pedal after attack	24	52	18	22
Release damper pedal in 4 (equal) degrees		1		1
Gradually release damper pedal			2	4
SILENTLY DEPRESSED				
Keys	5	36	13	8
Clusters	6	8	3	3
CLUSTERS				
Palm	4	9	9	10
Arm		1	2	1
Both arms			2	2
Both hands				1
Forearm arpeggio				1
2 palms or arm		1		
STRIKE OUTSIDE PARTS				
Slam keyboard lid closed		1	3	3
Strike half closed keyboard with flat of hand			4	1
Under keyboard (flat hand)			1	1
Under keyboard (slightly cupped hand)			1	
Strike wood at left end of keyboard; wood stick (flat)				1
Strike top of keyboard-lid (normal open position) wood stick				1
Tremolo: wood sticks between uprights of pedal supports				1
ON INSIDE				
Pizzicato		2	2	5
Pizzicato (sec)		2	2	2
Glissando on strings with fingertips		3	1	
(sharply) Glissando on strings with coated paper		1		
Arpeggio-glissando on strings with fingernail			1	2
Arpeggio-glissando on strings with fingertips, beyond dampers				1
Arpeggio on strings with metal			1	
Arpeggio-glissando on strings with plastic				1
String stopped with finger		1		
String muted with finger		8	3	5
String muted with finger (high overtones)		2	1	1
Scratch strings lengthwise with fingernails		1		3
Scratch string lengthwise +properly playing same key				2
Tremolo on strings				1
Strike strings with finger tips		4		1
Strike strings with timpani stick		1	1	
Strike bass construction bar with timpani stick		1		
Strike vertical construction bar this side of dampers (wood stick)				1
Drop cymbal beater vertically through hole in metal construction (middle range) to strike soundboard				2
Number of techniques/ number of occurrences (duration):	5/40 (+/- 3.5')	21/139 (+/- 16.5')	21/72 (+/- 10.5')	30/88 (+/- 11')

Table 3.7. J. Cage's use of extended techniques in *Music of Changes* (1951)

All four books have indications for a halfway depressed damper pedal ("after the attack, sustaining overtones"), palm clusters and silently depressed keys as well as silently depressed clusters. The short first book contains the only keyboard glissando in the whole composition.

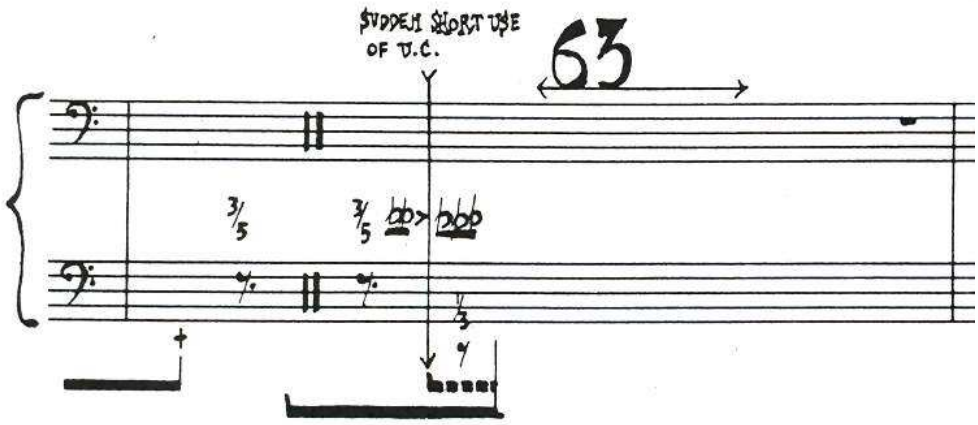
Other than these basic improper techniques, each part adds more types of extended techniques, certainly when considering the numbers in relation to the duration of each book. Regardless of that relationship, Cage showed a clear preference towards improper resonance in the second book compared to the third and fourth: compare the number of ½ depressed damper pedal indications (after the attack of the sound) and silently depressed notes.

The notation of the music is very precise, e.g. indicating a sound's beginning to be counted from its stem and its ending to be determined exactly by a "+" sign. For glissandos, Cage even specified its starting point in time to be in the center of the duration indicating. (Ex. 3.825.) This shows that – at least in this composition – Cage considered the glissandos to be performed fast, i.e. as a short sound-instance rather something that takes an audible amount of time.



Example 3.825. J. Cage: *Music of Changes* (1951), book III, beginning of 4th system on p. 54. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Some individual techniques are noteworthy by themselves, e.g. the release of the damper pedal in four (!) equal degrees, the "nearly not sounded" notes and the "sudden short use of Una Corda." The latter is meant to make the noise of the pedal action (and shifting keyboard) audible as a sound-incident. (Ex. 3.826.)



Example 3.826. J. Cage: *Music of Changes* (1951), book III, beginning of 4th system, p. 53. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Both the types and numbers of clusters increase in between book one and four. Regarding the percussion techniques that use the wood of the piano for sound, the gain in diversity is obvious, with Cage investigating even the difference in sound between hitting the underside of the keyboard with the flat of the hand and with the hand slightly cupped. Again taking into account the length of the books, the rise in types and numbers of inside-piano playing is steady, but more interesting here is the comparison between techniques (or sounds) that Cage seems to have favoured over the course of the composition and others that were discarded. Simple pizzicato won over the "dry" variant, which is more difficult to execute cleanly; simple glissandos on strings were left out of the last book in favour of arpeggio-glissandos (gliding over the strings while keeping certain keys silently depressed); he indulged more in simply muting strings (i.e. before they are hit by the hammer) than in halting their vibrations or aiming to achieve a particular range of overtones. Playing a tremolo on the strings was only used in the last book, as was striking the soundboard with a beater.

In between Book 1 and 2, Cage had composed the third of his *Seven Haiku*, only a page long with seven sounds, of which two are finger-muted, one is a chord of which the resonance is to be caught by a half depressed damper pedal, and one is a glissando on the strings. Of all the Haikus in this set, the third is the only one showing such intense interest (for the short piece that it is) in extended techniques. (The second has one finger mute but was composed in January 1952.) Therefore, in Cage's work for the piano, the summer of 1951 sparked off an interest in exploring the inside of the piano that lasted for five months and made *Music of Changes* a key work in his development of music for the non-prepared extended piano.

Music of Changes has been stated to be "largely the result of his new association with the pianist David Tudor."[1460] Both seem to have collaborated on the making of the four books, but it is not known whether the interest in extended techniques that grew as the composition evolved had to do with any particular influence by Tudor, even if Cage has claimed that "at that time, he [Tudor] *was* the Music of Changes."[1461]

The *Two Pastorales* were written before resp. after book 4 of *Music of Changes.* Most of the techniques prescribed in the *Pastorales* come from that larger work, although they are sometimes even more differentiated, e.g. in *Pastorales* there are *three* types of finger mute positions, *two* types of pizzicato positions, a penny is needed for a very loud pizzicato, a glissando is performed on untuned strings (between the dampers and the

[1460] Pritchett 1993, p. 78.
[1461] Cage 1981, p. 178.

keyboard) and a specific (2nd) harmonic is asked for. Most importantly is the combination of those techniques with fixed preparations and the use of whistles. (Printed in italics. See also 3.4.3.2.3.2.3.)

Pastorale 1 (November 9, 1951)

- ½ pedal
- Silently depressed single keys and clusters
- Black- & white-key arm- and palm-clusters
- Finger-muted string at the end of string / beyond the damper / at the bridge
- "pizz sec" at the end of the dampers / pizzicato beyond the dampers
- Sweeping a string lengthwise towards the damper (from beyond) with the fingernail
- Slow glissando on strings with a cymbal beater
- "cymbal beater between and along strings towards bridge (fast)"
- Striking a vertical construction bar with a wood stick
- *7 (specified) notes are to be prepared* (two in the bass and five in the alto range) with specified materials (bolts, screws, a penny, rubber, and two combinations of them)
- *Tapping preparation materials with a cymbal beater*

Pastorale 2 (January 31, 1952)

- Same preparations as in *Pastorale 1*
- ½ pedal
- Palm cluster
- Pizz / pizz sec / pizzicato with a 25cent piece (fff)
- Tap mute cymbal beater
- Silently depressed keys
- Sweeping / scratching a string lengthwise towards damper (fingernail)
- Tap treble vertical construction bar with fingers
- Bass drum stick on treble/bass vertical construction bar
- Finger-muted / finger-muted this side of the dampers / beyond the damper
- Arpeggio-glissando on strings beyond dampers with fingertips
- New Year's Eve whistle
- *Aztec whistle*
- *Glissando on untuned strings this side of damper at the middle range with a wood stick*
- *Touching strings lightly to produce 2nd harmonic*

Combining inside piano playing and prepared notes had been a rarity in Cage's oeuvre (cf. *In the name of the holocaust* and *Works of Calder*), accessories for direct sound production to be used by the pianist had not appeared yet at all. This diverse mix of such different-grade extensions makes for the richest concept of the extended piano at this moment in the history of the extended techniques.

For the *Pastorales* Cage used the same chart system as for *Music of Changes*, only the number of layers, which served to add vertical density to an otherwise single series of consecutive sound events, is now two in stead of eight. The texture in the *Pastorales* is therefore much thinner and the sounds made through extended techniques can be more focused upon by the audience during the listening process as well as by the pianist during the execution of the score.

3.4.4.2 1952 The two extremes: *Water Music* and *4'33"*

In between the Spring and Summer of 1952, Cage wrote two works that represent two extremes in extending the piano. One work contains the first synthesis of piano extensions; the other requires the pianist to *not* make any sounds at all.

Water Music was composed in the spring of 1952 and is the first piece in which piano playing techniques are extended into the realm of instrumental theatre. It involves, apart from playing on the keyboard and some "regular" extended piano techniques like (or close to) those found in *Music of Changes* (muting strings; pizzicato; preparing a chord of four notes; slamming the keyboard lid closed; hitting the open keyboard lid with a wooden stick); and a number of performance techniques that are new to the extended piano repertoire[1462]: operating a radio, shuffling cards and deal them into the piano strings, and pouring water from one receptacle to another.

Of the 39 sound producing actions[1463], 18 are proper, 6 are "known" extended techniques, 7 actions involve water, 9 actions concern the radio, four are concerned with whistles water warbler, siren and plastic duck) and one is really merely theatrical since the sound effect is minimal: shuffling and dealing (onto the strings) a deck of cards.

The whole score – printed with Cage's calligraphy – is designed to be set-up on stage like a presentation easel (as if a theatre prop), so that the audience can read the sequence of the actions together with the pianist. Unlike most of Cage's prepared piano pieces and the *Music of Changes*, the indications for the performance techniques in the score of *Water Music* show that they are more about the theatrical than the timbral effect. Cage did not make explicit what kind of sounds he wished the deck of cards to be used for, no details on the kind of preparation material are even hinted at, and tuning the radio as well as pouring water and blowing on whistles (one of them in a bowl of water) give less information on the required result than the mere fact of their action. Composing *Water Music*, Cage used intuitively made pre-composed "events" that were ordered by using chance.[1464] Among the unpublished working notes is a list with possible events, including some that were not used for the final score, e.g. "strike match, blow out (with teeth together)," "light a cigarette (smoke at will to?)," and " Speak: Hello!?."[1465] In *Water Music,* Cage explored the theatrical impact that performance techniques can have. Looking beyond the dramatic potential of reaching inside the piano to mute or prepare strings, he introduced actions as the material for the composition. Most of the extended techniques in this piece are in themselves the very effects that Cage wanted the performer to express in front of an audience, rather than that they would be the performance-technical means to a necessarily aural effect. In this way, the extended piano is integrated in a "whole complex of gestures, signs, postures, and sonorities," as Antonin Artaud envisioned a complete performance language in his book "*The Theatre and its Double*[1466]," which Cage had brought back to the US from his 1949 visit to Boulez in Paris.

[1462] To determine the moment of the actions indicated in the score, "a watch with a second hand" is stated in the score as "useful". Operating this device can be considered a performance technique, even one that makes a sound, but we do not consider this an extended technique in this instance as handling the stopwatch is not intended to have an effect that is meant to be experienced by the audience.

[1463] Fetterman counts 41 (Fetterman 1996, p. 29). We did not include the release of a key, which Cage indicates extremely precisely; turning on the radio and then tuning to a station was here counted as two actions; turning on the radio when it is already tuned to the specified station (as at the beginning of the piece) was counted as one action; multiple keys to be depressed are counted as one action when Cage indicated it to be one incident by adding only one timing indication. Admittedly, Cage was not consistent: some ends of sound were given a timing indication, others not.

[1464] See Fetterman 1996, p. 41-43.

[1465] Fetterman 1996, p. 42.

[1466] *Le Theatre et son Double*, published in 1938. For more on Artaud, Cage and his early theatrical pieces, see Fetterman 1996, p. 36-46.

The next step in the evolution of the extended piano in Cage's oeuvre – the opposite of *Water Music* – is represented by the famous "silent" piece. The first version was composed at Black Mountain College in the summer of 1952 but the whereabouts of the first score of *4'33"* is unknown. However, reconstructions by David Tudor (who played the first performance) consist of traditional music paper with staffs (implying a keyboard instrument) laid out in empty bars that are measured according to space-equals-time notation (probably 2.5 centimeters for the length of a quarter note[1467]) and a tempo of 𝅗𝅥=60. The three movements had individual durations of resp. 30", 2'23" and 1'40".

As much as the indications in the score prove that it is a proper composition, the pianist is meant to use performance techniques that ensure the composition can be experienced as such: David Tudor read the piece from the score, punctuated beginning and ending of each movement by closing resp. opening the keyboard lid, used a different pedal for each movement, turned pages, checked the reading by looking at the stop-watch, and folded his hands in his lap during the three movements.[1468]

4'33" pushes the limits of the extended piano and shows paradoxical characteristics. The score is improper because it requires the performer to make sounds audible that are not notated. The piano is handled improperly because it is designed for making sounds while the performer does not play the instrument (yet it is performed upon). The only performance technique that would, in a proper composition of sounds, be considered improper is the closing and opening of the piano lid, although it is designed for this function when nobody plays on the keyboard. The purpose of all the proper aspects in the score and performance is to draw the focus towards the performer so that the intensity of the audience's attention enables them to become aware of the sounds that are not made by the performer.

Through the use of performance techniques that are not related to the sounds that may be heard during the performance, *4'33"* is an extension of the theatre techniques that Cage prescribed for *Water Music*. But, with *4'33"*, Cage hit upon the limits of extending the piano. Disconnected the techniques from their purpose and the piano from its sounds – proper or improper – in a performance is the farthest extension possible and, afterwards, Cage (and other composers) returned to prescribing sound-producing performance techniques in their scores. Cage did elaborate on *4'33"* when he wrote two more versions of it. In 1953 he renotated the piece and subtitled it "for an instrument or combination of instruments"[1469]; in 1960 he reduced the score to typed instructions that "may be performed by an instrumentalist or combination of instrumentalists and last any length of time."[1470] From the perspective of the extended techniques, these versions of *4'33"* are the same, regardless of the instrument the composition is played upon.

3.4.4.3 1952-58 Indeterminacy and categorization of extensions
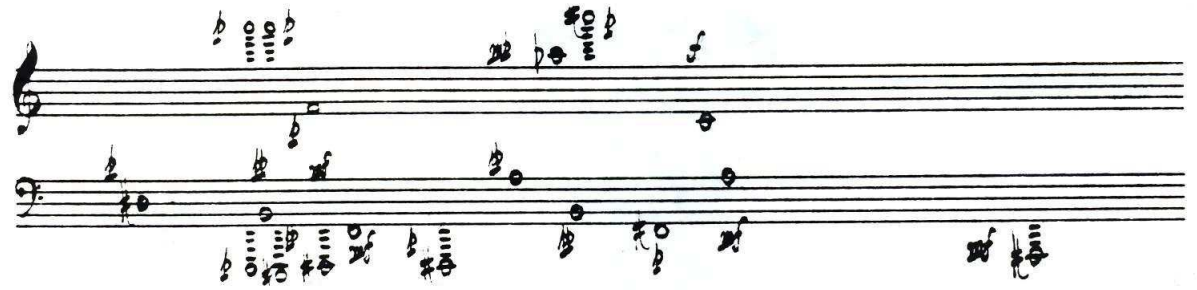
If *4'33"* was still a classical score in that it was notated with precise directions for the pianist – even if the sounds depended on coincidence – Cage now began to leave more and more decisions to the performer, from choosing where exactly to mute a string to actually make the score with only the most basic of materials provided. At the same time he started to see sound production in terms of categories rather than individual sounds or particular combinations thereof. This led to evidence of predilections for certain types

[1467] Fetterman 1996, p. 72-73.
[1468] See Fetterman 1996, p. 75-76.
[1469] Fetterman 1996, p. 76.
[1470] Fetterman 1996, p. 78. In the mid-1980's, a calligraphic version of the 1960 score was published.

of sounds or techniques (as in *Music for Piano*), and to causal relationships between the choice of notation and the choice of sounds it is prescribed to represent.

3.4.4.3.1 1952-53 *Music for piano 1-20*

In December 1952, four months after *4'33"*, Cage returned to the extended piano and started writing the first of 84 pieces that eventually made out the collection *Music for Piano.* At that time, Cage was searching for new and faster ways to achieve chance-based compositions.[1471] The chart system that he had developed since the *Concerto for Prepared Piano* (1950/51) was time consuming because of the number of coin tosses for every detail that had to be determined, and dependent on Cage's imagination for the variety of the sound events that would characterize the eventual composition. In *Music for Piano* Cage let imperfections in the paper of the score determine the placement of the sound event (and therefore the vertical and horizontal relation between the events). In *Music for Piano 1*, the tempo is set (1 system equals 7 seconds) but durations, pedal usage and the "manner of producing piano tone" are free, the range of the latter left open but "including pizz., striking, scratching and muting strings, etc. production of harmonics, etc." That Cage left the tone production entirely up to the pianist maybe because of the density of the pitches and the ensuing level of virtuosity dependent on the performance techniques. The density in this piece is a result of the method Cage used to determine the number of paper-imperfections to be used: he simply set a time limit and then marked as many points as possible.[1472] (Ex. 3.827.)



Example 3.827. J. Cage: *Music for Piano 1* (1952), 2nd system. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

From the second piece of *Music for Piano* onwards, the density is much less and Cage limited the performer's input to dynamics and tempo (sometimes also the change thereof). In *Music for Piano 2* (May 1953) the pedal (presumably the damper pedal) is to be held throughout the piece and the tone production is confined to proper playing on the keyboard, pizzicato or mute (either at an unspecified place on the string or near the bridge). From the third until the 20th piece (May-August 1953), only proper, pizzicato and muted playing (no further specifications) are indicated.

[1471] Pritchett 1993, p. 94.
[1472] Pritchett 1993, p. 94.

3.4.4.3.2 1954 *34'46.776"* and *31'57.9864" For a Pianist*

These two pieces are part of a set that was projected to have a total length of 10.000 bars. This number became associated with the Chinese philosophical symbol of 10.000, representing infinity, as well as with "The Ten Thousand Things," a phrase found in Taoist and Buddhist writings where it connotes the material diversity of the universe.[1473] That phrase became Cage's private title for this collection of pieces, each of which was named for its duration. David Tudor and Cage called them "whistle pieces" or "time-length pieces."[1474]

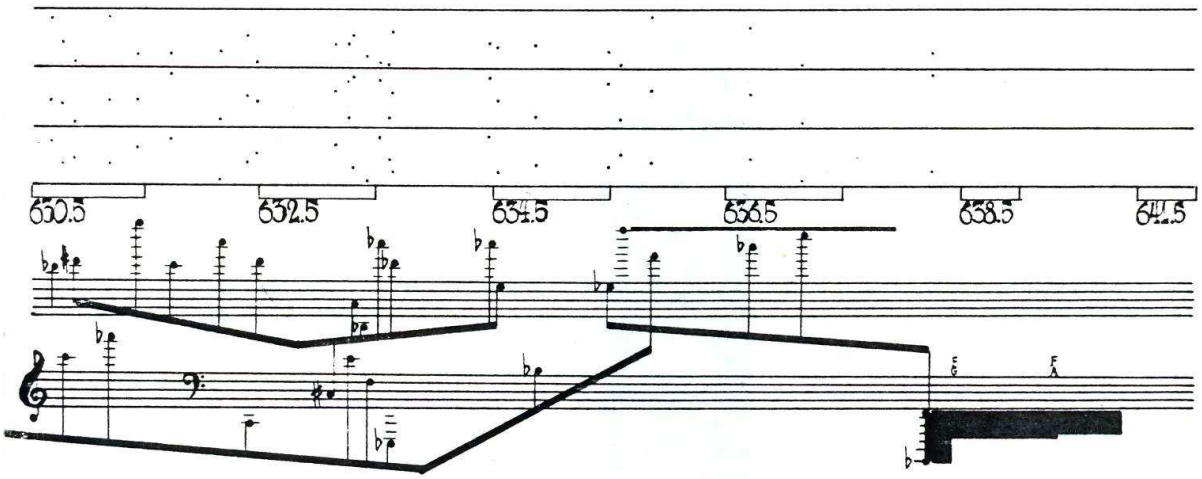
Chance operations were again used to obtain durations, dynamic factors and the sound events. The materials for the sound production used to compose these two pieces with were highly categorized:

- Pitches (notated on the staves):
    - On the keyboard
        - "Normally" [single notes, aggregates and chromatic clusters, including subtraction – ex. 3.828.]
        - "So as to produce harmonics" [=silently depressed, combined with muting the relevant strings]
    - on the harp (= inside of piano):
        - Finger-muted;
        - Pizz;
        - Muted and pizz;
        - Struck with mallet, beater, fingers, etc.;
        - Strike or otherwise activate preparation (if any);
        - "Etc."

- Noises (notated on a line between the staves):
    - Inside the piano
    - Outside on the piano
    - Through accessories (whistles, call noises, percussion instruments, etc.)

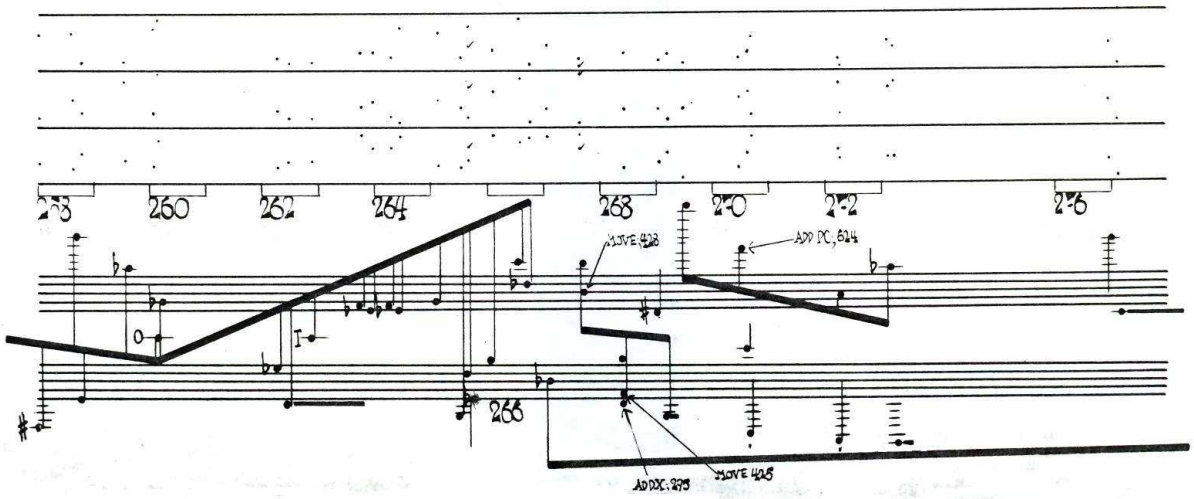
- Preparations classified by the material they are made of:
    - M = metal (19 in *31'46.776"* / 9 in *31'57.9864"*)
    - W = wood (11 / 11)
    - C = cloth/fibre/rubber (11 / 13)
    - P = plastic/glass/bone (21 / 6)
    - X = free (28 / 24)

[1473] Pritchett 1993, p. 96.
[1474] Tudor 1994, p. 630; Cage 1994, p. 108.

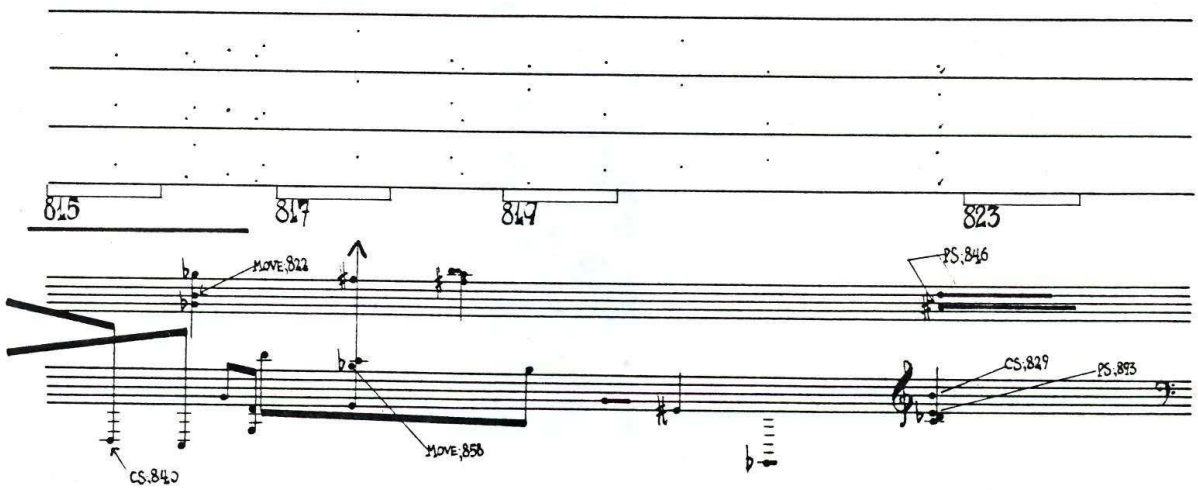


Example 3.828. J. Cage: *34'46.776"* (1954), p. 19, 2nd system. The four lines on top of the system encase the three ranges for the constituents of the dynamics (top to bottom): degree of force (between most and least), vertical distance (between far and close) and speed of attack (between slow and fast). The squares underneath the bottom of these lines indicate the amount of space equal to a second. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

In the introduction to both piano pieces, Cage outlines a preparation set-up that is valid only for the beginning (see above, table 3.5). In the course of the performance, this set-up is indicated to be changed: materials are to be subtracted partially or completely from the strings of specified notes, or their position alongside the strings is to be moved. (Ex. 3.829 and 3.830.)



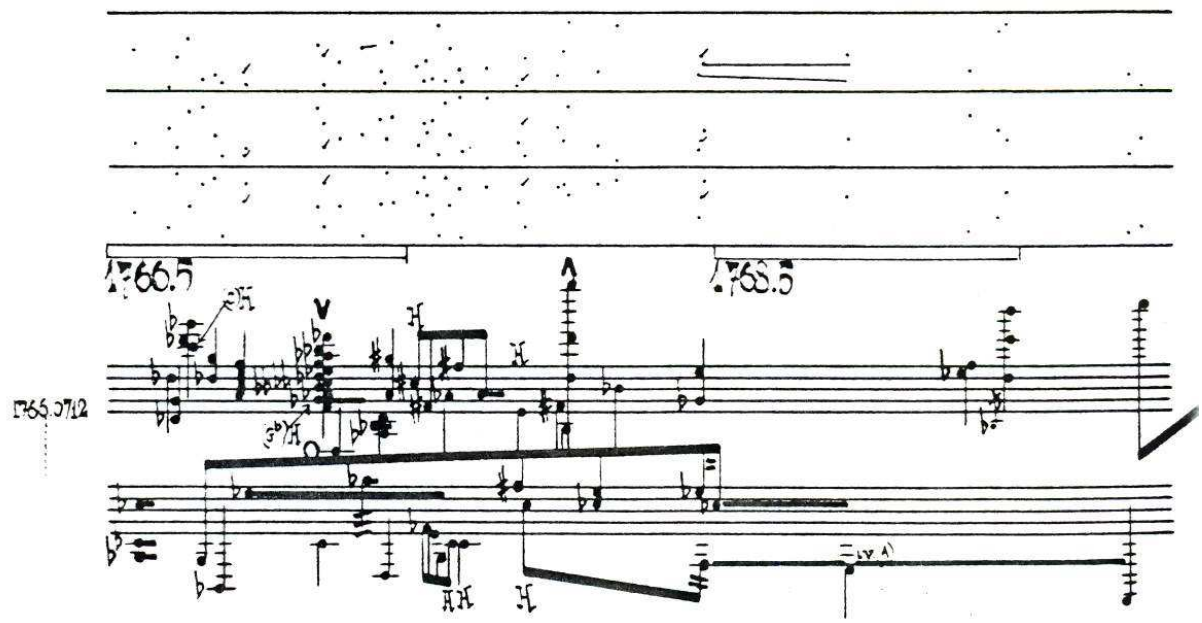
Example 3.829. J. Cage: *31'57.9864"* (1954), p. 4, 2nd system. The number after "move" or "add" refers to the timing indication (on the chronology line above the music staff) by which time the action has to be completed. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.830. J. Cage: *34'46.776"* (1954), p. 24, 2nd system. CS = complete subtraction; PS = partial subtraction. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

The classification of the sound events left many details unspecified. In fact, much of the performance practice is left to the discretion of the performer:

- Any amount of these two pieces may be played or not, performed by itself or in any vertical or horizontal combination with each other or with any amount of one or more of the other "parts" of the set (e.g. *27'10.554"* for a percussionist or *59½"* for a string player). The title must then reflect the length in minutes, seconds and decimal fractions of the latter, followed by a suitable reference to the performers.
- The result of different compositional operations, sometimes aiming to combine multiple layers of sound structures, could lead to unclear situations (e.g. keyboard as well as harp indications above a 5-note aggregate) or outright impossibilities (e.g. the fifth event on the right hand stave in ex. 3.831) that the pianist can solve on his own authority.
- Harmonics and pedals are not specified.
- The preparation type that is prescribed most in the preparation set-up is the one that the performer is free to choose.
- For the initial preparation set-up, the exact object and the position of the material on strings are left to the performer to decide upon.
- Partial subtraction of preparation materials, and the moving of preparations alongside the strings are both up to the pianist. Only when materials are to be added, is the type of material indicated.
- In case of a notated impossible change in preparation material, the pianist may act in one of various ways, for example: (1) alter the direction to one within his powers, (2) ignore the direction, (3) keep it altering the time, etc.

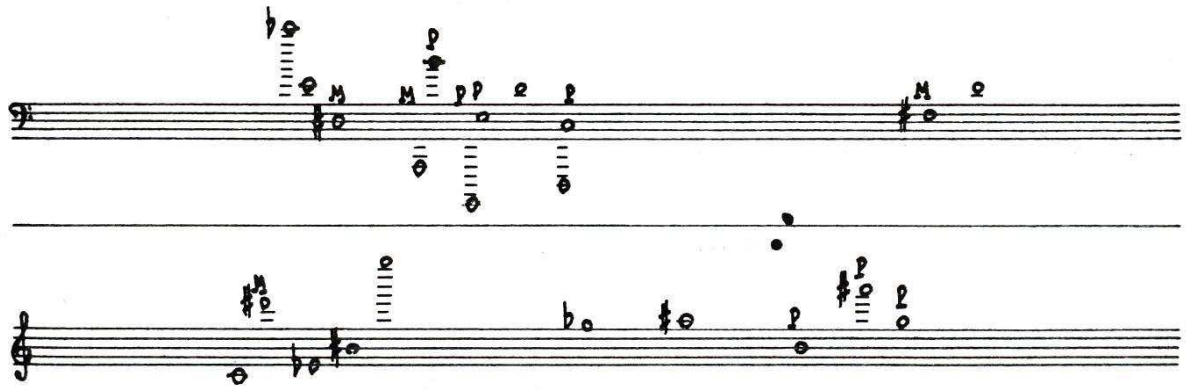


Example 3.831. J. Cage: *34'46.776"* (1954), p. 50, 3rd system. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

With these two pieces from the Ten Thousand Things, the pianist is given a serious responsibility towards finalizing the score. Especially the application of the extended techniques is to be further worked out before the music can be played.

3.4.4.3.3 1954-56 *Music for piano 21-84*
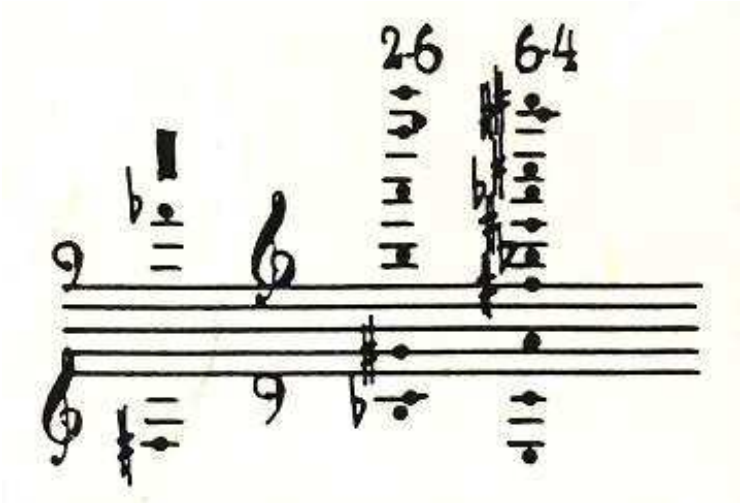
Compared to the 20 first pieces of this set (see above), *Music for Piano 21* to *84* includes added manners of producing sounds, notated indeterminately: a system is 2 staves with a line in between. •'s above this line are noises produced on the interior piano structure, below on the exterior, manually or with beaters. The pitches on the staves are still prescribed to be played properly, pizzicato ("P") or muted ("M"). (Ex. 3.832.) For the last 32 pieces (numbers 53-84, May 7-8, 1956), Cage indicates that mute and pizzicato playing is allowed in "free combinations" and with "free pedals and harmonics."



Example 3.832. J. Cage: *Music for Piano 21* (1955), 3rd system. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

3.4.4.3.4 1957 *Winter Music*

Like the piano pieces from the Ten Thousand Things and *Music for Piano, Winter Music* (January 1957) is notated with a principle of indeterminacy. The texture consists of individual and non-connected sound events, not individual notes like in *Music for Piano* but aggregates or chromatic clusters (indicated by black squares above the notes). Each sound event is written on one staff with two (possibly different) clef indications that leave the pianist to decide which notes relate to which clefs. For cases of such choice, Cage added the number of notes that are to be read in one or the other clef, e.g. second instance in ex. 3.833: 2 notes in one clef of choice and 6 in the other.



Example 3.833. J. Cage: *Winter Music* (1957), excerpt. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Depending on the choice of clef-note relationship the pianist chooses, the constellation of the aggregates or clusters is different. For instance, if the first sound event of ex. 3.833 is read with the top not in the F-clef and the bottom note in the G-clef, the cluster is only three semitones wide (*f#-a♮*). The other way around, the pianist will have to play a two-arm cluster between $A\#^{1}$ and $f\flat^{3}$.

All sound events are to have a single attack, i.e. no arpeggiation. As the performance notes explain, in case an aggregate is unplayable in a certain choice of clef-note relation, then the unplayable notes are to be depressed silently on beforehand so that they will sound together with the rest of the aggregate. For instance, if the second aggregate in ex. 3.833 is read with the two lower notes in the F-clef and the 6 upper notes in the G-clef, minimum three of those six notes cannot be played together and have to be held silently by way of the sostenuto pedal.

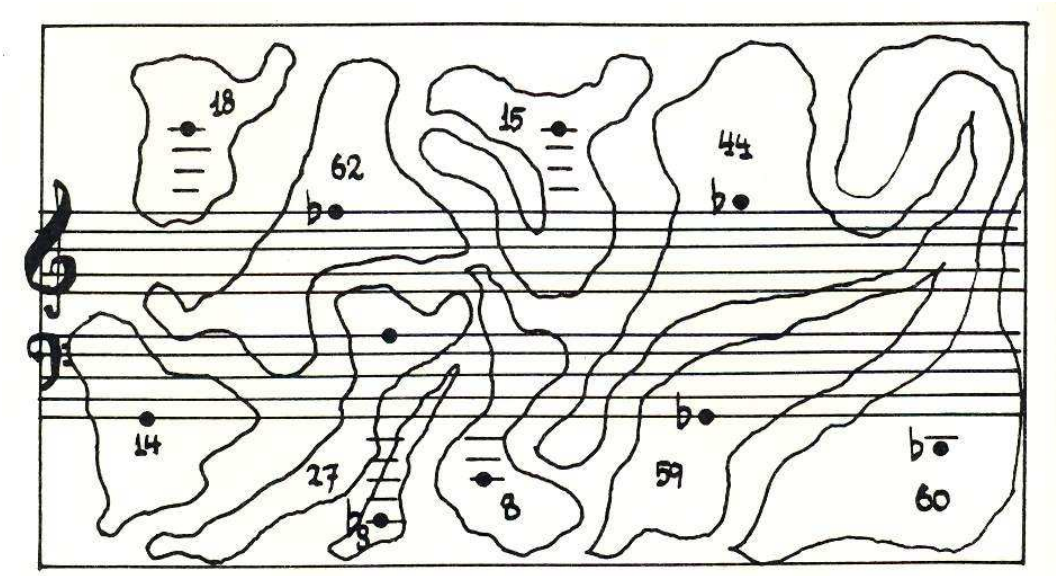
Cage made sure that, with these rules, all possible permutations of all the sound events could be executed, i.e. there are no clusters greater than the average length of two upper-arms and there is always a way to depress on beforehand all the unplayable notes silently. In *Winter Music* Cage made efficient and pragmatic use of extended techniques to make conflicting results of chance operations playable.

3.4.4.3.5 1957-58 *Concert for Piano and Orchestra*

The *Concert* (not concerto) is a collection of independent parts for piano, 13 instruments and conductor. Each part can be performed solo or in any combination, even combined with other pieces that do not belong to the *Concert*, such as the *Solo for Voice*.
The first decision in composing the piano part (with its own title *Solo for piano*) – regarding which method of composition to use – was left to chance procedures based on *I Ching* to decide and resulted in more than 80 different types of notation that were identified by letter-codes. Many of these notation formats are graphic and are translated into music by way of, for instance, superimposed musical staves and added performance practical notes explaining the margins for interpretative decisions left to the performer.

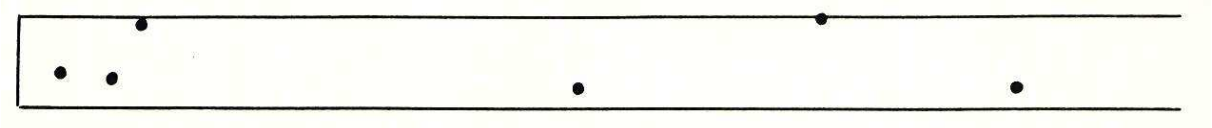
By forcing himself to create so many different types of music notation, Cage ended up with graphic representations that range from figurative (easily associated with specific techniques or sounds) to abstract (usable for any type of sound or technique). However, all of the notations are applied to *categories* of sounds:

- The outlines of the curved closed shapes in notation *T* represent changing contours of clusters (ex. 3.834)



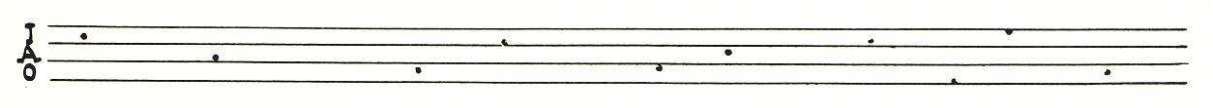
Example 3.834. J. Cage: *Solo for Piano* (1957-58), *T*. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

- Notation *BY* shows production of noises of any kind with only the relative parameters as height (vertical dimension) and timing (horizontal) indicated (ex. 3.835)

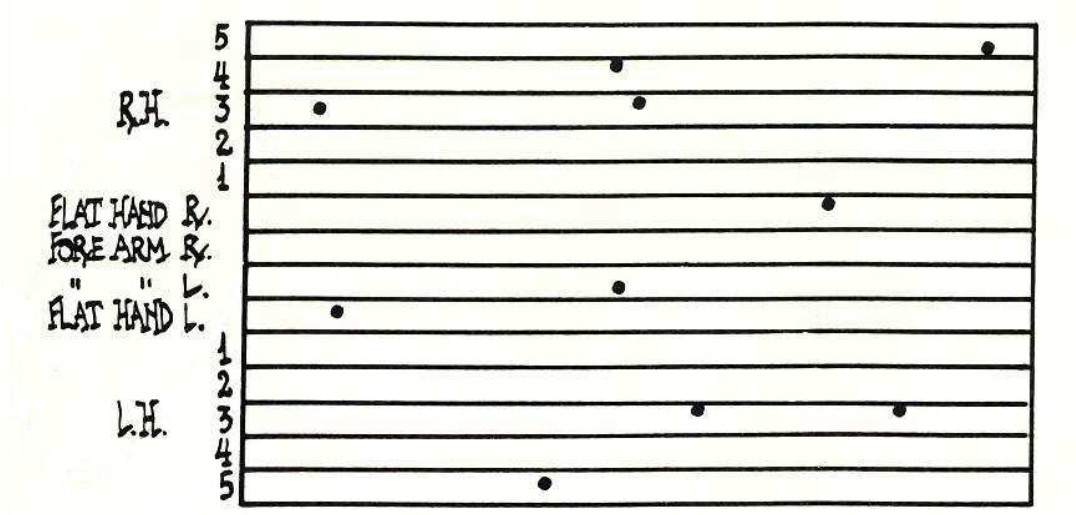


Example 3.835. J. Cage: *Solo for Piano* (1957-58), *BY*. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

- *AC* and *BE* are grids that convert points (determined by imperfections in the paper on which Cage composed) to more concrete pitches.[1475] *AC* distinguishes between noises made on the interior (I) or exterior (O) of the piano, or by way of auxiliary sources (A). (Ex. 3.836.) *BE* is specific in another aspect, differentiating between finger, palm and forearm techniques. (Ex. 3.837.)

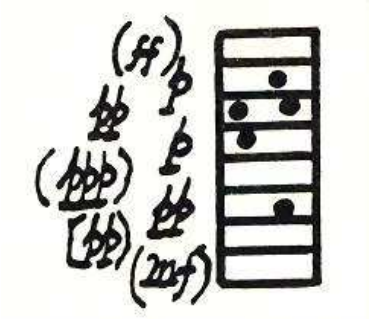


Example 3.836. J. Cage: *Solo for Piano* (1957-58), *AC*. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.837. J. Cage: *Solo for Piano* (1957-58), *BE*. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

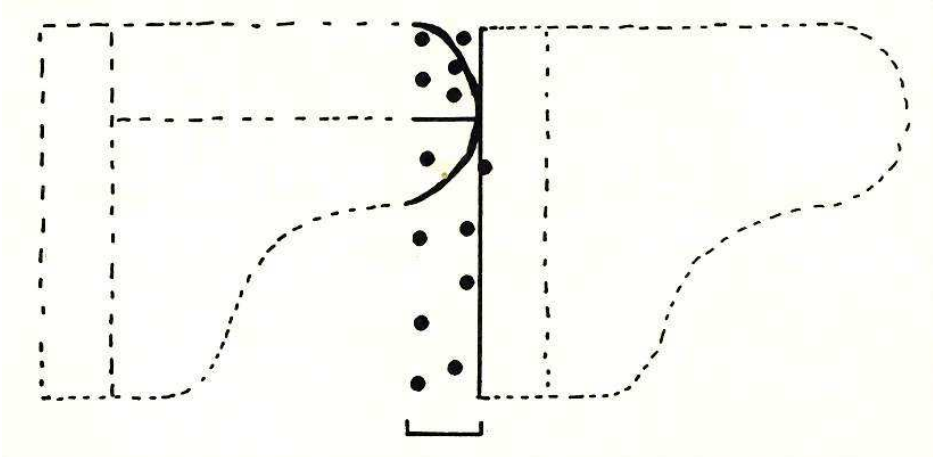
- Some types of notation do not indicate the kind of sound that is to be produced, showing only parameters other than pitch, e.g. *BD*. (Ex. 3.838.) Such a score could be read to represent sounds that have not necessarily anything to do with the piano. In that respect, *BE* is to be interpreted as well, as it is not said that the indicated techniques are to be employed on the keyboard. Sometimes pages are merely meant to be played "in any way that is suggested by the drawing."



Example 3.838. J. Cage: *Solo for Piano* (1957-58), *BD*. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

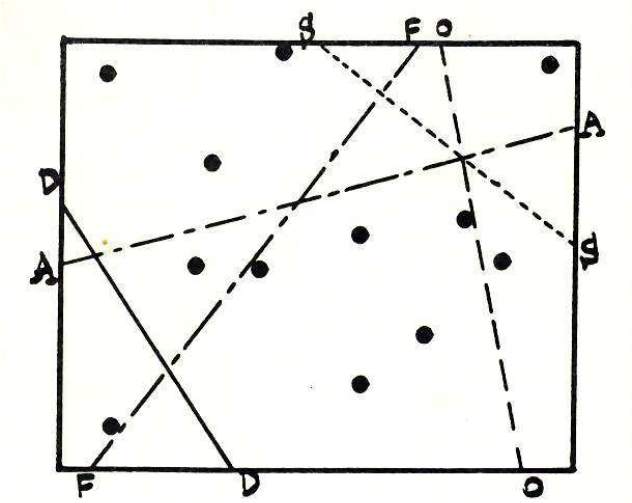
[1475] The number in front of the grid indicates how many of the notes are to be selected among those notated.

- Another notation – *BT* – shows only the places on or around the piano where sounds have to be made. (Ex. 3.839.)



Example 3.839. J. Cage: *Solo for Piano* (1957-58), *BT*. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

- More abstractly, *BB* consists of points (pitches) of which the characteristics are determined by five lines representing frequency (F), amplitude (A), duration (D), overtone structure (S) and point of occurrence within a time frame (O). The S-line in fact controls timbre and can be the basis for generating improper sounds at the piano. (Ex. 3.840.)



Example 3.840. J. Cage: *Solo for Piano* (1957-58), *BB*. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

The extreme indeterminacy of the piano part score shows – again – how Cage would put his trust in the performer. Each solo part was composed after consulting instrumentalists to ascertain performance practice of improper techniques. That the piano part goes to greater lengths in exploring indeterminate notation and – consequently – improper performance techniques is evident from the difference with the other parts. The presence in Cage's life of David Tudor no doubt played an essential role in this matter of trust. It could – again – well be that Tudor was partly responsible for Cage's interest and trust in extended techniques as well.

3.4.4.3.6 1958 *Variations I*

However much scores like the *Concert* had contained indeterminacies, they still described events. Cage now started to develop procedures that were to enable the performer to create any number of such descriptions himself. *Variations I* (January 20, 1958) is derived from notation *BV* from the *Solo for piano*, which in itself is a variant of *BB* (see above, ex. 3.840). Instead of a fixed drawing, however, *Variations I* has a square containing points on one transparency and five lines, arranged on five separate transparencies. The transparencies with the lines are to be superimposed over the points to yield the determinations, i.e. to create a score usable for performance. The composition is now specified as being for "any number of performers; any kind and number of instruments." Likewise, the sound production type is completely free: duration, occurrence, amplitude, frequency and "simplest overtone structure" are determined by their distance to a line. The farther away from the overtone line a point happens to lie, the less simple its overtone structure should be. As "close" and "far away" are not determined, the overtone structure of each sound may be complex enough for it to be an improper piano sound. The first performance of *Variations I* was as a solo piano piece, executed by David Tudor.

3.4.4.4 1959-63 Action piano

If *Variations I* seems like an end of the road type of concept, with nothing determined before the performer starts working on it, Cage still saw one step he could take in extending the piano. *Variations I* and the previous pieces were still explicitly about making sounds. The compositional method was more and more focused on the process that the performer must go through to realize a performance, but the sounds were still objects, and the characteristics that were to be determined by the performer were still acoustic. Cage now began to apply the notion of process-instead-of-objects to the sound production as well: he began to focus on the action of performing, i.e. on the techniques instead of the sounds. This shift of focus led to a shift from music performance to instrumental theatre. It also evolved from treating the piano as a sound-producing object to an object of which the presence or the necessity for the performance of a composition is, at best, implied.

3.4.4.4.1 1959 *Sounds of Venice*

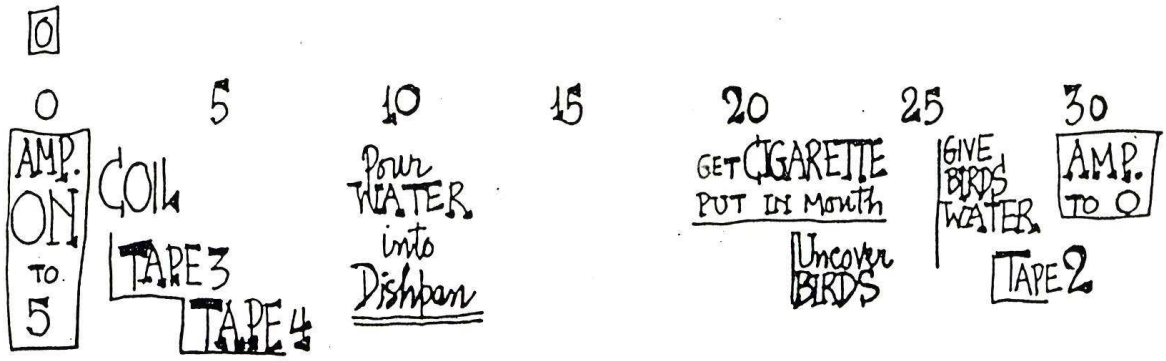
Sounds of Venice (January 1959) was composed for Cage's own appearance on an Italian TV quiz, hence subtitled "for a solo television performer." The piece involves 21 props (several of the objects and sounds are related to water[1476]) and 4 tape recordings, all placed around a piano:

Stopwatch
Chair
Grand piano (Pedal must be depressed)
Coil ("slinky")
Pitcher of water
Water receptacle

[1476] Together with *Water Walk*, *Sounds of Venice* was written for and performed in the Italian quiz *Lascia O Raddoppia*, where Cage was asked questions on the subject of mushrooms. After five weeks he won enough money to buy a van for the Merce Cunningham Dance Company and a grand piano. Every week Cage performed one of his compositions, including the prepared piano solos from *Amores*, *Water Walk* and *Sounds of Venice*.

Pack of cigarettes
Matches
Ashtray
Birdcage with canaries
Cloth cover for bird cage
Cat sound (toy)
Slide whistle
Marble slab
Dishpan
Venetian broom
Toy horn and rattle
Piece of wood
Telephone bell
Amplifier
Microphone

The score includes a floor plan and lists the sequence of actions to be performed along a time line expressed in seconds. (Ex. 3.841.)



Example 3.841. J. Cage: *Sounds of Venice* (1959), beginning. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Of the 42 actions (including operating the tape machines), only four involve the piano, of which two are more than mere actions: "Pull up a Chair + Sit," "Friction with wood on bass strings (Ped.)" and "Pizz. Low String." In all of this composition, the piano is extended towards being no more than a stage prop like the birdcage or the cigarette.

3.4.4.4.2 1959 *Water Walk*

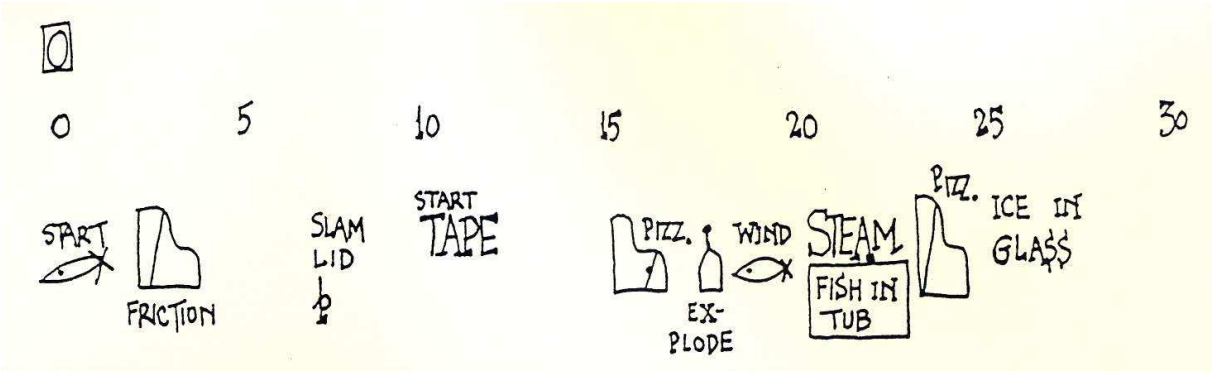
In one of the manuscripts Cage subtitled *Water Walk* (January 1959, again for solo television performer) as *Water Music No.2* but it is much more elaborate than the original *Water Music* and on a larger scale than its more immediate predecessor *Sounds of Venice*: there are now 34 props, including a bath tub filled with water, confetti-ejecting explosives ("paper bottle"), kitchen appliances, a vase and fresh roses, 5 radios "of inferior quality," several whistles, a bottle of Campari, etc. Ten of the props now have to do with water, three are game call (duck, quail, goose). Most of them are clearly chosen for entertainment value.

Only three instruments are required: Turkish cymbal, Chinese gong and grand piano. There is now no piano bench, as the piece is faster in pace and the numerous (often large) props require much walking around. The actions that involve the piano are (not in order of the sequence in the score):

- Slam piano keyboard lid closed
- Open keyboard lid
- Play 2 notes on the keyboard
- Play a dominant 7th chord doubled at the octave, in the middle register with both hands
- Gliding over the keyboard from lowest the A to the highest C
- Play a forearm cluster
- Pizzicato playing with finger tip and with finger nails
- Glissando on strings (low or middle register up or down) with timpani stick
- Scrap a bass string lengthwise with fingernail or 25cent coin
- Placing an electric toy-fish on the strings of the piano
- Explode bottle up and over piano

There is a noticeable balance between the grades of extension of the piano, with several types of proper playing, all of the basic extended techniques and only a few exotic ones. Besides these 12 techniques pertaining to the piano, all the other ones are selected as much for visual effect as for the sound they can produce.

Like *Sounds of Venice*, the score is again a horizontal time line listing the sequence of actions, this time with words and pictographic symbols. (Ex. 3.842.)



Example 3.842. J. Cage: *Water Walk* (1959), beginning. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Besides the larger, more theatrically efficient set-up, the score is detailed to show the attitude of a professional performer in a professional stage environment: a separate sheet now lists minute explanations of 27 of the 52 actions in the score; the performer is advised to have more than one explosive for rehearsals; an assistant is advised to mop the wet floor afterwards.

3.4.4.4.3 1960 *Theatre Piece*

Theatre Piece (January 1960) is composed for one to eight performers who can be musician (e.g. a pianist), dancer, singer, etc. but "he is also performing a piece of theatrical music" and "music is here understood to mean the production of sounds."

Brackets indicate numbered actions and the time in which these are to be performed. The performer(s) conceive(s) of 20 such actions that are described by a gamut of nouns and/or verbs to be written on cards. In contrast to *Sounds of Venice* or *Water Walk*, although *Theatre Piece* can end up being very similar to those, the score of the latter only contains aspects of the processes involved in performance. Even if *Theatre Piece* is principally about sound (though Cage felt he had to add this reminder to make sure that it was "understood"), and even if nouns can be chosen to name sounds (though he

allowed nouns *or* verbs), the title and dedication (not necessarily a musician) show his interest in the performance aspect more than the acoustic result, i.e. in the techniques more than in the sounds.

3.4.4.4.4 1960 *Cartridge Music*

In *Cartridge Music* (July 1960) the performers are to rub or strike small objects such as pipe-cleaners, matches, feathers, wires etc. that are inserted into the needle holder ("cartridge") of old phonographic pick-ups. The cartridges are used to amplify the sounds and make them audible through the loudspeakers. This is basically the same as attaching a contact microphone to an object to amplify the sounds made with or on that object, hence the subtitle "also Duet for cymbal and Piano Duet, Trio, etc." For the *Piano Duet* a contact microphone is attached to the soundboard.

There is again no real score to speak of: the performance material consists of numbered sheets with irregular shapes, and 4 transparencies (showing either points, circles, a circle marked like a stopwatch, or a dotted curving line with a circle at one end) to be superimposed on the sheets.

When explaining the performance procedures, Cage hardly mentions the nature of the intended sounds anymore. Instead he writes about "the actions to be made," about "any manner" or "any means" in or by which sounds are to be produced, about "using" the objects in the cartridges, about "altering the amplitude control of the amplifier" (instead of altering the amplitude of the sound). The only sounds he specifically considers are some that can have "an electronic character," and those "ordinarily thought to be undesirable," such as feedback, humming and howling.

For sound production, the piano is basically divided into zones of operation: keyboard, strings, interior and exterior construction, with possible further distinctions of range or mode of action. The strings may be prepared but "in some radical way," i.e. with materials that can have a highly visual impact, such as blankets, pillows, large plastic sheets or newspapers.

There is some similarity between *Cartridge Music* and La Monte Young's *Poem for Chairs, Tables, Benches, Etc. (or other sound sources),* which is about sounds that furniture makes when being dragged over the floor. (See below, 3.4.5.3.) Cage and Tudor are reported to have introduced this piece, which dates from January 1960, to the New York scene before September of that year.[1477]. It is not clear whether Cage first got to know Young's friction piece before or after July of 1960, when he composed *Cartridge Music*.

3.4.4.4.5 1961 *Variations II*

The "score" consists of five transparencies with each one point, and six larger ones with each one line. Five of the line-transparencies represent the by now familiar factors (see Variations I), the sixth line represents the number of notes of each sound event. Added to the directions is the statement: "If questions arise regarding other matters or details … put the question in such a way that it can be measured." The difference between this work and the previous ones is that there is no fixed way to relate the points and lines anymore, no fixed number of events, no fixed number of variables. The only determinant left is the action of measuring. *Variations II* is again for any number of players, but now "for any sound producing means," which can be any object, not necessarily a musical

[1477] Potter 2002, p. 45.

instrument. The first performance of *Variations II* was by David Tudor, as a piano solo piece.

3.4.4.4.6 1962 *0'00"*

The consequence of replacing sounds with actions was to dispense with objects in favor of actions. Therefore, measurements that characteristically define those objects, such as their place in time, had become superfluous in a world of actions and process. Hence this "zero-time" composition. The original performance instruction merely demands: "In a situation provided with maximum amplification (no feedback), perform a disciplined action." Soon after the first performance, specifications were added, but all specified actions, not sounds: the action cannot be repeated in another performance, it should not be the performance of a musical composition; it should fulfill an obligation to others, the performer should not pay any attention to the situation he finds himself in. The amplification requirement shows that Cage still considers it to be about sound, and, as the prohibition of performing a "musical composition" includes *4'33"*, it must be the performer who makes the sound. *0'00"* therefore still is about an action that produces sound. But, as *4'33"* is about unintentional sounds, so is *0'00"* about unintentional sound-producing actions, hence the subtitle of the latter as "4'33" No. 2." There is no instrumental dedication anymore, so it can be performed by a pianist and may therefore be a piano piece. That is then the only link to the piano, for the instrument is certainly not necessary for any performance of *0'00"*, just like the technique to produce a sound (i.e. intentional action) is not required.

In contrast to the previous pieces, *0'00"* has no "score" anymore: besides the performance instructions, there is no "material" with which the performer can make his version of the piece. Here Cage and Young found themselves at crossroads. As early as 1960 Young had already moved away from composing scores. Young's *Poem for Chairs, Tables, Benches, Etc.* (cf. above, 3.4.4.4.4) still had a Cageian score with random numbers determining the number of events, durations, the points at which events begin and end, and the relation between sound sources and the durations scheme.[1478] But his consequent "word pieces," starting with *Arabic Numeral (Any Integer),* composed in April of 1960*,* consisted of nothing but imperatives that inform the performer which action(s) he or she has to take. But, while Young quickly became increasingly poetic and even nonsensical (cf. some of his *Compositions 1960*, below 3.4.5.3), Cage grew abstract and practical.

3.4.4.4.7 1962/1963 *Variations III*

0'00" is still about sound, despite the fact that it is only implied. In *Variations III* – "For one or any number of people performing any actions" – this aspect is now positively left out of the performance requirements, making the composition the ultimate consequence of the evolution that Cage went through since the 1950's.

The piece is much more a composition than *0'00"* because fulfillment of the prescriptions in the score of the latter *is* the piece (the one disciplined action), while *Variation III* needs the performer to determine the required actions by way of applying specific rules to combinations of transparencies. Nevertheless, sound now definitely does not come into the picture, not even indirectly. There are no additional specifications for the actions either, such as the obligation to others. *Variations III* can be performed by a pianist (as was the first performance by David Tudor) performing any actions, sound-producing or not, involving the piano or not. The action may deny the piano and the pianist, even the

[1478] Potter 2002, p. 45.

performance, its identity as such. *Variations III* is therefore the most extended form of piano performance imaginable, and the endpoint in the evolution towards ever extended playing and compositional treatment of the piano.

3.4.5 1950's Other US developments

3.4.5.1 1951-53 Alan Hovhannes: extended techniques and exotism

In 1943, after a thorough European-style classical training in New England, US-born Alan Hovhannes (1911-2000) decided to explore his Armenian heritage and develop his own direction in music. To make a fresh start, he destroyed nearly a thousand of his own earlier works. What became his highly individual and kaleidoscopic musical style would be especially shaped by the impact of his Armenian studies, his exposure to Indian music and his interest in Indian and Asian philosophical ideas as well as his inclination toward meditation and mysticism. He would later vehemently express his interest in non-Western music:

> Twelve equal intervals to the octave, or "equal temperament," is a mechanical convention of Western industry. It is the "piano scale." It destroys all the mysterious intervals of Armenia, India, Korea and Japan. […] Equal temperament is a prison of chrome and glass. Equal temperament gives no chance for "chance." To hear and perform exact intervals of ragas, melas, and tonalities, study the shanai of India, the piri of Korea, the hichiriki of Japan […] Where are the fifty-three divisions of the octave?[1479]

Next to an interest in exotic and unusual modes, and the improvisatory character that typifies virtually all his piano works, the linear nature of the music either defies a harmonic language or gives it a distinctly subordinate role in the overall texture. The musical interest often derives from the sonorities themselves rather than through chordal function or harmonic progression. In the 1950's his musical vocabulary was expanded to utilize antiquarian and contemporary compositional traits from around the world, e.g. the *Fantasy* op. 16, written in a Japanese formal structure, but also incorporating traits derived from Indian, Armenian and Arabic music.[1480]

The early 1950's are also marked by the use of extended techniques such as playing with plectra and other implements directly on the strings of the piano. The use of these techniques mostly coincides with Hovhannes' imitation of Non-Western instruments on the piano. Imitations of instruments like the Tar, the Oud and the Tambour in piano music of the Armenian composer Komitas Vartabed – seen by Hovhannes as the Armenian "Bartók" – influenced Hovhannes "to develop the piano as an Oriental instrument."[1481] He even learnt to play some of those traditional instruments and discovered unique new approaches to the keyboard by borrowing their playing styles, figurations, rhythms and modal inflections.

Many such instruments can be recognized in Hovhannes' piano works, for instance the Oud, Kanoon, Jhaltarang, Tambura, Sitar, Nai and the Japanese Shakuhachi, Ryuteki and Sho. Of these, the Jhaltarang, Oud and Kanoon have influenced Hovhannes into using extended techniques for his piano music. The most important one is the Jhaltarang[1482].
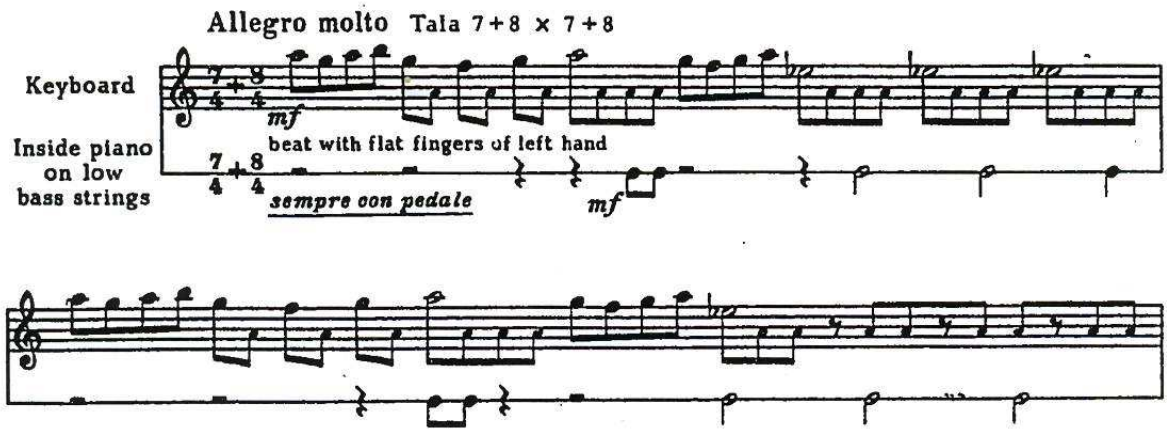
[1479] As quoted in Johnson 1987, p. 70. All the biographical information on Hovhannes is taken from Johnson 1987.

[1480] Johnson 1987, p. 15-16.

[1481] Johnson 1987, p. 14.

[1482] Literally: "waves of water," or cup-harmonica. The Jhaltarang is a relatively obscure north Indian instrument using a set of graduated porcelain bowls, usually 11 in number. Filled with varying amounts of water and thus tuned to the scale required, it is placed in a semicircle on the ground in front of the player and struck rapidly with thin, wooden sticks to produce bell-like tones. The Jhaltarang has a short envelope so many repeated notes are necessary in order to prolong the pitches and to give the effect of drone notes. The instrument is particularly well

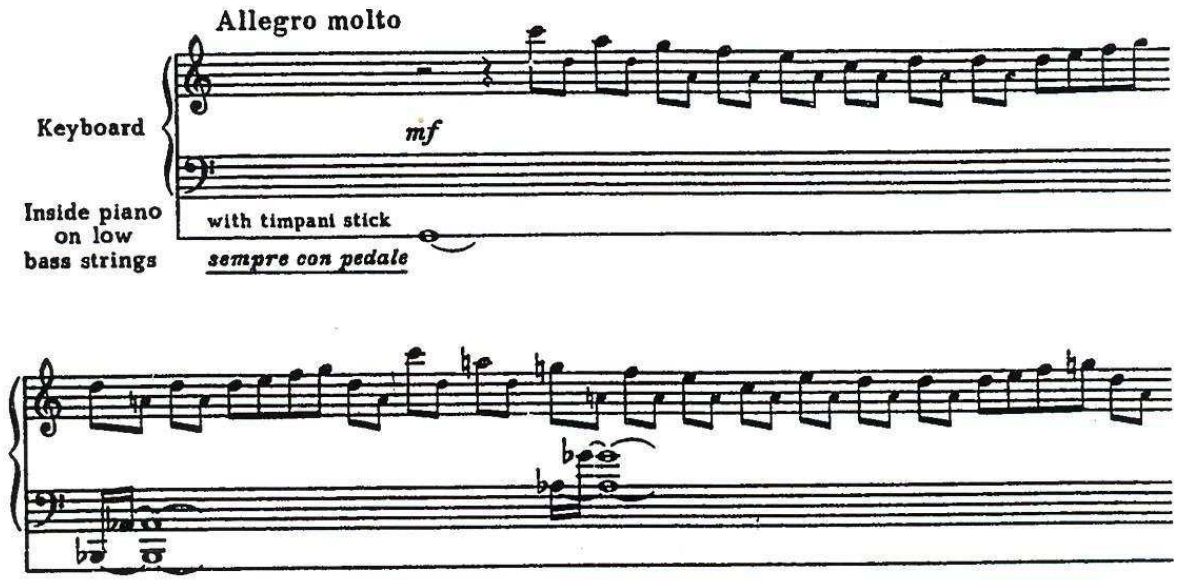
Generally, the "jhala" style involves the right and left hand playing in parallel motion two octaves apart, with the sustaining pedal often depressed throughout. One of the characteristics of both Hovhannes' Jhaltarang and Oud[1483] imitations is the rapid repeated notes, which both ethnic instruments need to prolong pitches. In the *Fantasy* opus 16 (1952 – ex. 3.843 and 3.844) and *Jhala* op 103 (1951 – ex. 3.845), the right hand plays such a jhala pattern while the left hand uses a timpani stick to play gong and bell sounds above and below. Complex sounds of bells and gongs have always held a fascination for Hovhannes. In his orchestral works they are recognizable as a recurring effect, on the piano he sometimes produces gong-like effects in a conventional manner by simply writing non-harmonic clusters in the lower registers and allowing them to ring through the use of the sustaining pedal, or using an implement such as a timpani or marimba stick to strike the open strings of the grand piano. Besides *Jhala* and the *Fantasy*, more of the latter techniques are found in the *Concerto* op 98 (1953), the *Pastoral* opus 111 nr. 1 (1952) and *Orbit* nr. 2 op 102 (1952).



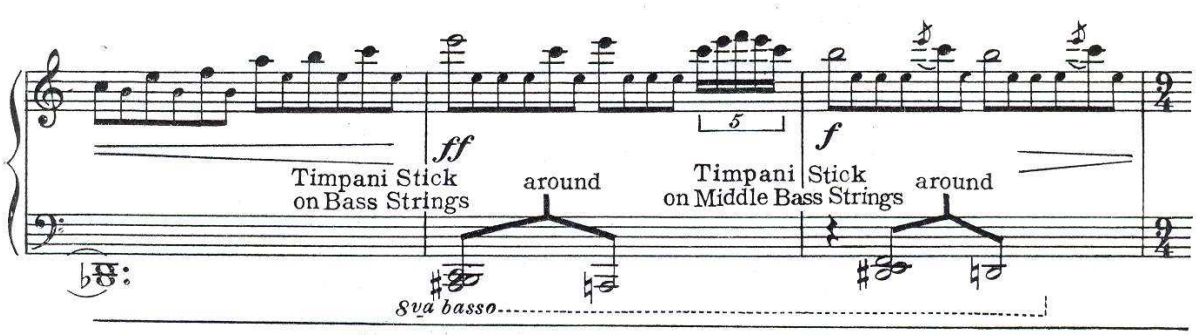
Example 3.843. A. Hovhannes: *Fantasy* opus 16 (1952), section 10. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

suited to imitation on piano due to its percussive nature and because it is one of the few instruments using fixed pitches throughout performance. For instance, the characteristic bending of pitches to produce the "shrutis," or microtonal inflections, so characteristic of Indian music would not be possible on either the Jhaltarang or on the piano, as it is on stringed instruments or with the voice.

[1483] Arabic name for a lute (al-ùd). It is considered the Queen of instruments in Arabic-speaking lands and normally has five or six strings, relying on many repeated notes for a feeling of prolongation of tones. These are typically played very rapidly, in a sort of mandolin-like style.



Example 3.844. A. Hovhannes: *Fantasy* opus 16 (1952), section 9. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.
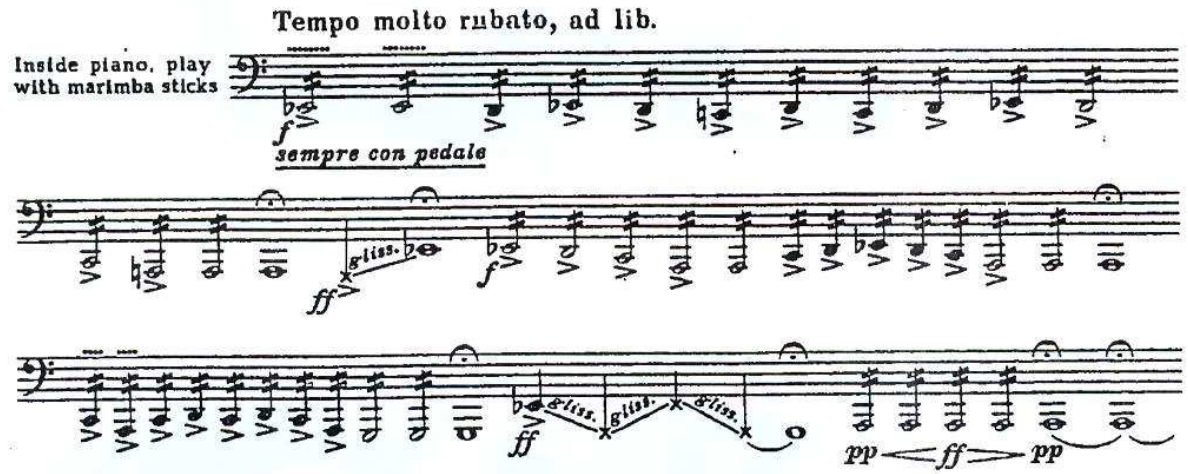


Example 3.845. A. Hovhannes: *Jhala* (1951), bars 92-94. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

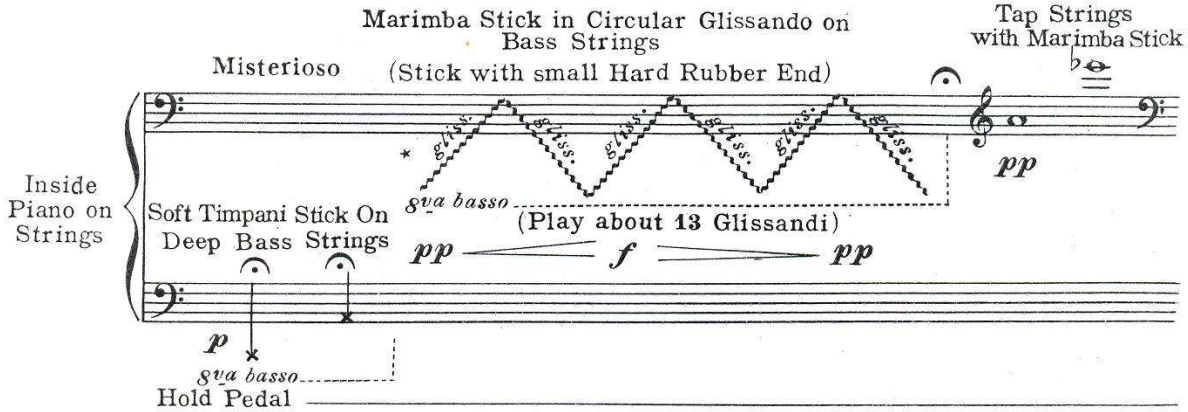
Extended techniques not only appear to *accompany* non-Western influences in Hovhannes piano music. Sometimes they represent the imitation itself, as is demonstrated in another example from the *Fantasy* (ex. 3.846) where percussive technique is used to prolong notes of the Kanoon[1484], an instrument described by Hovhannes as "a smaller version of the inside of the piano." The use of marimba sticks with hard rubber beaters makes for a metallic quality that sounds remarkably similar to the actual timbre of a large Kanoon. In the *Pastoral* opus 111 nr. 1 (1952), the piano is effectively considered as a psaltery, to be played upon with timpani and marimba sticks

[1484] The Kantoon is of Turkish origin and widely used in Greece and Arab countries. It is basically an Arabic version of psaltery: a trapezoidal box across which are stretched up to one hundred strings arranged in triple choruses with a range of about 3.5 octaves. The player rests the instrument on his lap and plucks the strings with plectra fastened to the fingers. Because of the natural resonance of the Kanoon and the fact that it is basically undamped, there is a considerable overlapping of tones. Since both hands are involved in plucking, a multilayered texture is possible; one hand frequently provides a drone-like framework while the other hand plays florid melodic passages. Again, very rapid passagework is possible, and frequently the instrument is played in free or unmetered rhythms. In compositions or improvisations in which the mode or scale changes during the course of the piece, the Kanoon can actually be retuned during the performance by the use of the small metal bridges near the tuning pins or by the left hand in "stopping" certain courses of strings.

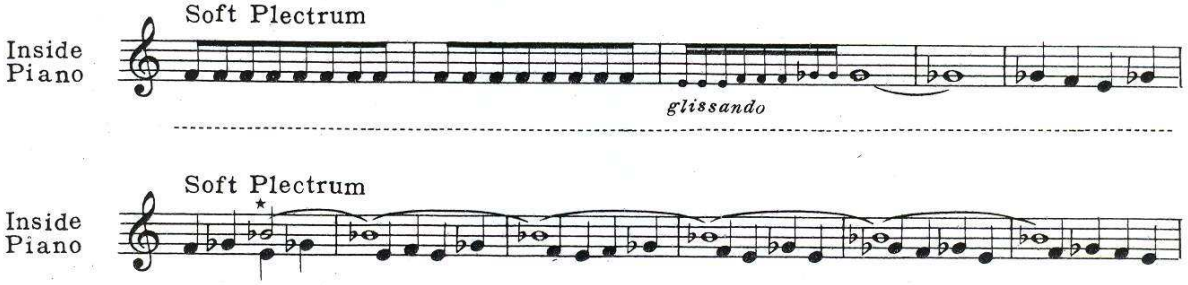
(ex. 3.847), and in the *Hymn to a celestial musician* opus 111 nr. 2 (1951), where gliding with a plectrum over consecutive tricords, slowly enough to produce the rhythm regularly, imitates the repeated notes of the Jhala style in pizzicato. (Ex. 3.848 and 3.849.)



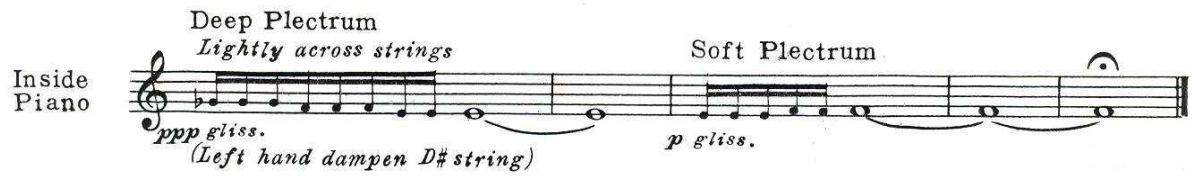
Example 3.846. A. Hovhannes: *Fantasy* opus 16 (1952), section 1b. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.847. A. Hovhannes: *Pastoral No. 1* opus 111 nr. 1 (1952), opening. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

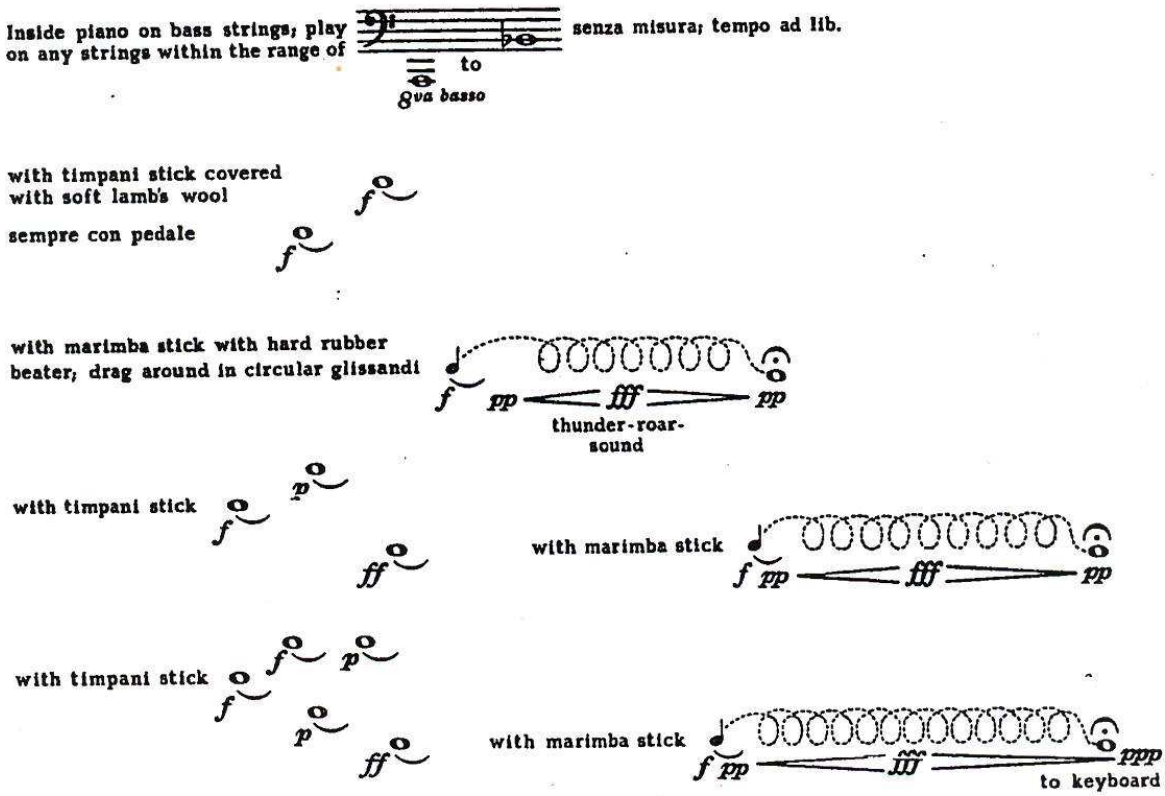


Example 3.848. A. Hovhannes: *Hymn to a celestial musician* opus 111 nr. 2 (1951), bars 55-65. The dotted line underneath the top staff represents the sustaining pedal, which is to be depressed throughout this passage. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



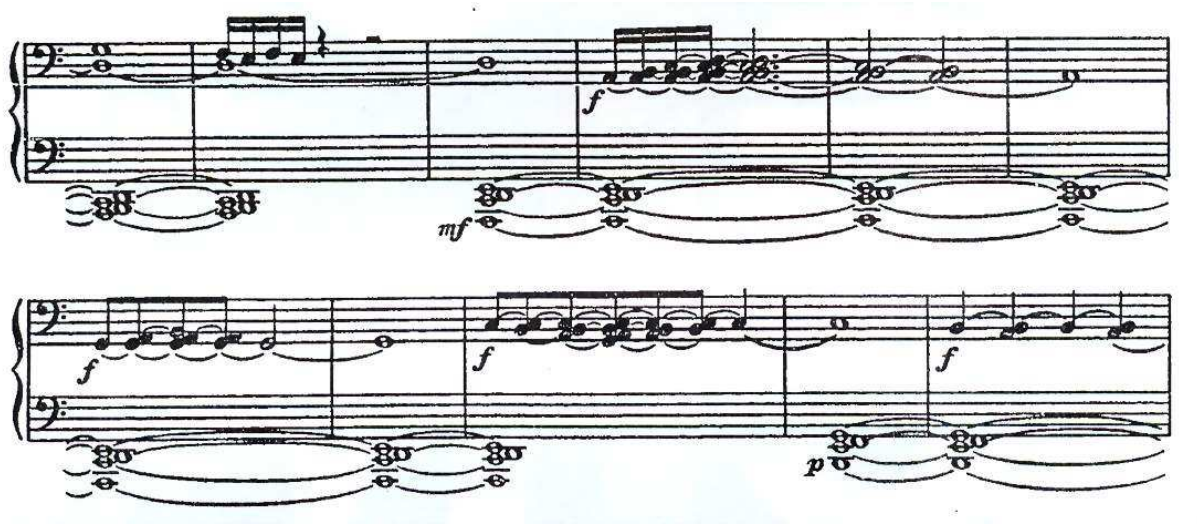
Example 3.849. A. Hovhannes: *Hymn to a celestial musician* opus 111 nr. 2 (1951), final bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Next to prescribing mallets to achieve timbral effects like gong sounds, or to play exactly notated melodies, Hovhannes lets the performer improvise as well as create pure sonorities as in yet another part of the *Fantasy.* (Ex. 3.850.)



Example 3.850. A. Hovhannes : *Fantasy* opus 16 (1952), section 4. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Although Hovhannes incorporates imitations of ethnic drums in several works, he never required the performer to play with cluster technique. In isolated piano works clustered chords can be found, e.g. in the *Poseidon Sonata* op 191 (1957), where they are based on sounds of the Sho, or additive and subtractive cluster-chord build-ups in the *Bardo Sonata* op 192 (1959), reminiscent of Cowell's moving clusters (ex. 3.851).



Example 3.851. A. Hovhannes: *Bardo Sonata* opus 192 (1959), bars 27-37. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

From the second half of the 1950s, Hovhannes turned to more standard practices and phased out the string piano techniques.

3.4.5.2 1951-60 The New York School

In the early 1950's four composers in New York became friends and formed a group that was to be remembered as the New York School: John Cage, Christian Wolff, Morton Feldman and Earle Brown. They were not really a school – only Christian Wolff had been taken lessons with Cage – but they found themselves on common ground beyond geographic and social proximity. With regards to compositional aesthetics, Feldman and Brown were closest to each other in that they converted their interest in American modernist painters most directly into their music: in just a few years, they were responsible for developing some of the key works and compositional attitudes that took music notation away from its tradition to reach its farthest representational limits. Both Wolff and Cage also used graphic notation but with different goals in mind. All four composers were connected through the collaboration with pianist David Tudor, who premiered so many of their works in this decade, and whose playing (and professional work ethic) was such an inspiration to his four friends (if not a a direct influence) that he may be considered the fifth member of the New York School.[1485]

3.4.5.2.1 1951-60 Christian Wolff

In 1950, Christian Wolff (°1934) was sent by his piano teacher Grete Sultan (who had been introduced to Henry Cowell by Richard Buhlig, and to whom Cage would dedicate his *Etudes Australes* in 1975) for lessons in composition with Cage. The first piece Wolff wrote for keyboard instrument was *For prepared piano* (1951) and demonstrates the typical characteristics of the prepared piano as Cage had developed them through more than a decade of experiments. Wolff's preparation materials consist of screws, bolts, a strip of jar rubber, a penny, a screw with a loose nut and rubber wedges, all to be

[1485] See Holzaepfel 1993.

inserted between specified strings of specified notes. New are the indications to specify the timbre, showing the composer's preferences and helpful to determine the intended place and manner of insertion, e.g. "to give some wooden sound to sound about *e♭*^{1}" (the prepared note being *g*^{1}) or "to sound pitchless and dead" (for the rubber wedges).

Measurements for the location of the preparations materials range from precise measurements (to a 16th of an inch) from bridge or damper to an indication of timbre ("to sound about ¼ tone above [*e*^{2}]").
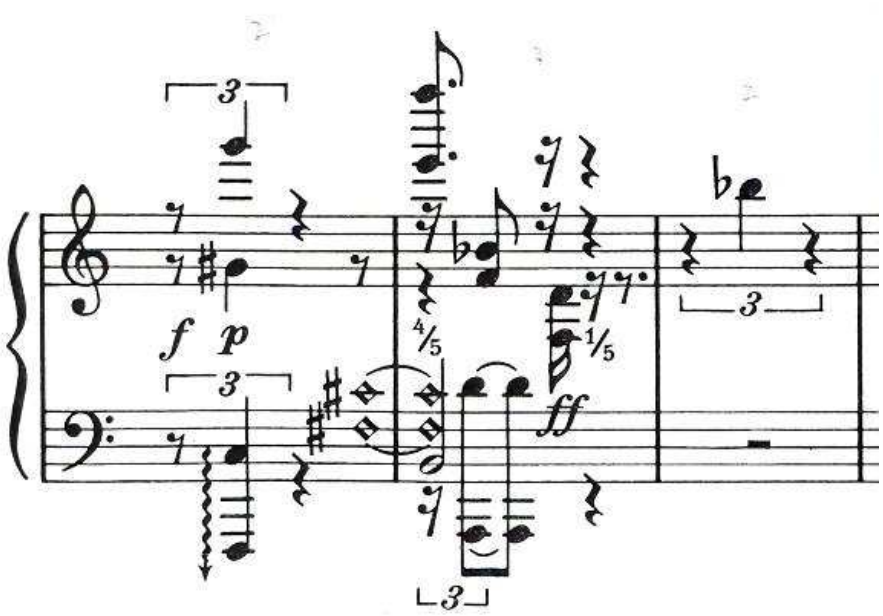
Contrary to Cage's habit of only using prepared sounds in a composition "for prepared piano" (except just a few pieces – see above), Wolff makes a point of including proper piano sounds among the prepared ones. He also prescribes silently depressed keys for producing sympathetic resonance and asks the pianist to have a "pod rattle or [an]other convenient rattle-producing instrument on [the] piano at player's right. To be tapped."

Wolff is clearly aware of the potential for differentiation that the *una corda* pedal offers to the prepared piano, using its shifting of the keyboard to the right often to only let the 2nd and 3rd string sound, leaving an unprepared 1st string out of the sound. One sound is specifically prepared with a penny so that a "metallic buzz should sound when played *mf*, none when *mp.*" In the score, that sound appears with both dynamics but the effect is not exploited structurally.

In his *Suite (I)* for prepared piano (1954), Wolff almost duplicates the preparation table of his first prepared piano piece written three years earlier, only adding a small stick of wood and wrapping jar rubber around a bolt. Again timbres are specified, measurements now range from precise to the complete lack of such indications for the very high (short) strings. Again proper piano sounds appear among the prepared ones: the first of the three movements – about half of the number of bars in the whole composition – contains no prepared piano sounds at all. In the second and third movement, the prepared sounds pop up regularly but mostly simultaneously with one or more proper sounds. No accessory to produce sounds (cf. the rattle pod in *For prepared piano*) is here required.

With the *una corda* pedal Wolff now ingeniously exploits some unexplored particularities of the preparation effects. All three strings of *c*^{2} are prepared by a tin strip wound through them, so the shift of the *una corda* pedal would make no difference in sound. Nevertheless, that *c*^{2} appears several times in the first movement, each time specifically given the *mezzo piano* dynamic (the only indication of dynamics in the whole of the first movement). Since this note is prepared with a strip of tin specifically to "make the tin rattle only after *mf*," the *mp* is to ensure that the *c*^{2} only sounds as an unprepared note. Similarly, the *f*^{1} is used without dynamic indication as well as with *fortepiano*, the latter case enabling the effect of the prescribed "no rattle [of the penny and wood stick] until *mf*, then high, thin metallic 'overtone'."

Another example of Wolff's creativity in using prepared sounds relates to sympathetic vibrations. There are two instances in which keys are to be depressed silently. The first such instance occurs in the first movement and does not involve prepared notes for the silently depressed keys, nor for the related keys that potentially activate the open strings. The second instance is written in the second movement, and here the silently depressed *f#* can be activated by the properly sounding *B*, but the silently depressed *c#*^{1} will sound really only by the *preparation sound* of the *d*^{1}. The latter is prepared with rubber in such a way that it should sound "about *c#*^{1}," i.e. the only sounding pitch in that bar that can trigger the silently depressed note's vibrations. (Ex. 3.852.)



Example 3.852. Chr. Wolff: *Suite (I)* for prepared piano (1954), 2nd movement (♩ = 60-70), bars 16-18. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Wolff's *Sonata* for three pianos repeats the preparation practices of the earlier works, but *For piano with preparations* (1957) represents an evolutionary step within Wolff's oeuvre. The preparation materials deviate from the *Suite* in that they are more diverse (eraser and a "strip of address book cover, or something like it, e.g. cork strip" are required), but also by allowing for materials that he previously did not want to rattle (e.g. screws) to now be "slightly loose" or fitted "with loose nut." Measurements of preparation locations again range from more or less precise to "anywhere," and timbral descriptions are added to the preparation table ("slight harmonic to sound"; "almost dead sound," "rather more rattle than previous note," "sound between [d^2] and [$c\#^2$] [preparation of $f\#^3$]"). Compared to the *Suite*, where prepared notes and sympathetic vibrations were the only improper piano sounds among many proper ones, there are now several other extended techniques, among which the pizzicatos (for fingertip and –nail / with damper on or off the string) and finger mute. Again, Wolff adds some techniques of his own making:

- To touch a string (its damper lifted) with the fingertip, setting the string into vibration by lifting the finger suddenly or by sliding it off;
- To snap at a string (its damper lift) with the fingernail

Outside of the prepared piano pieces, Wolff had written for piano also (*For Piano I* contains some silently depressed keys) but it is not before *Duo for pianists (I)* (1957) that other extended techniques appear in Wolff's oeuve. The duo is for 2 pianos four-hands and first performed by Tudor and Cage. With this composition, Wolff approaches the aesthetic of Cage's *Two Pastorales* from 1952, where preparations are mixed with non-prepared extensions as well as proper piano playing. He does not go as far as Cage's *Water Music* of that same year, or as the two Ten Thousand Things pieces that Cage wrote for (prepared) piano in 1954. (See above 3.4.4.3.2.)

The performers are to play certain types of sounds freely within indicated timings. The number of sounds to be played are indicated, as are silences and sometimes dynamics or octave transposition. The sounds are to be chosen from sets of traditionally notated pitch sources or from a special category of prepared sounds. Each of the two performers has to choose two materials to prepare strings with (e.g. wood, rubber or metal), to be called "y" and "z." Both materials may be similar but should have a minimum degree of difference. The preparations can be placed on any string but may not interfere with

sounds that are otherwise called for, e.g. those from the pitch sources. When there is time, the location of the materials can "and might well be" changed from one string to another or on the same string, even when that string is being sounded.

Besides preparations, Wolff uses improper modes of playing like in the previous pieces, adding yet one more new technique:

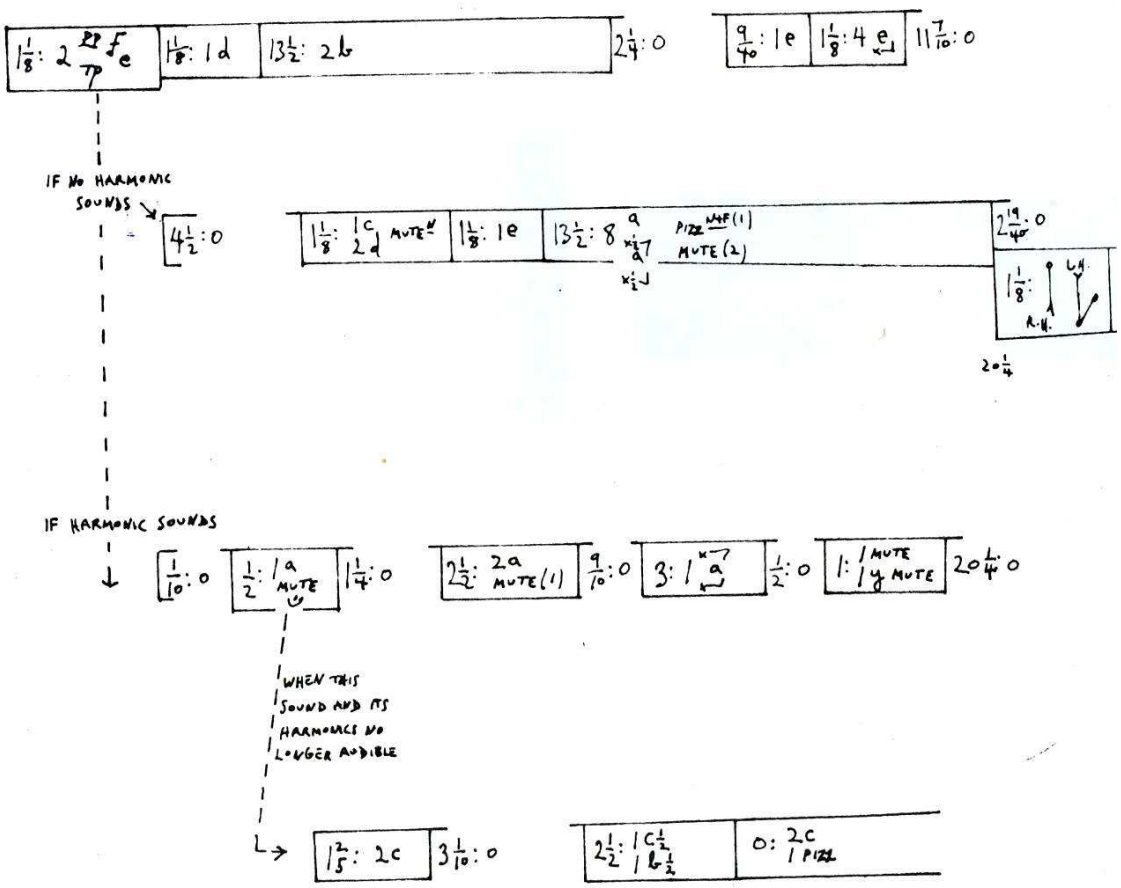
> To mute strings simultaneously with the finger and the finger nail (in between or next to the strings of a tone) so as to produce a slight buzz of the string against the nail when the corresponding key is struck;

Two years later, Wolff wrote *For pianist* (1959), which uses many of the performance processes and techniques from *Duo for pianists (I)*. Now the preparation materials are completely unspecified , and they may interfere with sounds otherwise called for "except by oversight." The technique of touching the string with the fingertip and setting it into vibration by either suddenly lifting the finger or by sliding off, can now also be applied by means of a small magnet, "set noiselessly on [the] string, then pulled off with damper off." The pizzicato technique is further refined, "sometimes specifically with the nail of the right hand thumb while the flesh of the finger rests on (or just off and falling on) the plucked string, choking off the sound. The motion of the nail can be like snapping at the string from below while the flesh comes to rest on the string." Again some new techniques are introduced next to existing ones (scraping strings with the finger or the fingernail): "Mute-pinching" (pinching the strings of a chorus tightly together) and "Battuto muto" ("as in Bussotti," i.e. striking the keys without the intent of making a sound – the activation of the hammer may accidentally produce sounds).

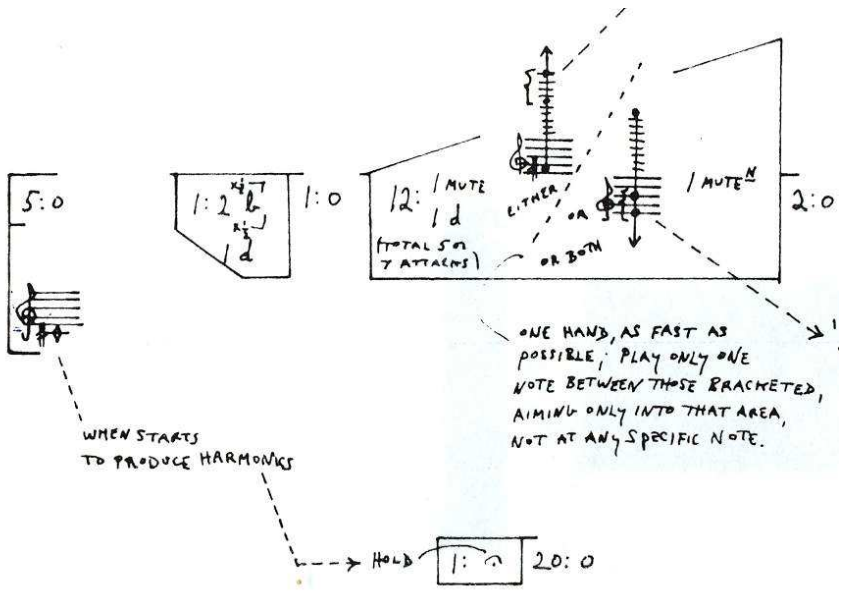
Wolff further uses a notation of his own to give the direction of the movement of the hands rather than indicating which note to play. Such movements can bring the pianist to either places on the keyboard ("out") or on the strings, inner construction and dampers ("in"). Movements can be from "in" to "out" or vice versa.

Most noteworthy is how Wolff lets a perceived or intended uncontrollability of improper sounds influence the structure of the composition:

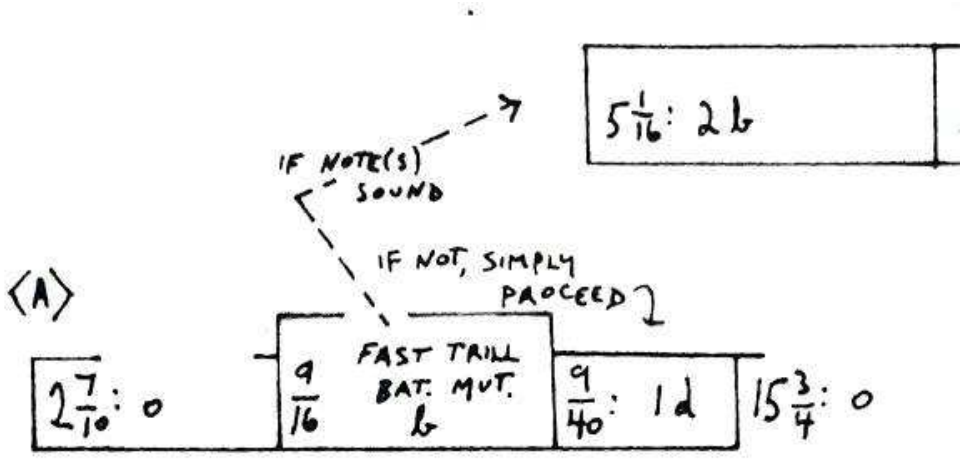
- different paths of action are to be followed depending on whether or not tapping strings (with the nail or the flesh) produces a harmonic (ex. 3.853);
- actions are indicated for the exact time at which open strings (relating to silently depressed keys) start to vibrate (ex. 3.854);
- different proceedings are indicated depending on whether strings neighboring a plucked string are accidentally hit ("usually involves finger’s slipping"), a neighboring string of the same pitch is hit, or if the sound is clear;
- if a *batutto muto* produces no sound, the performer must "simply proceed" to the next action; if "note(s) sound," a secondary path is to be added to the original one;
- different ways to proceed are indicated for when a muted string does or does not "hit" a prescribed harmonic (ex. 3.855)
- in some cases, the performer has to proceed to another page, e.g. when tapping a string produces no harmonic, or in case of accidental sounds from the preparations (e.g. by unintentionally hitting them);



Example 3.853. Chr. Wolff: *For Pianist (I)* (1959), excerpt from page 7. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.854. Chr. Wolff: *For Pianist (I)* (1959), excerpt from page 2. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.855. Chr. Wolff: *For Pianist (I)* (1959), excerpt from page 6. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

The *Duet I* for piano four-hands (1960) extends the principles of circumstantial sound production to the art of ensemble playing. To compensate for the complexity of making sounds depend on somenone else's actions, Wolff uses less specific improper techniques and defines them more generally, e.g.
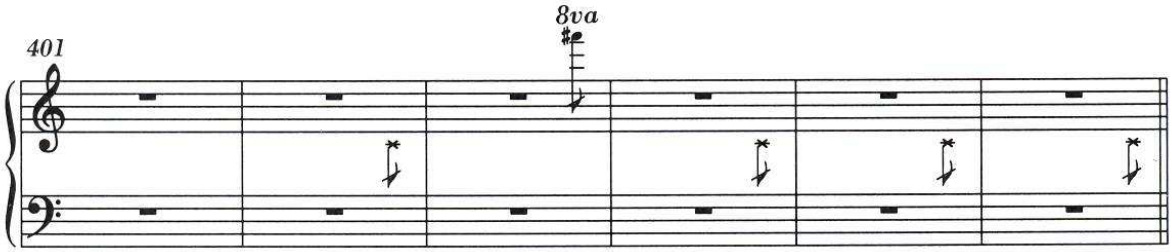
> play inside the piano on a string struck by the other player (from the keyboard), in any way. Generally not knowing which string will be played, you must try to play as soon after you see a string struck as possible, while the damper is still off that string. The simplest action is to mute the string.

The extreme is to perform "an alteration of timbre, from any initial timbre to any other timbre." But Wolff tries out new varieties of existing techniques as well: next to pizzicatos with nail or flesh, he combines them with flageolet technique or asks for a plucked string to be cut off immediately; next to muting a string to obtain a flageolet, he requires a mute "with finger plus fingernail (between or next to strings of a tone), to produce a slight buzz (of string against nail) when key is struck."

3.4.5.2.2 1951-56 Morton Feldman

Soon after meeting Cage, Feldman composed music to accompany solo dancers. His *Three Dances* were first performed in 1951 for Merle Marsicano (who would be the dedicatee of Cage's *Two Pastorales* in 1952) and require the pianist to play a drum and a glass.[1486] In the *Variations* for solo piano from the same year, the score contains unexplained indications in between the staves (ex. 3.856) that remind us of Cage's percussion notation showing when the pianist has to play on the construction of the piano. (See above, 3.4.4, ex. 3.808.)

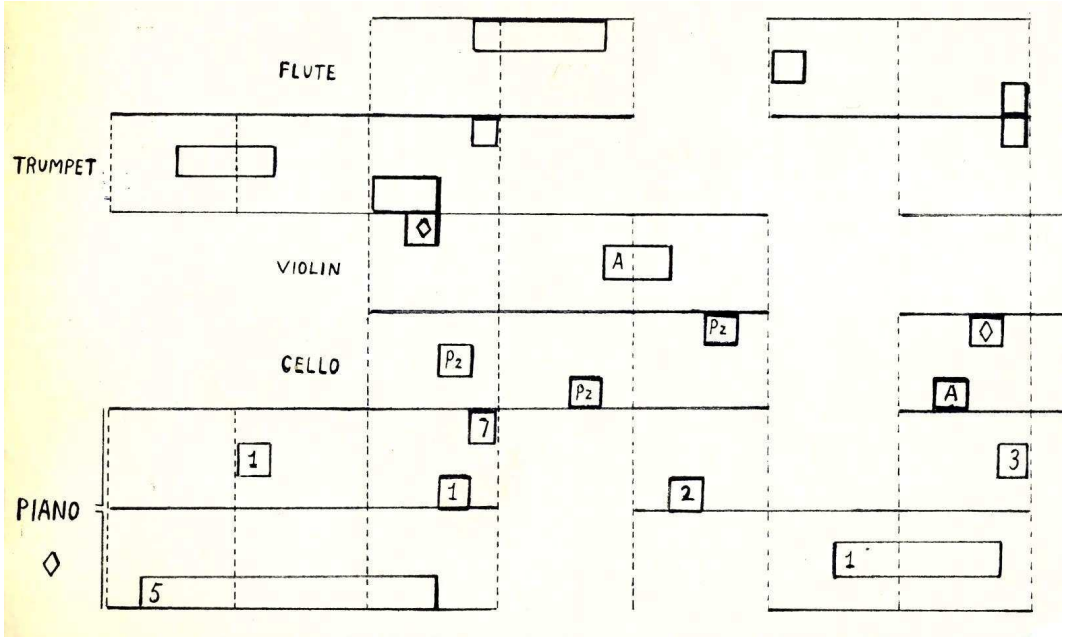
[1486] Rizzardi 2003.



Example 3.856. M. Feldman: *Variations* (1951), final bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Such works remained rarities in Feldman's output and his attention quickly turned to what became known as his "graph" pieces. Notated on graphic paper, the musical parameters of time and pitch were represented by resp. the vertical and horizontal dimensions of boxes drawn upon the paper. It was in between 1950 and 1953 that he wrote the bulk of these graph scores, mostly in the series of *Projections* (1-5), *Extensions* (1-3) and *Intersections* (1-3) for settings ranging from solo over chamber music to orchestra.

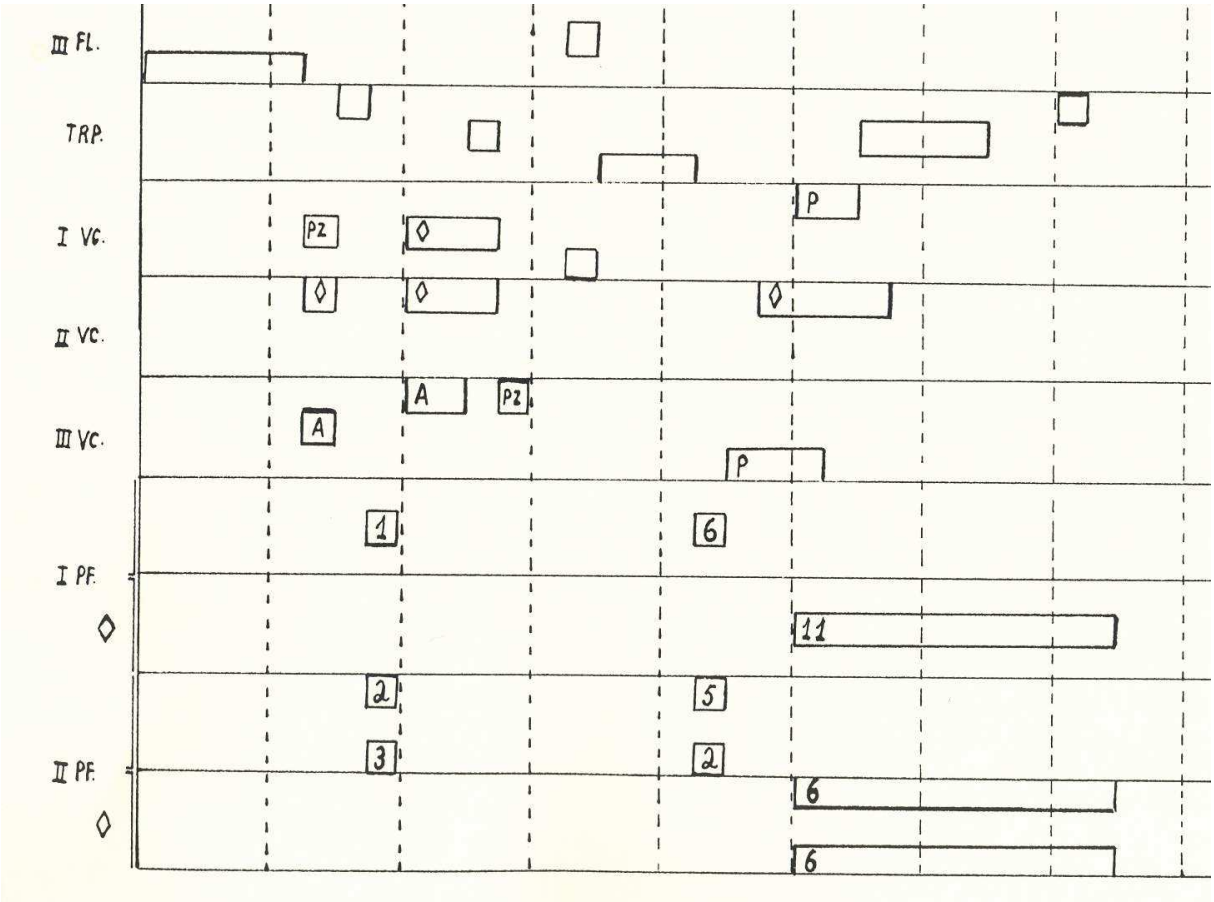
Projections formed an important conceptual breakthrough for Feldman, as he could now "project" sounds into "a totally abstract sonic adventure."[1487] In this series, Feldman notates piano harmonics on a separate system specified with the familiar diamond symbol. In the second piece of the set (the first one is for cello solo), the performance note says "to avoid over-crowding on the score, harmonics for piano are indicated below sounded notes" but he does not explain how the harmonics should be produced. That they are compared to sounded notes suggests that Feldman notated the harmonics as silently depressed keys. Only one such harmonic remains completely silent as there are no sounded piano notes to trigger sympathetic vibrations, not even by the trumpet, which is instructed to play into the open piano. (See box 6-7 in the piano part of ex. 3.857.)



Example 3.857. M. Feldman: *Projection 2* for flute, trumpet, piano, violin, cello (1951), opening. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

[1487] Skempton 1996.

In *Projection 3* for two pianos (written two days after the previous piece of the set), "each pianist reads two parts simultaneously, with the lower part (◊) making of the piano a source of sympathetic resonance."[1488] Every one of the boxes on that lower system now has a properly played note on the system above to set of the sympathetic vibrations. The next piece, *Projection 4* (for violin and piano), written another eleven days later, has a specification "the ◊ indicates playing without sounding (for the release of the harmonics)." Again, there are no silently depressed notes without their proper counterpart. Yet, in the last of the series, *Projection 5* for 3 flutes, trumpet, 3 cellos and 2 pianos, the performance notes are exactly the same as in the third piece, but here, none of the nine boxes on the harmonics staves have any corresponding struck string sounds above them. The trumpet always plays during these nine instances, but it can only play "into either one of the two pianos." (Ex. 3.858.)

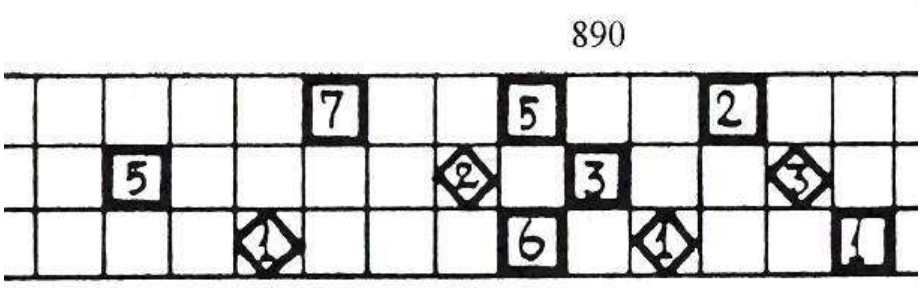


Example 3.858. M. Feldman: *Projection 5* for 3 flutes, trumpet, 2 pianos, 3 cellos (1951), opening. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

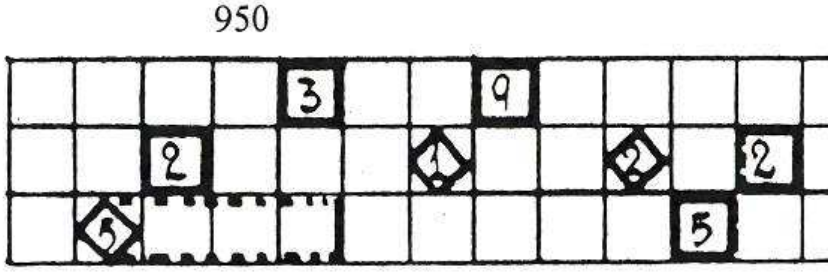
These early pieces suggest that he is not yet fully aware (or does not care) about the less effective ways to apply the technique of sympathetic vibrations (some silently depressed keys are written in the treble where they have little effect, even if all dynamics are choosen freely). Outside of the graph pieces, Feldman continued to use sympathetic resonance, sometimes experimenting with the technique. In *Extensions 1* for violin and piano (also 1951, written in traditional notation), he combines a silently depressed black key chord with a loud white-key glissando over the same range. In most further instances, like in *Piano Piece 1956 A* and *Piano Piece 1956 B,* the silently depressed notes are used to poduce very soft sounds that fit in very well with the already quiet aesthetic of these pieces.

[1488] All quotes regarding *Projection 3* come from the performance notes in the score. (C.F. Peters P6961.)

In *Intersections III,* the score consists of square and diamond shaped boxes. That the performance notes are quiet about them is unfortunate: with the *Projection* pieces in mind, the diamond shaped boxes would suggest silently depressed keys, but many of them stand on their own. Even if they mostly appear right before square boxes, they are most often stopped before the properly played sounds can trigger sympathetic resonance (ex. 3.859) only ocasionally having the adequate length (ex. 3.860). At one point such a diamond shaped box is simultaneous with a square one (ex. 3.861 – inefficient at this tempo), while in one instance the diamond-shaped box is separated from any other sound by at least one empty box. One editor suggests that these diamond-shaped boxes may indicated flageolet technique[1489], but there is no other evidence in any piece by Feldman to corroborate this idea. The solution may lie in the tempo of the piece and the idea that actions rather than sounds are notated. It is clear that the sostenuto pedal is needed to lock silently depressed keys. When diamond-shaped boxes appear right before or after proper boxes, Feldman may have intended them to be depressed for the duration of one boxes and held with the sostenuto pedal. That he sometimes wrote prolonged diamond-shaped boxes may be explained by the fact that these were located long before or had to last until long after sounds that were meant to trigger the resonance. If these were not explicitely notated it may have been too confusing for the performer. It is also possible to see the short diamond-shaped boxes as coming *after* proper sounds, perhaps meant to *catch* resonance. At a tempo of at least 158 and with dynamics free (i.e. loud enough to carry the sound over more than one empty box), this is just possible. Another possibility – perhaps a little theoretical – would be to consider these discrepancies part of the aesthetic and have silenlty depressed keys that serve no sound producing purpose. This would fit with the four tempo changes between box 1250 and 1310, when only two boxes contain sounds and at least one of the changes is purely psychological.

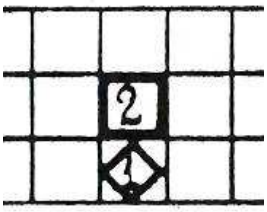


Example 3.859. M. Feldman: *Intersection II* (1951), box 881-895. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.860. M. Feldman: *Intersection II* (1951), box 947-949. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

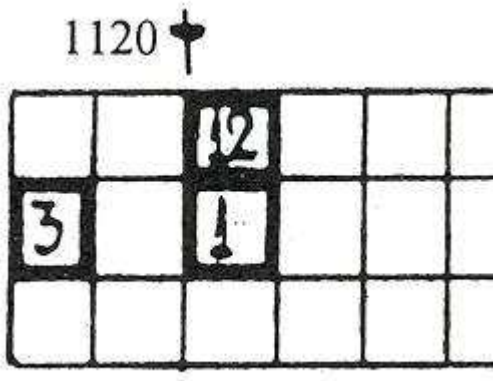
[1489] Straebel 1998.



Example 3.861. M. Feldman: *Intersection II* (1951), box 992-996. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

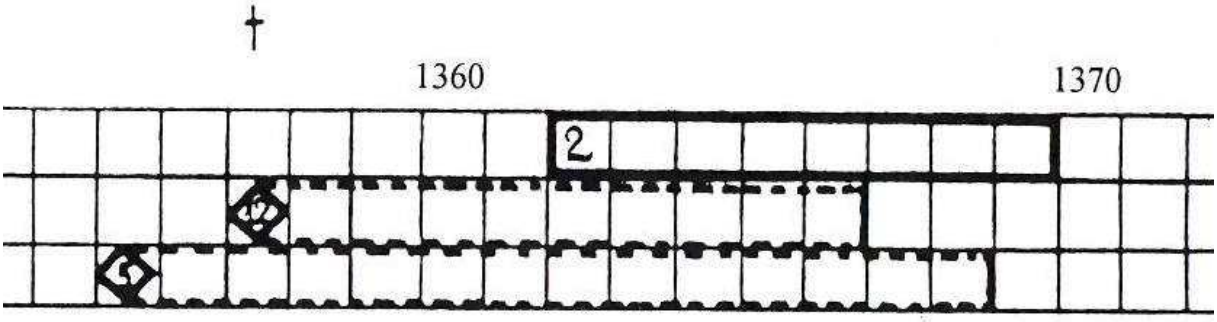
In the *Intersections* the performer is free to enter at any time during the time span indicated, "like crossing a street, that's why I called them 'Intersection,' to me time was the distance, metaphorically, between a green light and a red light. It was like traffic, it was a control. So I always controlled the time, but I didn't control the notes."[1490] Feldman may not have intended to control the notes, he did desire them to be neutral ("pure (non-vibrating)"[1491]) and he was the one prescribing the number of notes to be played in the boxes. Most of these pieces are characterised by low-density and low-speed, but the second and third *Intersections* – the ones for piano, both from 1951 – are the exception. In these, the density was larger than any performer could possible master when using proper piano technique, often even with three chords in a space that lasts less than third of a second.

In the score of *Intersection II* "the number 12 indicates any number, 12 or more." That number appears only three times. The first time it sits alone and can therefore still be played with mostly proper fingering (all ten fingers; thumbs depressing two notes simultaneously), the second and third it is combined with a number in another register. Feldman then indicated "with elbow, not broken" (ex. 3.862), resp. "with flat of the hand." (Ex. 3.863.) With "elbow" Feldman most likely meant the forearm, to depress more than 12 notes; the flat of the hand would be just enough to cover a chromatically filled octave cluster.



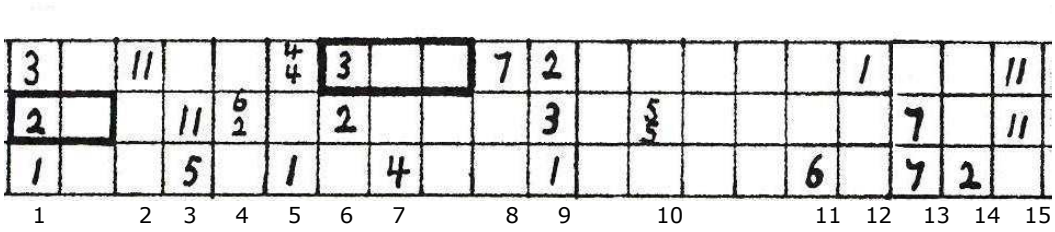
Example 3.862. M. Feldman: *Intersection II* (1951), box 1119-1124. The cross refers to a footnote with the performance practical indication. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

[1490] Feldman's explanation of the title "Intersection," quoted in Zimmermann 1985.
[1491] Griffiths 1995, p. 94 and p. 303-306.
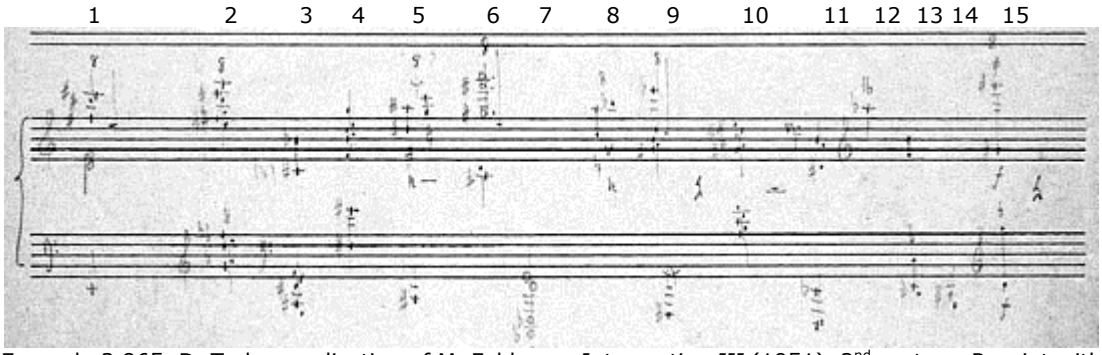


Example 3.863. M. Feldman: *Intersection II* (1951), box 1353-1372. The cross refers to a footnote with the performance practical indication. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

In *Intersection III*, no such indications are included in the score. Feldman knew that the 22 notes required in two simultaneous boxes (In Feldman's metronome indication, one box equals 176) would have to be adjacent and practically simultaneous, necessitating cluster technique. (Ex. 3.864.) A realisation by David Tudor further shows how clusters were deemed logical sounds also when the number of notes did not necessarily require cluster technique. If the second chord (our numbering in ex. 3.865) is divided over two hands, the third consists of an 11-note chromatic cluster and a 5-note aggregate; in the fifth instance, the two 4-note accumulations that are required in the treble range were chosen by Tudor to be a 4-note pentatonic cluster (indicated by # under the cluster) and a 4-note diatonic cluster (with a ♮ underneath); at instance 8 Tudor combined a diatonic cluster with a *b♭³* to accumulate 7 notes; at 13, the right hand has a 7-note chromatic cluster and a 6-note diatonic cluster with a *D#*; at 15 two forearms are put on the keyboard to make for a 22-note combination of black and white keys.
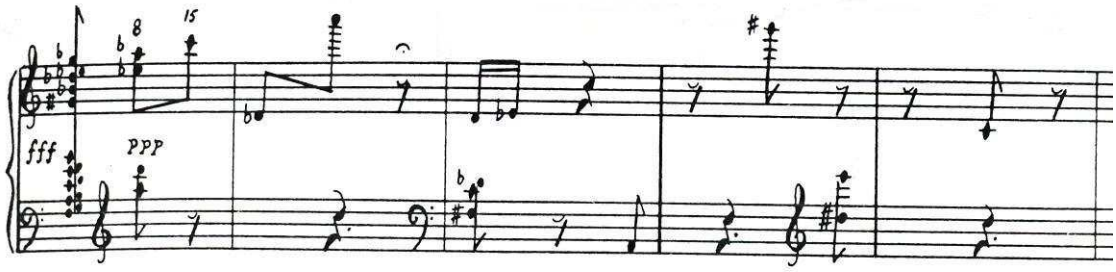


Example 3.864. M. Feldman: *Intersection III* (1951), box 20-39. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.865. D. Tudor: realisation of M. Feldman: *Intersection III* (1951), 2nd system. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Except for two orchestral works (*Atlantis* in 1959 and *Out of* "*Last Pieces*" in 1961), Feldman did not return to graphic notation. During the years of writing on graph paper, he still used conventional music notation, but we find very few extended techniques. Although Feldman acknowledged that he had learned from Cage how "all intervals are equally accessible or equally useable or equally beautiful," Feldman restricted himself to pitched sounds rather than using noises.[1492] Only in *Intermission 5* (1952) do we see a black- and white-key combination of two clusters written out. (Ex. 3.866.) According to the composer, "Intermission means between; I wrote a number of them as a part of living, that is, I did many other things during the day than just writing music. The writing of one of them never took more than two hours."[1493] *Intermission 5* is reported to have been written at just such a part of living: coming home from the hectic New York city streets, Feldman slammed the door shut and tried to relax. The opening cluster represents the sound of the door, the soft pitches that follow symbolize the relaxation process. A few times in this process, smaller clusters reappear, as symptoms of stress not having disappeared in one effort.[1494]



Example 3.866. M. Feldman: *Intermission 5* (1952), opening bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

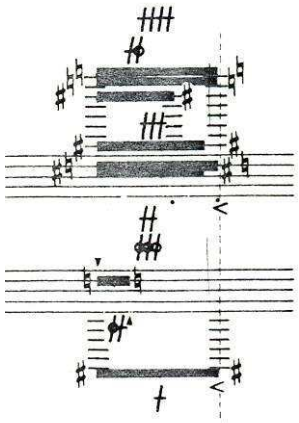
3.4.5.2.3 1952-54 Earle Brown

Earle Brown (1926-2002) met John Cage in 1951. Like Feldman and Cage, Brown experimented with new forms of notation that allowed the performer more choices of his own (Brown enjoyed a longtime fondness for jazz improvisation). Like Feldman and Cage, Brown was interested in the work of painters, notably Jackson Pollock, Alexander Calder, Jasper Johns, and Robert Rauschenberg. The combination of both interests culminated in *4 Systems and Folio*, dated 1952-54 as a published set. *Folio* is conceived much like a painter's portfolio: it consists of 6 single pages, each with a composition worked out in a different type of notation (like Cage realised on a grander scale with the piano part of his *Concert for Piano and Orchestra* – see above), each untitled but signed with a different date in between October 1952 and (June) '53[1495], i.e. a few months after Cage first experimented with time equals space notation in *Water Music* and *4'33"*, and about a year after Feldman started composing on graph paper.

One page (*Oct. '52*) of *Folio* has three systems of double music staves, with traditional noteheads and durations but without rests, barlines or clefs. Another page (*Nov. '52*) has the same type of notes and durations, but now placed on one big staff consisting of fifty

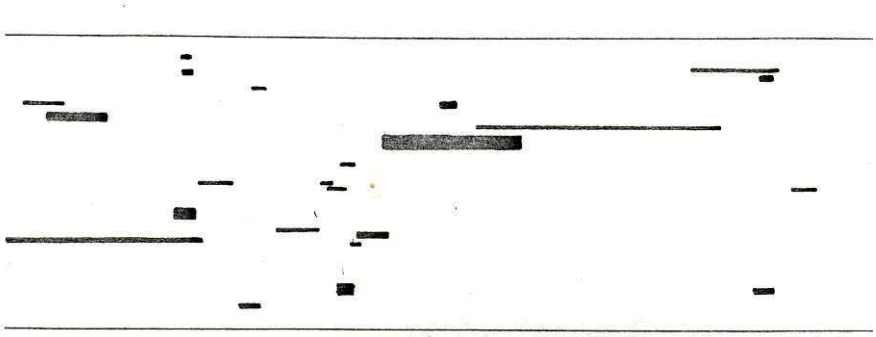
[1492] Zimmermann 1976, p. 24.
[1493] From the programme notes for a recital by David Tudor at the University of Illinois, Urbana, Illinois, USA, on 22 March 1953. (http://www.cnvill.net/mftitles.htm - last accessed in August 2008.)
[1494] This story was reported to the author by Yvar Mikhashoff, who taught at the music department of the University of Buffalo, New York at the time that Feldman was his colleague and held the composition chair.
[1495] Five of the six pages are dated with month and year (the latest June '53), one only has "1953."

regularly spaced lines. If *Oct. '52* could still be associated with the right and left hand of a keyboard player (aggregates sometimes have stems that connect notes on both staves), each stem in *Nov '52* belongs to only one note and it is up to the performer to decided on the range, on the way the notes relate to that range, and therefore on the instrumentation. Yet another page (*June '53*) has stemless noteheads on double music staves and is "transcribed from floor plan spatial paterns of a dance by Carolyn Brown" but turned 90° to the left. One page, dated only 1953, leaves the tradition of indicating a note's place in time by notating its point of attack (notehead) and its length in code (white/black notes, flags and dots) to literally extend the notehead to its entire length. (Ex. 3.867.) As there is now no more visual differentiation between beginning and end of a note, the score can be turned 180° to give a different composition. To facilitate both readings, the accidentals are positioned at each end of the notes and the dynamic indications are written so that they can be read from either side.



Example 3.867. E. Brown: *1953* from *Folio* (1952-54), excerpt. © G. Schrimer, Inc.

Brown used this notation again for *25 Pages* (also dated 1953) and *Forgotten piece* for four pianos (1954). On January 20th, 1954, however, *4 Systems* shows an evolved state: the lines representing the pitches are retained, but the staves, accidentals and dynamics are no longer part of the score. (Ex. 3.868.) The outer lines of each system now define the limits of the keyboard, the sequence in which the four such systems are played is free, as is (are) the speed(s), and the score may be turned around 180°. Of importance here is Brown's performance practical note "Thickness may indicate dynamics or clusters."

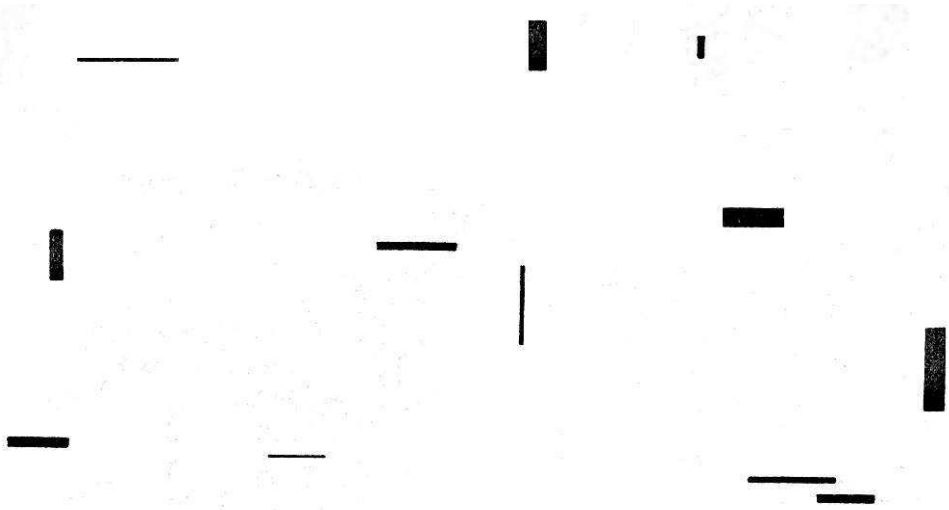


Example 3.868. E. Brown: *4 systems* (1954), first system. © G. Schrimer, Inc.

The most well-known part of *Folio,* dated *December 1952*, seems to have been thought of more than a year before *4 Systems.* Logically, however, it is the ultimate consequence

of the evolution between *Oct. '52* and *4 Systems*. Despite the location of Brown's signature (typically indicating the bottom right side of any drawing or painting) the score can now be read with any of its four sides up. There are no specifications anymore of how the vertical and horizontal dimensions of the score are representative of pitch range and time. Neither did Brown leave any indication of how to interpret the thickness of the lines, nor can one deduce that this piece was still intended for the keyboard.

If *December 1952* is the follow-up of the process that led to the notation in *4 Systems*, then it follows that thickness can here also represent dynamics or clusters, and even that the piece was conceived with the piano in mind. However, if the composition was indeed written *before* 1954, it would be part of the set of conceptual excercises that is formed by *Oct '52*, *Nov. '52* and *June '53*, collecting different takes on how to rethink musical notation, with no real regard for instrumentation. Following on *Nov. '52*, which has no more clue as to instrumentation, *December 1952* can be seen to fit the inside of a piano, with the lines and rectangles representing noises as much as pitches, positioned in relation to the space on the strings as much as in relation to time. (Ex. 3.869.)



Example 3.869. E. Brown: from *Folio* (1952-54): *December '52*, excerpt. © G. Schrimer, Inc.

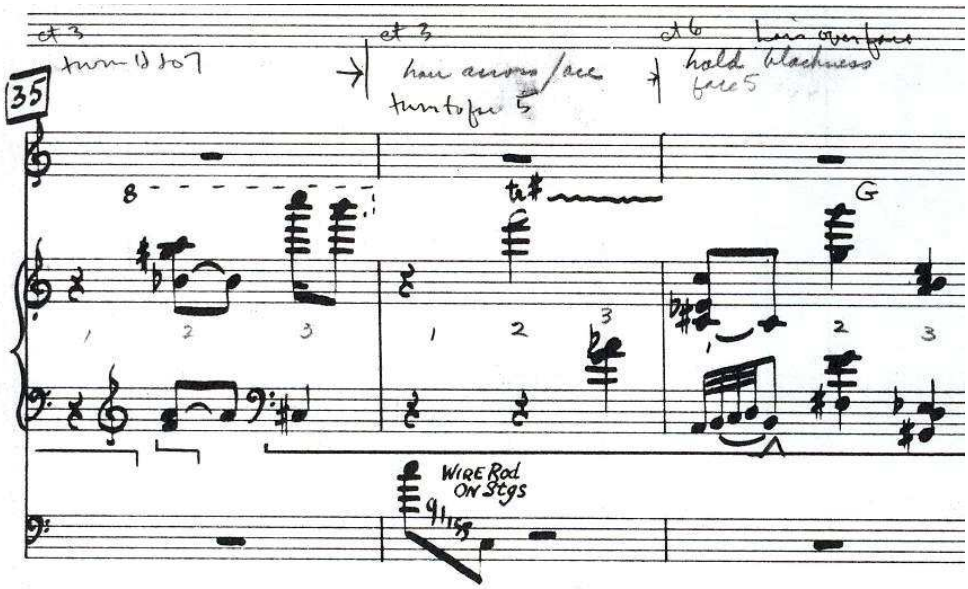
3.4.5.3 Lucia Dlugoszewski and the timbre piano

As a composer, Lucia Dlugoszewski (1932-2000)[1496] had studied with Varèse and considered herself to have been lucky "because I escaped the rigid dead-end dogmas of both serialism and aleatory disciplines. He always said, 'Go to the direct exploration of pure sound. That way you will be original.'"[1497] She studied piano with Grete Sultan, who had worked with Cage on his *Etudes Australes* and who had already sent Christian Wolff to Cage. It was through Sultan that she met dancer Eric Hawkins (1909-1994), for whose dances most of Dlugoszewski's consequent music was made.

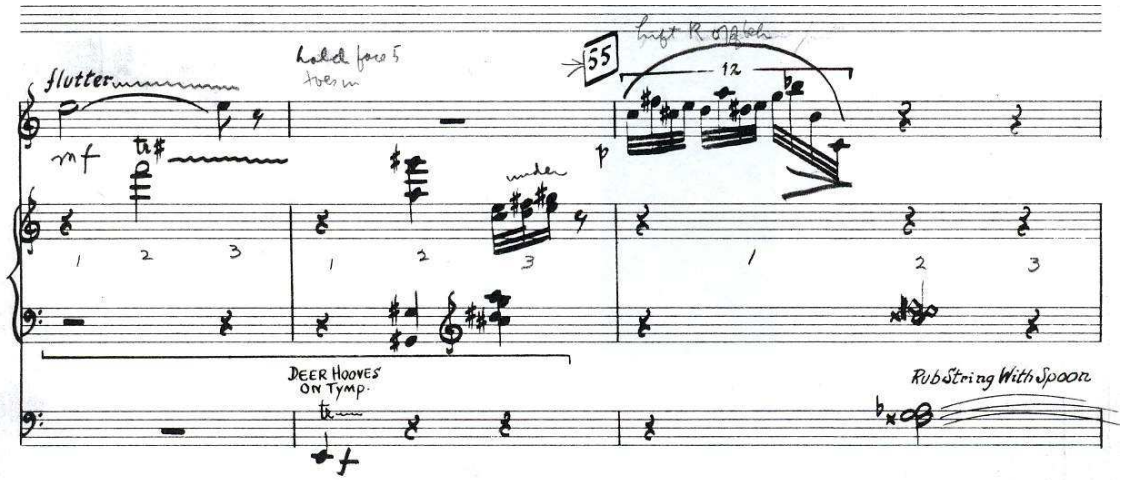
In her work, Dlugoszewski searched for "the sheer wonder of making and hearing a sound with no logical or emotional interference; hence all my inventions and explorations into new sound, new playing technique, new instruments of which one result was the timbre piano."[1498] The term "timbre piano" was first created by the then editor of Musical America, Robert Sabin when he wrote about her in a 1969 article[1499], but she had started experimenting with insides of the piano as early as 1952, with *Openings of the eye* "for flute, percussion and piano."

Openings of the eye[1500] [1952] for the dance by Eric Hawkins contains 5 movements: *Discovery of the Minotaur, Disconsolate Chimera, Ritual of the Descent, Goat of the God, Eros, the first born.* The piano part is written to be played mostly on keys, including glissandos and clusters. But indications on the percussion staff such as "Wire rod on st[rin]gs" over a glissando written between two notes of a two-octave interval (ex. 3.870), or "rub string with spoon" while the piano shows diamond shaped notes (ex. 3.871), "tone cluster – roll with hard FELT MALLET on St[rin]g" and "HOLD HARD MALLET DOWN ON G# St[rin]g. + Rub Slowly Upward" (ex. 3.872) show that the percussion staff was intended for the pianist as well. Furthermore, there is never any real conflict between both parts: most of the percussion part happens when there is nothing in the piano part, or they can both be understood as a double notation for combined actions on keyboard and strings. The program leaflet of a concert on May 18, 1959, where Dlugoszewski is listed as playing both piano and percussion parts, finally confirms the suspicion that *Openings of the Eye* is in fact a work for flute and piano.[1501]
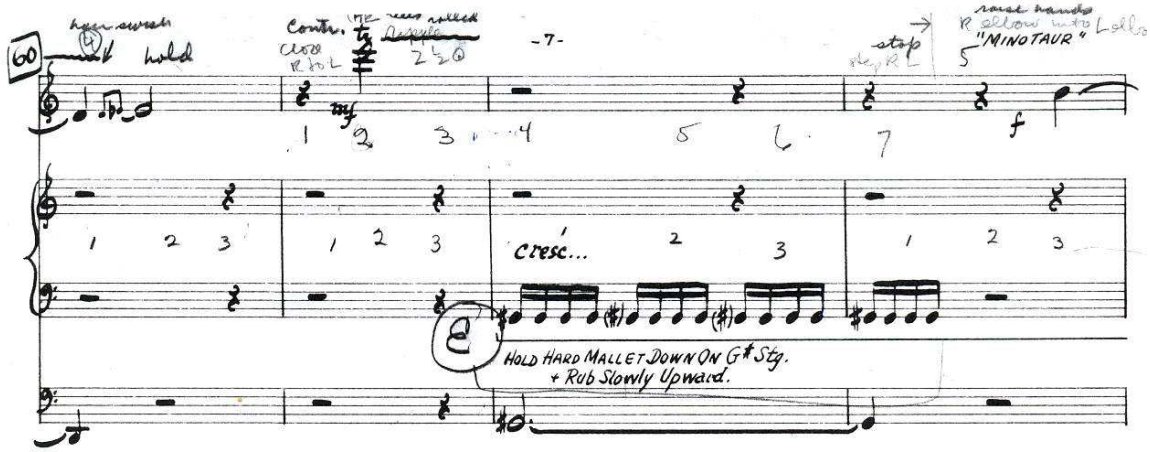
[1496] Some early references cite "Lucille" as a first name. Since her marriage to Hawkins, the name was consistently Lucia.
[1497] BMI – The many worlds of music, May issue 1969, P. 5. As found among personal papers of Dlugoszewski in BOX 174, Folder 6 of the Dlugoszewski papers at US-Wc.
[1498] BMI – The many worlds of music, May issue 1969
[1499] Information from a typed A4 in BOX 174, Folder 6, of the Dlugoszewski papers at US-Wc. It is not clear whether the term Timbre Piano was thought of in 1969 or in 1957. He latter date – at which Sabin first met Dlugoszewski, seems suggested by Sabin.
[1500] Score in Box 178, folder 1, of the Dlugoszewski papers at US-Wc.
[1501] The concert was called "Composer's Showcase". The program leaflet is in box 175, folder 6, of the Dlugoszewski papers at US-Wc.



Example 3.870. L. Dlugoszewski: *Openings of the eye* (1952), 1st movement *Discovery of the Minotaur*, bars 35-37. Reproduced with permission of the Library of Congress.



Example 3.871. L. Dlugoszewski: *Openings of the eye* (1952), 1st movement *Discovery of the Minotaur*, bars 53-55. Reproduced with permission of the Library of Congress.



Example 3.872. L. Dlugoszewski: *Openings of the eye* (1952), 1st movement *Discovery of the Minotaur*, bars 60-63. Reproduced with permission of the Library of Congress.

Further techniques mentioned in the manuscript of *Discovery of the Minotaur* are the dropping of deer hooves on tympani, pizzicatos and the use of a wire brush on the strings. Except for the tympani in the first movement and the indications "Drum", "Bone" and "Log" in the second movement, there is hardly any indication of which instruments the percussion part is written for. The lack of performance notes and detailed instructions in the score itself points to the intention of it being used solely by Dlugoszewski herself.

As much as Dlugoszewski continued conceiving music for or including the piano to accompany dance, she did not limit herself to that medium. Her music for the 1953 or '56 film *Visual Variations on Noguchi* was possibly made with the manipulated sounds of timbre piano; the 1957 string quartet prescribed the use of multipronged plastic bows, glass bows and "steel trilling ricochets."[1502]

The next score that survives, including the timbre piano, is that of *Early Floating: Five Curtains of Timbre* from 1961.[1503]As the title is accompanied by both this early date and an indication "Jan 29, 1995", it is not clear whether the score is not a later product of an early composition, possibly under the influence of experiences, discoveries and developments from the years in between. Nevertheless, it is worthwhile to look at it since it demonstrates where her ambitions led her in the matter of the timbre piano.

Many of Dlugoszewski's indications are cryptic, such as "Music matras," "delicate buzz cloth of gold angel syndrome" or the often-returning "Whisper Wham" and "Ricochet asymmetrical texture." Most striking is the number of household objects that she uses to produce sounds at the piano. From those that are decipherable, we can list:

Knife (cutting edge)
Bow
Hairpin
Plectrum
Glass
Yarn mallet
Wire brushes
Spoon
Paper clip
Tray
Comb
Fastener
Coin
Ruler
Wood mute
Steel mute

It seems that the often-added "bow" refers to an action rather than a tool, as we came across "Tray bow," "Yarn bow," "Glass bow," and "Ruler bow."

It seems that Dlugoszewski used more tools than the fingers to mute strings. Some of the specific manipulative actions that can be deduced are:

[1502] BMI – The many worlds of music, May issue 1969, P. 5. As found among personal papers of Dlugoszewski in Box 174, Folder 6 of the Dlugoszewski papers at US-Wc.
[1503] Box 190 of the Dlugoszewski papers at US-Wc.

- Scraping with a knife on the brass windings of string
- Glass glissando on bass string
- Hairpin "celeste" texture scraping on highest strings
- Glass bow hit brass
- Glass gliss on brass, roll yarn
- Wire brushes roll
- Spoon bow tremolo mid strings
- Yarn bow tremolo mid strings
- Hit ribs with yarn mallet
- Drop glass bow on resonator
- Hit II string with ruler bow
- "Bubble" roll with plectrum on wood of mute
- Tray delicate rub fastening
- Gliss moving finger mute (bubble sound)
- Plectrum trill
- Comb mute
- 2 comb bows slow bowing
- Ruler hit
- Glass drop on resonator
- Pizz

Often, Dlugoszewski indicates the sound that she had in mind:

- Ripple texture on clip mute with plectrum
- Violence scrape wood on fastening (whisper wham)
- Hairpin celeste texture highest string
- "Sho" texture
- Hairpin shriek
- Plectrum ripple clip mute
- Knife cutting edge shriek gong
- Keyboard graces on "bubble" comb ruler [mute?] una corda delicate
- Ripple on comb mute keys "bubble sound"
- Flower front friez glissade
- Ripple coin mute
- Hairpin cluster
- Hairpin trills rich metallic wash
- Ruler squeak
- Glass gliss slow like rain
- Shriek gong
- Low ripple
- Knife "oboe"
- Tender brush
- Plectrum ripple mute

Indications for techniques mixing keyboard with other performance surfaces are rare, e.g. "on combs + keys," "Keys (comb high) mute," "Key comb mute bubble" and "Total dissonance pure keys high."

3.4.5.4 1952- Extended techniques in popular music

3.4.5.4.1 1952 The Ferrante-Teicher duo and Easy Listening

The piano duo of Arthur Ferrante (1921-2009) and Louis Teicher (1924-2008) had been professionally trained at the New York Juilliard School of Music (where they joined the music faculty) and embarked on a 42-year career in 1947. From the 1950's to the 1980's they were well known for their light arrangements of familiar classical pieces, movie soundtracks, and show tunes, and they scored several hits as the major US easy listening act.[1504]

In 1952 the duo recorded their third record, called *Hi-FiReworks* (released in 1953[1505]). On the record are popular pieces like *Chopsticks*, *I've got you under my skin*, *Flight of the Bumble Bee* and *Semper Fidelis*, all arranged for extended pianos. Listening to the music, it is easy to detect such techniques as glissandos on the strings with fingertops and plectra, keyboard glissandos, Cowell's Aeolian Harp technique, pizzicatos, muted bass strings and rubber preparations. Less clearly identifiable are percussive sounds that may have been made with sticks and hands on wooden parts of the piano, buzzing sounds that are likely made by objects lying on the strings (like metal bars, glass, chains), inividual chorusses struck with mallets or thimbles, and large glissando sounds that may have been filtered by releasing the pedal while holding smaller keyboard clusters depressed. The record is obviously heavily postproduced: string glissandos are faded-in or cross-faded, at least three pianos can be distinguished (prepared and unprepared) in the most virtuoso passages, sometimes the fingerwork is so fast that it sounds as if a player piano is at work, or as if the speed was tempered with.

3.4.5.4.2 ca1956- Jerry Lee Lewis and Little Richard: rocking the piano

In the second half of the 1950's, Little Richard (°1932) and Jerry Lee Lewis (°1935) gained notoriety for their Rock-'n-Roll pioneering efforts. Until then, the early Rock-'n-Roll style "rockabilly" had rarely featured piano, but both Richard and Lewis succeeded in dragging the instrument out of its classical salon-style habitat and make it compatible with the performance needs that the new genre thrived on.

Early television performances show Little Richard standing up while playing (there is no piano bench in sight), with the piano closed except for the keyboard.[1506] His keyboard technique consists mainly of repetitive chords and shows nothing improper, as does his buttoned up suite. For some performances, he put his right leg on top of the piano's lid while singing *Long Tall Sally* in 1956[1507], or he stepped on the piano to sing and dance to Lewis' signature hit *Whole Lot of Shakin' Goin' on* (1957)[1508]. In the year of that song, Richard pulled away from the rock-'n-Roll scene to concentrate on a religious calling as a minister.[1509]

In general, Lewis displayed a very similar keyboard style, for which he was billed as "Jerry Lee Lewis and his Pumping Piano." But early television performances of, for

[1504] Biographical information from http://allmusic.com/cg/amg.dll?p=amg&sql=11:jeb1z81ajyvn~T1 - last accessed September 2009.
[1505] Columbia CL 573.
[1506] On Youtube, many clips van be found from 1950's performances by Lewis and Richard on American national television shows.
[1507] http://www.youtube.com/watch?v=QFL047fmsgg&feature=fvw - last accessed September 2009.
[1508] http://www.youtube.com/watch?v=rwsS1IQfTrc&feature=related - last accessed September 2009.
[1509] http://en.wikipedia.org/wiki/Little_Richard - last accessed September 2009.

instance, *Great Balls of Fire*[1510] show hime to consistently use glissandos to vary the pumping. A second trade mark was the hitting of the repeated chords from very high up, resulting in approxamations that would have been clusters if the depressed keys did not visibly demonstrate that chords had been the goal. Lewis generally started out playing while seated. Sometime during the song, most often towards the final repeat when the adrenaline soared, he kicked back the bench to play standing up.[1511]

Much of the performance style served to define the aesthetic against the traditional genres of musical performance. The rebellious attitude of "going mad" at the keyboard was synchronous with the way audiences attempted to lose themselves in their dance moves. If much of the establishment reacted with reserve – show hosts would introduce such artists as the ones that might destroy the piano – some played along, as the host of the Steve Allan show, who threw back chairs and objects from back stage after Lewis threw out his.

The visual evidence of this emancipatory episode of musical youth culture is limited. Clips from televised performances can be seen on the internet, but dating is difficult and opinions seem hard to distinguish from facts. Lewis is reputed to have played the piano with fists, arms and behind,[1512] and has reportedly set a piano on fire at the end of a live performance in the 1950's[1513], but no evidence is offered, at least not of the dates going back to the 1950's. In the 1960's these two Rock'-n-Roll artists demonstrably evolved in their use of exended techniques (see below), but as far as the 1950's are concerned, and aside from some Richard's dancing or displaying his leg on top of the piano, improper piano playing was still mostly limited to glissandos and stand-up playing, i.e. not all that far removed from what had been the case in ragtime practices. (See above, 3.4.2.4.)

Another unconfirmed rumour is that of jazz pianist Cecil Taylor playing clusters on the piano in the 1950's. He is often referred to as considering the piano to be "eighty-eight tuned drums" while the biographies start discussing his emergence on the scene to be in the 1950's. Both are true, but there is no proof that he concentrated on clusters and glissandos produced with open palms, fists, elbows and forearms before the late 1960's.[1514]

[1510] http://www.youtube.com/watch?v=nmLagQCgCwo&feature=related - last accessed September 2009.
[1511] E.g. on the Steve Allen show on November 3, 1957 (http://www.youtube.com/watch?v=nmLagQCgCwo&feature=related - last accessed September 2009).
[1512] http://en.wikipedia.org/wiki/Tone_cluster#cite_note-73 - last accessed September 2009.
[1513] http://oldies.about.com/od/rockabill1/f/jerryleepiano.htm - last accessed September 2009.
[1514] Dobbins 2002, p. 406.

3.4.5.5 1960 La Monte Young: extended techniques, minimalism and word pieces

In 1959, Californian composer LaMonte Young (°1935) had attended Stockhausen's composition course in Darmstadt, where he discovered Cage's indeterminate music.[1515] For Young,

> there is no question but that my exposure to John Cage's work had an immediate impact on my Fall, 1959 and 1960 work, such as […] the presentation of what traditionally would have been considered a non-or semi-musical event in a classical concert setting […][1516]

Nevertheless, Young "felt that I was taking these ideas a step further" as he considered Cage's pieces to be "realized as a complex of program sounds and activities over a prolonged period of time with events coming and going" and "I was perhaps the first to concentrate on and delineate the work to be a single event or object in these less traditionally musical areas."[1517]

One of the pieces that followed this impact was *Poem for Chairs, Tables, Benches, Etc. (or other sound sources)* (January 1960), in which the composer specifies that the sounds should be as constant and as continuous as possible, but "what is actually perceived is the uncontrolled and unintended deviation which arises from the impossible attempt to achieve a constant sound."[1518] Revealing as this is for Young's attitude towards the performer and the sound-making process, *Poem* is still about more than one action and therefore not yet "a step further" than for instance Cage's *Theatre Piece* (also from January 1960 – see above, 3.4.4.4.3). Three months later, however, Young would realize his break-through by composing *Arabic Numeral (Any Integer) to H.F. (April 1960)*, which requires the performer to repeat a specific single action for a certain number of times that is to be decided on by the performer. The composition is popularly known as *X for Henry Flynt*[1519] but, when used for a performance, the composer wants the title to show the actual numeral selected for a particular performance, the dedication to Flynt and the date of April 1960, regardless of the date on which the realization for the particular performance was made. According to Young that numeral maybe any, including one, but the titles that he has used for his own performances in 1961 show numbers ranging from 566 to 1698[1520]. Young first began to play the piece with drumstick on a gong that was lying flat on the floor[1521] but on his most recent work list he indicates it to be for "piano(s) or gong(s) or ensembles of at least 45 instruments of the same timbre, or combinations of the above, or orchestra."[1522] Nevertheless, his indications (e.g. explaining how the title must be determined) mention "the number of clusters that will be sounded" or "1,698 bangs at the cluster," suggesting the piano as the main instrument on which the piece was then played.

For Young, the reductive repetition of *Arabic Numeral* shows a definitive beginning for what he sees as mainstream or 'hard core' minimalism. According to Cornelius Cardew,

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[1515] After Cage's notorious visit to Darmstadt in 1958, he did not return there until 1990 (Shultis 2002, p. 39). In 1959, Young heard Cage's music presented in lectures by Stockhausen and on recordings by David Tudor. (Young 1969, p. 27.)

[1516] Young 2009, in which Young quotes himself from an interview with Richard Kostelanetz in *The Theatre of Mixed Means*, The Dial Press, 1968.

[1517] Potter 2002, p. 53.

[1518] Smith 2004.

[1519] Smith 2004. Henry Flynt (°1940) is a philosopher, musician and artist, with training in mathematics. He had been in touch with Young as early as 1959. (See www.henryflynt.org .)

[1520] *566 (to Henry Flint)* is mentioned on www.henryflynt.org (last accessed September 2009), 1698 in Potter 2002, p. 54. In Young 2009 he writes about a 2001 performance of *997 (to HF) (April 1960).*

[1521] Young 2009.

[1522] See his website http://www.melafoundation.org/lmyresum.htm#works. Last accessed September 2009.

the interest of the piece lies in its duration, in the variation within the uniform repetition, and – reminding us of what he had in mind for his *Poem for Chairs, Tables, Benches, Etc. (or other sound sources)* – in "stress imposed on the single performer and through him on the audience […] The mind constantly refocuses as the listener's attention is drawn by different elements and transformations of the sound. And the acoustics of an enclosed performance space ensure varied perceptions in different parts of the room." [1523] What are usually regarded as noises can reveal a rich variety of both acoustic and psycho-acoustic phenomena. By extending a single activity in time, a hypnotic status can be reached to "get inside the sound."[1524] Such goals explain the high integers that Young uses himself for his performances.

Other pieces from the year 1960 include the set of "word pieces" *Composition 1960* (May – December 1960[1525]). Like *Arabic Numeral (Any Integer)*, this collection consists merely of performance practical instructions. These do not specify any instrument and require the performer to for instance build a fire (#2), set free a butterfly (#5) or draw a straight line (#10). In contrast, *Piano Piece for David Tudor* #1 and 2 (October 1960) are very different: each piece conveys actions that relate specifically to the piano and the tasks have become very much Sisyphean. For the first, the performer has to attempt to feed the piano until the instrument is satisfied or decides it does not want the hay and the water that it is offered. In the second piece, the keyboard lid must be opened without any sound audible to the performer. He may try as many times as is necessary to succeed or to give up. In *Piano Piece for Terry Riley* (November 1960) the performer must keep pushing a piano through the wall (and any further obstacle) until he is too exhausted to continue. *Composition 1960 #13* (November 1960) is the most proper one as it demands from the performer to prepare a composition of his choice and then play it as best he can, but *Piano Piece for David Tudor #3* (November 14, 1960) is not so practical, with seven words revealing that "Most of them were very old grasshoppers."

Combining the principle of minimalistic reptition and the poetry of the word pieces, Young's *Compositions 1961* is comprised of 29 pieces that each instruct the performer to draw a straight line and follow it.

[1523] Cardew 1971, p. xiv.
[1524] Young 2009.
[1525] The whole set numbers 15 pieces, but some are not listed by Young anywhere (1, 8, 11,12, 14).

3.4.6 1940's-1960's The European situation
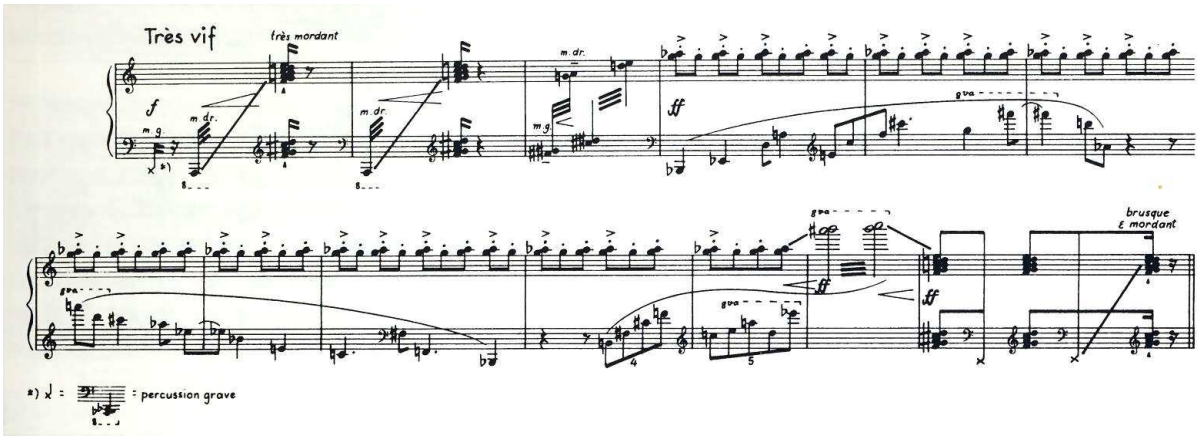
Compared to the American developments through for instance Ives, Cowell and Cage, the European inter-bellum did not yield any revolutionary steps towards the extended piano. Besides the early glissando, some interest in silently depressed keys, the dead-end experiments in Paris with paper between the strings and Langgaard's isolated position, the old continent cannot be said to have cared much for the improper potential of the piano. After the Second World War, this changed. Three factors shaped the renewed European compositional interest in the extended piano. The first was serialism and the attempt at integrating timbre into parameterized composition; the second was the direct and indirect influence of American imported experiences; the third was the interest in electronically generated music. The clash between budding serialism, the potential and the limits of tape music, and American theory (Cowell), music (Cage) and performance practice (Tudor) shaped the most prominent peak in the European evolution of the extended piano.

3.4.6.1 1945-52 Tentative extensions and serialism I: early Boulez

Besides a few instances of sympathetic resonance (see above, 3.4.2.3) – not taken to its full potential – the second Viennese school had shown no interest in extending the piano or its performance techniques. But in the second piece of *Notations* (1945[1526]) – Boulez' first official work and written for "his" instrument the piano – we find the two most basic of improper keyboard techniques, the glissando and the cluster, integrated at a structural level.

The set of twelve pieces, each exactly twelve bars long, was finished only a few months after Boulez had began working with René Leibowitz, whom he had sought out to be introduced to Schoenberg's twelve-note music.[1527] The double-palm clusters in the second *Notation* contain 12 adjacent chromatic pitches and, together with the glissandos, they open and close the little but violent and percussive palindrome composition. The whole is structured according to the dodecaphonic methods of retrograde and inversion. The keyboard's lowest three notes and the ensuing upward glissando are mirrored at the end with the highest three notes as a double trill followed by a downwards glissando. The cluster-glissando pairing at the start and finish encases the retrograde, inverted and transposed manipulations of the row that lies at the basis of all 12 *Notations.* The melodic direction of which is inverted as well and, except for some Messiaenic *valeurs ajoutées*, the rhythm is an almost perfectly retrograded. The right hand accompaniment to the middle section provides the rhythm of the last bar, adding to the feeling of unity in this piece.[1528] (Ex. 3.872.)

[1526] All dates and performance as well as publishing information are based upon the work list in Hirsbrunner 1985, p. 225-231.
[1527] See Nemecek 1998, p. 126-130.
[1528] For more, see Nemecek 1998.



Example 3.872. P. Boulez: *Notations*, nr. 2 (1945), complete. The opening symbol is explained as « percussion grave » in the footnote. © With kind permission by UNIVERSAL EDITION A.G., Wien.

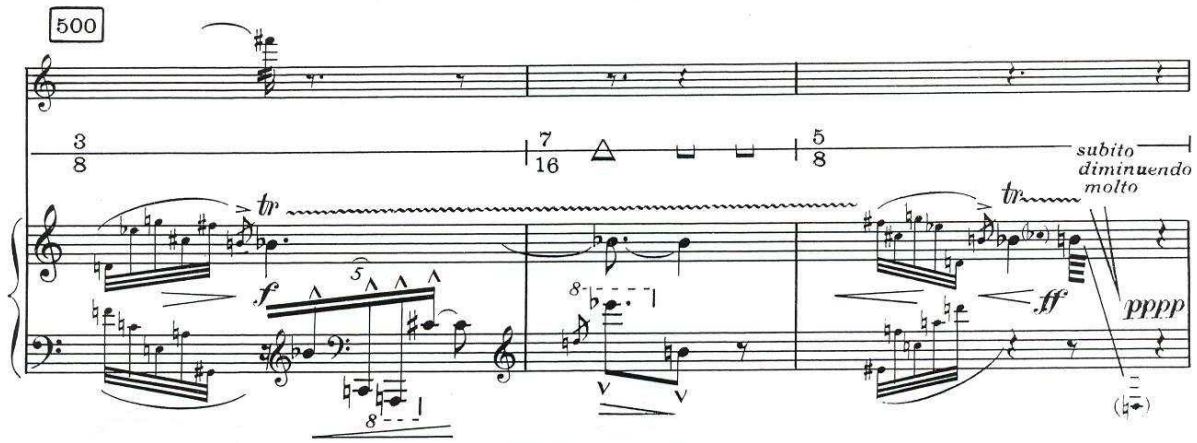
It is curious to notice how the duration (and thus the speed) of the first glissandos cannot be deduced from the notation. The tempo is "very fast" and this may be the actual factor determining the meter in these first two bars. The basic row is spread over the keyboard, complementing the density of the clusters, which are the only real vertical constructs if the little percussive sounds ("x" and A♭-G) are not counted.

That Boulez makes a point of integrating both the cluster and the glissando in the "highpoint" of his early works, this synthesis of all his knowledge on dodecaphonic techniques and stylistic elements[1529], shows his eagerness to extend the principles of row-composition. That he incorporated these basic extended piano techniques into twelve-tone structures offsets his personal interests against those of Schoenberg, who had dismissed both the cluster and the glissando as artistically deficient.[1530]

The first published works after *Notations* was a *Sonatine* for flute and piano and his first *Sonate* for solo piano. The cluster technique has disappeared from his writing though both works still demonstrate an interest in the glissando.

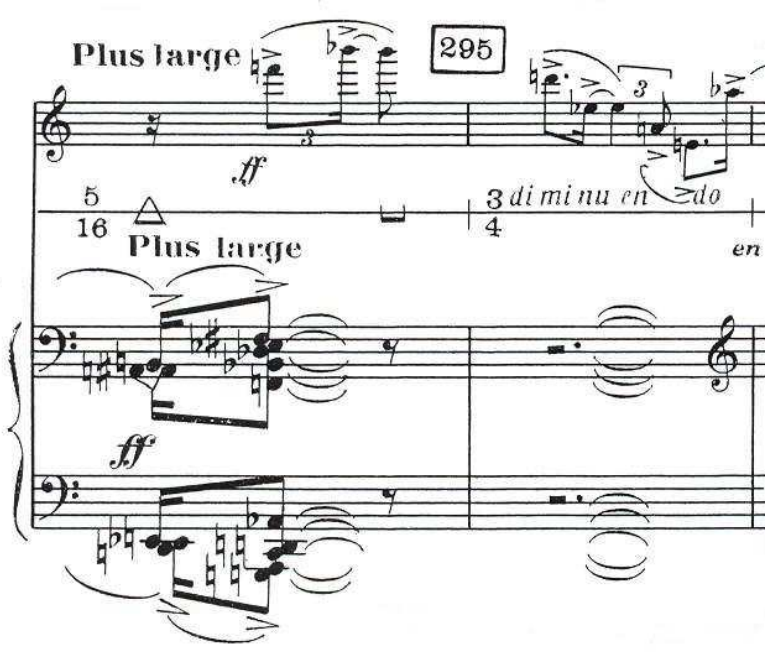
Although the *Sonatine* for flute and piano (1946) shows signs of an attempt to find a common structural root for rhythm and pitch[1531], the work still has thematic as well as athematic sections and strict counterpoint as well as quasi-improvisatory writing, placing it at crossroads between tradition conceptions and serialism. As musical gesture that is neither motivic nor rhythmic, rather movemental and timbral, the glissando is not easily fitted into concepts of multi-level structuring where each pitch and its duration are precisely positioned and measured. Most of the seven white-key glissandos in the *Sonatine* are fast sweeps of color – like the trills Boulez favored in so many of his works – and used as a transitional tool in between sections with changing material and textures. (Ex. 3.873.)

[1529] Nemecek 1998, p. 131.
[1530] Hirsbrunner 1985, p. 37.
[1531] See Bennett 1986, p. 57-60.

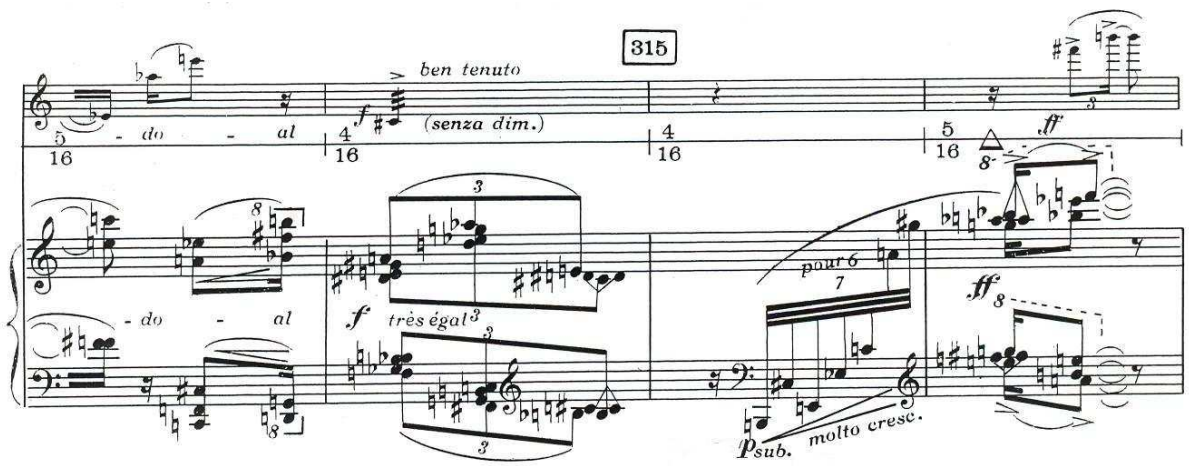


Example 3.873. P. Boulez: *Sonatine* for flute and piano (1946), bars 500-502. © Editions Amphion.

If Boulez found a way to still give the diatonic glissando a place in a twelve-tone system, the highly organized structuring of pitches did apparently not allow for cluster technique. Apart from several sequences with alternating intervals of two to three black-key, white-key or chromatically adjacent notes, there is an aggregate that includes five adjacent black keys and a chromatically filled out diminished fifth, both of which could (more) easily be played with the palm of the hand, were it not that they are ostentatiously divided over the two hands to be explicitly played with the fingers. (See bars 294 resp. 316 in ex. 3.874 and 3.875.)



Example 3.874. P. Boulez: *Sonatine* for flute and piano (1946), bars 294-295. © Editions Amphion.



Example 3.875. P. Boulez: *Sonatine* for flute and piano (1946), bars 313-316. © Editions Amphion.

While composing his first *Sonate* (1946), Boulez had Schoenberg's opus 11 laying on his piano for a long time, and
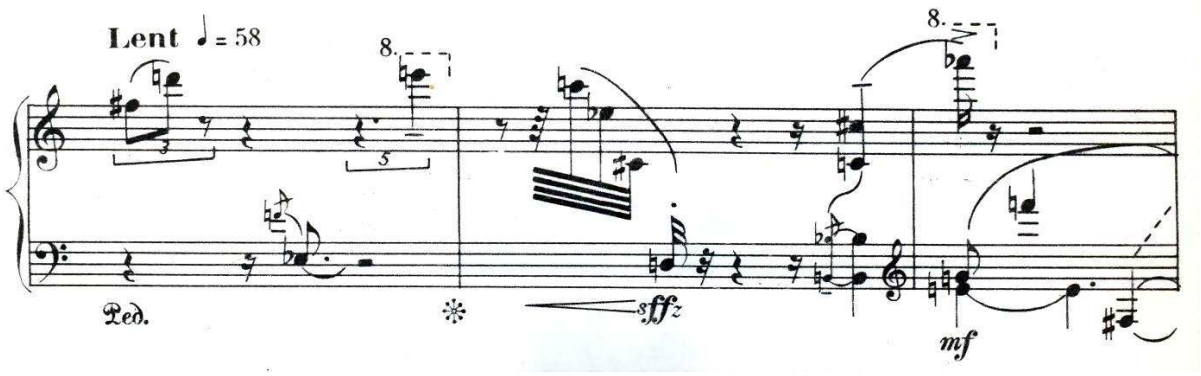
> its influence is very clear in this sonata. […] I maintain a preference for the third piece of opus 11, which is, for me, a great accomplishment. It makes one think of the piece that closes the second cycle of *Pierrot Lunaire,* "Die Kreuze", in which appears an immense solo. […] There is an immediate affinity, it is to say, a treatment of the keyboard that was unusual in that period: a great density of texture and a violence of expression in the fact that the piano is at once, not the piano of Stravinsky, which is a piano treated as percussion, but a percussion-piano and at the same time extraordinarily ready to exhilarate; I would say it is the very instrument of ecstasy: in this third piece of the opus 11 as well as in the piece "Die Kreuze" of *Pierrot Lunaire*.[1532]

As much as both opus 11 and *Die Kreuze* contain early and therefore notable examples of silently depressed keys (see above, 3.4.2.3.1), it was not such treatment of the piano that delighted Boulez. There is one glissando in the first sonata (at 4/4/1), used as an eruptive gesture and as much a sign of bygone times as the glissandos in the *Sonatine.* Apart from this one relic, there is not a single extension of the classical performance technique. Nevertheless, the serial material is based on the densest of note groups, e.g. D-E♭-E-F-F# for the first bar, C-C#-D-E♭ and B♭-B-C-C# for the second bar, E-F-F#-G-A♭ in the third bar. (Ex. 3.876.) The rest of the first movement follows this method almost strictly, while trying to realize as many different kinds of combinations and textures with it as possible. Such theoretical clusters are inaudible in the music as they are exploded and spread over the octaves of the keyboard. This tension between the full chromatic space and the octave span (within which the series is structured) allows Boulez to take a distance from Schoenberg and Webern by realizing the series in terms of register and range rather than emphasizing the intervals within the octave or treating octave transpositions as a mere means to orchestration.[1533] It goes without saying that such
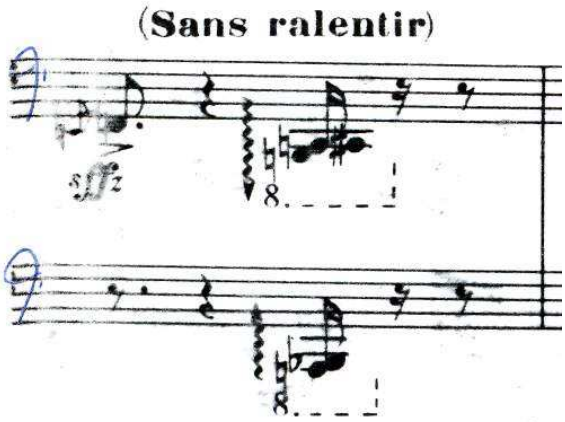
[1532] Boulez 1975, p. 34-35 : "[…] son influence est très nette dans cette sonate. … Je garde une préférence pour la troisième pièce de l'*op. 11* qui est, pour moi, une très grande réussite. Elle fait penser à la pièce qui termine le deuxième cycle du *Pierrot Lunaire*, « Die Kreuze », où figure un immense solo de piano. … Il y a une affinité immédiate, c'est-à-dire un traitement du clavier insolite pour l'époque : une grande densité de texture et une violence de l'expression dans le fait que le piano est à la fois, non pas le piano de Stravinski, qui est un piano traité en tant que percussion, mais un piano-percussion et en même temps extraordinairement prêt au délire; je dirai que c'est l'instrument même du délire : soit dans cette troisième pièce de l'*op. 11*, soit dans la pièce « Die Kreuze » du *Pierrot Lunaire.*

[1533] See Rosen 1986, p. 85-87 for more on this topic.

tessitura dispersion and the resulting open textures are unfavorable to cluster writing. In fact: the whole sonata has only three vertical constructs consisting of more than two (chromatically, diatonically or pentatonically) adjacent pitches: $B\flat^2$-B^2-C^1-$C\#^1$ (at 6/3/1), A^2-$B\flat^2$-B^2-C^1-$C\#^1$ at (8/5/1) and $c\#^1$-d^1-$e^{\cdot\cdot}$ (at 17/3/1). The only one that could possible be a candidate for cluster playing technique – the second instance – is expressly written so that only finger articulation can be used. (Ex. 3.877.) As much as the whole work is built on theoretical clusters, Boulez seems to have made an effort to avoid cluster-playing techniques.



Example 3.876. P. Boulez: 1st sonata for piano (1946), opening bars. The rest of the movement follows this working method almost strictly. © Editions Amphion.



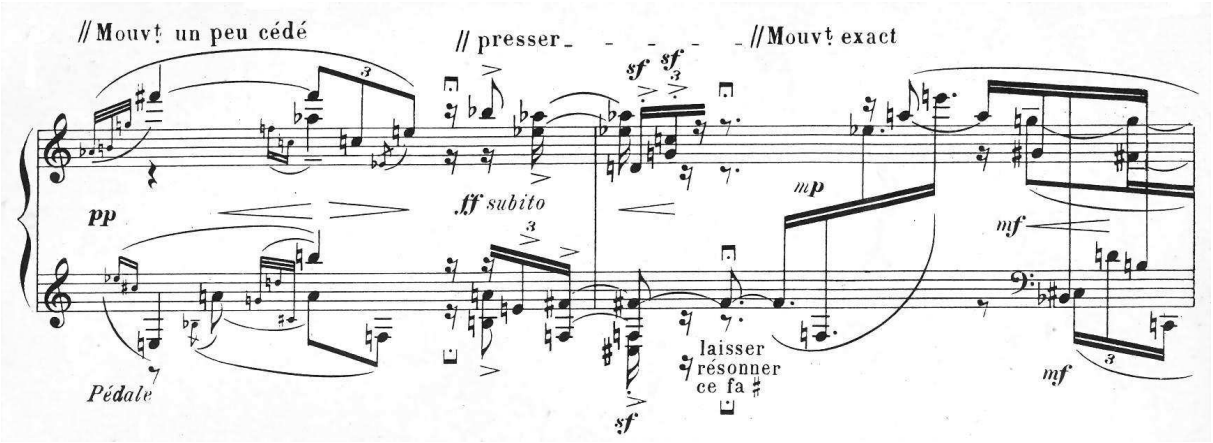
Example 3.877. P. Boulez: 1st sonata for piano (1946), 8/5/1. © Editions Amphion.

Boulez' next piano works are the second sonata for piano solo (1947-48), in which the diffusion of theoretically clustered series is further developed[1534] so that cluster playing is again excluded, and the first book of *Structures* for two pianos (1951-52).[1535] The focus on elaborating the serial principles of pitch-class to rhythm, attack and dynamics needs little more than the potential of the proper piano interface and its playing technique. There is no room, indeed no need (yet), for much experimenting with anything improper. The only instance that can be related to extended techniques in both the second sonata

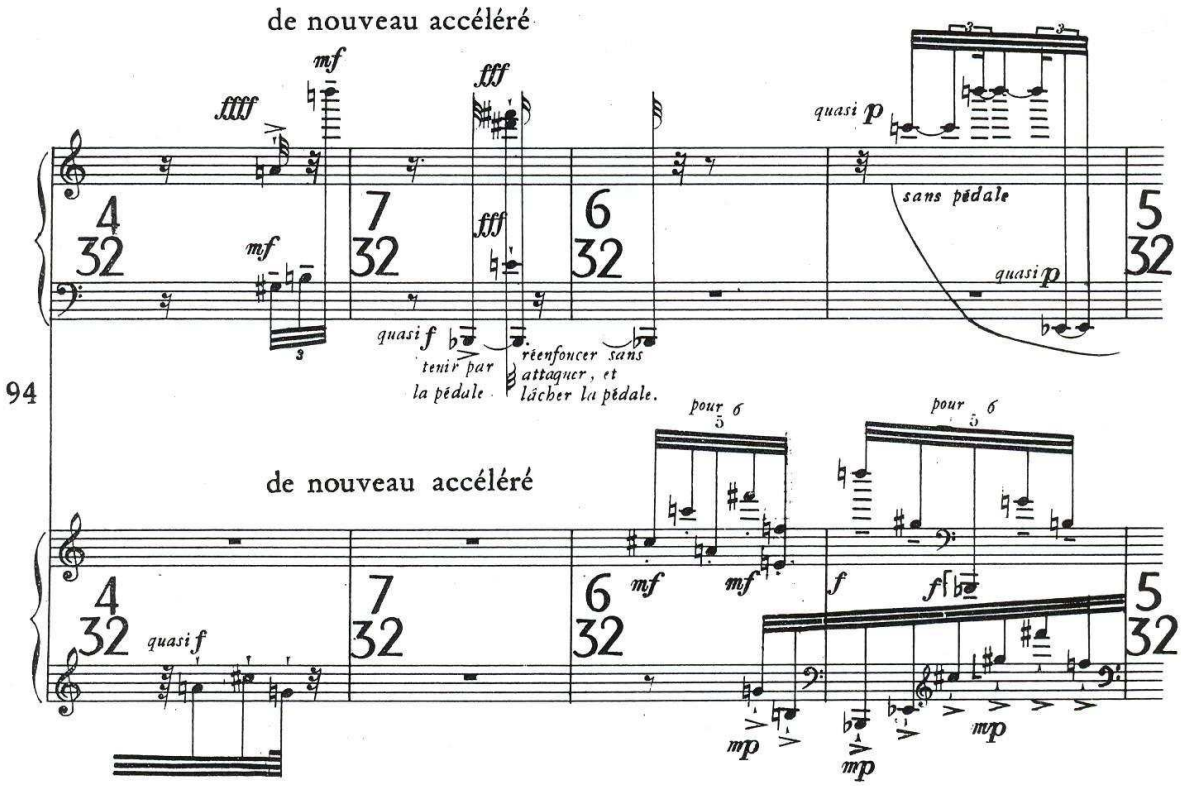
[1534] See Rosen 1986, p. 87.

[1535] *Le Visage Nuptial* for soprano, alto, two Ondes Martenot, piano and percussion (1946/47) remains unpublished in this first version, while the *Symphonie concertante* for piano and orchestra (1947) was lost. In between the second sonata and *Structures I*, Boulez diverted his attention to orchestra (*Le Soleil des Eaux*, 1948), string quartet (*Livre pour Quatuor*, 1948-49), ensemble without piano (*Polyphonie X*, 1951) and concrete music (*Etude sur un son* and *Etude sur sept sons*, 1951-52).

and *Structures I* is the pianistic necessity of keeping a note sounding while applying both hands elsewhere. (Ex. 3.878 and 3.879.)



Example 3.878. P. Boulez: 2nd sonata (1947-48), second movement *Lent,* bars 36-37: "let the f# ring". © Editions Heugel.



Example 3.879. P. Boulez: *Structures* (1951-52), *Book I,* bars 94-97. "hold by the pedal; re-depressing without attacking, and releasing the pedal." © With kind permission by UNIVERSAL EDITION A.G., Wien.

3.4.6.2 1949- Extended techniques and musique concrete

3.4.6.2.1 Pierre Schaeffer: the *piano à bruits*

Pierre Schaefer (1910-1995) played the cello and had taken courses with Nadia Boulanger, but he was trained as an engineer and worked for the national French radio.[1536] At the *Studio d'Essai*, the sound laboratory of the radio station in Paris he developed what he called "musique concrète", using his technical background and his experiences in radio play production to alienate recorded sounds by processing them through diverse manipulations such as filtering, playing them backwards, changing their speed and dynamics and cutting off their attack (which dramatically alters the definition of its timbre). He first considered the noisemakers available in the Noise Service at the radio, but found the bicycle bells, coconuts, gongs, bird whistles and ratchets too explicit. He nevertheless realized a set-up of such objects as well as of different lengths of wood and other materials so that they could be played upon comfortably, forming a 'noise-piano'. Disillusioned by the result but not wanting to revert to the synthesized sounds of the *elektronische Musik* which his colleagues in Germany were experimenting with, he recorded existing instruments. For the *Diapason concertino* (1948), a professional pianist improvised responses to recordings of noises (based on recordings of an orchestra) but the result was too disparate to satisfy Schaeffer. On the 4th of June 1948, it strikes him that

> There is no instrument to play musique concrète. Such is the major difficulty. Either, one has to imaging an enormous machine, of the cybernetic type, susceptible to satisfying millions of combinations, and we are not there yet. As long as I have only two or four turntables to realize approximate sequences, I will be the terrible prisoner of a discontinuous style, where all seems roughly manipulated. Is there a compromise? Instinctively, I turn towards the piano. The previous manipulations have in fact taught me that a piano advantageously replaced all the noise-making accessories. One can hit the strings directly, or scratch them, or touch them, but one can also use the keyboard instrument by considering it like a musical instrument but like a practical means of attacking the strings that one will have submitted to a "preparation". This way, each note of the keyboard corresponds to a more or less musical sound or noise, of which the dose can be exactly regulated. In this case, the keyboard is not a modulating instrument anymore, it must be considered as a switch.[1537]

The reference to "preparation" is conspicuous and has to be seen in the light of the fact that this journal extract is dated one year before four of John Cage's works for the prepared piano were presented – with the composer at the keyboard – to Paris audiences on four different occasions and venues during the summer of 1949.[1538] Schaeffer's

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[1536] All the information in this paragraph is based on Schaeffer 1952, p. 12-24.

[1537] Schaeffer 1952, p. 26-27 : « Il n'y a pas d'instrument à jouer de la musique concrète. Telle est la difficulté majeure. Ou bien il faut imaginer une énorme machine, du type cybernétique, susceptible de satisfaire à des millions de combinaisons, et nous n'en sommes pas là. Tant que je ne dispose que de deux ou de quatre tourn-disques, pour réaliser des enchaînements approximatifs, je resterai affreusement prisonnier d'un style discontonu, où tout semble taillé à la serpe. Existe-t-il un compromis ? Instinctivement, je me tourne vers le piano. Les manipulations précédentes m'ont en effet appis qu'un piano remplaçait avantageusement tous les accessoires de bruitage. On peut frapper directement sur les cordes, ou les gratter, ou les effleurer, mais on peut aussi user du clavier en ne le considérant plus comme un instrument de musique, mais comme un moyen commode pour attaquer les cordes auxquelles on aura fait subir une certaine « préparation ». Ainsi, à chaque note du clavier correspond un son ou un bruit plus ou moins musical, dont le dosage peut être assez exactement réglé. Dans ce cas, le clavier n'est plus un instrument modulateur, mais doit être considéré comme un commutateur. »

[1538] On the programs were *A Valentine out of Season* and parts 1 and 4 of *Amores* (both with a Cunningham choreography) at the Vieux Colombier theatre (Nattiez 1993, p. 5), the *Sonatas and Interludes* at the Paris

journal was published in 1952 and the edition contains a footnote under this particular passage, explaining how he had – in 1948 – been ignorant of Cage's systematic work with the prepared piano.[1539] In the main text of the journal, Schaeffer further distinguishes between Cage's instrument and his own experiments by deeming the prepared piano as serving the characteristics of instrumental performance and not as a source of concrete sounds, further seeing the merit of his first musique concrète studies of the piano (part of the *Cinq Études de bruits*) to have avoided the more brilliant but less pure effects of the prepared piano. It all sounds as if Schaeffer had experimented with a prepared piano before Cage introduced his work in Paris. However, there is every reason to believe that the published journal text was written (or at least edited) in 1952, i.e. after the term "prepared" had been introduced to the Parisian new music scene[1540]: even if two music makers an ocean apart had stumbled upon the same treatment of the piano, chances are very slim that they would have come up with the same name for it. Listening to recordings[1541] of the pieces that Schaeffer had produced after his insight regarding prepared strings (*Cinq Études de bruits*[1542] in 1948 and the *Suite pour 14 instruments* in 1949[1543]), there is no evidence of such treatment of the piano in the music. Even with the manipulations of the recorded sounds and the loss of quality due to the many re-recordings during the manipulative sessions, it is not difficult to recognize non-prepared (if not completely properly played) piano sounds as the basis for the technical alterations. In the piano study, the fourth of the five 1948 studies of noises[1544], there is an impressive level onto which the piano sound is alienated. Especially the inversions of multiple cut-off struck string sounds results in washes of attack-less resonance that can easily be mistaken for poor-quality recordings of glissandos on strings. Many of the noises can be associated with the thuds of struck strings that are prepared with rubber, or with flageolets. However, several passages demonstrate the level of processing that Schaeffer could accomplish departing from proper piano sounds and it is very difficult to determine the origin of a sound after what are clearly multiple layers of manipulations. In the third movement *Courante/Roucante* of the *Suite* Schaeffer plays around at will with sped-up keyboard glissandos (at +/- 3') while the second half of the last movement *Sphoradie* shows how Schaeffer still had ample grounds for experimenting without needing to use recordings of piano sounds that were altered to begin with. According to the journal, the suite was realized after the study and its still innocent approach towards the piano leads to the impression that the noises of the piano study owe their alienated character more to Schaeffer's processing skills than to the art of preparation.

3.4.6.2.2 Pierre Henri: the *piano complet*

The first pieces to include unquestionable prepared piano sounds in musique concrète were made in 1950, about a year after the performances of Cage's prepared piano music in Paris. Pierre Henry – born in 1927 – had formally studied percussion, piano, composition (with Nadia Boulanger) and harmony (with Olivier Messiaen) and had already (in 1949) written *le Petit Ballet Mécanique* (inspired by Léger's film *Ballet*

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conservatory for the pupils of Olivier Messiaen (Nattiez 1993, p. 5) and at a private gathering at the salon of the society figure Suzanne Tézenas (Nattiez 1993, p. 27); the piano duo Arthur Gold and Robert Fitzdale performed the *Three Dances* at the Salle Gaveau (Nattiez 1993, p. 32).

[1539] Schaeffer 1952, p. 26-27.

[1540] Revill 1992 (p. 100) writes that Boulez introduced Cage to Schaeffer. No source or details are given.

[1541] There are no scores for these pieces.

[1542] Later reworked as *Quatre Études de bruits* in 1971.

[1543] The suite was created on November 6th and December 3rd, 1949. (Bayle 1990, p. 70.)

[1544] The original 1948 title of the piano study was Étude n° 4 *Composé* (the *Diapason concertino* was used as the 3rd etude). The set was first performed on October 5, 1948 on the Parisian broadcasting network. For a concert performance in 1950 the piano study was split into two pieces - *Étude violette* and *Étude noire* – and the concertino was left out of the set. (See Bayle 1990, p. 68-69.)

mécanique, for which George Antheil had composed his notorious score including sirens and propellers) for piano, reportedly "prepared ad libitum"[1545], or as he would later call it: for "piano complet."[1546] In that same year, Henry began working in Schaeffer's studio at the French radio, where Schaeffer had been looking for a professionally trained hitter of objects for his new project *Symphonie pour un homme seul*.[1547] Although the new work was to be based on a scenario around the theme of human solitude and the "noises of the body"[1548], the final version (1950) contains mostly of manipulated recordings of voices and prepared piano.[1549] In recognition of Cage's works, the first part of the symphony (*Prosopopée 1)* contains a sound that was baptized "Élement Cage."[1550] The first piece that Schaeffer and Henry finished together (also in 1950) was *Bidule en ut*, a "short etude in fugato form on the theme of a pseudo-scale of *ut* (played on the prepared piano) where the dominant will be replaced by percussion."[1551] "Bidule" in French means "little thing," "little nothing," as an object (to prepare the piano with) as well as a concept (*Bidule* is 1.5' long). The piece was improvised, based on preconceived materials, but a score was afterwards written by Monique Rollin.[1552] Verbal indications in this score include

- Glissando ("gliss.")
- Struck keyboard, hammered ("Clavier frappé, martellé")
- Clear bell sound ("son cloche, clair")
- Glided, hissing/whistling sounds ("sons glissés sifflants")
- Plucked sounds ("sons pincés")
- Dull percussion ("percussion mate")
- Stamped ("estampé"
- Muted ("assourdé")
- Struck, metallic ("frappe métallique")
- Sonorous flurry ("bouffées sonores")
- Metallic vibrations («vibrations métalliques»)
- Vibrating sounds («sons vibrants»)

Even if the verbal indications do not always match what can be heard on the tape, Henry certainly prepared the piano for *Bidule en ut*. In fact, the sounds Henry produced at the piano can be defined more by listening than by reading the score. Despite the processing that the original sounds have gone through (e.g. the glissando sounds were made artificially), proper keyboard sounds are recognisable next to plucked string sounds and timbres that come from strings prepared with at least metal and paper. At times the rattling sounds suggest that some of the objects were inserted loosely or lying on the strings.

The first work Henry made on his own at the studio was a *Concerto des ambiguities pour piano et piano* (again in 1950), realized almost entirely with prepared piano sounds. For the following *Musique sans titre* (once more in 1950) Henry used recorded sounds of prepared piano as well as percussion and strings, next to "realistic sounds" of sirens, animals, voices that he had started to accumulate for a library of sounds.

In the middle of the decade, Pierre Henry created a great number of sounds for his "phonotèque", amongst which not only prepared piano sounds but also those of piano

[1545] Chion 2003, p. 14-15.
[1546] It has not been possible to determine when exactly in 1949 this piece would have been written.
[1547] Chion 2003, p. 17.
[1548] Chion 2003, p 23.
[1549] See also Lesaffre 1983, p. 296.
[1550] Lesaffre 1983, volume 1, p. 196.
[1551] Chion 2003, p. 22.: « une courte étude de forme fuguée sur le thème d'une pseudo-gamme d'ut (joué au piano préparé) oú la dominante serait remplacée par une percussion. »
[1552] This score is reproduced in Lesaffre 1983, volume 2, p. 11-14.

strings and sounds electrified by microphones. Keeping a microphone close to strings that were activated, the sound was re-injected into the piano by way of small loudspeakers set in contact with the soundboard. With the microphone and the piano string in one hand, and a potentiometer to regulate the level of the feedback, Henry could generate controlled continuous piano sounds.[1553] Another sound producing mechanism developed by Henry was the vertical inserting of long metal rods into the piano, as seen on a picture from 1951. (Ex. 3.880.)
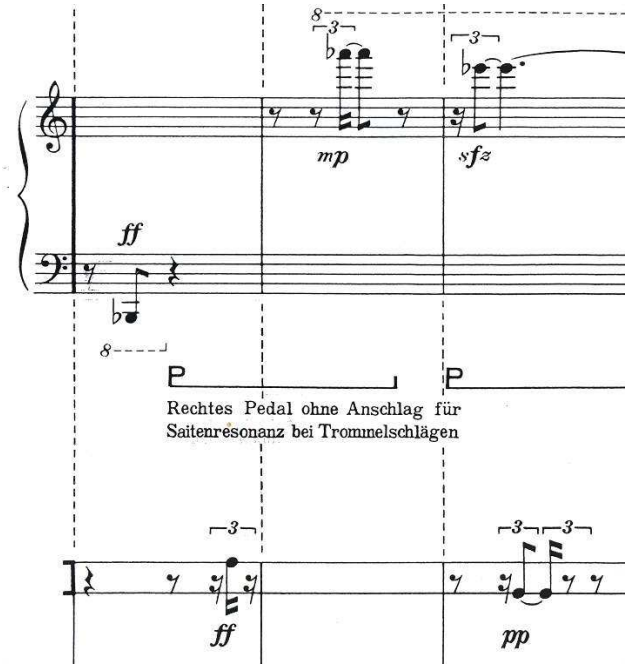


Example 3.880. Pierre Henry and Yvette Grimaud at the "piano complet" in the Studio d'Essai in 1951. (Photograph: S. Serge Lido.)

Extended techniques would remain amongst the most prominent of ways of obtaining sounds for Henry's musique concrète. Whether it be prepared, played on by hitting any part of the casing, by pulling or otherwise touching strings, by littering the instrument with objects to produce the most varied sonorities, whether it's usage sounds like an organ, a diving airplane or an earthquake[1554], Henry's "piano complet" has been present in most of his works.

[1553] Chion 2003, p. 52.
[1554] Chion 2003, p. 73.

3.4.6.3 1952 Tentative extensions and serialism II: early Stockhausen

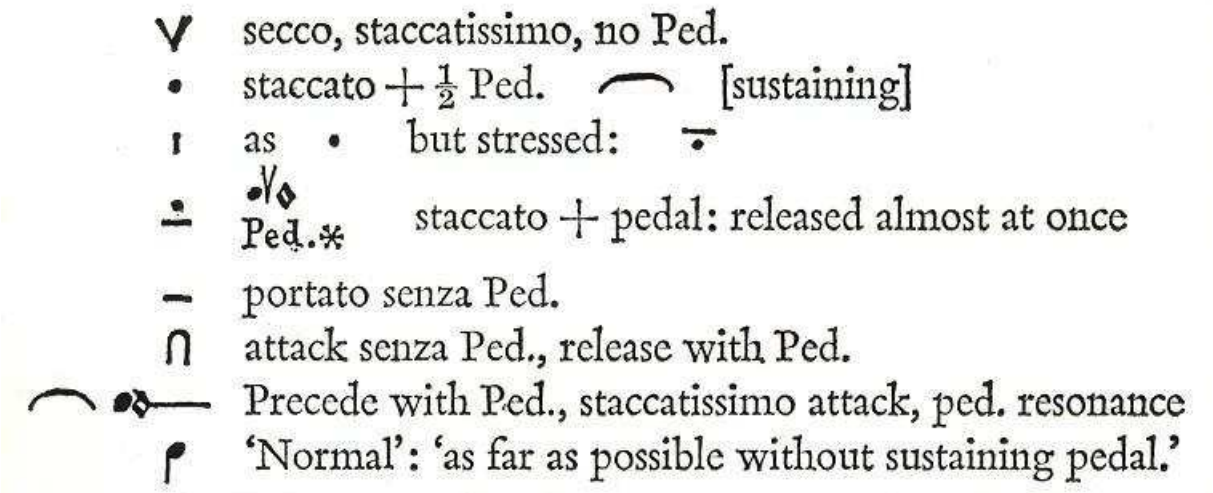
Stockhausen's interest in really extending the piano's struck string timbre started with his stay in Paris in 1952-53. The 1951 *Kreuzspiel*, for piano, oboe, bass clarinet and three percussionists, had included a passage in which opened strings of the piano serve to amplify a loud hit on the nearby drum (ex. 3.881), but his earliest pieces for solo piano – *Klavierstücke I-IV,* written shortly after arriving in Paris[1555] – do not yet contain the slightest extensions of proper performance techniques.



Example 3.881. K. Stockhausen: *Kreuzspiel* (1951), cue 30. © With kind permission by UNIVERSAL EDITION A.G., Wien.

The first extensions of the piano sound in Stockhausen's work are found in the 1952 *Schlagquartett* "for piano and 3 x 2 timpani" (reworked in the 1970's as *Schlagtrio* for piano and 2 x 3 timpani), where matching series of eight different touch modes for both the piano and the timpani are specified. The serialized timbre diversification on the piano includes[1556]: (ex. 3.882)

[1555] Kurtz 1992, p.46.
[1556] Maconie 976, p.48.



Example 3.882. K. Stockhausen: *Schlagquartett* for piano and 3 x 2 timpani (1952), performance notes for the piano part.[1557] © With kind permission by UNIVERSAL EDITION A.G., Wien.

Not all wordings are clear, but if the diamond shaped note heads refer to the sound of caught resonance (as they do in contemporary and subsequent scores, including Stockhausen's), then four out of the eight modes are extensions of keyboard and pedal techniques: besides three touch modes without pedal (longest possible natural decay, portato, staccatissimo) and one with a senza pedale attack but pedal-sustained decay, four techniques involve filtered resonance: two to catch residue resonance and two that dampen the sound by half depressing the damper pedal.

Besides influencing the timbre of the piano sound, these modes reveal a concern for the *end* of the piano sound more than the attack. This focus had already been apparent in the 1951 *Formel* for orchestra, in the piano part of which Stockhausen prescribes staccato playing in the very highest register of the instrument. The lack of dampers in this register normally prevents short sounds, but in a footnote to the part, he remarked that

> The piano part is written in this fashion because I used to have a piano in which I had the dampening mechanism extended to the upper extreme (in the expectation that pianos in general might eventually be so constructed…)[1558]

While in Paris, Stockhausen had been invited by Boulez to visit Schaeffer's Club d'Essai. Wanting to experiment with sound on the atomic level, he started working in a small electronic studio to synthesize sound. As the use of a sine-wave generator proved unsatisfactory in assembling the material, he found a compromise in spliced recordings of different prepared piano sounds, which were serially ordered in time structures relative to their harmonic proportions to form the basis for his 1952 *Konkrete Etüde*.[1559]

3.4.6.4 1954-61 Stockhausen, Boulez and manipulated piano resonance

In 1953 Stockhausen left Paris and started working with the more sophisticated equipment that the brand new studio for electronic music offered him in Cologne. The ensuing works – *Electronische Studie I* (1953) and *II* (1954) – were composed with

[1557] As reproduced in Maconie 1976, p. 48.
[1558] Footnote under bars117-120 in the score of *Formel* (Universal Edition).
[1559] Maconie 1990, p. 47-48.

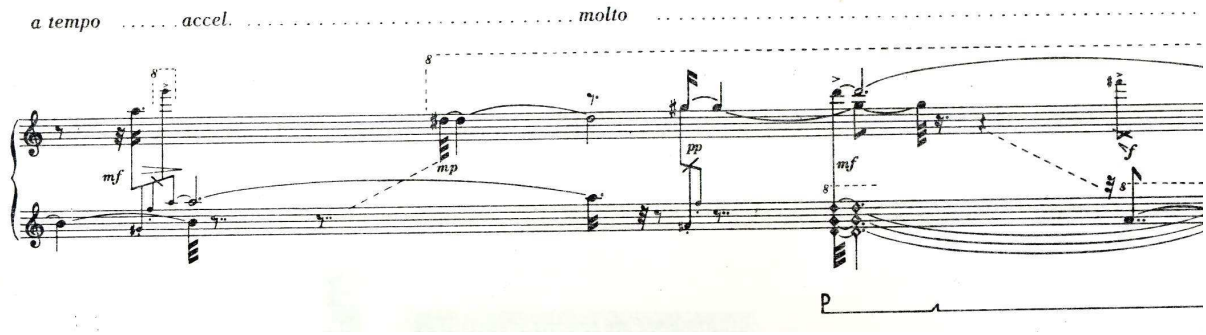
sounds made by a frequency generator. The first study was limited to superimposition of pure sine tones, the second study considered the opposite approach: filtering (combinations of) individual frequencies from electronic "white noise", i.e. the compound of all frequencies.

Still valuing a piano tone and music made by pianists at least as much as a sine tone and machine operated musical performance[1560], Stockhausen returned to composing for the piano. His second cycle of *Klavierstücke*, nrs. V-X, was commenced at the end of 1953 and its obvious interest in diversifying the piano timbre through the use of sophisticated pedalling and intricate handling of the keys is directly linked to his experiences with electronic music. According to Stockhausen's later words, the cycle was written

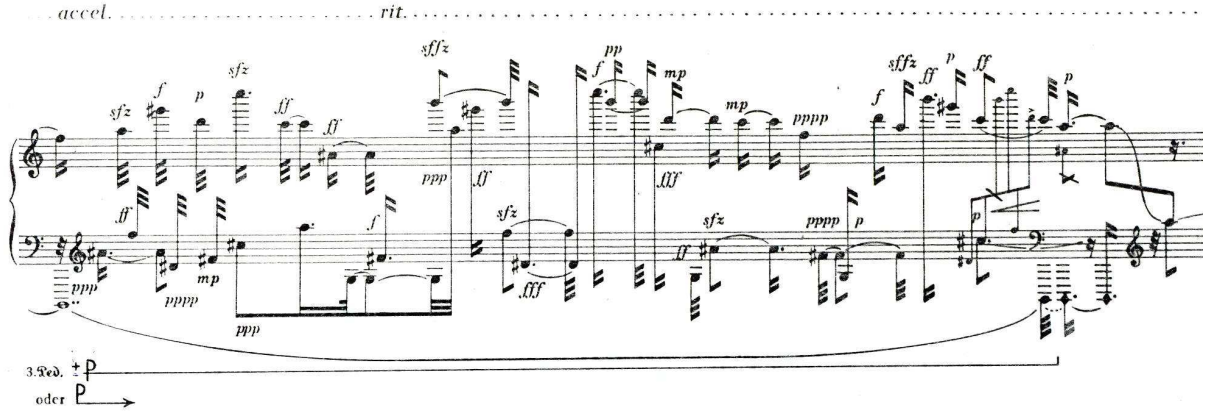
> In spite of, or rather because of, the very considerable significance of timbre ("Klangfarben") composition in my electronic music […][1561] [It] is characterized by an expansion of timbre compositions through the possibilities of the piano: I found 6 new "modes of attack" which differentiated the attacks of the piano sounds, just as I had used a series of "envelope curves" in composing sounds in the "Electronic Studies." For these modes of attack I defined new symbols. In particular, the discovery of harmonics with "subharmonic" resonances was very valuable to me; they made possible a simultaneous connection of short staccato attacks and soft continuations of the same pitches ("echo-sounds"). Moreover, I no longer composed single notes and chords, but sounds with characteristic *internal* structures. [1562]

Compared to the first four piano pieces, *Klavierstück V* already introduces a more accurate symbol for the pedal markings, distinguishes between fully and half way depressed sustaining pedal and contains just a few instances of silently depressed keys.[1563] As an alternative to the sostenuto pedal, Stockhausen indicates the use of the damper pedal combined with silently re-depressing the relevant keys. He is clearly still unsure of how to use the sympathetic resonance: at such high register (ex. 3.883), the open strings will yield very little audible vibrations. And the alternative to the sostenuto pedal (ex. 3.884) is both imprecise in its notation (especially for a time when this technique was far from common yet) and uninteresting (it cannot replace the original combination of the sostenuto pedal and the half-way depressed damper pedal)

[1560] Kurtz 1992, p.65.
[1561] Stockhausen 1964, p. 43.
[1562] Stockhausen 1971, p. 19.
[1563] Pieces V-VIII as we know them were published in the 1960's. The versions that were premiered in 1955 differ considerably from the published versions (Henck 1980, footnote 13). A recording by David Tudor of *Klavierstück VI* (copyrighted by the label in 1960, with the year 1956 indicated next to the title of the piano piece) demonstrates that at the half depressed sustaining pedal technique, silently re-depressed keys, and the special techniques on the last page of the published version of this piece (as discussed here) are part of the late 1950's version. (Side B of the LP VEGA C 30 A 278, re-issued on CD as part of the box Pierre Boulez. Le Domaine Musical. Vol. I. 1956-1967. Accord 476 9209 / LC 00280.) It may nevertheless be assumed only with some reservation that all extended techniques in the *Klavierstücke V-VIII* as here discussed were composed as early as 1955.

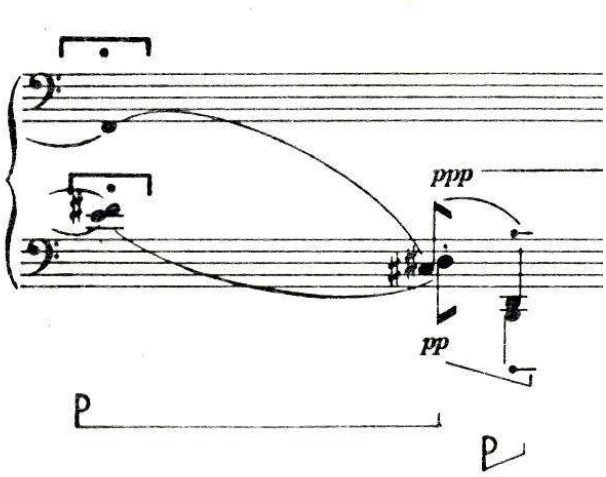


Example 3.883. K. Stockhausen: *Klavierstück V* (1954-55), 4/1. © With kind permission by UNIVERSAL EDITION A.G., Wien.
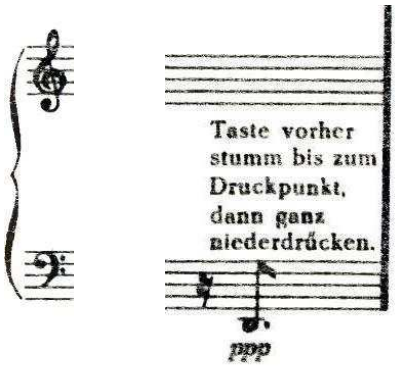


Example 3.884. K. Stockhausen: *Klavierstück V* (1954-55), 6/1. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Both pieces VI and VII use two new techniques: playing a note staccato but immediately re-depressing the key silently, for which Stockhausen introduced a new symbol (ex. 3.885), and silently bringing the hammer to its "point of no return," after which the key is further depressed so that the hammer strikes the string only very lightly (regardless of the force with which the finale stage is carried out). Both techniques aim at manipulating the timbre of the piano sound in ways that proper technique cannot achieve: the former catches the resonance of the staccato and leaves a filtered sound, the latter results in a sound that will always and without failing be extremely soft. (Ex. 3.886.)

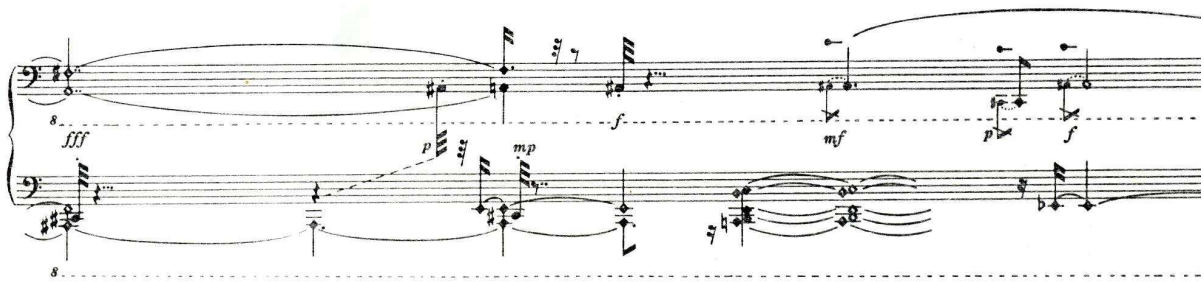


Example 3.885. K. Stockhausen: *Klavierstück VI* (1954-55/1965), 26/2. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.886. K. Stockhausen: *Klavierstück VI* (1954-55/1965), last note. "Silently depress the key in advance until its point of leverage, then depress it fully." © With kind permission by UNIVERSAL EDITION A.G., Wien.

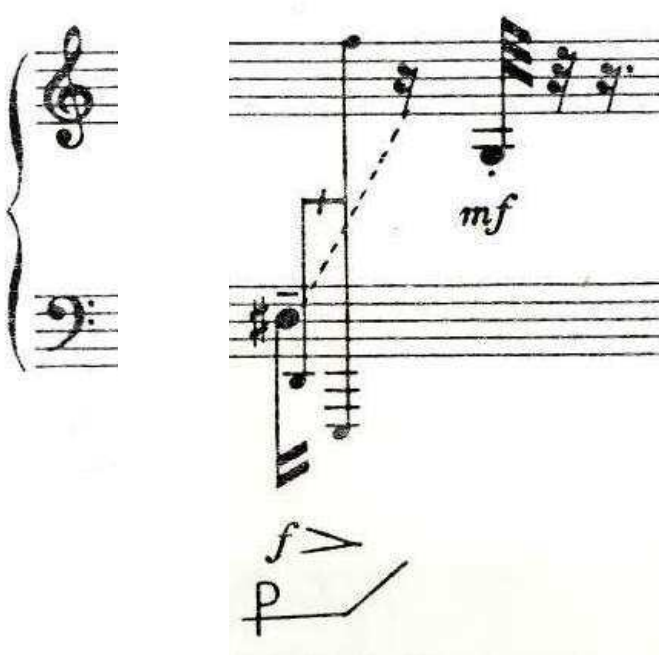
Compared to *Klavierstück VI*, nr. VII is more elegant in its use of the pedal- and key-techniques. (E.g. ex. 3.887.)



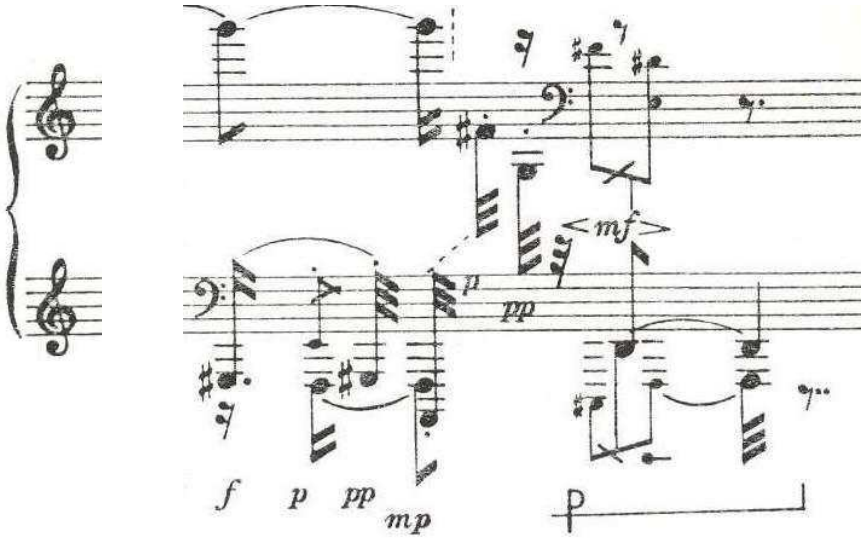
Example 3.887. K. Stockhausen: *Klavierstück VII* (1954-55), 4/2. © With kind permission by UNIVERSAL EDITION A.G., Wien.

The sixth of Stockhausen's pieces demonstrates that his expectations (of how sophisticated the results could be) were perhaps not always realistic, e.g. slowly lifting the half depressed damper pedal during the course of one (relatively) fast grace note

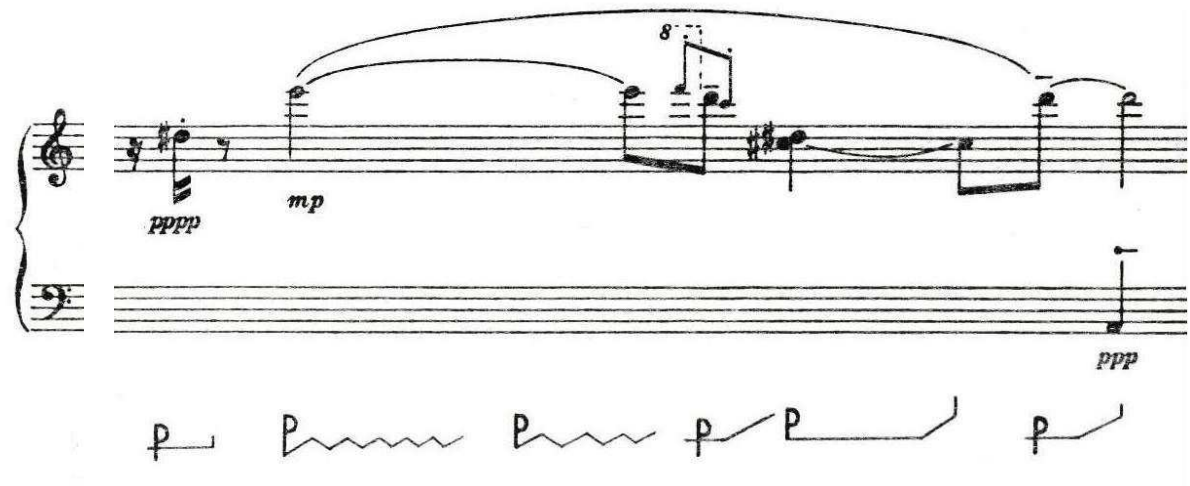
(ex. 3.888); combining a staccato but silently re-depressed grace note with a half-depressed sustaining pedal (ex. 3.889); quick succession of up and down pedalling while a relatively soft note in the treble is likely to sound less than the noise of the pedal action (ex. 3.890) or rhythmic pedaling that can hardly have a comparably audible effect (ex. 3.891).



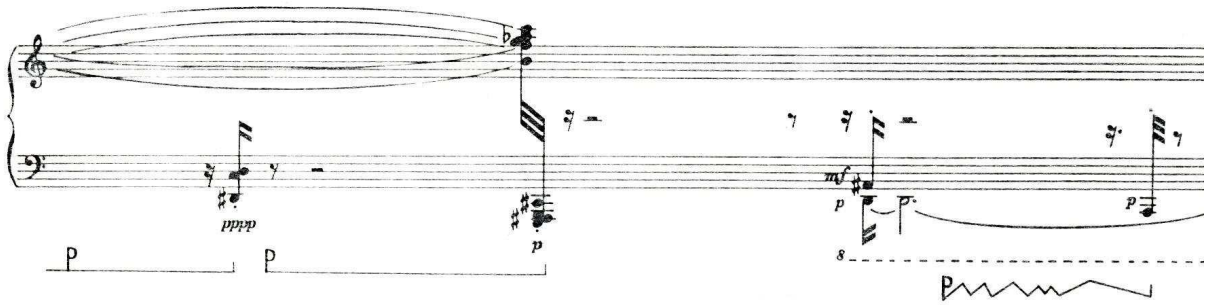
Example 3.888. K. Stockhausen: *Klavierstück VI* (1954-55/1961), 2/1. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.889. K. Stockhausen: *Klavierstück VI* (1954-55/1961), 2/2. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.890. K. Stockhausen: *Klavierstück VI* (1954-55/1961), 25/2. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.891. K. Stockhausen: *Klavierstück VI* (1954-55/1961), 39/2. © With kind permission by UNIVERSAL EDITION A.G., Wien.

The bases for the ninth and tenth of Stockhausen's *Klavierstücke* were decided on in 1954, when he conceived of the whole set of nrs. V-X. However, the initial work was laid aside in 1956 to give priority to nr XI, to *Zeitmaße*, *Gruppen* and *Gesang der Jünglinge*.)[1564] It was not until after *Kontakte* that he would continue to work on *Klavierstücke IX* and *X*. (See below.) As for resonance issues in *Klavierstück XI,* there is nothing that he had already tried out. There are only 20 pedal markings in the whole piece, all sustaining pedal and some to be released to ½, ⅓ or ⅔. As for silently depressed keys, a couple of chords and two arm clusters provide all the sympathetic resonance that Stockhausen is interested in. His attention had now shifted to the cluster, as we will discuss shortly.

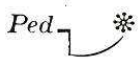
In the meantime, Boulez had let his interest in the piano rest for four years after the first book of his *Structures*, concentrating on voices (*Oubli signal lapidé*, 1952), ensemble (*Le Marteau sans Maître*, 1953-55), the combination of both (*Orestie*, 1955) and tape (*Symphonie méchanique*, 1955). When he took up the piano once more, it was to compose the large-scale – if incomplete – third sonata (1956-57). On September 25, 1957, Boulez himself premiered his third sonata for solo piano. Of the five movements[1565] – or *formants* – only two were eventually published: the second, called *Trope*, and the

[1564] Henck 1980, p. 4.
[1565] The first formant, *Antiphonie*, of which a fragment was published as *Sigle* by Universal Edition. (Hirsbrunner 1985, p. 227). The projected fourth formant (*Strophe*) and the fifth (*Sequence*) were never published.

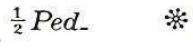
third, *Miroir.* The work is important above all for its development of techniques that manipulate the piano's resonance.

Like Stockhausen, Boulez' work with electronic sounds may have brought him to investigate the potential of controlling a sound's morphology on a polyphone instrument like the piano. Stockhausen had repeatedly described his interest to be in modes of attack (see above), but his use of extended techniques had more effect on the resonance of the sound *after* the attack. In Boulez' third piano sonata, the manipulation of the sound's decay – from a serial perspective this is the attack of the sound in retrograde – was taken to its limits by way of silently depressed keys and improper pedal techniques.

In *Trope* an unusual number of pedal techniques is prescribed. On top of the four basic modes – no pedal, sustaining pedal, una corda, the combination of both[1566] – we count no less than 17 subtly different pedaling actions in the score:

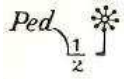
1. Sustaining pedal (SP) gradually released …… 

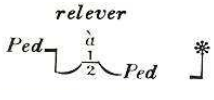
2. SP gradually depressed…… 

3. ½ SP…… 

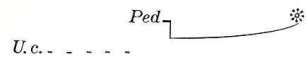
4. ½ SP gradually released…… 

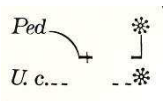
5. SP gradually released until ½…… 

6. SP gradually depressed until ½…… 

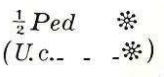
7. SP released to ½ and depressed fully again…… 

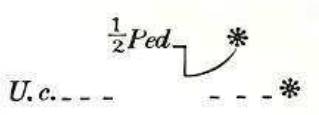
8. Catching resonance…… 

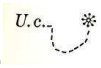
9. SP gradually released + una corda (UC)…… 

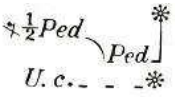
10. SP gradually depressed + UC…… 

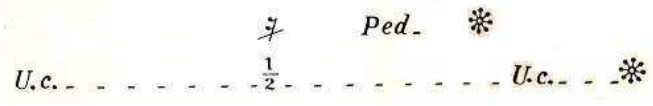
[1566] The use of the sostenuto pedal is not included here (although it is sometimes indicated in the score) because Boulez provides an alternative for pianos without this pedal (using mere SP and silently depressed keys), so that the sostenuto mode is obviously not essential to the set of pedal modes that are to extend the timbre range.

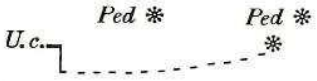
11. ½ Sustaining P + UC…….. 

12. ½ SP gradually depressed + UC…… 

13. UC gradually depressed and released…….. 

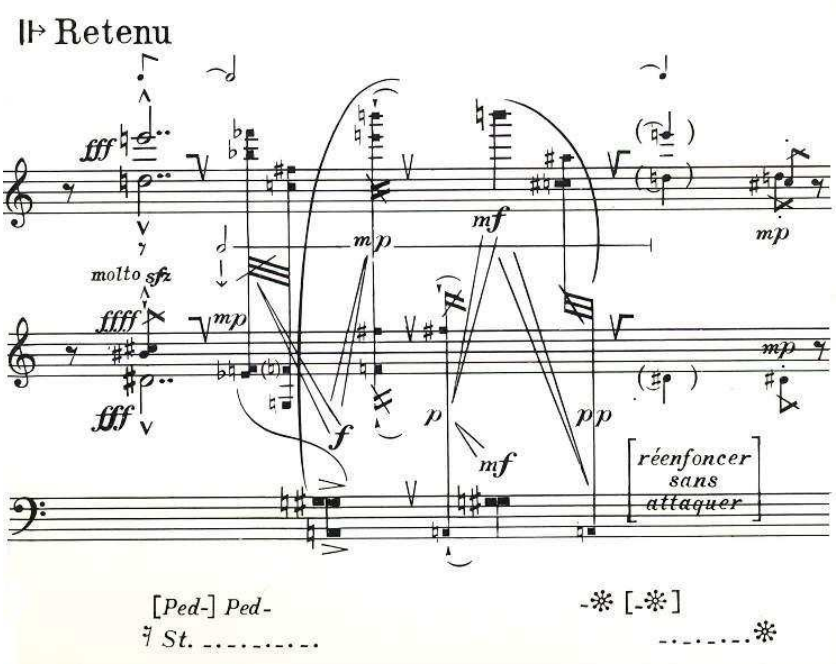
14. Catching resonance gradually depressed + UC……... 

15. Catching resonance + ½ UC ….. 

16. UC gradually released while depressing SP…….. 

17. Gradually released SP until the strings' sound is audibly affected by the felt
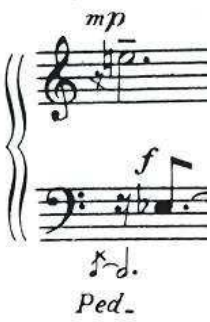
The last type is in principle the same as number 5, the difference being that the noise of the dampers interfering with the resonance of the strings is explicitly asked for. Consequently, Boulez does not expect this noise to be heard or aimed for with nr. 5. All of the pedal markings on the list are meant to result in sounds that deviate from the strictly proper struck string sound. The technique of silently re-depressing keys is prescribed as an alternative to the sostenuto pedal. (Ex. 3.892.) Since the latter is basically a proper technique (the sostenuto pedal is used as it was intended), we do not consider it, or its alternative, here, even though they both allow the sustained sounds to be altered by sympathetically resonating with the other notes that are played in the mean time.
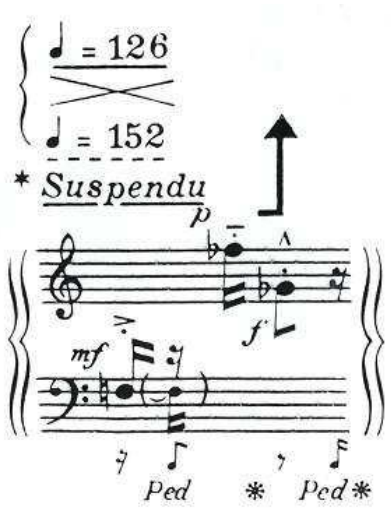


Example 3.892. P. Boulez: 3rd sonata (1956-57), second movement *Trope*, *Commentaire*, end of 3rd system. © With kind permission by UNIVERSAL EDITION A.G., Wien.

In the third formant *Miroir*, the projected centrepiece of the sonata, Boulez extends this pedal sophistication to a plethora of combinations of pedal modes with silently depressed key techniques, notated in even more graphical and rhythmical detail to ensure control over the exact execution and sound. The effects are refined by combining finger-, cluster-, pedal- and silently depressed keys techniques to the most subtle level.

Boulez does not merely indicate whether or not there is to be sustaining pedal, he now differentiates between whether the pedal should be depressed on, after or before the key is depressed. (Ex. 3.893.) When remnants of resonance are to be caught, their amount and richness are determined by the time that passes before the pedal is depressed. (Ex. 3.894 shows how the residue of the *f* is caught after a 16th note rest, while the resonance of the *g♭1* has to wait an 8th note rest before it is captured. Both notes are staccato and therefore equally short, so that there will be less left over resonance after the *g♭1* then after the *f.*)

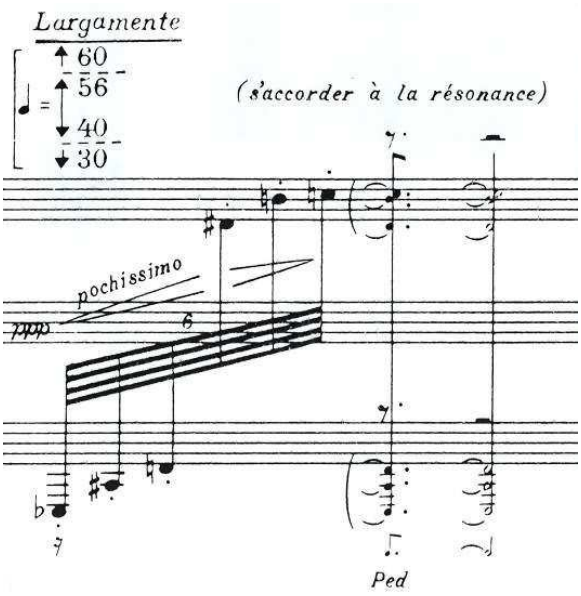


Example 3.893. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *a*, top left quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.
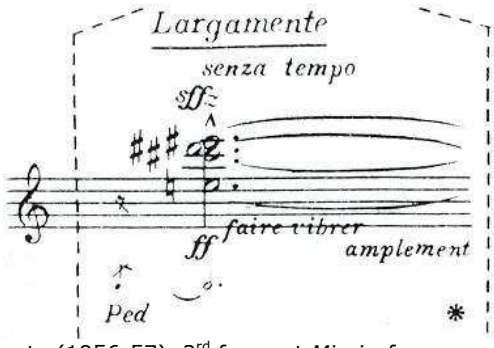


Example 3.894. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *a*, top right quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.
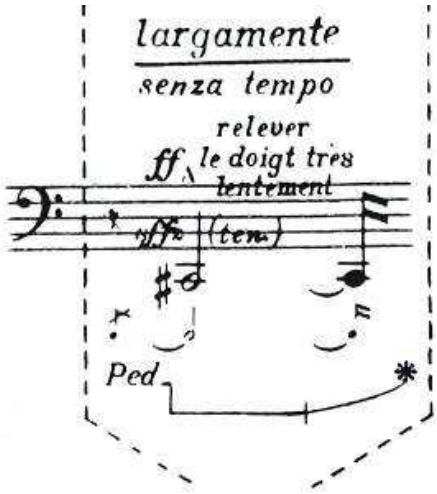
The tempo now often has to be adapted to fit the resonance (ex. 3.895 and 3.896) and even the speed of releasing a key is synchronized with that of releasing a pedal (ex. 3.897).



Example 3.895. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *h*, bottom left quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.

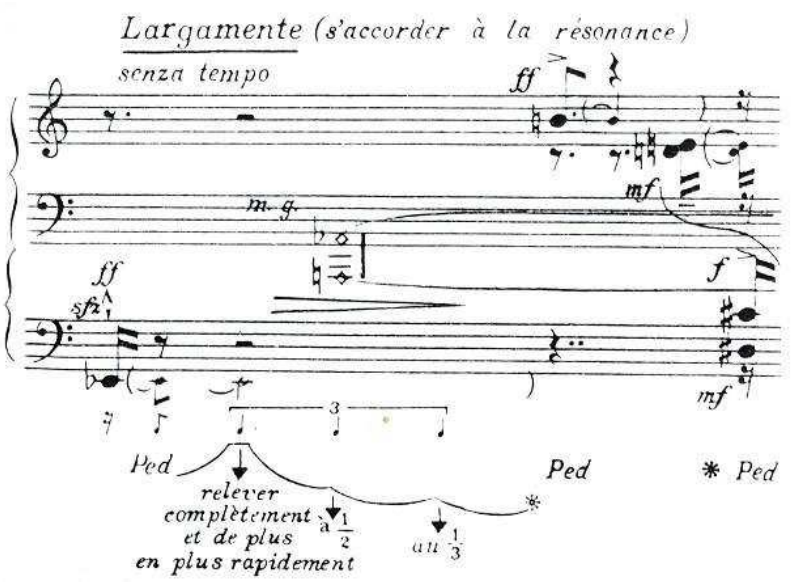


Example 3.896. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *d*, bottom left quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.



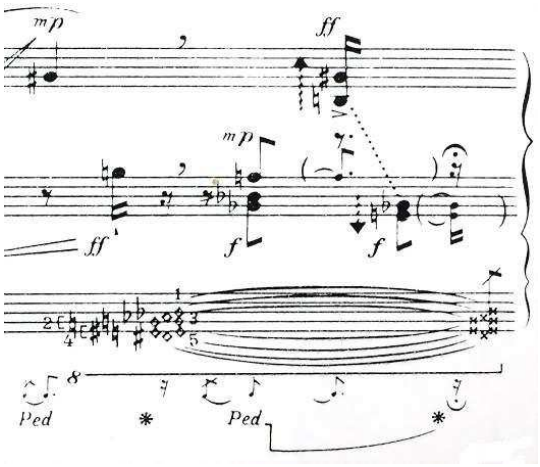
Example 3.897. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *e*, bottom left quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Some of the techniques that seemed daunting already in *Trope* are now brought to the brink of their potential by adding layers of graphic and textual information on the performance practical aspects (ex. 3.898). The verbal explanation shows Boulez thinking practically: to depress the pedal to ½ and ⅓ is a mere question of quickly releasing it. The faster it is released, Boulez reasons, the less the pedal actually went up all the way.

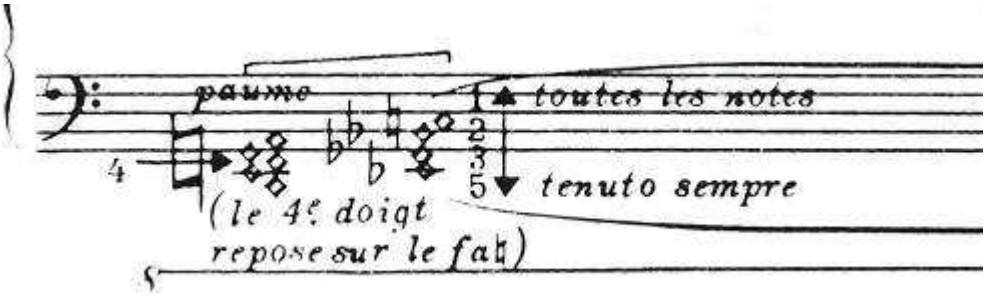


Example 3.898. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *d*, top right quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.
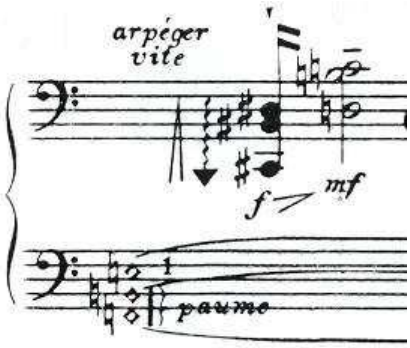
The use of silently depressed keys in *Trope* was limited to providing an alternative on a piano that might not be equipped with a sostenuto pedal. In *Miroir* the technique is explored in all its potential. Next to aggregates with prescribed fingerings (ex. 3.899) there are chromatic clusters (ex. 3.900), combinations of both (ex. 3.901) and virtuoso passages in which different silently depressed aggregates overlap, possible only by applying finger-changing technique. (Ex. 3.902-3.903.)



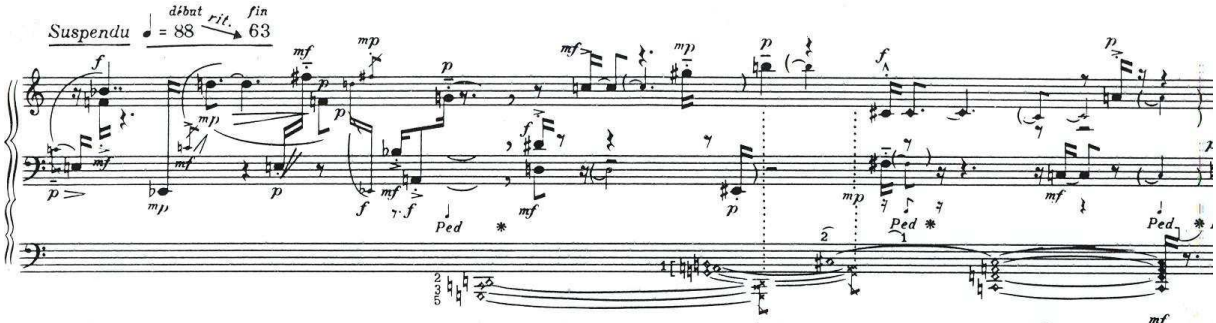
Example 3.899. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *c*, top right quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.



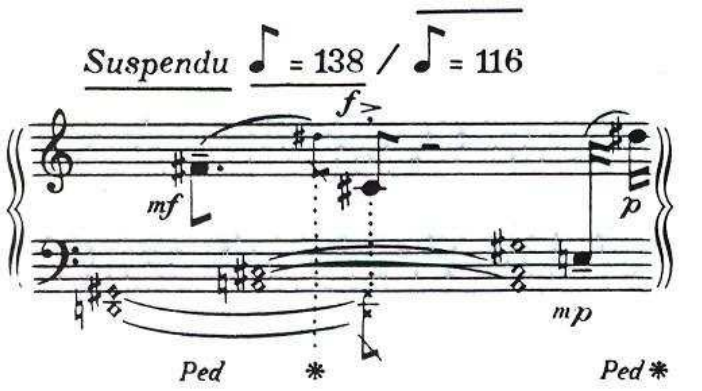
Example 3.900. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *c*, top left quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.901. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *c*, top left quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.

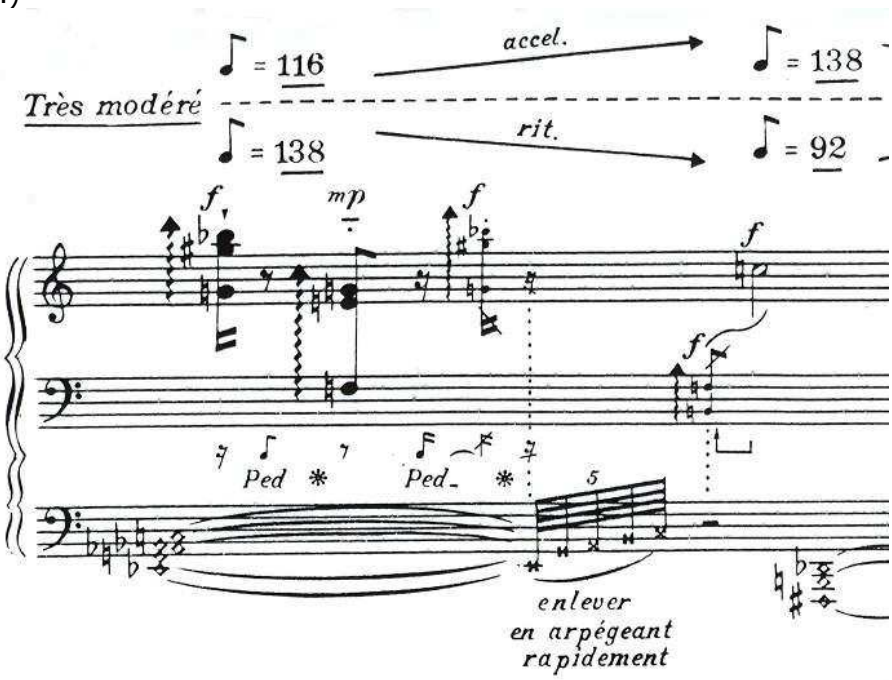


Example 3.902. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *e*, top left and right quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.

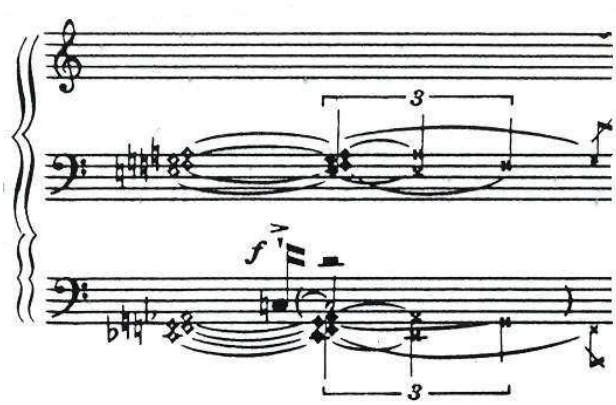


Example 3.903. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *e*, bottom right quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.

If the ending of a struck string can be manipulated by sympathetic resonance, the ending of that sympathetic resonance itself is also explored, e.g. by subtraction techniques that go back to Schumann's negative arpeggio but also to Cowell's moving clusters. (Ex. 3.904-3.905.)

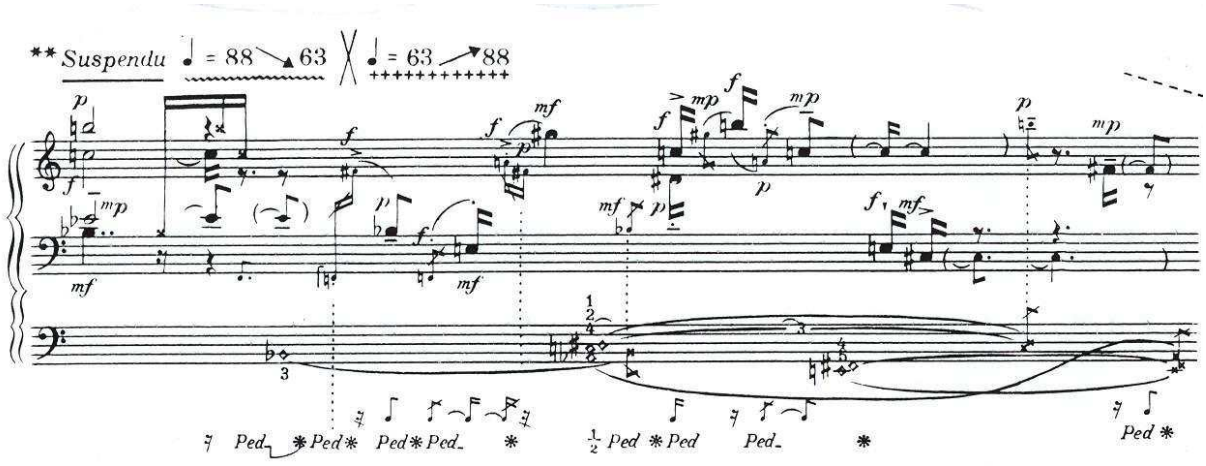


Example 3.904. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *a*, top right quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.

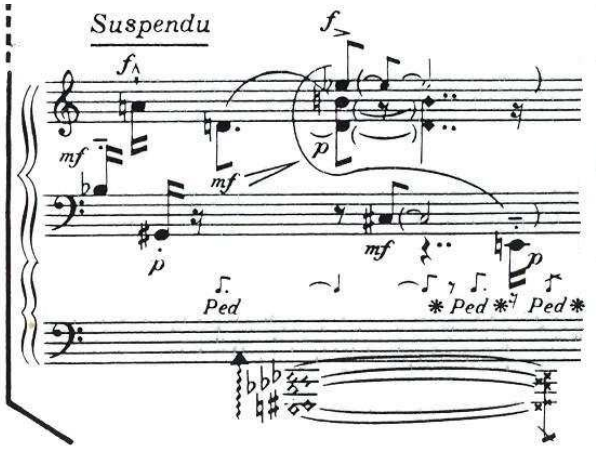


Example 3.905. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *i*, top left quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Miroir has a near-constant layer of sympathetic resonance to "envelop" the dispersed proper piano sounds. But, despite the greater grasp of the techniques' characteristics which Boulez demonstrates realized in the third formant of this sonata, some passages are still as unrealistic as in the previous formant *Trope*, if not more. Sometimes the tempo and the number of consecutive pedal actions are too great to give enough time to hear the activation of open strings before they are masked by other effects (ex. 3.906), or the string sound is too weak to let an arpeggiated silently depressed aggregate activate consecutively opened strings at a relatively fast speed (ex. 3.907, ♩ = between 63 and 72 for a quarter note).



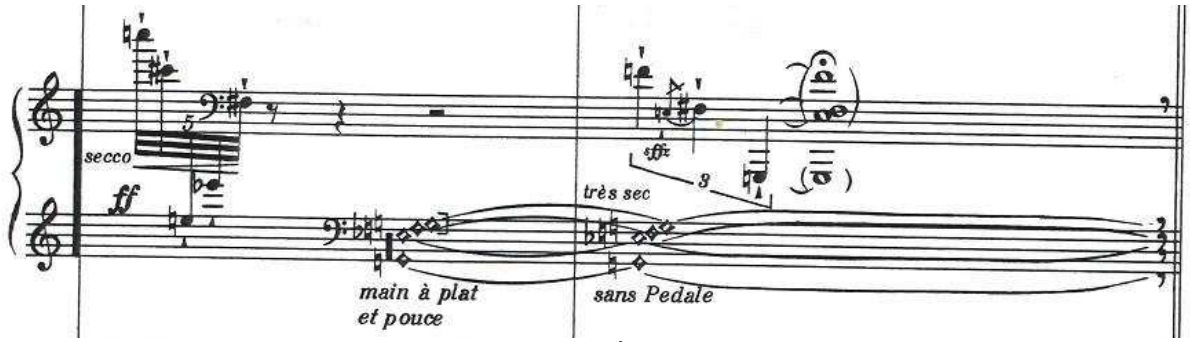
Example 3.906. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *a*, top-bottom left quadrants. © With kind permission by UNIVERSAL EDITION A.G., Wien.



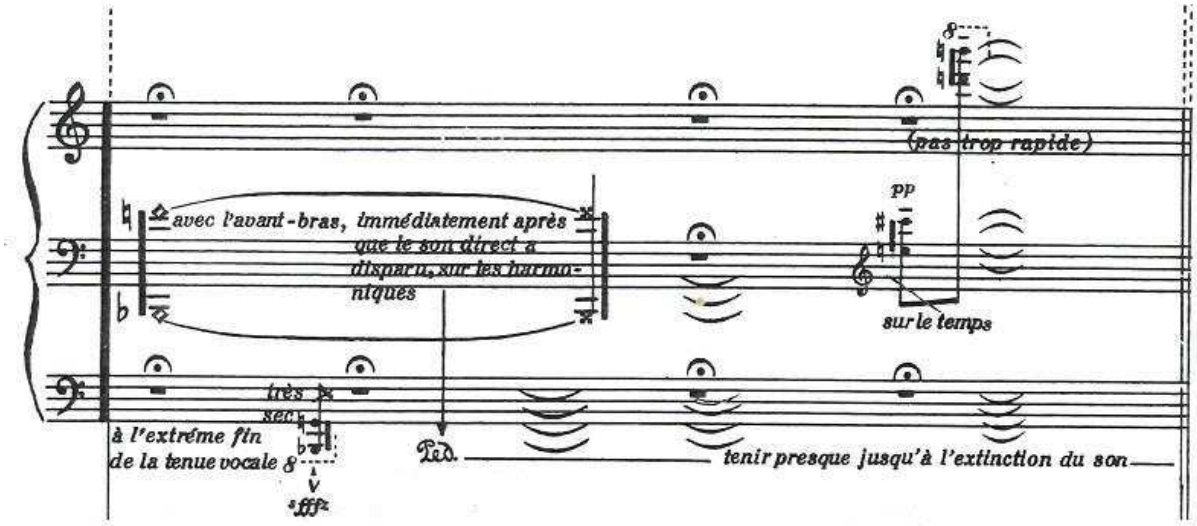
Example 3.907. P. Boulez: 3rd sonata (1956-57), 3rd formant *Miroir*, from page *e*, bottom left quadrant. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Boulez' third sonata is to this day the most advanced study in pedalling and silently depressed keys for any pianist, taking the potential diversification of the struck string sound by using the proper interfaces to unheard-of levels. Not all indications are realistic, especially those pertaining to the una corda pedal (cf. numbers 13, 15 and 16 on the list above) or when taking into account some of the speeds at which they have to be accurately performed as well as result in specific sounds.

The experiments with sympathetic resonance in the third sonata have left obvious traces in the *Improvisation II sur Mallarmé* for soprano and nine instruments (1957). In contrast to the obsessively intricate handling of the pedals and silently depressed keys in *Miroir*, however, Boulez' attitude is now much more relaxed. Instead of prescribing the most complicated fingerings to silently depress overlapping notes and aggregates, combined with a demand for an incredibly sensitive foot action and this all structured in an open form that leaves the tempos to be determined on the basis of how the performer reads through the score, Boulez now handles the extended techniques in a practical, pragmatic and efficient manner. Complex silently depressed aggregates are kept to an absolute minimum and then often to leave a note out of a cluster (e.g. *e* in bar 9 of ex. 3.908) so that it can be played properly (with the right hand in bar 10). Most of the open strings are now freed by large chromatic clusters that are depressed by palms and forearms. (Ex. 3.909.)
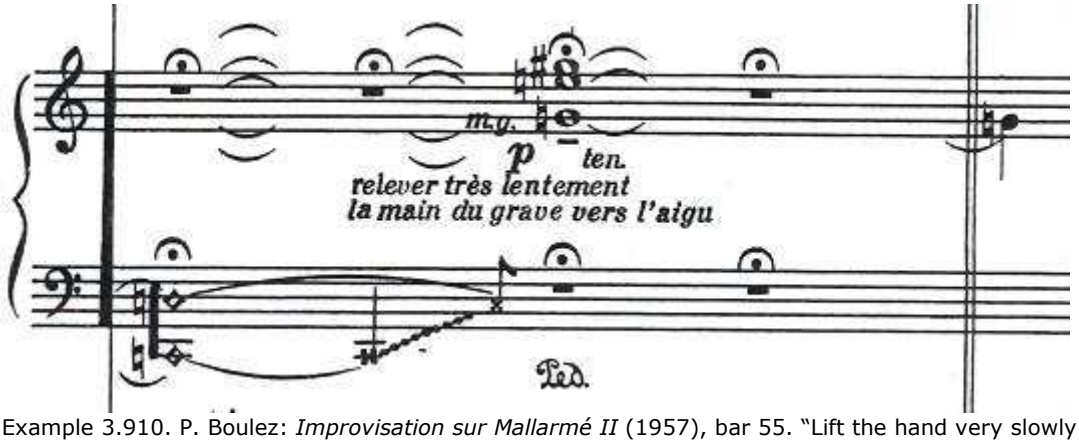


Example 3.908. P. Boulez: *Improvisation sur Mallarmé II* (1957), bars 9-10. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.909. P. Boulez: *Improvisation sur Mallarmé II* (1957), bar 67. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Except for only very few ½ pedal markings or gradual releases, most of the sustaining and una corda pedals are prescribed as simple on/off switches. Boulez often does not even bother indicating the release of the sustaining pedal. The third sonata's sophisticated passages, with individual fingers releasing individual keys in carefully timed sequences, are here left out in favor of the larger movement of an entire palm or arm, gradually lifted in a tempo that is entirely at the discretion of the performer. The composer's attitude towards the technique is now one of efficiency, both ergonomically and acoustically. (Ex. 3.910.)

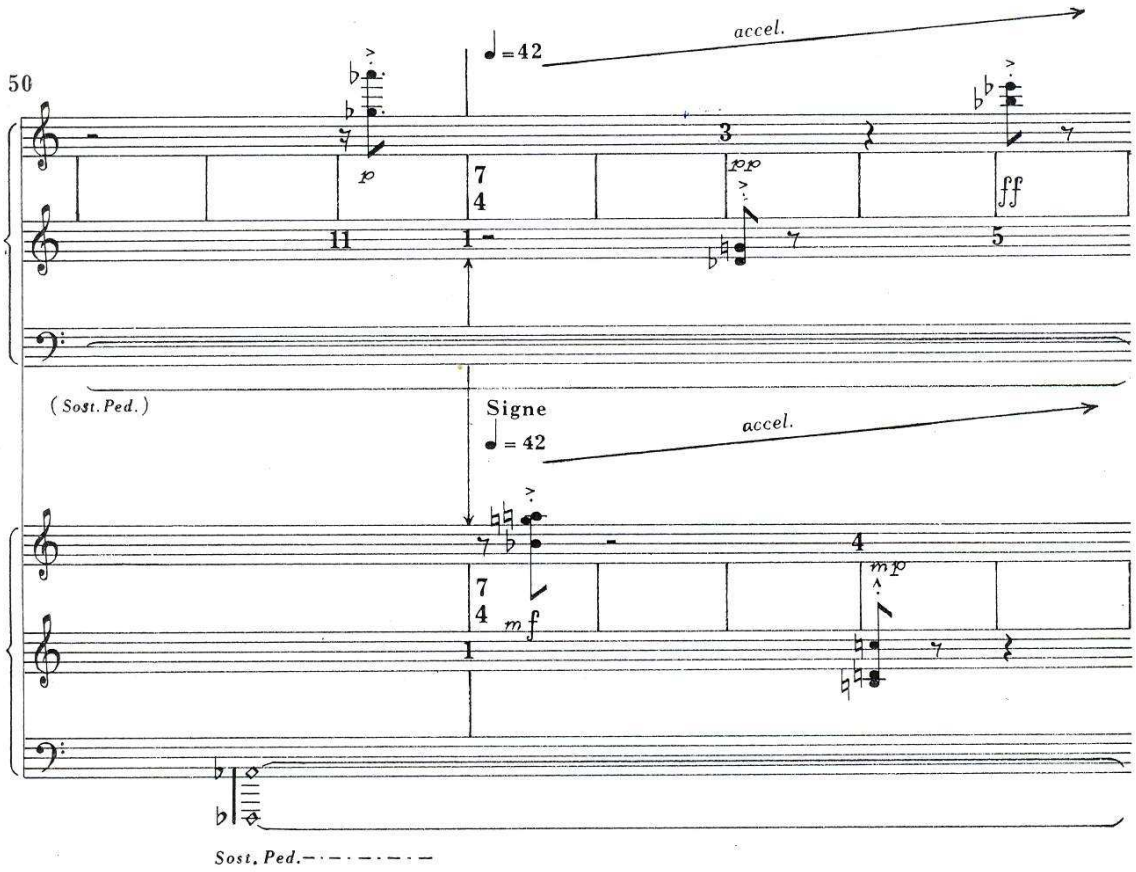


Example 3.910. P. Boulez: *Improvisation sur Mallarmé II* (1957), bar 55. "Lift the hand very slowly from the bass to towards treble". © With kind permission by UNIVERSAL EDITION A.G., Wien.

The apparent steps back from complexity in fingering and spacing, the attempt to create masses of resonance instead of meticulously filtered separate notes together with the attention to the audibility of the effects now provides the instrument with a writing that transforms "the ordinary sound of the piano into a halo of noise", so that "the totality of the sound spectrum takes on an *almost tangible* existence."[1567]
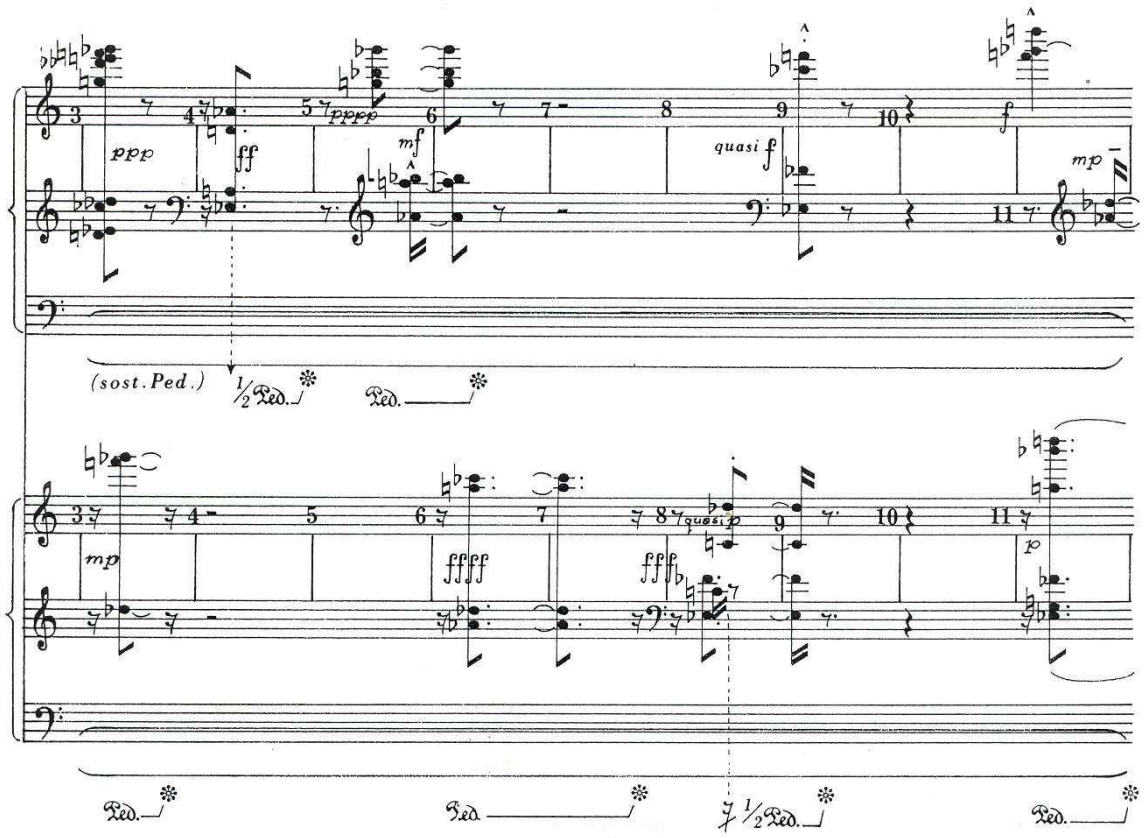
[1567] Boulez 1985, p. 164.

In the second book of *Structures* (1956-61), large, low ranges of open strings (*A♭^{1}-d* on the first piano, *D♭^{1}-A♭*on the second piano) are set from the beginning of the piece. The rich complexes of sympathetic vibrations are given the necessary time to reach the audience by keeping the tempo slow for a while (♩ = 42-112 for the first 41 bars with an average of less than one triggering impulse per quarter). (Ex. 3.911.)
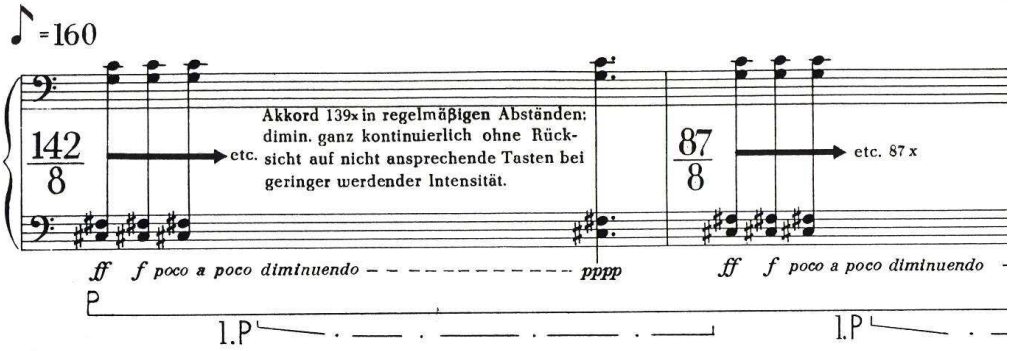


Example 3.911. P. Boulez: *Structures*, 2nd book (1956-61), 2nd chapter, p. 50, 1st system. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Both pianists are still asked to depress the sustaining pedal halfway and only fraction of a second after the attack of a sound, or to release it slowly, but these techniques are now applied over the fundament of the long-term silently depressed clusters that ensure a constant envelope. (E.g. ex. 3.912.)



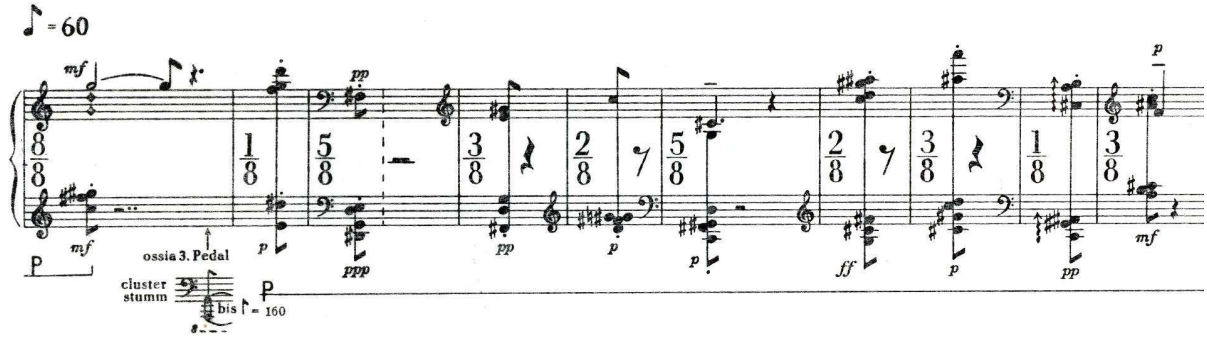
Example 3.912. P. Boulez: *Structures*, 2nd book (1956-61), 2nd chapter, p. 53, 2nd system. © With kind permission by UNIVERSAL EDITION A.G., Wien.

While Boulez had been working on his third sonata, Stockhausen had not concentrated on solo piano music. After *Klavierstück XI* (1956), he had worked on music for woodwinds (*Zeitmaße*), for orchestra (*Gruppen*) and for tape (*Gesang der Jünglinge*). When he returned to piano piece IX in 1961[1568], he arrived at the same conclusion as Boulez had done. If the gradually depressing of the una corda pedal ("l.P." (=linke Pedal) in ex. 3.913) at the beginning is somewhat of a misfit – it cannot produce any gradual effect and therefore only helps to avoid the dilemma of when exactly to depress the pedal – Stockhausen lets the performer produce sympathetic resonance by clusters so that whole clouds of partials are ensured to envelop the chords and grace note groups. (Ex. 3.914 and 3.915.)

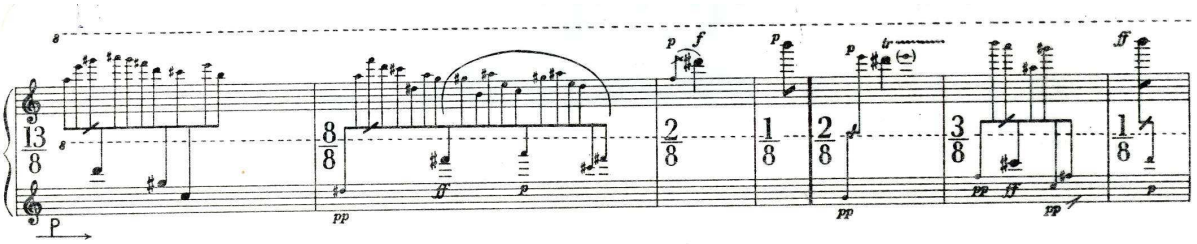


Example 3.913. K. Stockhausen: *Klavierstück IX* (1961), opening. © With kind permission by UNIVERSAL EDITION A.G., Wien.

[1568] Stockhausen finished piano pieces IX and X after *Kontakte*. When both were laid aside in the 1950's (see above), they had not evolved beyond the initial planning stages. For nr. IX, the characteristic beginning and its working out first took place in 1961. (Henck 1980, p. 4.)



Example 3.914. K. Stockhausen: *Klavierstück IX* (1961), 5/2/1-10. © With kind permission by UNIVERSAL EDITION A.G., Wien.

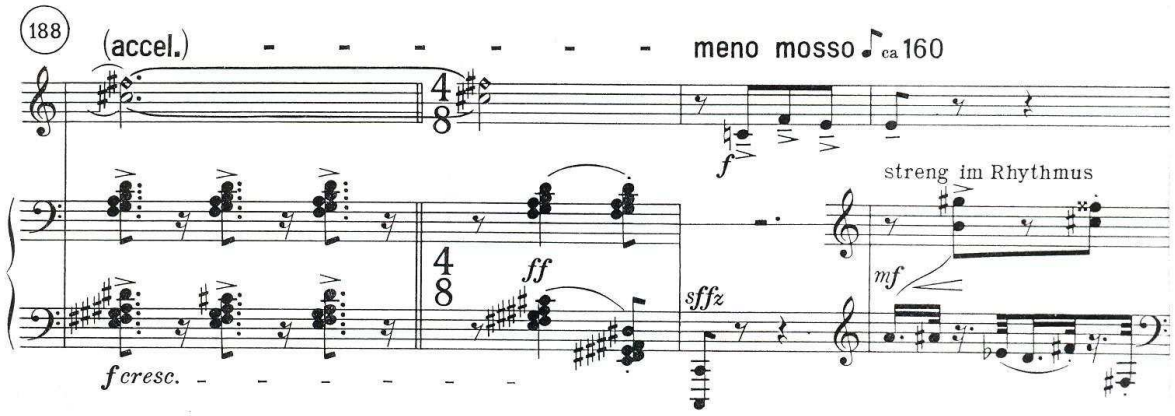


Example 3.915. K. Stockhausen: *Klavierstück IX* (1961), 6/2/1-7. © With kind permission by UNIVERSAL EDITION A.G., Wien.

The intentions to extend the control over the struck string sound in both Boulez' and Stockhausen's works from this period are clear. They not only point to a historical deficiency in pedal notation but also, above all, demonstrate how the control over the piano's sound had, until then, been unjustly limited to the attack of the sound. The serialist interest in cataloguing modes of attack and release, so that they can be handled systematically, aims to better understand and put to use one of the crucial properties of the piano as an instrument with a struck string sound that can be highly controlled by the interfaces. For the attack, the extension of the technique make little difference; for controlling the decay, however, extended techniques have proven to be essential to the endeavours of Boulez and Stockhausen. Nevertheless, the complexity of mastering both the performance practical aspects and the acoustical circumstances led them to prefer efficiency in production of harmonics over control of the most miniscule detail of the techniques' potential.
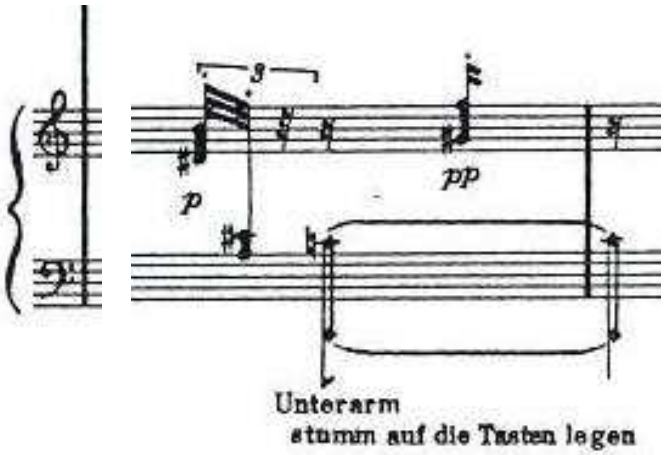
3.4.6.5 1955-61 Stockhausen, Boulez and the cluster

In 1951, Stockhausen had already written a few dense chords for the piano, but nothing indicates the use of body parts other than the fingers. (Ex. 3.916.)



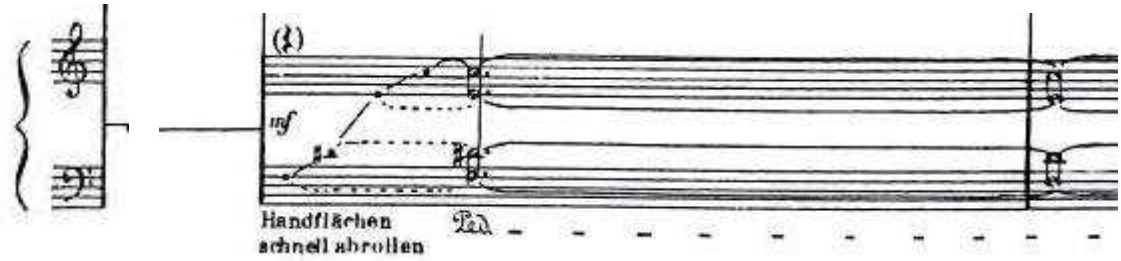
Example 3.916. K. Stockhausen: *Sonatine* for violin and piano (1951), bars 188-191. © With kind permission by UNIVERSAL EDITION A.G., Wien.

In October of 1954, when Cage and Tudor toured Europe, Stockhausen spent a few days with Tudor, who played for him the repertoire he had brought with him from the US. Among those pieces were Cage's *Music of Changes* and Feldman's *Intersection III,* in the latter of which Tudor no doubt used the palms as well as forearms. (Cf. above, ex. 3.865.) According to Tudor, Stockhausen was "fascinated" by the clusters.[1569] When Stockhausen then produced *Gruppen* (1955-57), its piano and celesta part incorporated a wide variety of cluster techniques. Next to many "ordinary" palm- and arm-clusters (silently depressed or not – e.g. ex. 3.917), there are clusters that "move" by building up (ex. 3.918) or leaving off tones. (Ex. 3.919.)

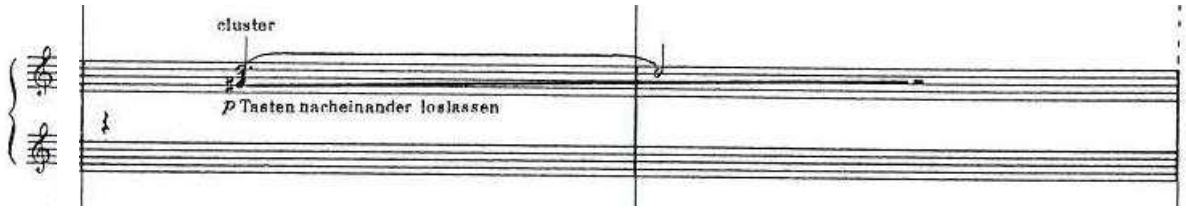


Example 3.917. K. Stockhausen: *Gruppen* (1955-57), piano part, cue 120. © With kind permission by UNIVERSAL EDITION A.G., Wien.

[1569] Kurtz 1992, p. 75.



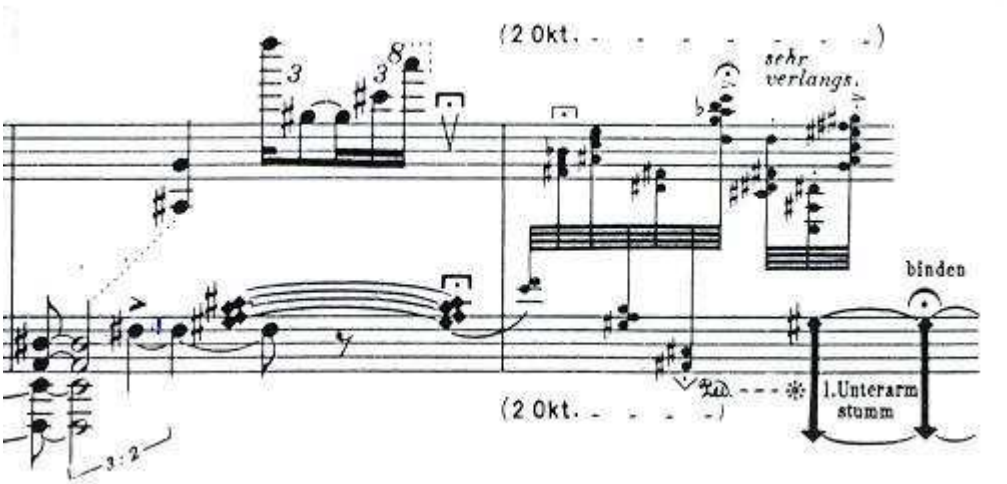
Example 3.918 K. Stockhausen: *Gruppen* (1955-57), celesta part, cue 8. "Quickly turn over the palms." © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.919. K. Stockhausen: *Gruppen* (1955-57), piano part, cue 8. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Since none of the clusters in Cage and Feldman were of the moving type, it is likely that these were added to *Gruppen* no earlier than 1957, when Kagel settled in Cologne and gave Stockhausen his copy of *New Musical Resources*. At that time, Kagel was composing *Anagrama*, in which he used many forms of moving clusters (see below).
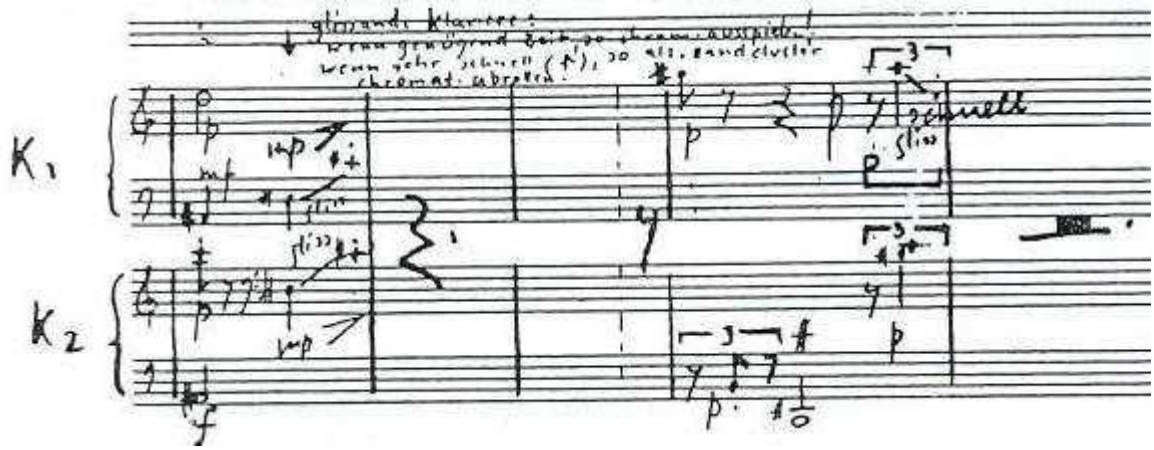
At the time of composing *Gruppen,* Stockhausen also finished his *Klavierstück XI* (1956). Again, clusters are plentiful, though none of them are of the moving type. Interesting to note is Stockhausen's understanding of the fact that not every pianist's forearm is of the same length. (Ex. 3.920.)
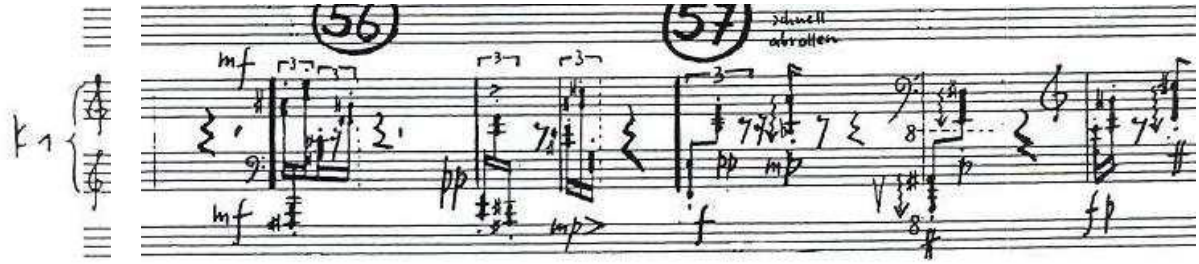


Example 3.920. K. Stockhausen: *Klavierstück XI* (1956), excerpt. © With kind permission by UNIVERSAL EDITION A.G., Wien.

In *Punkte* (1952/62) for orchestra, the moving clusters appear again in the piano part. Sometimes they are notated as chromatic glissandos (ex. 3.921), at other times as arpeggios (ex. 3.922). Built-up clusters are written as chromatic runs while for negatively
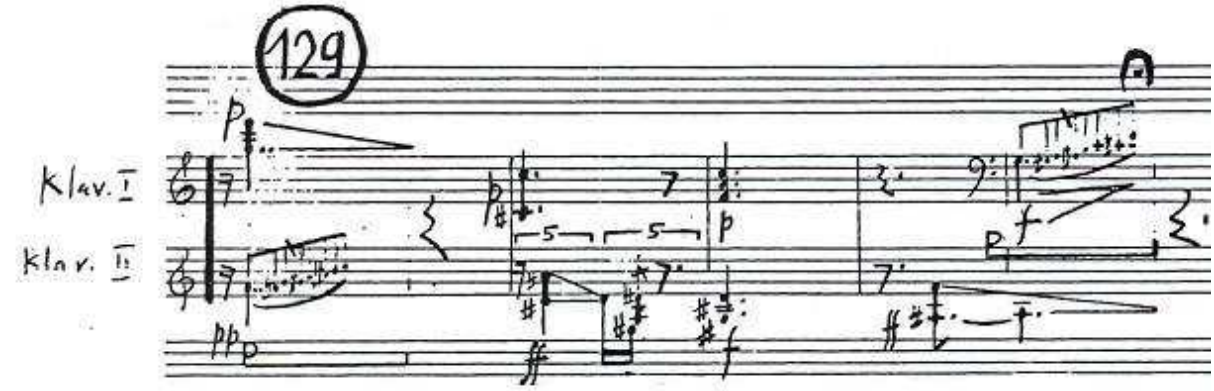
arpeggiated clusters Stockhausen now uses the triangular sign that Kagel used in *Anagrama* (Ex. 3.923.) Both the cluster use and its different notations strongly suggest that the piano part for *Punkte* as we know it was reworked after 1957.



Example 3.921. K. Stockhausen: *Punkte* (1952/62), cue 8. "glissandi keyboards: when enough time, play chromatically [with the fingers], when very fast […], roll chromatically as hand-cluster." © With kind permission by UNIVERSAL EDITION A.G., Wien.



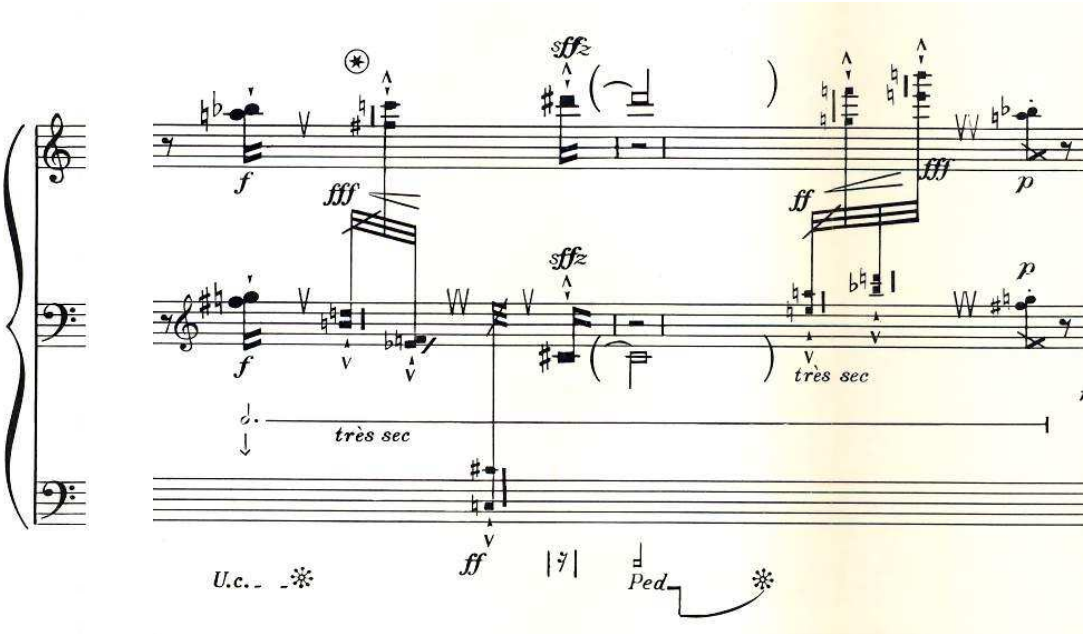
Example 3.922. K. Stockhausen: *Punkte* (1952/62), cue 56-57. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.923. K. Stockhausen: *Punkte* (1952/62), cue 129. © With kind permission by UNIVERSAL EDITION A.G., Wien.

In the case of Boulez, clusters appear only in *Glose*, one of the four parts of the third sonata's *Trope*. (Ex. 3.924.) All of *Trope* is constructed on a complicated process that involves the composition of initial "squelettes" (skeletons) based on "champs" (fields) of

material provided by permutations of the composition's basic series. The skeletons are constructed with pitch-cells that are then removed from the rows to leave the rest of the pitches for the elaborations that complement the skeleton in the eventual finished score. In finalizing *Glose,* its skeleton is pushed far to the background so that the score basically consists of notes that were not used in the skeleton. Since in some passages the skeleton was constructed on single-note cells from the series, the remaining pitches result in chromatic clusters.[1570]

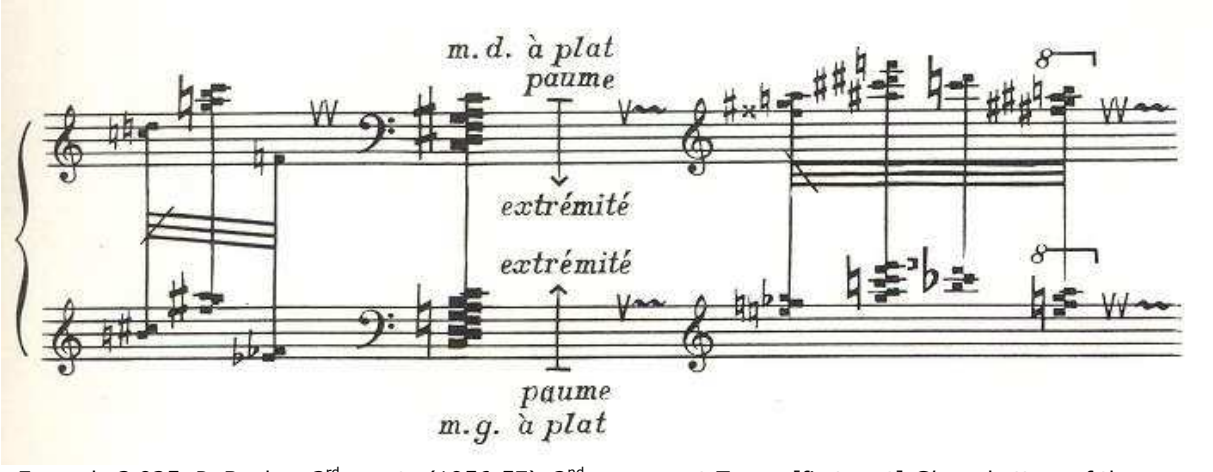


Example 3.924. P. Boulez: 3rd sonata (1956-57), 2nd movement *Trope*, [first part] *Glose*, middle of the first system. The clusters are notated by vertical lines to the left or right of an interval that indicates the cluster's ambit. (The big square half notes in the middle of the excerpt are to be held for as long as the performer wishes.) © With kind permission by UNIVERSAL EDITION A.G., Wien.

If Boulez found a way – or necessity – to integrate the cluster into a serial composition, the basic dodecaphonic premise, i.e. all 12 notes are equal, awoke in him the reflex to at least indicate the possibility of playing the constructs with as much proper fingering as possible. Above the first set of clusters, an asterisk points to a footnote on the bottom of the score where Boulez suggests a performance practical transcription of the clusters, dividing each one over the two hands. (Compare the main text in ex. 3.924 with the footnote score in 3.925.) The pitches at the extreme of the clusters (often in danger of being missed by the shape of the hand) can thus be articulated more clearly, which is surely the way to interpret Boulez' remark (accompanying the alternative notation) that "it will in general be easier to play them with two hands".[1571]

[1570] O'Hagan

[1571] "Il sera plus aisé, en général, de les jouer à deux mains ; [...]»



Example 3.925. P. Boulez: 3rd sonata (1956-57), 2nd movement *Trope*, [first part] *Glose*, bottom of the page (footnote). © With kind permission by UNIVERSAL EDITION A.G., Wien.

It is interesting to see that Boulez refers to the clusters as "bandes de frequences"[1572] ("frequency bands"), using terminology from the electronic studio.

As for Stockhausen's use of the cluster technique, a closer look at *Klavierstück X* (1961) is indispensable for gauging the relationship between the cluster and serialism. As with piano piece IX, only basics aspects such as proportions and dimensions had been worked out for nr. X. The indications in some of the manuscripts of the complete tenth piece – "Komposition 1954/Neuschrift 1961" – and in the publishers catalogue – "Neufassung" – are therefore euphemistic rather than historically informative. From the beginning, this composition would have been "characterized above all by dense chord groups. But the intended method of constructing these groups, as well as the rhythmical structuring, has absolutely nothing to do with the actual 10th piano piece. In short: *Klavierstück X* is in no way based on the original cycle-sketches."[1573] In fact, Stockhausen's treatment of the cluster technique, as well as the idea to systematize it's compositional use, owes much to Kagel's gift of Cowell's *New Musical Resources* (see above). Cowell had wanted to set up a theoretical framework to legitimize the cluster both historically and aesthetically (see above, 2.5.2.2.1) and this must have appealed to Stockhausen, for his *Klavierstück X* epitomizes what Cowell had set out to do in theory, though never accomplished in music.

For Stockhausen serialism was

> only a way of balancing different forces. In general it means simply that you have any number of degrees between two extremes that are defined at the beginning of a work, and you establish a scale to mediate between these extremes. […] that means to interconnect, to – yes, to try to balance out the different aspects of sound.[1574]

As *Klavierstück IX* mediates between the poles of periodicity and aperiodicity, the extremes in X are disorder and order. The higher degrees of organization contain greater unequivocacy (absence of chance), lower density and a stronger individualization of events; the lower degrees are characterized by greater probability and a levelling-out of differences (increasing interchangeability and decreasing aural transparency). The actual extremes are in fact attained (structures are crystallized in solitary individual shapes or

[1572] In the footnote to which the asterisk refers in ex. 3.922.
[1573] Information by Richard Toop, as cited in Henck 1980, p. 4. It is not clear from this remark whether the idea of 'dense chord groups' included clusters at the earliest point of the composition's inception, but in an e-mail to author (11.V.2009), Richard Toop confirmed that there were no clusters in this early version.
[1574] As stated by Stockhausen and quoted in Henck 1980, p. 8.

levelled out in mass complexes) but the point is not to use them as mere opposites, rather to have them enter in association with one another.[1575]

Consistent with Stockhausen's view that material and form should be one[1576], i.e. that the material contains within itself the criteria by which the composition is structured, he chose the polarity of sound and noise to be the point of departure for Klavierstück X. He had already intensively researched these extremes in his two electronic studies (see above) and found it essential "that a continuum between sound and noise be composed[1577]," i.e. the "coloured noise" in between the sine tone as the smallest noise band (ordered sound) and white noise as the densest superimposition of sine tones (unordered nose).[1578]

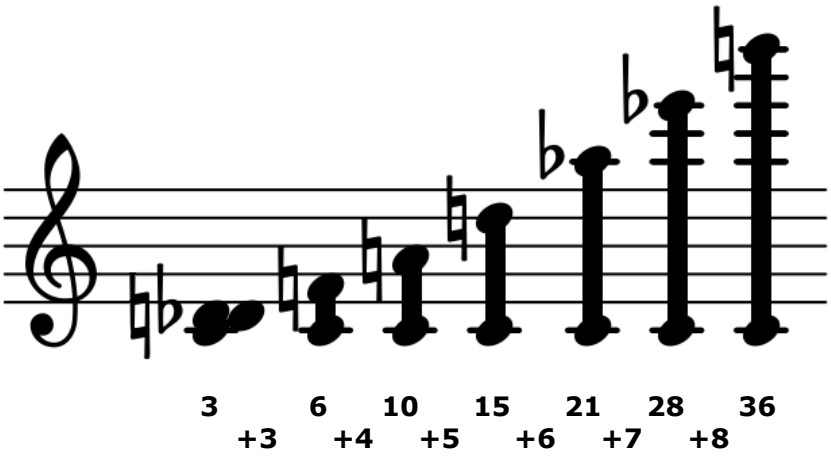
By transferring the categories of sound and noise onto the piano, the factor of playability became representative for the mediation between the two extremes. In between the single note and the largest possible forearm cluster Stockhausen filters a scale of carefully graded chords and clusters from the total sound spectrum of the piano.[1579]

The whole composition is intricately structured upon a single series of proportions (7-1-3-2-5-6-4), through which a formal framework is comprised of an opening part and 7 "phases". The pitch material (7 "characters") is coordinated with 7 "basis-durations" (shown in the score by the abstract note-symbols above the staves, e.g. examples below) that consist of "action-durations" (in which the pitches and their durations are distributed) and "rest-durations."[1580] Besides more or less fixed attributions of dynamics, keyboard ranges and forms of motion (e.g. upwards/downwards, cluster-scales/arpeggios/glissandos, chromatic connections, repetition) the characters are determined by specific chord- and cluster-types:

Character 1: 7-voice-chord / 36-note cluster / cluster-scales	(ex. 3.925)
Character 2: 6-voice chord / 28-note cluster / cluster-repetition	(ex. 3.927)
Character 3: 5-voice chord / 21-note cluster / arpeggio	(ex. 3.928)
Character 4: 4-voice chord / 15-note cluster / step-by-step	(ex. 3.931)
Character 5: 3-voice chord / 10-note cluster / single cl.-glissandos	(ex. 3.936)
Character 6: 2-voice chord / 6-note cluster / groups of cl.-glissandos	(ex. 3.929)
Character 7: 1-voice chord / 3-note cluster / melodies, chromaticism	(ex. 3.925)

[1575] Stockhausen 1964, p. 106.
[1576] As quoted in Henck 1980, p. 9.
[1577] Stockhausen 1978, p. 394. "Wesentlich ist […] daß also zwischen Ton und Geräusch ein Kontinuum komponiert wird."
[1578] Stockhausen 1963, p. 146.
[1579] Henck 1980, p. 10. All information about the compositional processes of *Klavierstück X* is taken from Henck 1980.
[1580] For more details, see the exhaustive analysis in Henck 1980, p. 14-60.

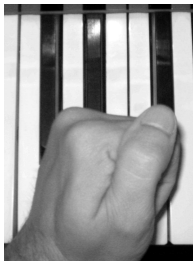
The clusters' ambit is determined according to an addition principle and conveniently agrees with the 7 ways of using hands and arms to play clusters on the keyboard. (Ex. 3.926.)

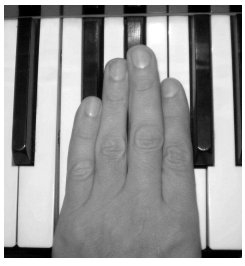


Example 3.926. Ambit range of the cluster material in Stockhausen's Klavierstück X.

Looking at the playability factor and not taking into account the smallest, three-note unit, each ambit corresponds to a particular bodily position:

6-note cluster c^1-f^1 (fist or perpendicular palm with closed fingers):

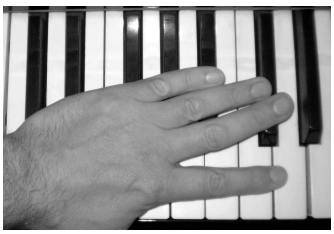
1. 

2. 

10-note cluster c^1-a^1 (perpendicular palm with spread fingers):

3. 

15-note cluster c^1-d^2 (palm)

4. 

21-note cluster c^1-$a\flat^2$ (arm + lifted hand)

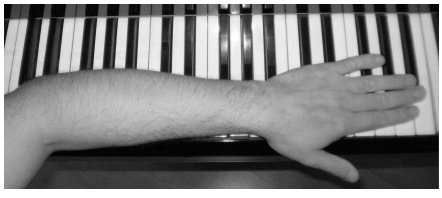
5. 

28-note cluster c^1-$e\flat^2$ (arm + oblique palm or arm + fist):

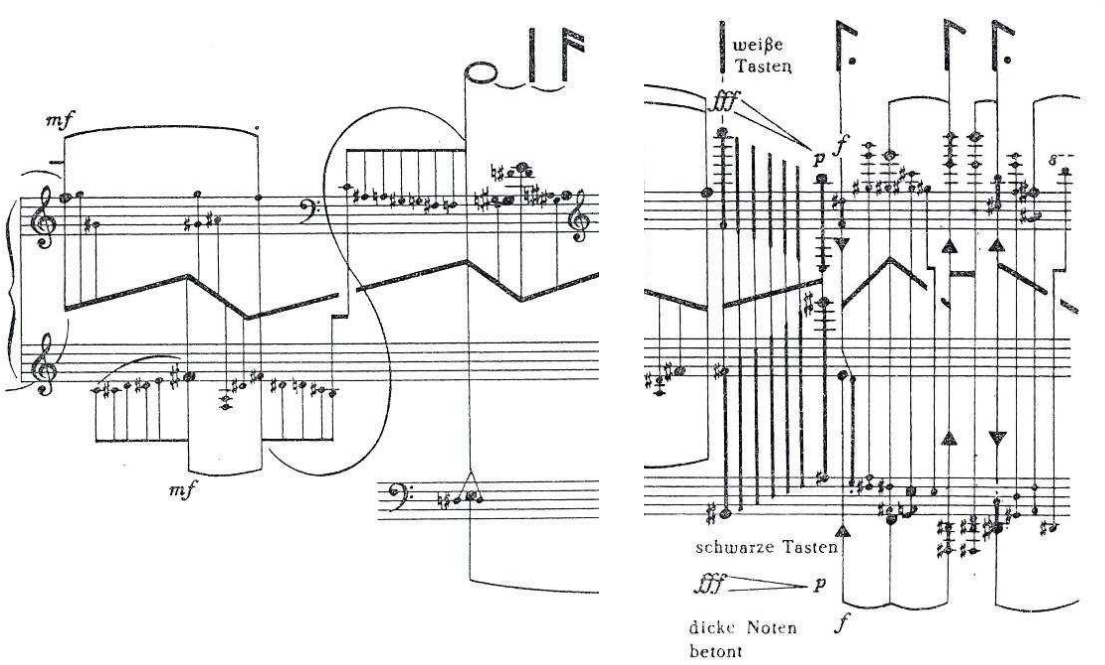
6. 

7. 

36-note cluster c^1-b^3 (arm + palm):

8. 

As beautifully as the math underneath the series of ambits seems to match the ergonomics of the technique, it is no perfect fit: not every pianist's arms and fingers are long enough to reach certain stretches (those of the author are visibly short in 4. and 8.), the form of the elbow, arm, wrist and palm does not guarantee that all black and white keys are in fact depressed, and it is a great challenge for many of the positions to hit the complete stretch at the fast speeds that are often required. Especially his request to accentuate the endnotes of large clusters is difficult to meet when these keys are to be struck by the elbow (ex. 3.927).
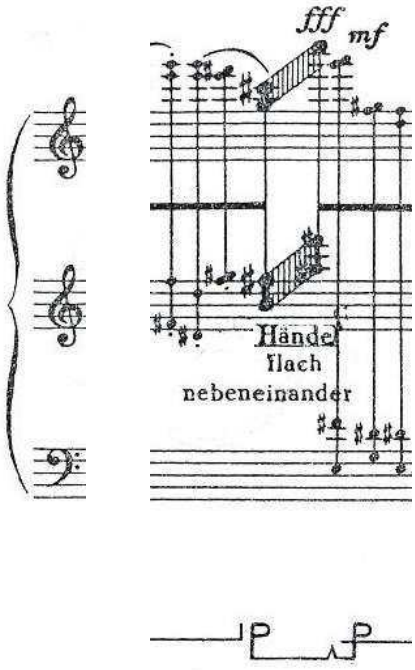


Example 3.927. K. Stockhausen: *Klavierstück X* (1961), 1/2. © With kind permission by UNIVERSAL EDITION A.G., Wien.

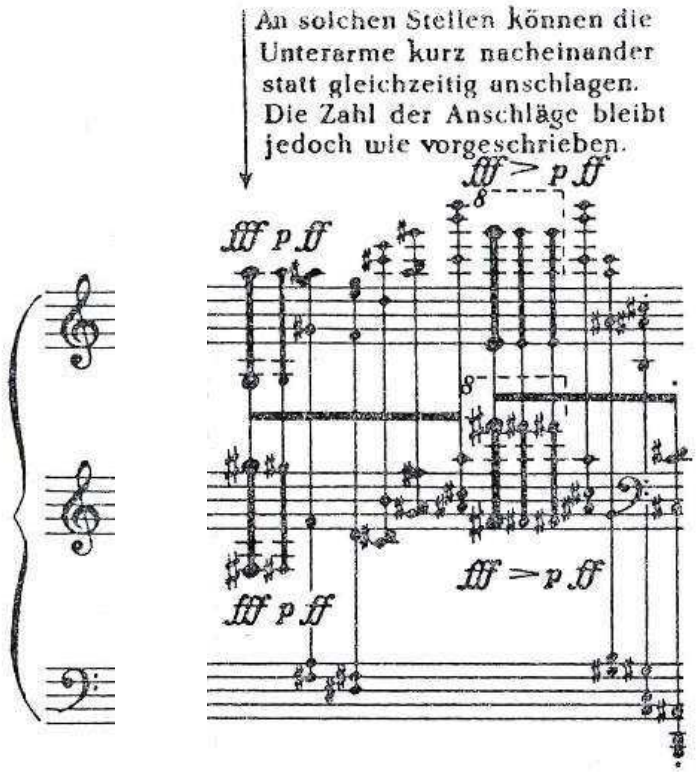
Stockhausen was aware of how instrumental conditions (and the way the performer's physiology matches the interface is such a condition) could compromise his ideal of bringing them "to a maximum of their efficiency into the serial structure," for he put this goal into perspective by admitting that "for the player this means only: to answer as precisely as possible the notated signs with the corresponding playing mode of his instrument."[1581]

Some traces of his concern for the performance practical feasibility can be found in the score, for instance when he divides a larger cluster into two smaller ones for two hands to use them for a glissando or when he indicates how very fast repeated forearm clusters can be performed as alternated clusters to avoid uncomfortable shaking of the whole body[1582]. (Ex. 3.928 and 3.929.)

[1581] Stockhausen 1964, p. 44.
[1582] Herbert Henck supposed that Stockhausen showed such leniency while working on the piece with pianists, as this indication does not appear in the first finished manuscript. (E-mail to author May 18, 2009.)

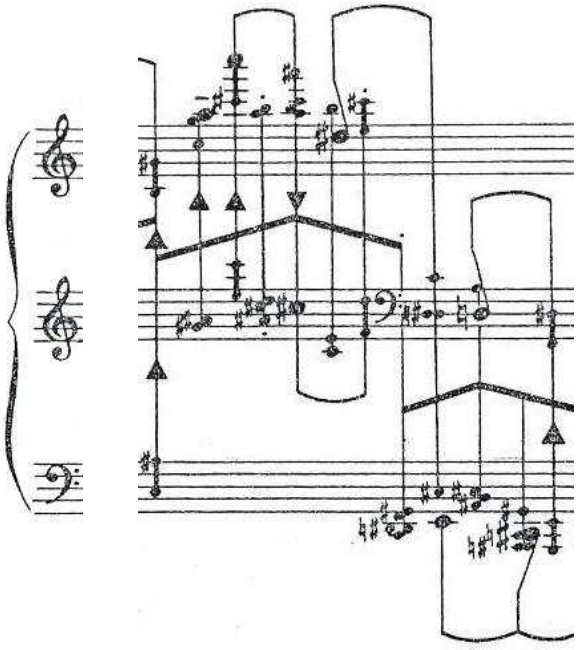


Example 3.928. K. Stockhausen: *Klavierstück X* (1961), 3/1/2. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.929. K. Stockhausen: *Klavierstück X* (1961), 4/1/4. "At such places, the forearm can be articulated shortly one after the other instead of simultaneously. The number of attack remains as prescribed, however." © With kind permission by UNIVERSAL EDITION A.G., Wien.

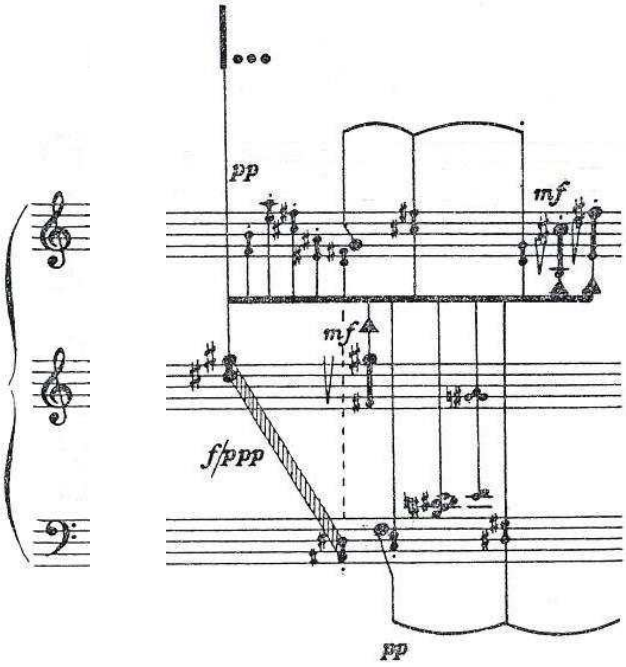
As much as the cluster types are obviously based on how they can be played, i.e. on the morphology of the cluster *performance technique*, Stockhausen composes with them really as fixed aggregates of 3, 6, 10, 15, 21, 28 or 36 notes (except for some mistakes[1583]). Even when a large chromatic cluster is to be played with two arms, he makes sure that the total ambit is exactly 28 or 36 while the stretch for each arm separately is less. For instance, in ex. 3.929, the total ambit of the first double-arm cluster is 28 while each cluster separately has 27. Similarly, two adjacent rolling palm clusters (10- resp. 11-note stretch – only one of which fits the series) are combined to form one rolled 21-note cluster. (E.g. the first and last instances in ex. 3.930.) On the one hand this again shows his regard for the performance technical comfort, though on the other hand it increases the number of cluster positions that the pianist has to master.



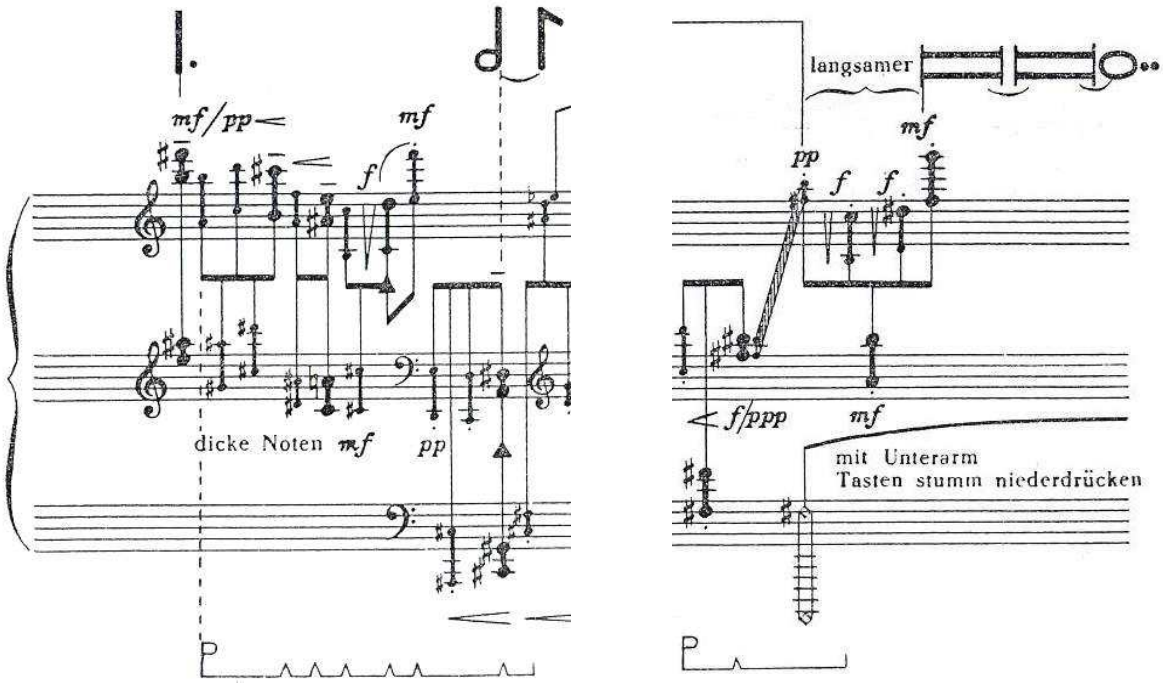
Example 3.930. K. Stockhausen: *Klavierstück X* (1961), 5/1/2. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Stockhausen is very creative in his use of the cluster. Next to chains ("cluster-scales") and repetitions ("hammered") of static clusters, he prescribes arpeggiated clusters and internal crescendos for both static and arpeggiated clusters. The arpeggiated clusters only occur in the 15-, 21- and 28-note type. The dynamic "movement" in the cluster is mostly limited to the rolled type (ex. 3.931), only rarely appearing in a static cluster. (Ex 3.932 – this may actually be a mistake.)

[1583] For instance in 8/1/5, the left hand has a F1-a cluster, which should be either *F#* ^{1}*-a* or *F*^{1}*-a♭*.

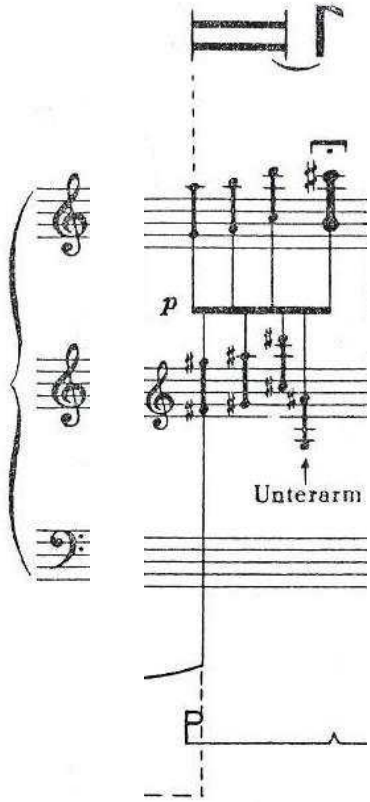


Example 3.931. K. Stockhausen: *Klavierstück X* (1961), 8/2/9. Stockhausen's sign for arpeggiation is seen in the last to instances of the right hand. © With kind permission by UNIVERSAL EDITION A.G., Wien.



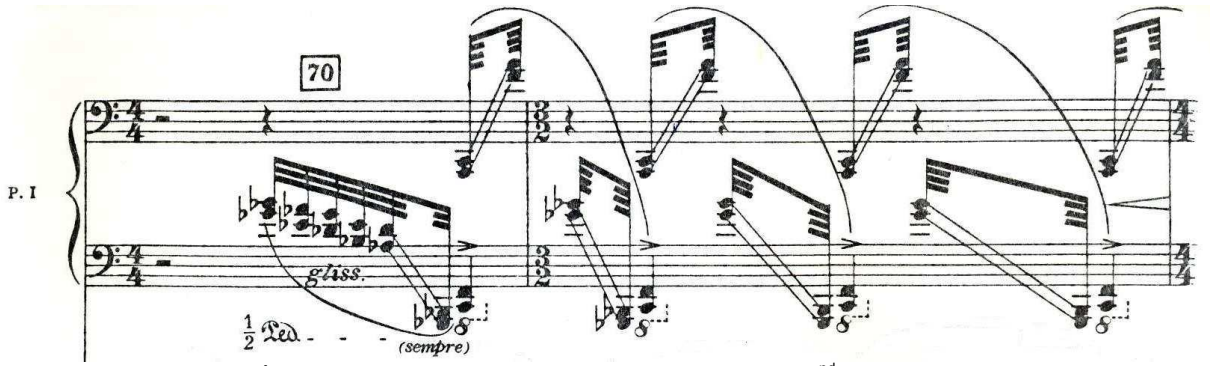
Example 3.932. K. Stockhausen: *Klavierstück X* (1961), 9/2. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Stockhausen's creativity with the possibilities of cluster playing is further noticeable in for instance ex. 3.933, where he takes advantage of a free elbow to accomplish the fluency necessary for this very traditional (melodic) type of build-up towards the fermata.



Example 3.933. K. Stockhausen: *Klavierstück X* (1961), 8/2/9. © With kind permission by UNIVERSAL EDITION A.G., Wien.

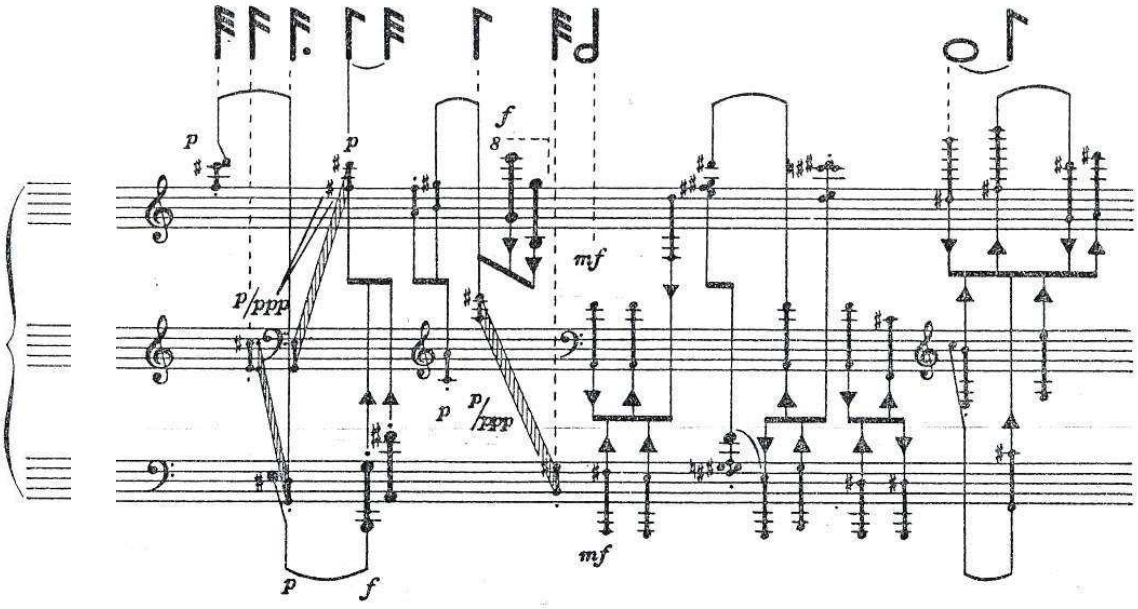
Although Stockhausen's cluster glissandos bear conspicuous resemblance to Cowell's idea of moving clusters, they may go back as far as to Stockhausen's analysis of Bartók's *Sonata for two pianos and percussion* that he made for his graduation exam. Bartók wrote some black-key double-note glissandos that, if they were performed with the palm of the hand (which they were not intended for), would have exactly the same effect as Stockhausen's cluster glissandos.[1584] (Ex. 3.934.)



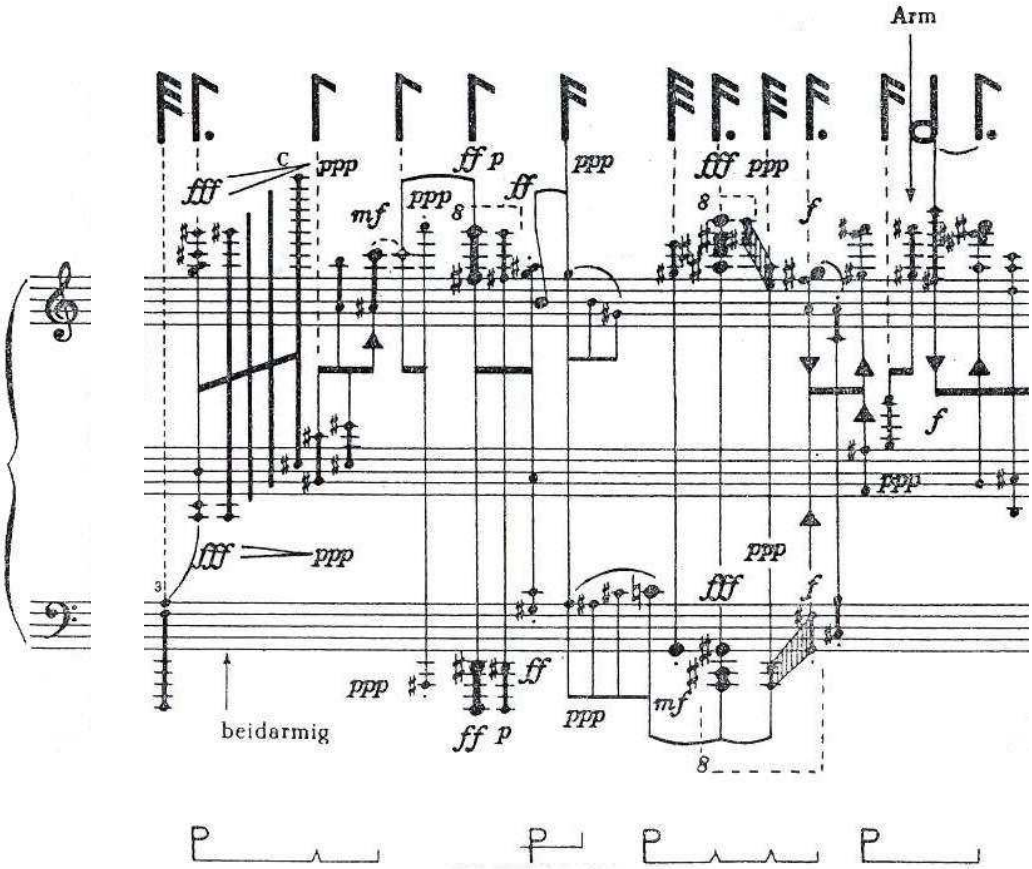
Example 3.934. B. Bartók: *Sonata for two pianos and percussion* (1937), 2nd movement *Lento, ma non troppo*, 1st piano part, bars 70-71. Reproduced by permission of Boosey & Hawkes (London) Ltd.

[1584] Herbert Henck (Henck 1980, p 9) refers to this analysis when connecting it to Stockhausen's idea of mediating between extremes.

Stockhausen is consistent in his use of closed-finger palm clusters for isolated cluster glissandos (ex. 3.931 and 3.932), and spread-finger palm clusters for groups of glissandos (ex. 3.935). But, although in most cases, the size of the cluster in cluster glissandos remains the same, this is not always the case, e.g. above, ex. 3.928 and ex. 3.936.



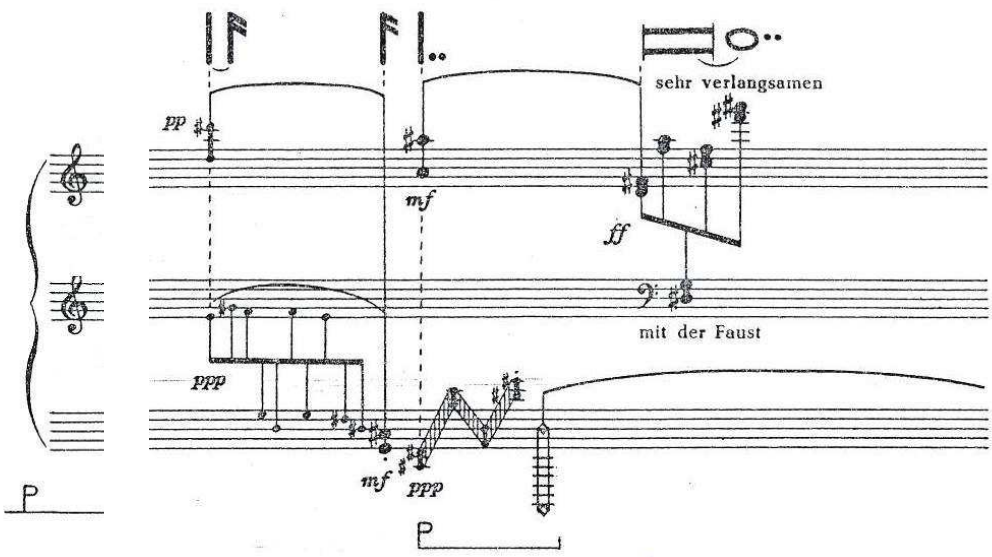
Example 3.935. K. Stockhausen: *Klavierstück X* (1961), 14/2/1. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.936. K. Stockhausen: *Klavierstück X* (1961), 3/2/7-18. © With kind permission by UNIVERSAL EDITION A.G., Wien.

The clusters in *Klavierstück X* are generally chromatic. If black- and white-key clusters appear, e.g. one in each forearm, it is to be combined into a chromatic cluster. Only rarely do they occur on their own, and then Stockhausen warns the performer of it (see above, ex. 3.927.)

Both the fist and the perpendicularly placed palm can play the 6-note clusters. That Stockhausen only once specified the fist may be additional evidence to the claim that these particular clusters have a special meaning, perhaps indeed spelling out the five syllables of the composer's name on the before-last page of the piece.[1585] (Ex. 3.937.)

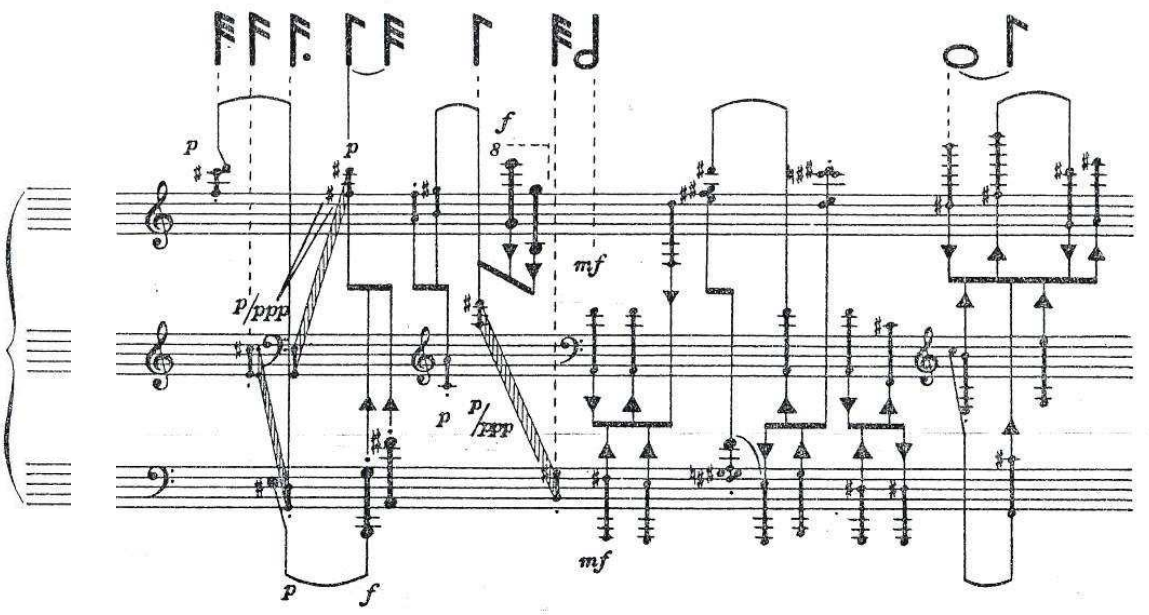


Example. 3.937. K. Stockhausen: *Klavierstück X* (1961), 35/1/4-6. © With kind permission by UNIVERSAL EDITION A.G., Wien.

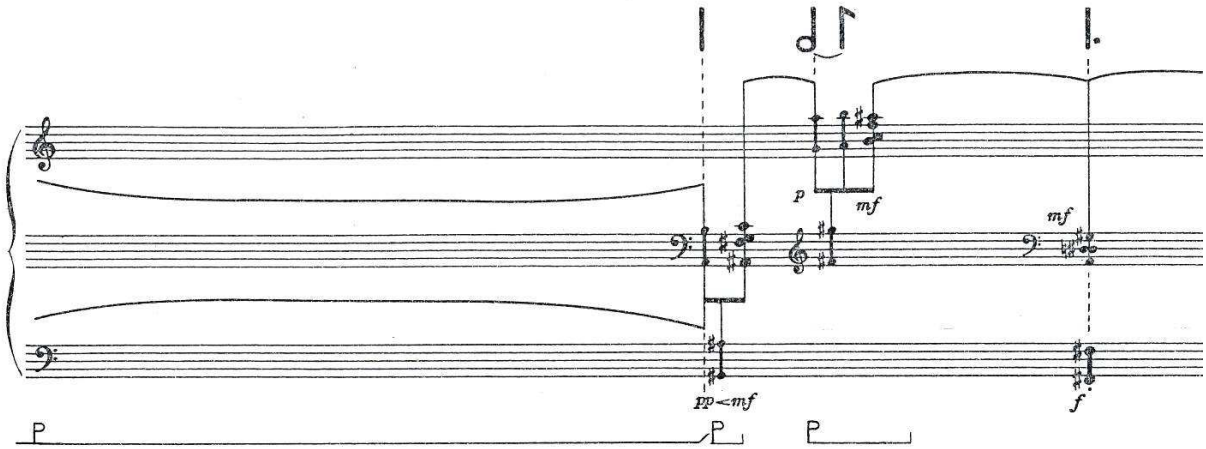
The distribution of the clusters throughout the composition is related directly to the structural duality between order and disorder. The opening phase of the piece (the first 5 pages) is a contraction of all the following 7 phases, compressing all the characters and all of the basis-durations into one phase. Stockhausen called this opening section of the score the "initial homogeneous state of advanced non-organization."[1586] In the extraordinary high density and speed of the opening section, the clusters are less numerous than the chords and single notes, thus operating as audible breaks in the material.

The transition from noise to sound, i.e. from disorder to order, is represented by an ever-greater transparency in the texture of the composition. To achieve that, Stockhausen gradually withdraws the cluster material in the distribution of the vertical structures. After the opening phase, the texture is made of clusters and single notes exclusively. (E.g. ex. 3.938.) Chords only enter in the third phase (page 15 of the total of 38), increasing statistically until they are the majority in phase 6. In the last phase, the apparent polarity of cluster and chord is abolished in favor of their mutual properties, for instance when a chord is filtered out of the preceding cluster (by way of silently depressed keys), when a cluster is followed by a reconstruction of it in sequences of single notes, or when part of a cluster is made audible as a chord. (End of ex. 3.939.)

[1585] Henck 1980 (p. 50) offers a compositional argument for singling out this passage, but does not give any source for the claim.
[1586] Henck 1980, p. 43.



Example 3.938. K. Stockhausen: *Klavierstück X* (1961), 14/2/1. © With kind permission by UNIVERSAL EDITION A.G., Wien.

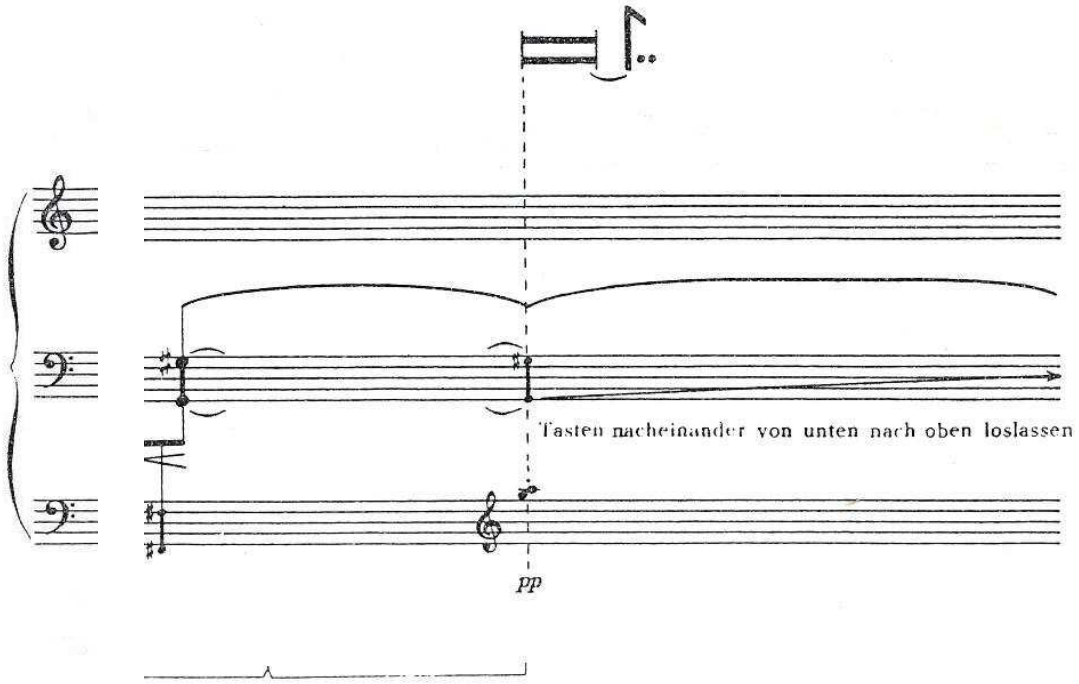


Example 3.939. K. Stockhausen: *Klavierstück X* (1961), 36/1. © With kind permission by UNIVERSAL EDITION A.G., Wien.

On a whole, the mediation between order and disorder takes place on the level of the action-durations; the rest-durations are more static through silence, stationary sounds and "hearing-out" of character materials. Contrary to the action-durations, the rest-durations contain no clusters and rely instead on techniques to manipulate the decay of sounds by use of pedaling and open string techniques. The "post-production" techniques in *Klavierstück X* are a summary of all that Stockhausen had used before:

- Natural decay
- Gradually releasing the sustaining pedal
- Half-depressed sustaining pedal
- Abruptly muting the sound by lifting the pedal halfway and immediately fully re-depressing it (so that the dampers do not cut it off)
- Catching resonance of staccato notes by immediately silently re-depressing the keys
- Catching resonance and adding sympathetic resonance by making opened strings audible when the pedal is released
- Activating sympathetic resonance of opened strings by properly played notes

Natural decay is not limited to that of sound with or without pedal: Stockhausen even manipulates pure decay by gradually releasing the keys in a cluster. (Ex. 3.940.)



Example 3.940. K. Stockhausen: *Klavierstück X* (1961), 18/2/2. © With kind permission by UNIVERSAL EDITION A.G., Wien.

When comparing the relation in time-length between the action-durations (==) and rest-durations (--), we see that the ratio between action- and rest-duration is 1:1.72. (Leaving out the condensed opening section, the ratio is 1:2.6.) (Ex. 3.941.) Thus, the extended techniques to control the end of the sounds are determinant of more than half of this composition.

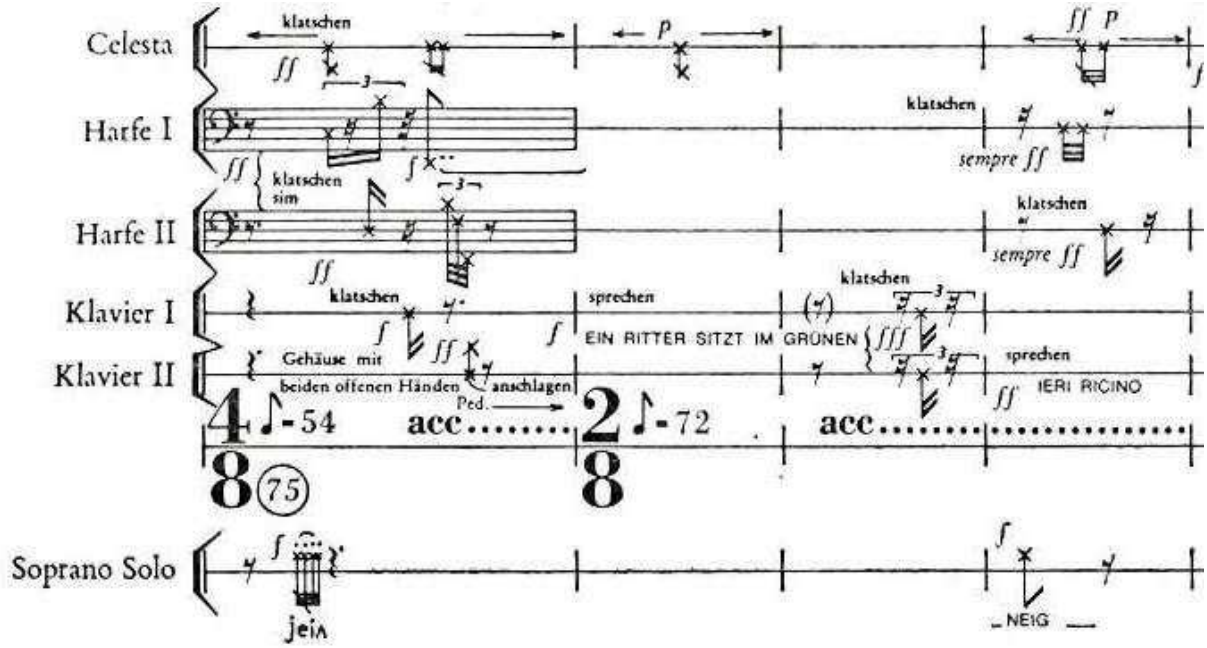
```
1  ==
2  ===--
3  =====----
4  ========--------
5  ============----------
6  ================------------------------------
7  ================--------------------------------------------------------------------------------
```

Example 3.939. K. Stockhausen: *Klavierstück X* (1961), relationship in length between action- and rest-durations.

In the last phase, the differences between action- and rest-duration are abandoned: the density and the character material of the last action duration is as minimal as the previous rest-durations, the dichotomy between the two categories of extended techniques in this piece (cluster playing and decay-manipulation) is relinquished.

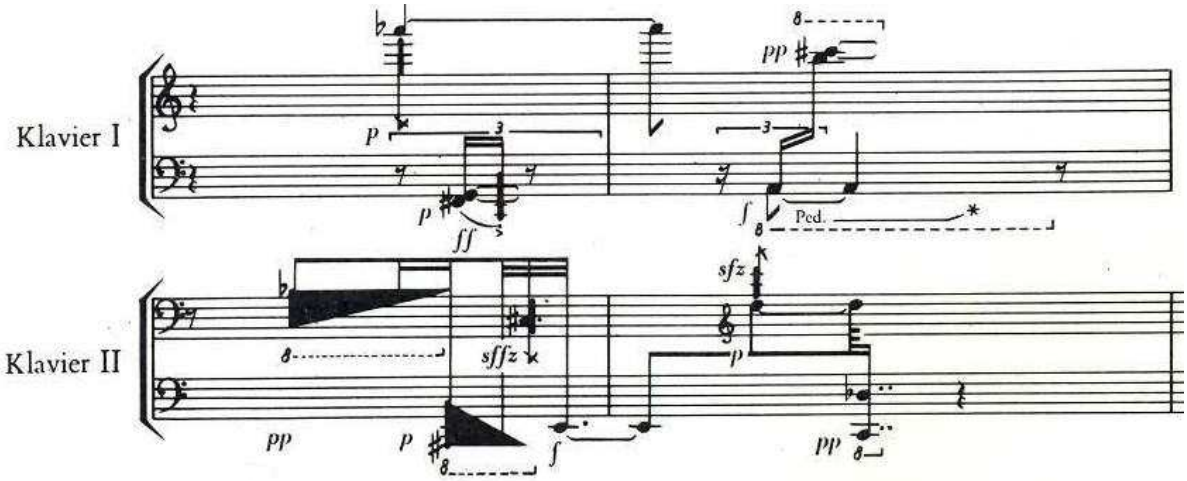
3.4.6.6 1957-58 Kagel, *Anagrama* and the first European synthesis

Besides Boulez Stockhausen, there as a third key player in the European post-war development of extended techniques for the piano. Mauricio Kagel came to Germany from Argentina in 1957 and was immediately accepted by the Darmstadt group that included Boulez and Stockhausen. The first piece Kagel finished in his new home country was *Anagrama* (1957-58). In this work for vocal soloists, Sprechchor and chamber ensemble, Kagel investigated the possible instrumentalization and serialization of vocal expression. Treating vocal sounds as musical material the way instrumental pitches are composed with, text could be integrated into instrumental music to a level unheard-of. At the same time that text is alienated – often to the point of unintelligibility – and textual inarticulation is on a par with improper instrumental sounds. Next to using untraditional percussion instruments (e.g. metal sheets and different types of paper), Kagel often treats the performers of regular ensemble instruments as percussionists and vocalists. (Ex. 3.942.)

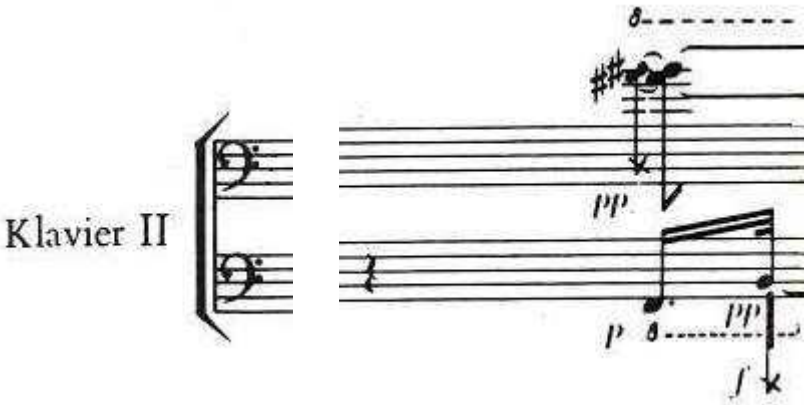


Example 3.942. M. Kagel: *Anagrama* (1957-58), 1st part, page 17. © With kind permission by UNIVERSAL EDITION A.G., Wien.
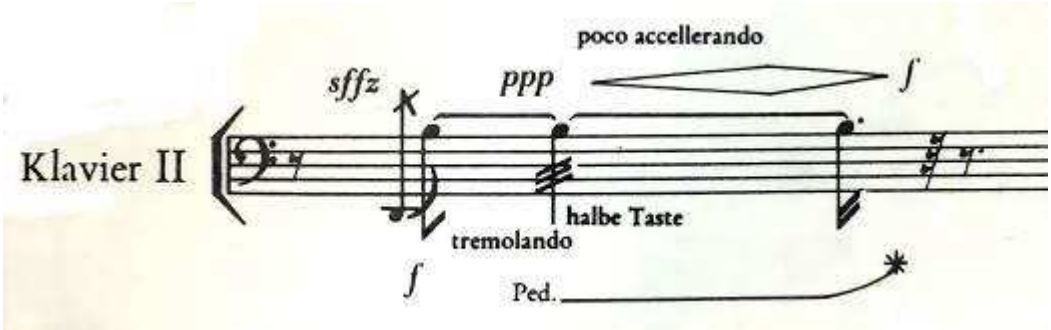
For the two pianos in the ensemble, a multitude of extended techniques is applied. On the keyboard we find a very rare glissando in 7ths, many clusters (chromatic, black- and white-key, arpeggiated, silently depressed), moving clusters (ex. 3.943), clusters in undefined range (ex. 3.944), and tremolando with keys that are only half-depressed (ex. 3.945). For the sustaining pedal, gradual release (sometimes "not avoiding the rattle of strings" – ex. 3.946) and half-way is prescribed, next the noise of abruptly depressing and releasing the (sostenuto) pedal (ex. 3.947). Resonance is manipulated by activating opened strings, by catching it with the sustaining pedal and by re-depressing keys after they were played staccato. On the strings, Kagel asks for glissandos with fingernails, scraping tremolandos (ex. 3.948), nail- and flesh-pizzicatos, and muting them before or after playing the keys. Outside of the keyboard and strings, the pianists have to clap their hands, hit the casing wit both open hands and speak. (Above, ex. 3.942.)
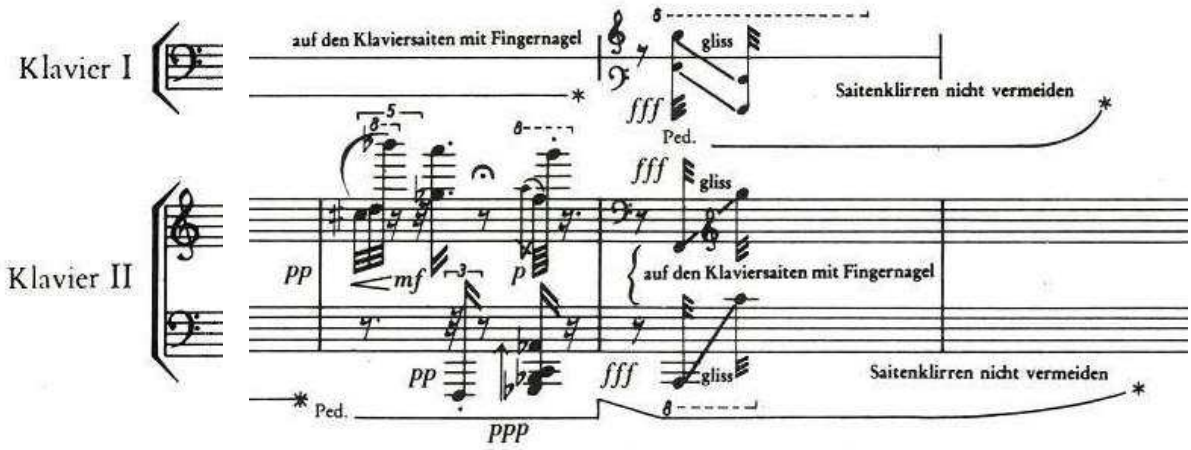


Example 3.943. M. Kagel: *Anagrama* (1957-58), 1st part, page 6. © With kind permission by UNIVERSAL EDITION A.G., Wien.



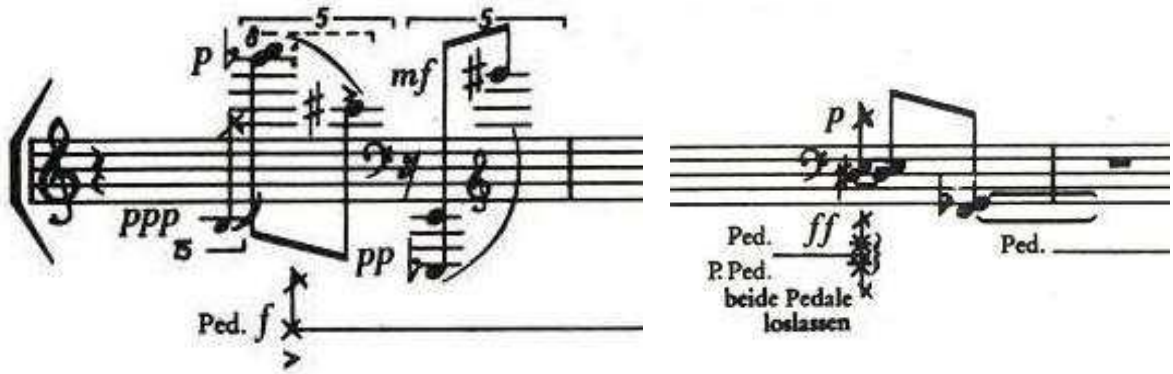
Example 3.944. M. Kagel: *Anagrama* (1957-58), 1st part, page 6. © With kind permission by UNIVERSAL EDITION A.G., Wien.



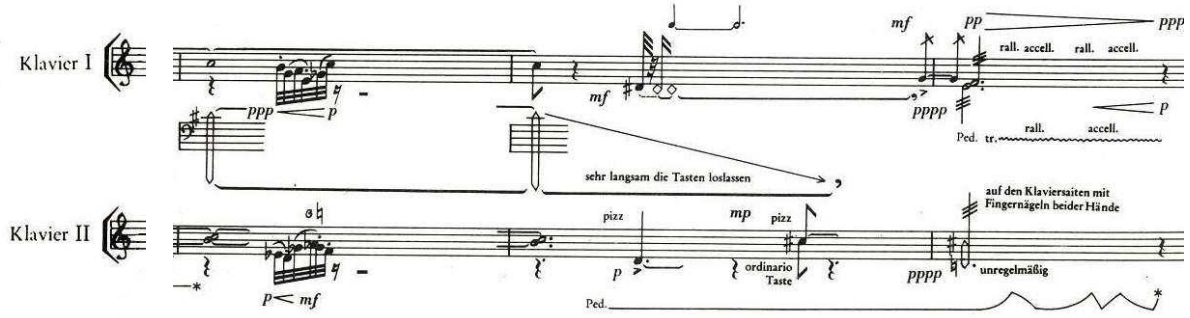
Example 3.945. M. Kagel: *Anagrama* (1957-58), 1st part, page 8. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.946. M. Kagel: *Anagrama* (1957-58), 5th part, page 38. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.947. M. Kagel: *Anagrama* (1957-58), 4th part, page 28. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.948. M. Kagel: *Anagrama* (1957-58), 5th part, page 39. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Anagrama was started in 1955/56 while Kagel was still living in Argentina, and finished in Cologne between 1957 and '58. It is not clear exactly how much of the improper playing techniques were already part of the pre-European state of the piece. At least the noisy gradual release of the pedal (ex. 3.946) conspicuously appeared before in Boulez' 1957 third sonata (see above, 3.4.6.4). But the moving clusters must certainly be traced back

to Kagel's interest in Cowell's *New Musical Resources*, of which he obtained a copy in an antique bookshop in Buenos Aires in 1952 or '53.[1587]

3.4.6.7 1957-60 The extended piano and percussion

Following on the previous interest in combining and even overlapping the piano idiom with that of percussion (see 3.4.3), some notable European composers turned their attention to embedding the piano in a percussion biotope so as to explore the piano's unpitched potential. In between pieces by Boulez, Stockhausen and Kagel, a development is noticeable, from the basic search for blending of sounds and noises made by different instruments to the complete fusion of piano and percussion playing.

3.4.6.7.1 P. Boulez: *Improvisation II sur Mallarmé*

In 1957, with the third sonata fresh in mind, Boulez finished his *Improvisation II sur Mallarmé* for soprano and nine instruments. (See also above.) In 1961[1588] he explained how he had conceived of the instrumentation of the second improvisation as for voice and three groups of instruments categorized on the basis of their sound: one group with fixed-pitch instruments (piano and harp), one partially pitched (celesta, vibraphone, tubular bells) and one group with "unpitched ('noise')" instruments (wooden and metal percussion instruments).[1589] He further details the difference between the first two categories, as the piano's and harp's pitches are identifiable among a thousand others where as the celesta's, vibraphone's and bell's demonstrate confusion between real sounds and harmonics. The instruments are placed on the stage on the basis of their characteristic sonorities, making sure that they can each be heard fully and not be overpowered by a neighboring instrument, taking into account the stereophonic potential of blending the three sound categories. Boulez then approached the individual instruments from novel perspectives, devising subtle mixtures of instrumental sonorities from the different categories to create new perceptive experiences.

Boulez searches for new methods of playing and new sonorities, for instance using the hands to selectively dampen single notes on the vibraphone, "to remove notes one by one from a held chord, leaving the rest vibrating, or to remove the chord by degrees"[1590] as Cowell thought of with his subtraction principles for moving clusters in his *New Musical Resources*. For the bells Boulez writes intricately composed sound complexes so that they can serve to be the link between fixed-pitch and partially-pitched instruments, with a homogenous mixture making it virtually impossible to determine which instrument plays which note. Instruments such as the tam-tam act as a catalyst in the transformation between instrumental sounds. As the tam-tam belongs "to the same zone of sonority as the lower register of the piano", it is used to "change the way we hear the tone of the piano. […] The essential thing is to obtain a mixture in which the listener is not aware of the gong and the tam-tam individually, but one of complete transformation of the character of the piano."[1591]

[1587] Kagel 2007.

[1588] In a lecture at Strasburg, entitled "construire une improvisation". "The original German text transcribed from tape was published in *Melos* under the title 'how the avant-garde works today', Vol. Xxviii No. 10, October 1961, pp.301-8. Revised by Boulez in 1981. Translated here from the French text prepared by J.L. Leleu for *Points de repère*." As in Boulez 1985, p. 155, footnote. We used this English text as in Boulez 1985, pp. 155-173.

[1589] Boulez 1985, p. 157.

[1590] Boulez 1985, p. 160.

[1591] Boulez 1985, p. 169.

Finding inspiration outside of Western conventions by considering for instance the vibraphone as a kind of substitute for the Balinese gamelans, associating the tubular bells with Far eastern music and borrowing performance techniques for the harp from Andean peasants in Peru, the alienation of instruments and the blending of the sonorities thus obtained is one of the major excercises in the second improvisation on Mallarmé.

For optimum blending of the piano's timbres with the other instruments, its lid is to be taken off; to deny the audience even a visual clue as to what the piano does, its keyboard is to be turned towards the back of the stage. Just like the instruments are to be widely spaced on stage, so are the sonorities given ample time to be prepared and developed, with senza tempo passages, fermatas, greatly sustained notes, a-rhythmical grace note flourishes and materials that are often placed ad libitum within the open spaces in the score.

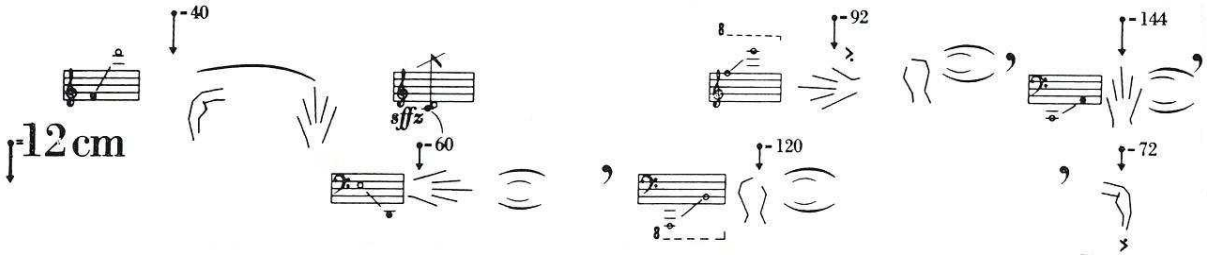
3.4.6.7.2 M. Kagel: *Transición II* and extended piano for percussionist

The first piece of Kagel's to have been composed completely in Germany, was *Transición II* (1958/59) for a pianist and a percussionist (both playing one and the same grand piano) and two tapes.[1592] One of the tapes consists of prerecorded materials from the score and the other of passages recorded (and played back) during the live performance of the piece. It would be possible to realize a version of this piece for 2 pianos (two pianists and two percussionists) with the additional musicians replacing (and/or complementing) the function of the tape recorders and loudspeakers.

Sixteen pages of directions contain elaborate explanations of the rules that the performers must follow to work out their version of the graphically notated score (which includes cut-outs – "translation ledges" and "rotation discs" – that have to be inserted into the score) and to realize the tape, as well as additional performance practical annotations per score-page and per performer, explanations of symbols (six pages) and a nomenclature.

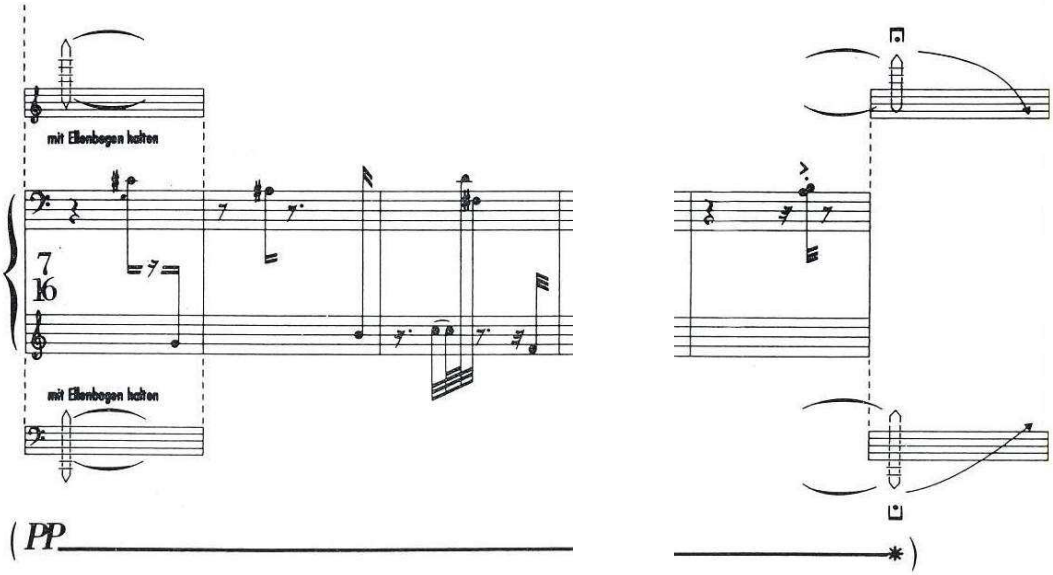
For the piano, clusters are chromatic and played with the closed or open palm, with the edge of the hand, with the fist and with the forearm.[1593] The forearm clusters are further specified as excluding or including the hand's palm or edge, as arpeggiated beginning with the wrist or with the elbow joint, and as release by negative arpeggio, beginning with the wrist or the elbow joint. For the attack of the clusters, either the speed of the movement (from any height) is prescribed, or the distance from the keyboard (when the tempo is free), in keeping with his ideas on the parameters of articulation as he described them in his article on clusters and their modes of attack. (See above, 2.5.2.2.2.) (Ex. 3.949.)

[1592] *Transición I* was composed afterwards (in 1960), and is a tape-piece.
[1593] Kagel mentions clusters with fingertips as well – his definition of a cluster obviously includes what we here consider to be clustered chords.



Example 3.949. M. Kagel: *Transición II* (1958-59), page 4aB. Distance form the keyboard = 12cm; speeds range from M.M. 40 to 144, cluster types include palm-edge and open-fingers palm clusters as well as fist-clusters. © With kind permission by UNIVERSAL EDITION A.G., Wien.

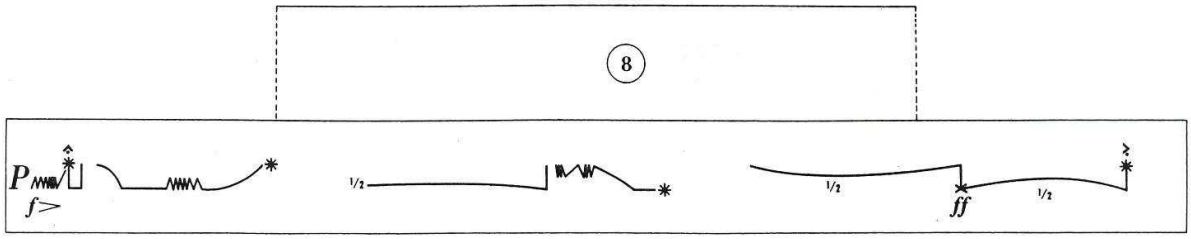
There are, of course silently, depressed clusters. Interestingly, in case the piano does not have a sostenuto pedal, Kagel composed silently depressed right and left elbow clusters specifically so that the performer can use his fingers to play the notes in the middle register in between his forearms. (Ex. 3.950.)



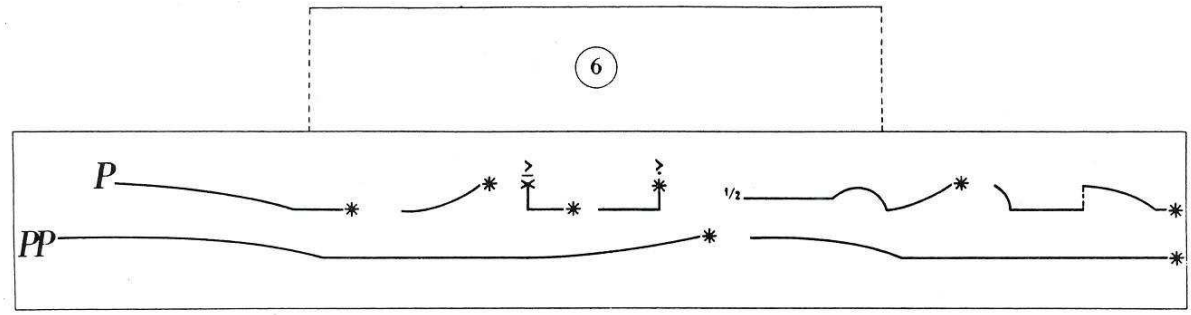
Example 3.950. M. Kagel: *Transición II* (1958-59), page 3C. © With kind permission by UNIVERSAL EDITION A.G., Wien.

For individual finger articulation, Kagel adds a few new attack modes to the already known staccato-followed-by-an-immediately-re-depressed-key: he asks for articulation with the ring of a finger, to hit an already depressed key (to produce noise, comparable to F.W. Wilhelm Rust – see 3.2.6.2), and to sustain a key and hit it with the finger ring (without depressing it).

Pedal markings are as virtuosic as they are idealistic or even absurd: fast pedal trills, gradually depressed and released half pedals, all kinds of combinations, sometimes even the noises of hitting the pedal or abruptly releasing it are composed. In some cases the pedal markings are composed independently from the keyboard or string action. (Ex. 3.951 and 3.952.)



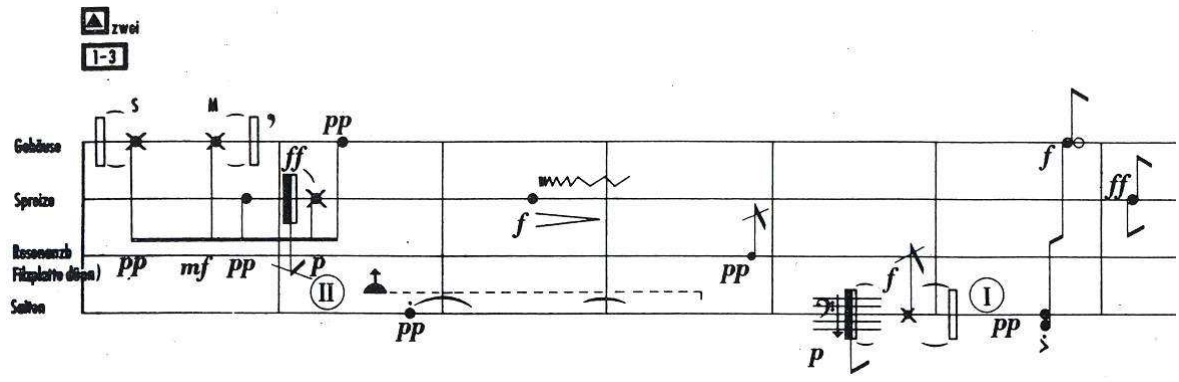
Example 3.951. M. Kagel: *Transición II* (1958-59), translation ledge 8, of which the precise insertion into the score is to be chosen by the pianist. © With kind permission by UNIVERSAL EDITION A.G., Wien.



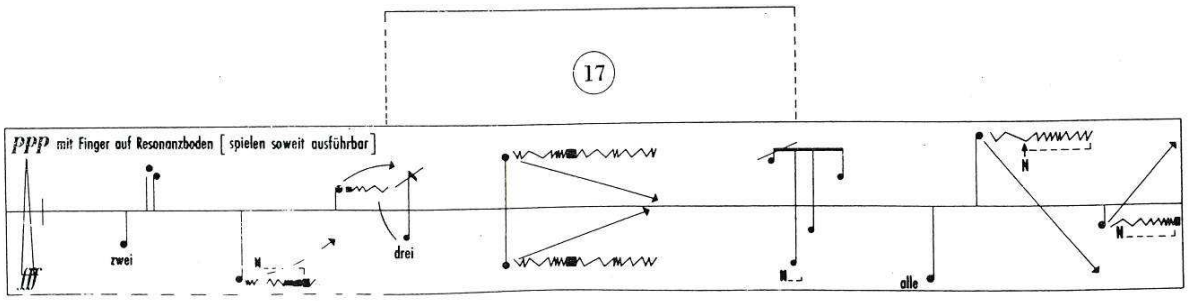
Example 3.952. M. Kagel: *Transición II* (1958-59), translation ledge 6, of which the precise insertion into the score is to be chosen by the pianist. © With kind permission by UNIVERSAL EDITION A.G., Wien.

The percussion part is confined to the strings and body of the piano, with the framework of the grand piano defined as consisting of four registers. Divergences from the given ranges are, of course, to be decided upon if the framework is laid out differently.
The percussionist uses 15 types of beaters to play on the piano. Sometimes the stick must be kept depressed against the strings; sometimes it can bounce freely on the strings. The player also has to hit specified parts of a stick that is placed upon a string or part of the piano's body. But also finger(nail)s, the edge of the hand and objects are used to play single tones and clusters on the strings. Strings are muted with the hand, for which the traditional dynamic signs (*p* and *F*) are used to indicate the pressure on the strings. While muting, fingers or sticks may have to move along the string. Specific rages of a string are indicated, e.g. to mute within the first, second or third part of its length. Glissandos are played over and along strings, clusters and cluster-glissandos as performed, and buzzing sounds are made by letting sticks lay on vibrating strings.

Noises are produced by playing on the body of the piano, on the framework, on the strings and on the soundboard (with or without a layer of thin wood, felt or rubber on it). (Ex. 3.953 and 3.954.)
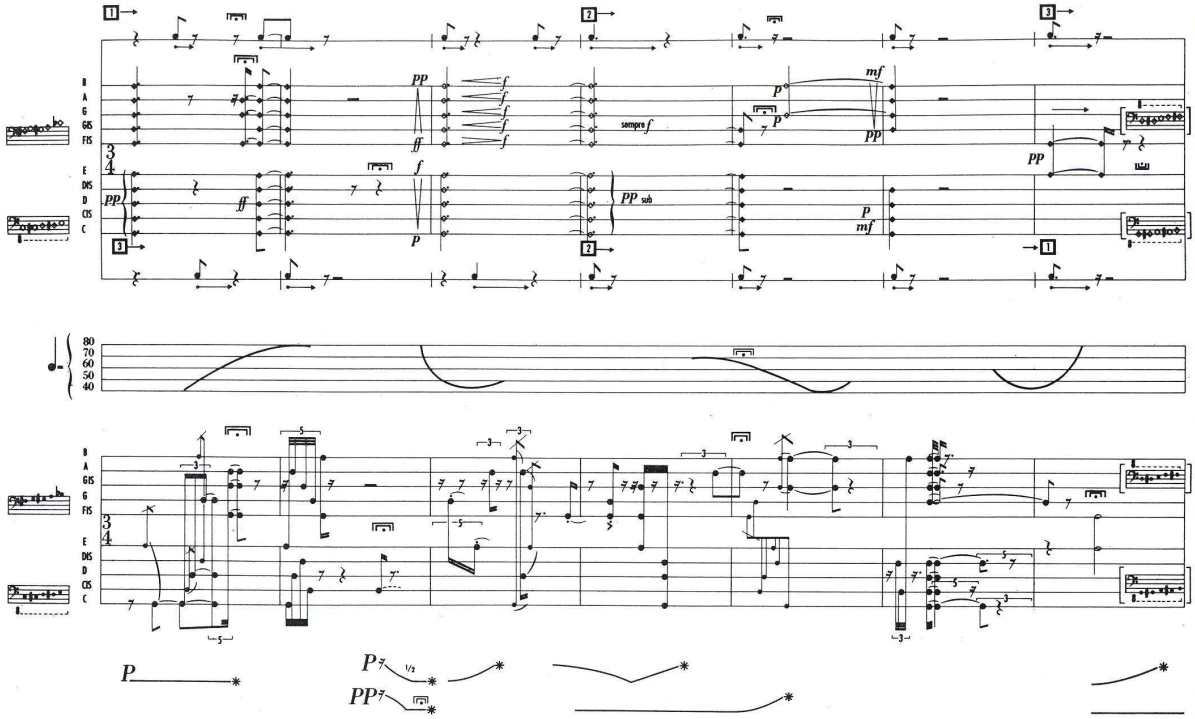


Example 3.953. M. Kagel: *Transición II* (1958-59), page 27A. Top line is body, second line down is framework, third line is soundboard, bottom line is strings. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.954. M. Kagel: *Transición II* (1958-59), translation ledge 17. "With finger on soundboard. (To play as far as possible)." © With kind permission by UNIVERSAL EDITION A.G., Wien.

The percussionist sometimes performs actions as if he was the pianist in a Cowell or Cage composition using the inside of the instrument. Besides operating the damper pedal, he also needs to mute strings with a stick or with fingers so that the pianist has both hands to produce complex harmonics when playing the keyboard. (Ex. 3.955.)



Example 3.955. M. Kagel: *Transición II* (1958-59), page 31C. The top part is for the percussionist, the middle part represents the tempo fluctuations, the bottom part is for the pianist. Each line represents one pitch (*C* to *E and f#* to *b♭*). On the top system's upper and lower lines rhythmic values are notated that refer to the duration of the movement of the hand on the strings. Accordingly, the silences are meant for the hands to rest on the same spot. The arrows underneath these lines indicate the shifting of the hands' position along the strings to produce different types of muted sounds. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Besides extensions of keyboard techniques, *Transición II* also moves into the field of instrumental theatre: when unprocessed taped material is sounding alone without simultaneous live performance, the players are encouraged – "freely, according to their taste" – to silently mimic the activity of the taped sounds on the piano's keyboard and interior. In the passages where both performers have to work together to make a single sound (where the percussionist mutes the strings that are activated by the pianist), the tension that results from the necessary virtuosity of such interaction radiates a dramatic quality that surpasses that of any regular chamber musical setting.

Kagel's *Transición II* is one of the culmination points of the extended piano as a sound-producing tool. By the time Kagel started working on it, Cage and Tudor had performed the European premiere of Cage's *Concert for Piano and Orchestra* (1957-58) at the *NMDR Musik der Zeit* concert series in Cologne[1594], the city where Kagel lived and worked since 1957. *Transición II* shares several characteristics with Cage's *Concert*. Both scores are "open" and rely completely on graphics to present the musical content to the performer. If Cage's score incorporated or suggested many extended techniques (see above, 3.4.4.3.5), Tudor's realization of the solo piano part added even more to them[1595], resulting in a ratio of proper to improper playing that is in favor of extended techniques, equaling *Transición II* in that respect. If Cage's *Concert* was ambitious in its undertaking, Kagel seems to have tried to exhaust the parameters along which he had set up the concept of his piece. Another of Cage's pieces – *Water Music* (1952) – was a further influence on Kagel for *Transición II.* Tudor's performance of *Water Music* during the Darmstadt summer courses in 1958, at which Kagel was present, may have awakened the latent interest in the physical dramatics of a performance, as made compositionally explicit by Kagel for the first time in *Transición II*.[1596]

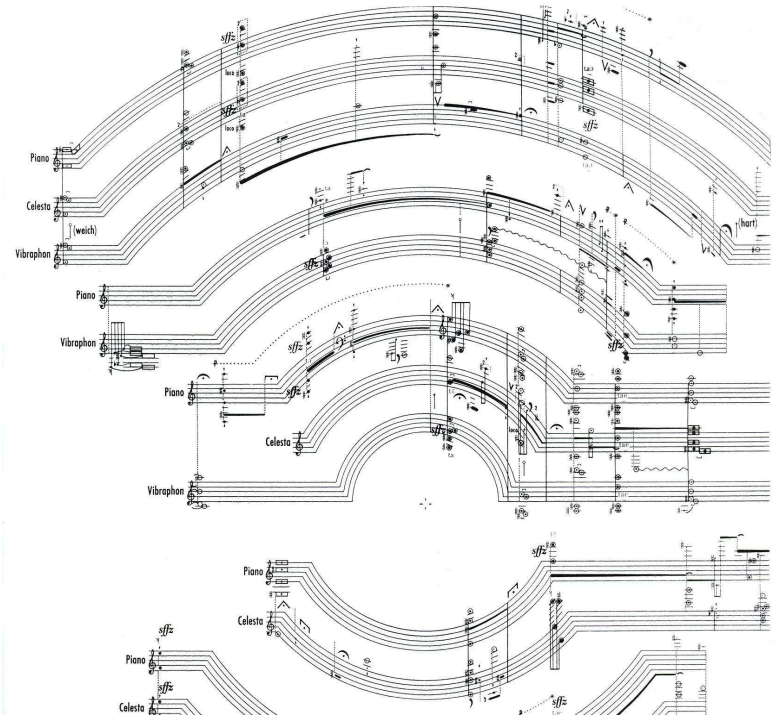
Despite such influences, Kagel's *Transición II* is unique in that it crosses the historically defined concept of an instrument and its proper performer. Cage's prepared piano was a percussive instrument in sound, but still played by a pianist and as a piano. Kagel's piano in *Transición II* is a hybrid instrument for hybrid performers.

3.4.6.7.3 Stockhausen: *Refrain* and *Kontakte*

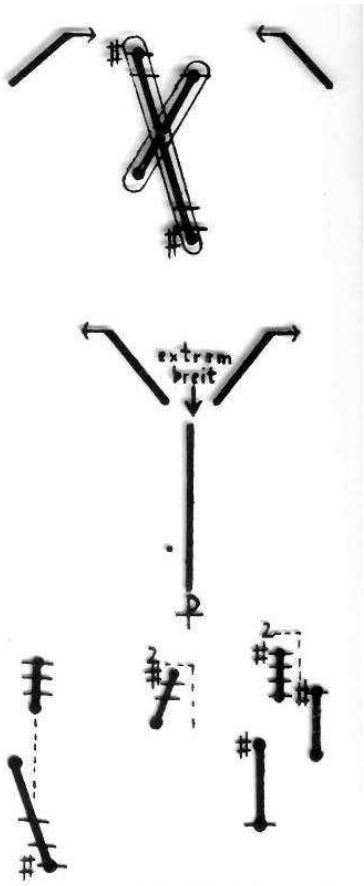
Refrain, for piano (and three woodblocks), vibraphone (and three cow-bells and glockenspiel plates), celesta (and three crotales) and electronics (1959), is another piece for which a specific notation and interpretative process was developed in order to let its form be "open."

The score has traditional music staves, some if which are bent to form to opposing semicircles (ex. 3.956), allowing a transparent plastic strip to be laid over the circular staves and rotated to a position the performers can decide on for any particular performance. The musical symbols printed on the transparent strip add to the musical information already on the staves and form the refrain that the title refers to. Except for the half-depressed sustaining pedal, the notes of the score that the performers have to play on their instruments all require proper performance techniques. The strip, however, has a symbol that indicates clusters or glissandos, depending on how it is placed over the score. (Ex. 3.957.)

[1594] Holzaepfel 1994, p. 322 and 333.
[1595] See Holzaepfel 1994, p. 197-312.
[1596] See also Heile 1994, p. 34. Heile mistakenly cites *Water Walk* as having been performed in 1958. *Water Walk* was composed in January 1959.



Example 3.956. K. Stockhausen: *Refrain* (1959), excerpt. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.957. K. Stockhausen: *Refrain* (1959), part of the rotating transparent strip. © With kind permission by UNIVERSAL EDITION A.G., Wien.

For reasons of coordination in ensemble playing and practicality in reading the score, the musical text on the staves is always to be considered in vertical relation to the page (not to the staff), irrespective of how bent the staves are. Depending on how the strip is rotated, then, the thick lines have a vertical or diagonal appearance on the staves, regardless of how they are printed on the strip. Lines that end up being vertical on the score represent clusters; if they appear as diagonals, they are glissandos. Through this visual ambiguity, Stockhausen succeeds in playing with the relationship between glissando and cluster, a relationship that is inherent in their traditional notation but also in their identity. A cluster is a glissando that is played so fast that it sounds as a point in time. Conversely, a glissando is nothing more than a cluster spread over the keyboard in time.

The strip serves to determine where exactly in the score the "refrain" is set to interfere with the main music. The materials on the strip include tremolos and single events just as well as clusters/glissandos but it is the latter that allows the listener to hear the disturbances of the refrain.

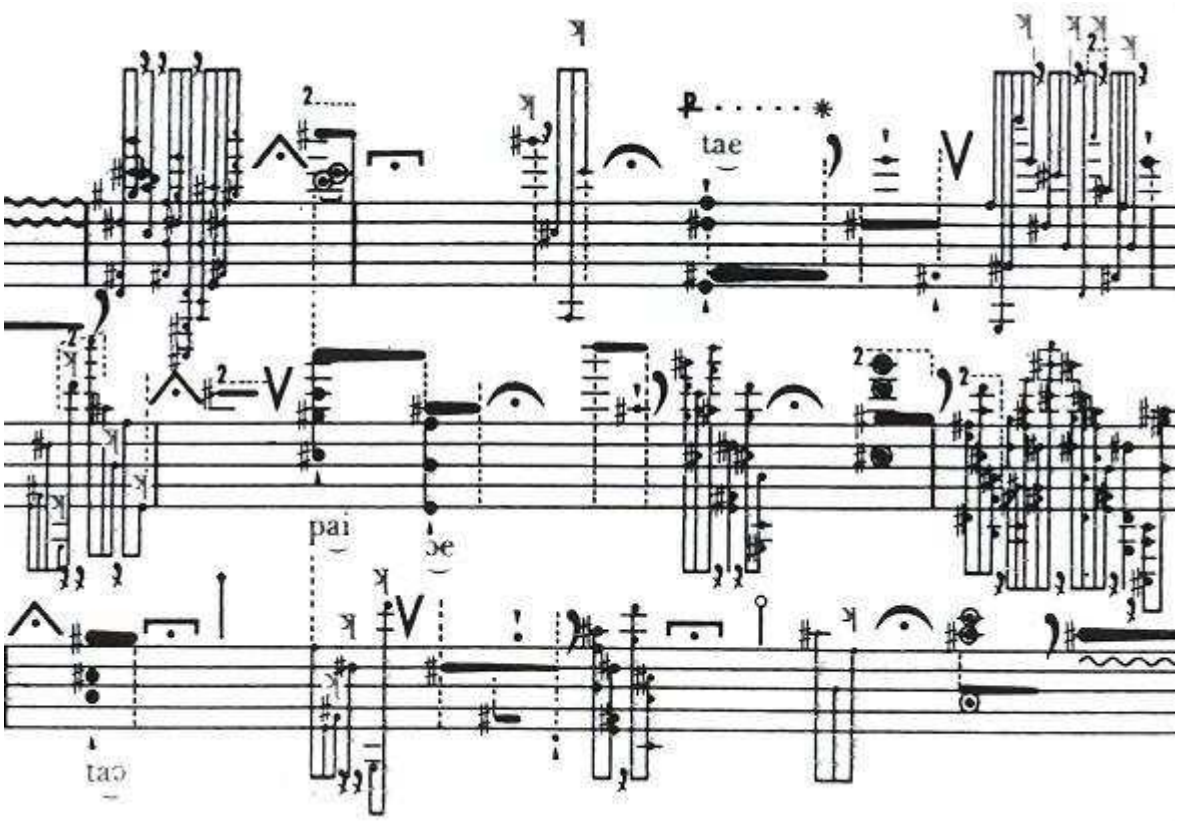
On top of cluster-playing and the inclusion of percussion instruments for each of the three players, Stockhausen gives detailed directions for performers to make "velar clicks":

> Simultaneously with a sound on his instrument, [the player] should produce a loud and very short CLICK with the tip of his tongue on his (upper inside) gums – neither a dental nor a retroflex click –:a light crack, very similar to the sound of the wood-blocks. It is possible to achieve 4 or 5 different pitches by changing the position of the mouth as if for the pronunciation of the vowels [I], [ɛ], [a], [Ɔ], [o], and the pitch of each click should correspond to the register of the note or chord with which it is synchronized.

Besides the tongue-clicks, *Refrain* demands from its performers syllabic cries (ex. 3.958):

> The syllables in phonetic scripts written in red – tai, pƆe etc. – should come together with the instrumental sounds (mostly *sffz*), and should be shouted out very hard and short. Sharp plosives at the beginning and then cut off the air immediately after the vowel ("hacked" articulation). Up to 5 speaking pitches should correspond to the registers of the notes or chords with which they are synchronised, so that voice and instrument melt into one unified sound. When articulating the clicks and syllables, movements of the mouth should be as unnoticeably as possible.[1597]

[1597] As in the score – U.E. 13188 L.W.



Example 3.958. K. Stockhausen: *Refrain* (1959), excerpt. © With kind permission by UNIVERSAL EDITION A.G., Wien.

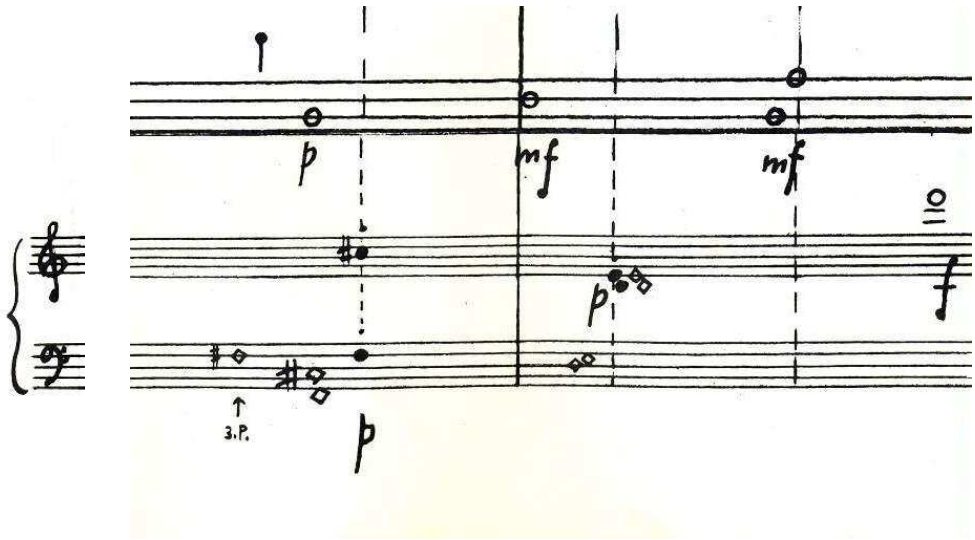
Like in Kagel's *Anagrama*, Stockhausen blends alienated vocal sounds with those of the instruments. The vocal sounds are either dryly percussive (the velar clicks) or they mimic a percussive sound and its decay (the phonetic syllables). These two categories are mixed with sounds from pitched and unpitched instruments that contain both categories as well, e.g. the dry soft woodblock sound and the natural or composed decay resonance of crotales or soft vibraphone tremolos.

In September of 1959, a few months after *Refrain* was finished, Stockhausen starts working on *Kontakte* (finished June 1960). Like Kagel's *Transición* pieces, *Kontakte* exists in two versions: as electronic music and as "for electronic sounds (on tape), piano and percussion". In contrast to the percussionist playing the piano in *Transición II,* the pianist of *Kontakte* is the only one to play the piano, but he has to perform on 14 percussion instruments as well as:

- Bundle of hanging bamboo claves
- 2 woodblocks
- 4 cowbells
- 3 single antique cymbal
- 1 cymbal
- 1 hihat
- 1 suspended sleighbells
- 1 bongo.

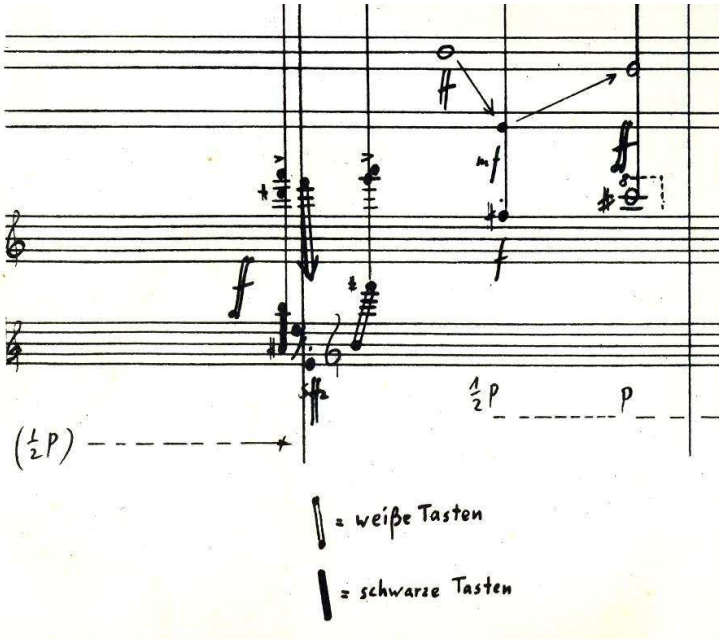
Besides playing on percussion instruments – taken over from *Refrain* – the extended techniques used in the piano include clusters (static, arpeggiated / chromatic, pentatonic, diatonic / arm, palm, fist), silently depressed clusters and keys, and half pedals.

It is remarkable how Stockhausen seems not at ease with notation of the extended techniques in this piece, or rather: he seems unaware that his writing lacks accuracy for the performer to always know what to do exactly. For instance, he indicates the use of the sostenuto pedal, but not until when or where. Similarly, the value of the silently depressed keys themselves is not determined, leaving the pianist to guess how many of the following notes are to be included in the game of sympathetic resonance. (Ex. 3.959.)

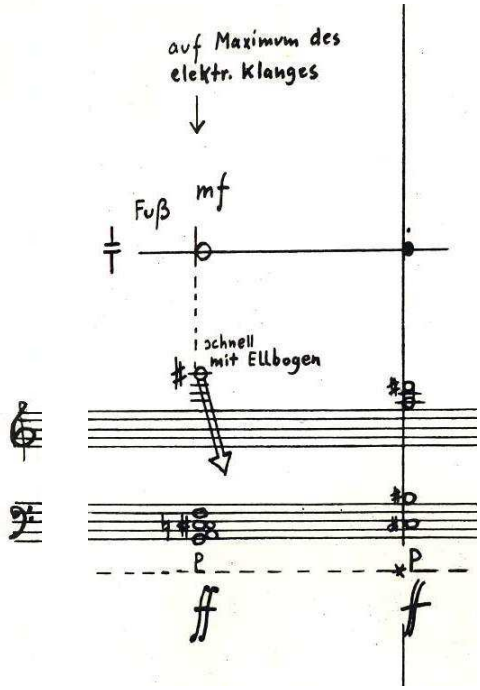


Example 3.959. K. Stockhausen: *Kontakte* (1959-60), page 6. Reproduced with kind permission of Stockhausen-Verlag.

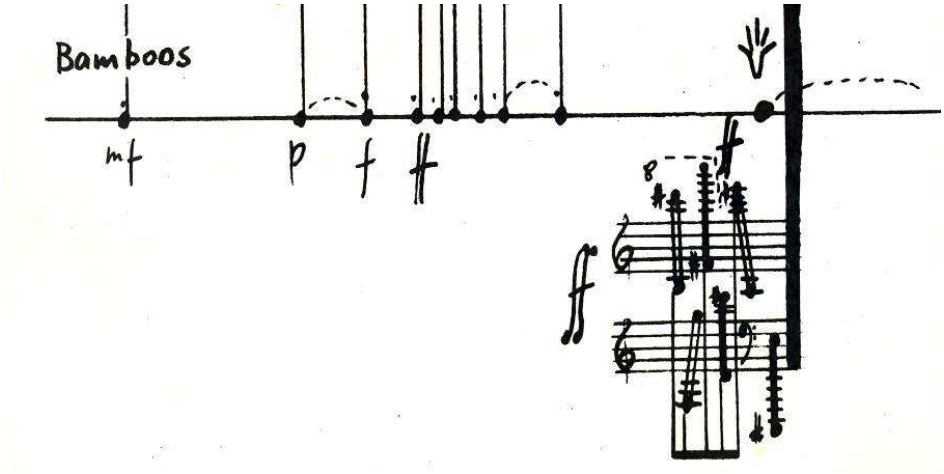
Most frustrating is the lack of unequivocal cluster notation. Instead of using any system to distinguish between the three types of keyboard clusters (pentatonic, diatonic, chromatic), Stockhausen starts off with the thick vertical line connecting the notes that indicate the ambit. Those notes can have sharps, flats or accidentals, but no sign or symbol specifies whether the inside of the cluster consists of black, white or both keys. Based on previous pieces, it could be supposed that all clusters are always chromatic, but on page 33 (of a total of only 38) he suddenly decodes two cluster symbols: one for black keys and one for white keys. (Ex. 3.960.) The latter appeared once already on page 2 (ex. 3.961) but with the unexplained arrow. (As an indication of the direction toward which the cluster has to be arpeggiated, this arrow is superfluous since the cluster is already tilted in the required direction. Most likely the arrow is meant to represent an "open-end" cluster, i.e. one without a particularly specified note but rather dependent on how far the pianist wants to take it.) As almost all of the clusters after this page 33 are arpeggiated, the distinction between pentatonic and diatonic may refer to arpeggiated clusters from this point onwards (although there are arpeggiated clusters before this performance practical gloss). The two instances with vertical black-key symbols (e.g. ex. 3.962) that occur after this point may then either be inaccurately written arpeggiated clusters, or static clusters to be played like those before page 33. Trying to deduce the type of clusters as notated in the first 32 pages, these are all most likely chromatic, especially since one instance (page 28) specifically prescribes a cluster to be on black keys and since some cluster types are only really possible if they are chromatic. (E.g. the fist clusters – ex. 3.963.)



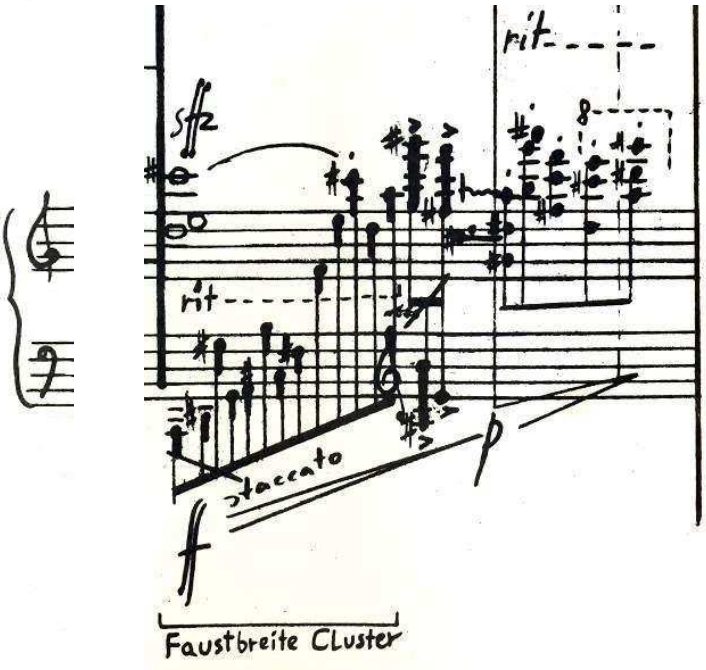
Example 3.960. K. Stockhausen: *Kontakte* (1959-60), page 33. The five horizontal lines above the keyboard staves serve to notate the percussion instruments on which the pianist has to play. Reproduced with kind permission of Stockhausen-Verlag.



Example 3.961. K. Stockhausen: *Kontakte* (1959-60), from page 2. The percussion instrument to be played when striking the fast arpeggiated cluster is the foot-operated hi-hat. Reproduced with kind permission of Stockhausen-Verlag.

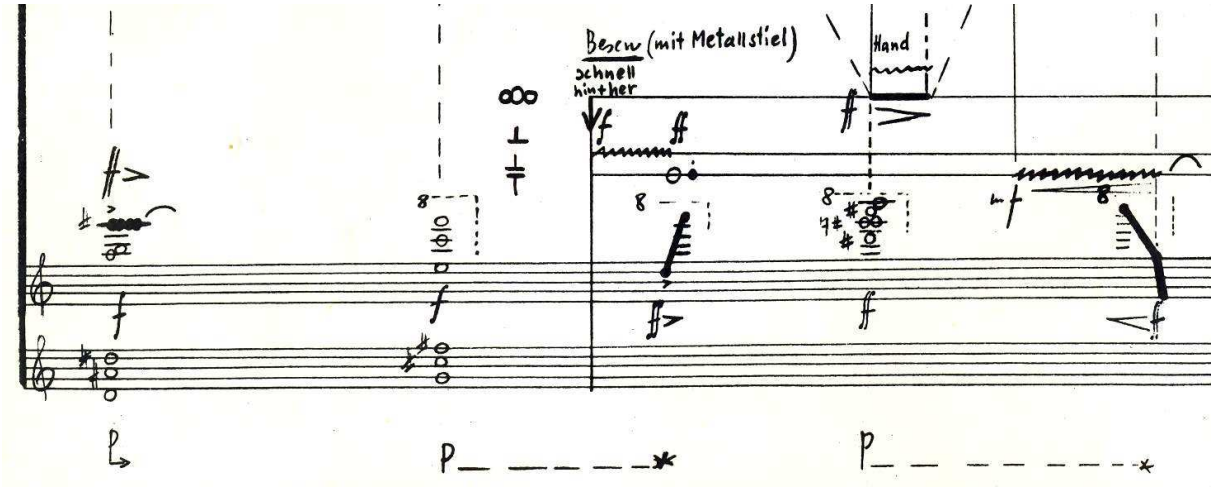


Example 3.962. K. Stockhausen: *Kontakte* (1959-60), from page 35. Reproduced with kind permission of Stockhausen-Verlag.



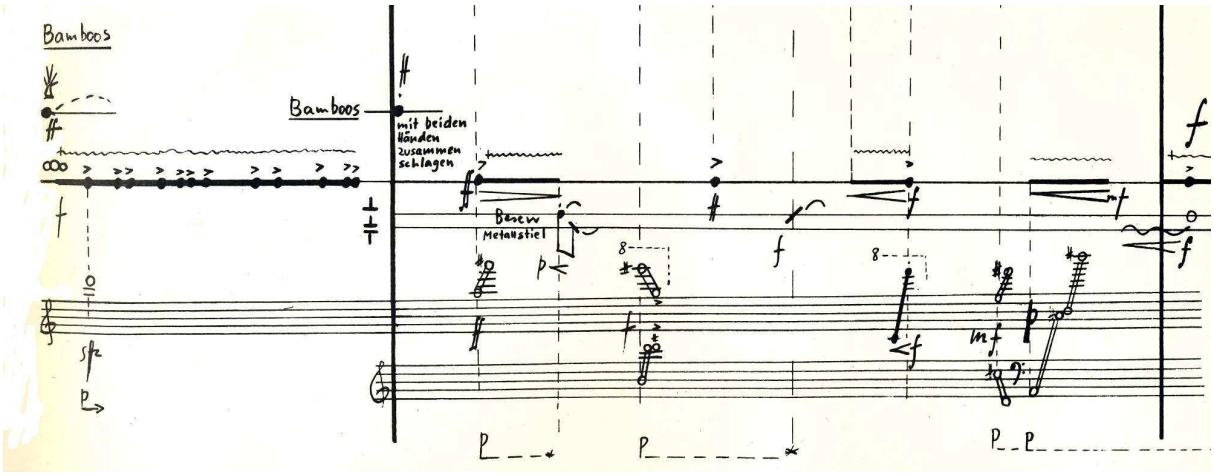
Example 3.963. K. Stockhausen: *Kontakte* (1959-60), from page 18. Reproduced with kind permission of Stockhausen-Verlag.

It is interesting to see how Stockhausen tried to differentiate between speeds for cluster arpeggiation. He does not merely distinguish between fast and not fast (see above, ex. 3.961) but even writes out an accelerating arpeggio on black keys. (See the last cluster in ex. 3.963, taken from after page 33.)



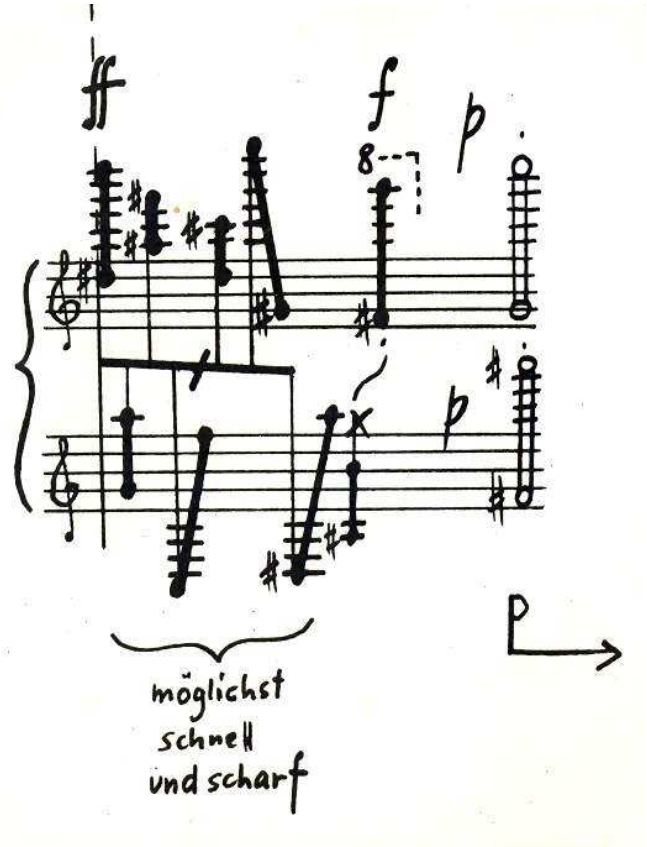
Example 3.964. K. Stockhausen: *Kontakte* (1959-60), from page 36. Reproduced with kind permission of Stockhausen-Verlag.

Playing on the percussion instruments often requires compressing the two-hand keyboard score for one hand (or arm) so that the other hand can pick up a stick and hit another instrument. (Ex. 3.965.)



Example 3.965. K. Stockhausen: *Kontakte* (1959-60), from page 39. Reproduced with kind permission of Stockhausen-Verlag.

Stockhausen was obviously aware of the difficulties in playing so many cluster-types and –sizes, nevertheless insisting that the performer at least try and reach the limits of playability and accuracy. (Ex. 3.966.)



Example 3.966. K. Stockhausen: *Kontakte* (1959-60), from page 13. Reproduced with kind permission of Stockhausen-Verlag.

3.4.7 1960's-70's The extended piano after Cage and Kagel

3.4.7.1 Consolidation and growth

Like with the glissando in the 19th century, most of the extended techniques were finding their way into mainstream composition in the second half of the 20th century. With Cage's *Variations III* (1963), Kagel's *Transición II* and Young's *Arabic Numeral (Any Integer),* almost every angle of the extended piano had been covered: from low-grade clusters and glissandos to the high-grade extensions of instrumental theatre and the prepared piano including all types of combinations; from pieces that attempt a synthesis of all techniques to the minimalist concentration on one extension-sound; from the pianist as an all-round instrumentalist (vocalising and playing other instruments) to the piano being played by a percussionist. Over the next four decades, countless composers have written countless compositions with most of the techniques discussed above.

After the climactic events from the early 1960's, many such techniques had become accepted to the point that not every composer felt compelled to search for new ways or new combinations, using what had already been accomplished as a new standard. In several 1970's publications of contemporary music from Eastern European and Soviet countries[1598], there are more pieces that incorporate extended techniques than those that rely solely on proper playing modes. Clusters are easily found in the most famous pieces, like Berio's *Sequenza IV* (1966) or Nono's *Sofferte Onde Serene* (1976); the wooden board with which Ives and Russel prescribed the depressing of keyboard clusters was used again by at least Davide Mosconi[1599], Peter Garland[1600] and Harrison[1601]; and Young's *Arabic Numeral (Any Integer)* was paraphrased by the duo of artists Mario Lavista and Arnaldo Coen[1602]. These are but a few pieces that will not be discussed specifically, as they offer no new perspectives for this study. Erhard Karkoschka's seminal manual on the notation of new music[1603] lists many dozens such compositions.

Composers that had been (hyper)active in developing an extended technique idiom, often continued to use their findings or composed with what others had come up with in the meantime: Cage wrote his *Etudes Boreales* for cello and/or piano solo (1978), the latter part to be played by a percussionist (to be compared with Kagel's *Transición II*, see above). Dlugoszewski continued to explore her timbre piano for purely instrumental concert occasions as well as for the dance of her husband Erik Hawkins.

At this point in the history of the 20th century, only a few specific perspectives remain to be discovered, such as the bowed piano and electronic manipulation. Apart from a few smaller evolutions (e.g. the *touches blocqées*), the further evolution of the extended piano is a question of the individual composer's taste in combining selected techniques to establish a personal idiom, some follow-up on previous developments such as the rediscovery of the organ as a vehicle for extensions or the educational angle, and the forays into other genres and musical cultures.

[1598] *Contemporary Rumanian Piano Music*, edited by Alexandre Hrisanide (Cologne: Musikverlag Hans Gerig), *Contemporary Soviet Piano Music*, edited by Rudolf Lück (Cologne: Musikverlag Hans Gerig), *Early Soviet Piano Music* (edited by Nikolai Koptchevsky – Leipzig: Edition Peters

[1599] *Grande Accordo Cromatico* (1976).

[1600] *The Three Strange Angels* (1972) and *Obstacles of Sleep* (1973).

[1601] E.g. in *Concerto for Organ with Percussion* (1973). See Miller & Lieberman 1998 p. 11 and 135-136.

[1602] See Henck 2004, p. 79-81: the Lavista/Coen composition is called *Cluster*, was written in 1973 and consists of the subtitle "for any number of pianos and pianists" with the score showing a giant two-forearm cluster that needs to sound for as long as its natural decay allows (helped by the sustaining pedal).

[1603] Karkoschka 1966.

3.4.7.2 1961- The Fluxus attitude towards the piano

The art of writing down simple instructions for a performer did not stop with La Monte Young's word pieces from1960 and 1961. (See above, 3.4.5.3.) At the end of the 1950's, George Brecht had been on the same track. In 1958 and '59 he had studied with John Cage at the New School of Social Research, an experience that influenced him to develop his own "event-scores." In the 1960's, many avant-garde artists, e.g. George Brecht, Dick Higgins, Alison Knowles, Yoko Ono and Nam June Paik, picked up on this concept and, under the inspiration of George Maciunas, such artists were collected to form the loosely fitted Fluxus group, which became official with the 1962 Fluxus Performance Festival of New Music in Wiesbaden, Germany.

Many of the innumerable event-scores or word pieces concern generic performers, but often they are written specifically for the piano. As much as "event" scores would suggest having realistic stage potential, they were often meant to be poetic more than performance practical actions. Nevertheless, some of them describe actions that are actually related to the act of playing on an instrument.

The 4th piece of Maciunas' *12 Piano Compositions for Nam June Paik* (1962) has the pianist using a straight stick to sound all the keys of the keyboard together; for the next piece of the set, the pianist must put a dog or cat inside his instrument and then play something by Chopin.

In many such "composition," the piano is treated as an ordinary object, as for instance Maciunas' third of the *12 Piano Composition for Nam June Paik,* which asks of the performer to "Paint with orange paint patterns over the piano." Such actions could be benevolently show respect towards the instrument, as in Mac Low's *Piano Suite for David Tudor and John Cage* (1961), for which the piano is to be carefully disassembled– nothing should break and welded parts should only be taken apart by an experienced welder in the 2nd movement – and reassembled, tuned and played upon. Or as in Maciunas' eleventh of his *12 Piano Compositions for Nam June Paik*, where the performer has to wash, wax and polish the piano well.

Phil Corner's *Piano Activities* (1962) was one of the pieces that raised the most scandal during the first, four-weekend-long series of Fluxus concerts in Europe. In a very free interpretation of Corner's score, Maciunas, Higgins, Ben Patterson, Knowles, Wolf Vostell and Emmett Williams proceeded over the course of several days to take to pieces a grand piano, after which they auctioned the parts to the audience. (Ex. 3.967.)



Example 3.967. Performance of Ph. Corner: *Piano Activities* (1962). George Maciunas, Dick Higgins, Ben Patterson, Alison Knowles, Wolf Vostell and Emmett Williams proceeded over the course of several days to take to pieces a grand piano, after which they auctioned the parts to the audience. (Photographer unknown.)

But the sixth of Maciunas' *12 Piano Compositions for Nam June Paik* demands that the performer stretch the three highest strings with a tuning key until they break. Such disrespect for the instrument – e.g. Mieko Shiomi's *Event for the Twilight* (1963), for which the piano must be steeped in the water of a pool to play some piece of F. Liszt on it – can evolve in outright violent behavior, as in Robert Bozzi's *Choices* (1966), where the third piece asks for a performer to crash into a piano (wearing a helmet). The fifth piece has two pianists depress the pedals of two pianos before they crash their instruments into one another several times; for the twelfth piece, two *teams* of performers compete in pushing one piano from all sides; a variation of number twelve requires two horses (or oxen, elephants, tractors, etc.) to pull a piano form opposite directions until it breaks in two; in the fifteenth part, the piano is kicked, keys are hit with fists, the covers are nailed down and broken open again with the claws of a hammer; and, finally, in the sixteenth and last piece, the piano should be dropped repeatedly from a height of two meters until either the piano or the floor is destroyed.

Anti-bourgeois feelings can be expressed much less harmful, though, as Brecht demonstrates by prescribing a vase of flowers to be put on a piano (*Piano Piece* - 1962). Fluxus composers were not shy of repeating someone else's ideas, as Maciunas in number eight of *12 Piano Compositions for Nam June Paik*, where the piano is asked to be put upside down and then decorated with a vase and flowers.

The event pieces can be downright nonsensical. If Brecht's *3 Piano Pieces* (1962), "standing", "sitting", "walking" still convey meaning enough for the pianist to know what to do, another of his piano pieces from that year consists of the word "center" only. Ben Vautier's composed *Nothing* (1962), for which music performers have to do just that.

Other pieces do describe accurately what pianists have to do. Takehisa Kosugi wrote *Distance for Piano* in 1965, in which David Tudor (to whom the piece was dedicated) had to position himself at a distance from the piano, not touching the instrument directly manipulating other objects to produce sound on piano through them. The points at which these sounds are produced must be previously determined. At the discretion of the pianist, assistants may move piano to change the distance and the direction from which he is to play.

Similarly, Larry Miller wrote *Remote Music* (1976) for a mechanical hand with pointing index finger (or a boxing glove) on a string-and-pulley system. Out of view, the performer lowers this fake hand onto the keyboard to produce a single note. Toshi Ichiyanagi on his part, in *Music for Piano* nr. 5, *Fluxvariation* wanted an upright piano with the pedal fixed in a depressed position and the performer, hidden from view in the wings, throwing darts into the back of the piano according to the time pattern indicated in the score.

Other composers – not part of the Fluxus group per se – were drawn more towards transitory processes affecting the instrument. Famous are the concepts of Annea Lockwood and her *Scores for Piano Transplants* (1968-82).[1604] In hommage to Christian Barnard, who then pioneered heart transplantation techniques, Lockwood wrote instructions for handling pianos that are already beyond repair:

> *Piano Burning* (1968 London).
> Set upright piano (not a grand) in an open space with the lid closed.
> Spill a little lighter fluid on a twist of paper and place inside, near the pedals.
> Light it.
> Balloons may be stapled to the piano.
> Play whatever pleases you for as long as you can.
>
> *Piano Garden* (1969-70 Ingatestone, Essex)
> Dig a sloping trench and slip an upright piano in sideways so that it is half interred.
> A small grand piano may be set down amongst bushes etc.
> Plant fast growing trees and creepers around the pianos.
> Do not protext against weather and leave the pianos there forever.
>
> *Piano Drowning 1* (1972 Amarillo, Texas)
> Find a shallow pond with a clay/other hard bed in an isolated place.
> Slide upright piano into position vertically, just off-shore.
> Anchor the piano against storms, e.g. by rope to strong stakes.
> Take photographs and play it monthly, as it slowly sinks.

For *Piano Burning*, the performance practical notes suggest to use an upright piano and overtune the strings as much as possible to get the loudest sound when they snap with the heat. Two cheap microphones and their lead wires should be covered with heat- and fire-resistant materials so that they can be put inside of the piano (one near the hammers in the middle register and one by the pedals and near the bass strings), feeding the sound into amplification and through speakers around the area. The outside of the piano can be decorated with colored balloons, firecrackers and sky rockets (especially if the burning is done at night). Another option may be to have a séance for a figure such as Beethoven. To start the fire, a small amount of kerosene should be splashed at the back of the piano in one corner so that the fire spreads slowly.

[1604] http://www.annealockwood.com/downloads/piano_transplant_scores.pdf. Last accessed September 2009.

3.4.7.3 1961/67 The extended organ revisited

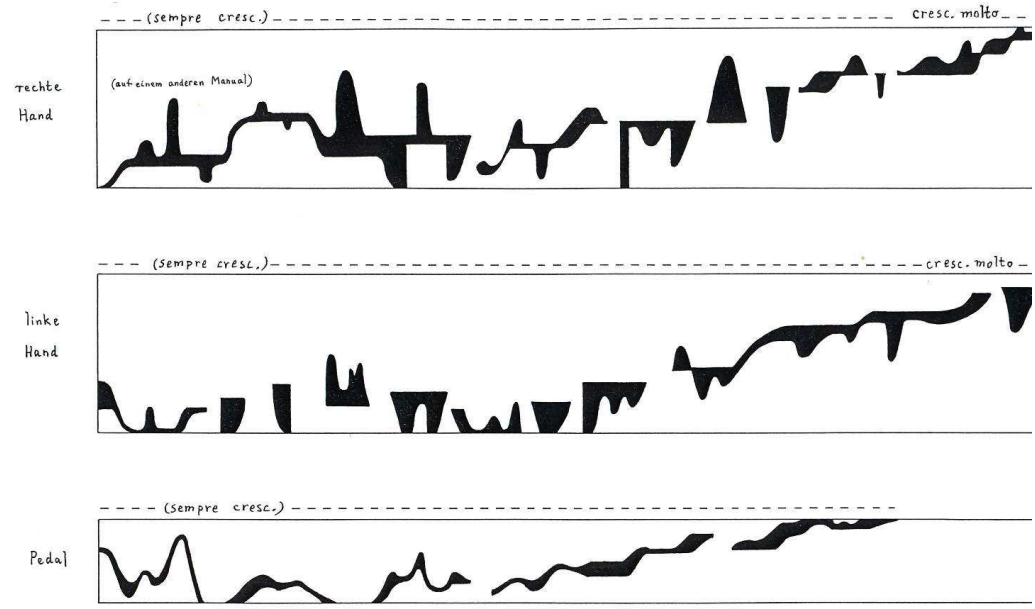
As previously stated, the use of extended keyboard techniques on the organ and its relation to what composers developed for the piano is of interest to the present study. Similarities and differences in the techniques' potential become noticeable and serve to further define the extended identities of both instruments. If any composers had read Cowell's *New Musical Resources* carefully and transferred his theories on clusters to the keyboard, it would have been Ligeti and Kagel. Their *Volumina* and *Improvisation Ajoutée* are without a doubt the musically most prominent treatises of keyboard clusters.

3.4.7.3.1 György Ligeti: *Volumina* (1961-62, revised 1966)

It is not documented that Ligeti knew Cowell's book, but he may have been even less aware of the 19th-century attempts at composing with moving clusters on the organ (see above, 3.3.3.1). Kagel's article, summarizing Cowell's cluster theories, does not mention internal movements of clusters (see 2.5.2.2.2), an aspect of cluster-playing that Ligeti does develop in earnest.

On the whole, Ligeti develops four types of clusters movement: stationary, external, internal and timbral. Besides the basic white-key, black-key and chromatic clusters, there is no other musical material. Performance technically, fingers, palms, hand-egdes, forearms, elbows and feet are used to play the clusters. Two assistants are needed for the continuous registration changes. If only one assistant is available, and the stops are situated at both sides of the keyboard, the performer may use pieces of lead to keep keys depressed. With enough weights of different sizes, *Volumina* may even be interpreted solo, without registration assistance. Regarding the production of the clusters, Ligeti is strict but shows an understanding of performance practicalities, such as the irregular shape of the performer's hands and arms: for very large clusters, it is not important to Ligeti if some keys at the ends or in the middle of a cluster end up not being depressed. The smallest cluster (e.g. less than an octave) should not have such gaps, however. For the pedal clusters, some keys may also be left out or half depressed. At any rate, for the moving clusters on the pedals, the individual technical mastery of the performer is crucial, and special gliding- and repetition-techniques are to be developed.

External movement of the cluster had already been described in theory by Cowell and Kagel, and composed with by Kagel and Stockhausen. (See above 3.4.6.5 and 3.4.6.6.) However, since the latter two composers tried out the effect on the piano's keyboard, they were limited to the subtraction type of movement: releasing keys one by one from a static cluster to a single note. As Ligeti wrote for the organ, he benefited from sustained sound and could therefore build and subtract at leisure without fear of losing the density of a cluster and being left with a melodic effect (see the problem Cowell encountered, ex. 3.636 under 3.4.2.7.2). For the movement of the cluster contours, Ligeti uses graphic representation. (Ex. 3.967.) The graphic score is to be interpreted along guidelines that are stricter than the thick flowing but seemingly interrupted arabesques might suggest at first sight. For instance, considered for the left arm, the lowest cluster limit of a spike (ex. 3.968) is taken with the fixed elbow, from which keys are depressed with the forearm, hand and, finally the fingertips. From the top of the spike downwards, keys are released in the opposite order. In smaller format, the graphic figure relates to wrist-, hand- and finger-movements.

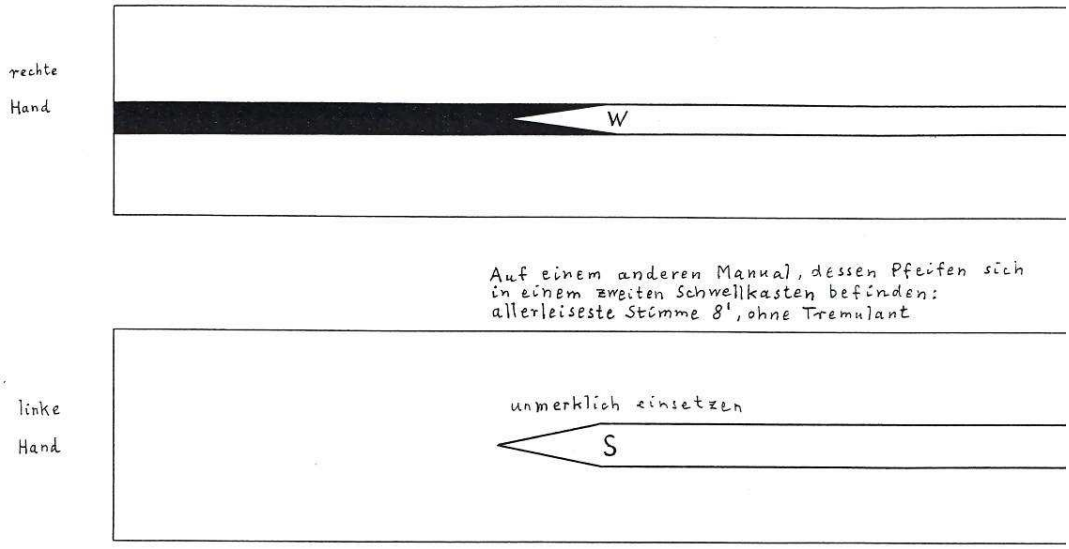


Example 3.967. G. Ligeti: *Volumina* for organ (1961-61/66), p. 10. © With kind permission by UNIVERSAL EDITION A.G., Wien.



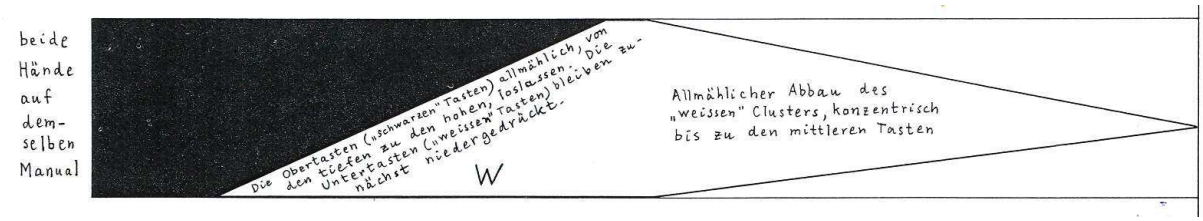
Example 3.968. G. Ligeti: *Volumina* for organ (1961-62/66), detail of moving cluster graphic. © With kind permission by UNIVERSAL EDITION A.G., Wien.

The second manner in which clusters are made to "move," is by changing their dynamics and timbre. Volume change is achieved in the traditional manner, i.e. by register changes, but also in improper use of the organ's mechanics, e.g. pulling stops halfway or shutting the motor so that the air pressure is diminishing. In case the organ is electric (and cutting power would mean loss of sound altogether), alternative ways are suggested, such as removal of pipes to be blown by the mouth. (Page 4 of the score.) Most of the changes are affected by register strategies, however. But specific cluster techniques help out: for instance, when the motor is not strong enough to provide air for all the pipes of the opening cluster (covering the whole keyboard), he advises to chose the largest possible cluster ambit for the loudest possible register. Another such example is the unnoticeably entering black-key cluster in the left hand while the right hand plays a diatonic cluster. If both manuals do not have separate crescendo mechanisms, the left hand cluster is to be given a softer register *and* it is to be made smaller than the right cluster so that the latter will cover it. (E.g. ex. 3.969.)



Example 3.969. G. Ligeti: *Volumina* for organ (1961-61/66), p. 7. © With kind permission by UNIVERSAL EDITION A.G., Wien.

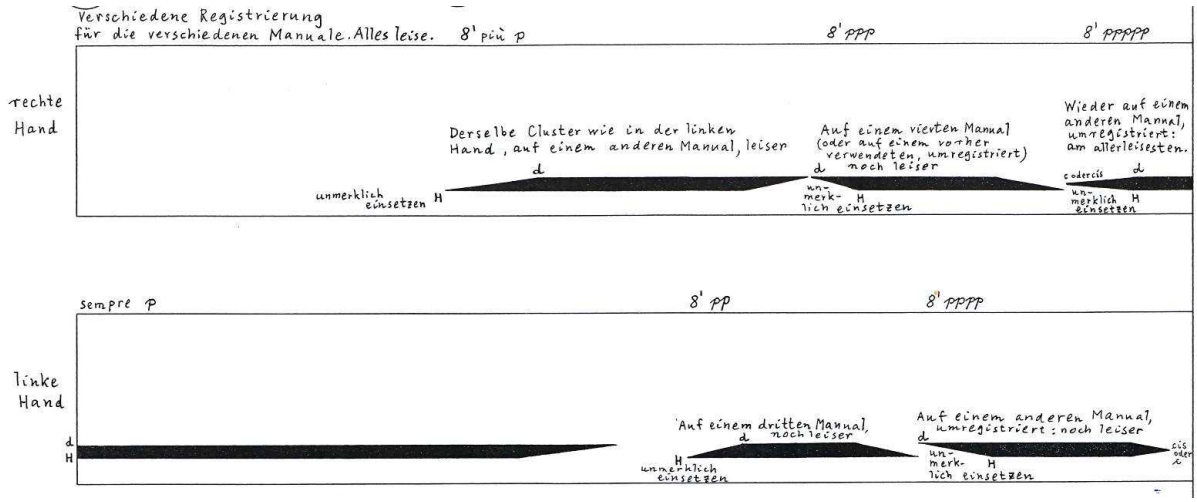
In *Volumina*, timbre differentiation is continuously linked to cluster movement. For the above example (3.969) Ligeti asks for gradual timbre change without audible break of the cluster (p. 2 of the score) and cluster technique has to cooperate to achieve the goal: "the key that is depressed on one manual is to be immediately released (legatissimo) on the other manual, so that all tones sound continuously."[1605] For crescendos, it is "essential that within the general crescendo the biggest possible colour- and timbre change is achieved."[1606] Already for the first cluster, a huge chromatic one, the movement consists of changing the register from the loudest to softer types, combined with first gradually releasing the black keys (from bass to treble), followed by a gradual concentric release of white keys (ex. 3.970) and, finally a gradual release of first the left foot (white-key pedals) and then the right foot (black-key pedals).



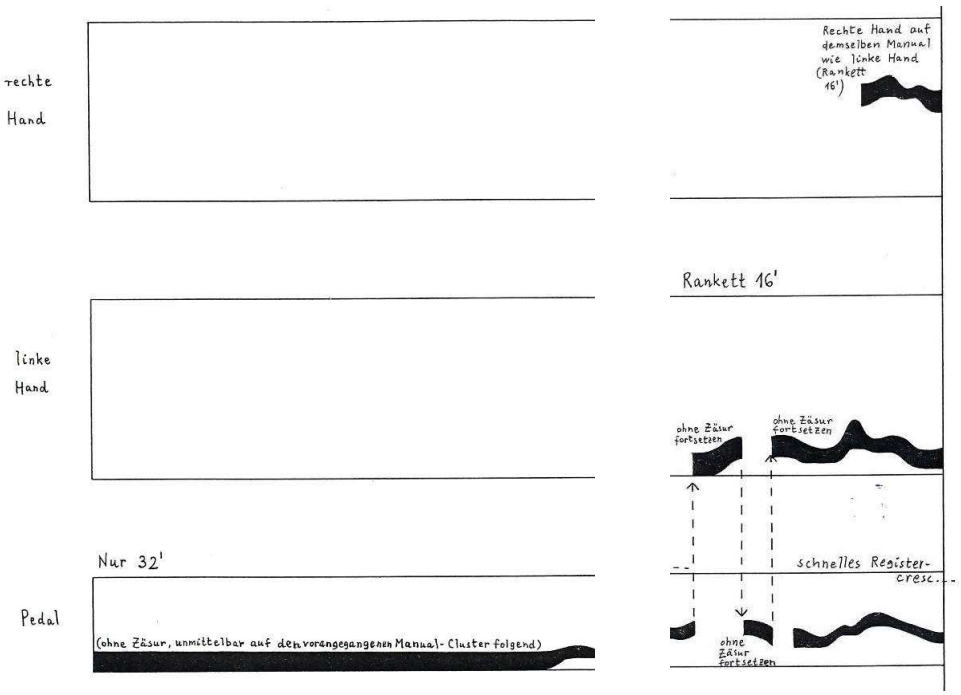
Example 3.970. G. Ligeti: *Volumina* for organ (1961-61/66), p. 5. © With kind permission by UNIVERSAL EDITION A.G., Wien.

One passage concentrates on the gradual timbre changes that a four-note B-D cluster can undergo by gradually fading in and out on different manuals with six different consecutive registrations. (Ex. 3.971.) It is the performer's cluster technique that must take care of each cross-fade going by inaudibly. It is also the cluster technical mastery that must assure that a sequence of moving clusters switches unnoticeably between pedal and manuals (ex. 3.972).

[1605] P. 2 of the score: "die auf einem Manual neu niedergedrückte Taste wird auf dem anderen Manual sofort losgelassen (legatissimo), so daß ständig sämtliche Töne erklingen."
[1606] P. 3 of the score: "wesentlich ist, daß innerhalb des allgemeinen crescendo die grossmögliche Farbigkeit und Klangfarbenveränderung erreicht wird."

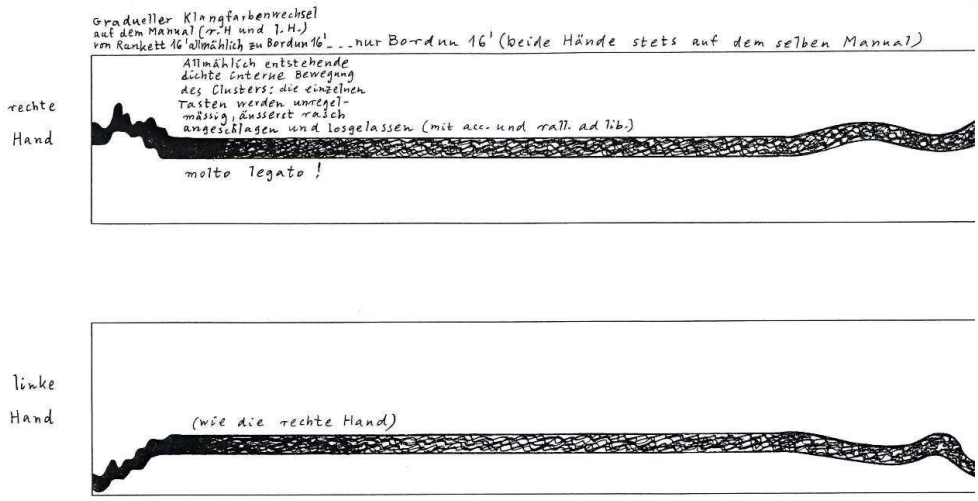


Example 3.971. G. Ligeti: *Volumina* for organ (1961-61/66), p. 18. © With kind permission by UNIVERSAL EDITION A.G., Wien.

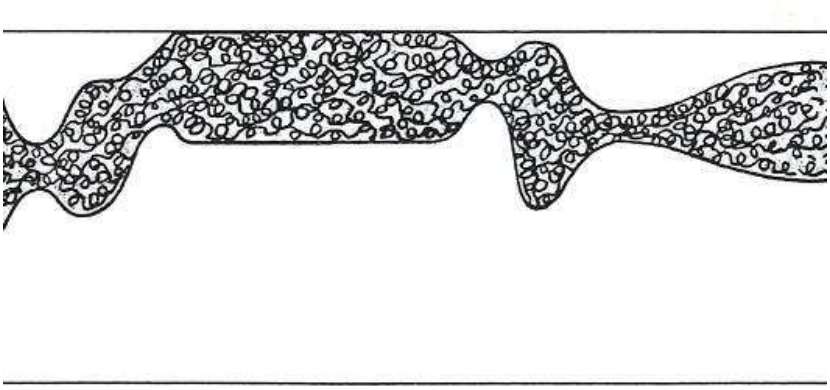


Example 3.972. G. Ligeti: *Volumina* for organ (1961-61/66), p. 12. © With kind permission by UNIVERSAL EDITION A.G., Wien.

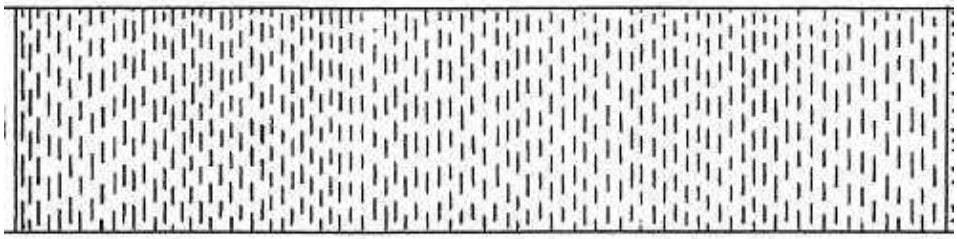
The third type of movement is created inside of the cluster. Ligeti prescribes five types of internal movement, all of which is to be chromatic. For the first type, the individual keys are depressed and released irregularly, extremely fast, molto legato and with accelerando and rallentando ad libitum. (Ex. 3.973.) The second type consists of a continuing, very dense, labyrinthine sound web with fast, a-periodic, molto legato individual attacks, but without accelerando or rallentando. (Ex. 3.974.) Two more types have fast staccatissimo individual attacks within the cluster (ex. 3.975), or fast internal movement like trills and tremolos (ex. 3.976), and a final type is like the second but also includes clusters as inner components. (Ex. 3.977.)



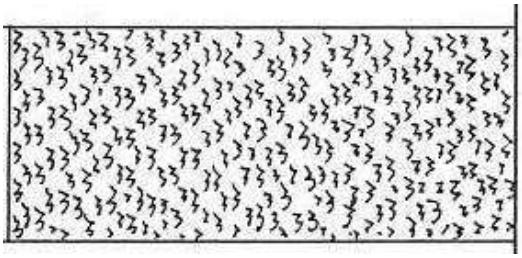
Example 3.973. G. Ligeti: *Volumina* for organ (1961-61/66), p. 13. © With kind permission by UNIVERSAL EDITION A.G., Wien.



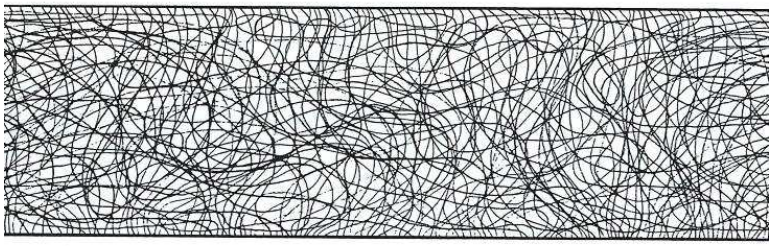
Example 3.974. G. Ligeti: *Volumina* for organ (1961-61/66), p. 14. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.975. G. Ligeti: *Volumina* for organ (1961-61/66), p. 15. © With kind permission by UNIVERSAL EDITION A.G., Wien.

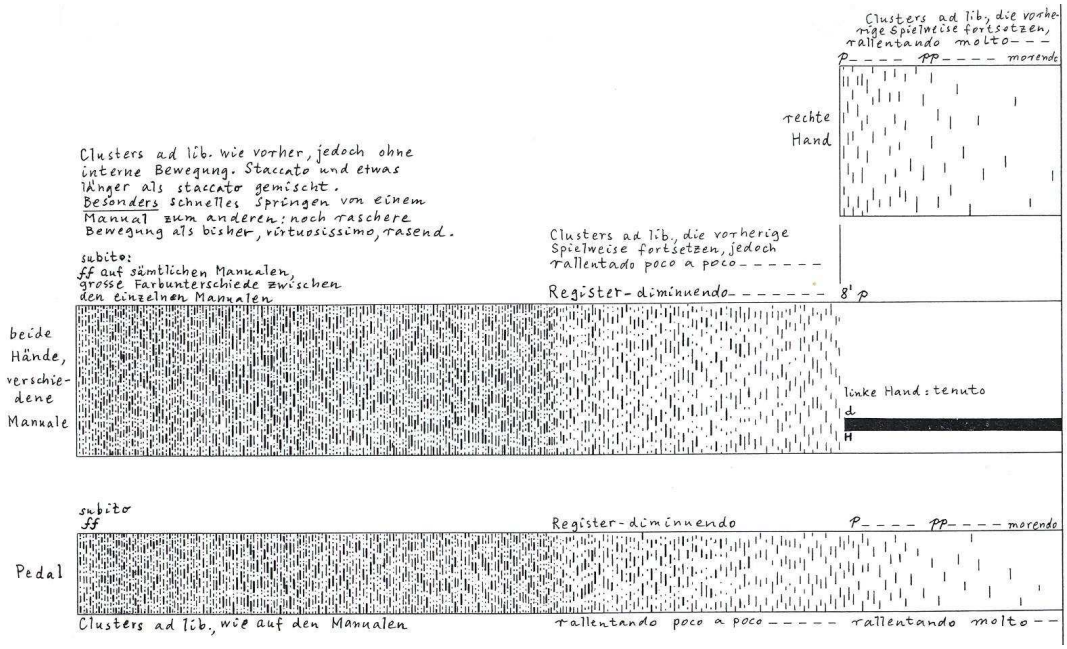


Example 3.976. G. Ligeti: *Volumina* for organ (1961-61/66), p. 15. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.977. G. Ligeti: *Volumina* for organ (1961-61/66), p. 19. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Besides real inner movement, Ligeti thinks of an idea that would become a trademark of his music. By accumulating extremely fast staccato clusters, jumping from manual to manual in a "virtuosissimo" rage, he effectively accomplishes a cloud of sound that is very close to the huge static cluster from the beginning of the piece, where internal "impurities" made by the complex friction of non-harmonic components of the sound are as "welcome" to the character of the piece as are imperfections of the performer's cluster technique.[1607] (Ex. 3.978.) With the high density of staccato clusters, Ligeti succeeded in writing a composition that consists of one cluster only, gradually shifting its shape to become a multitude of amorphous cluster sounds that had not been written down yet.

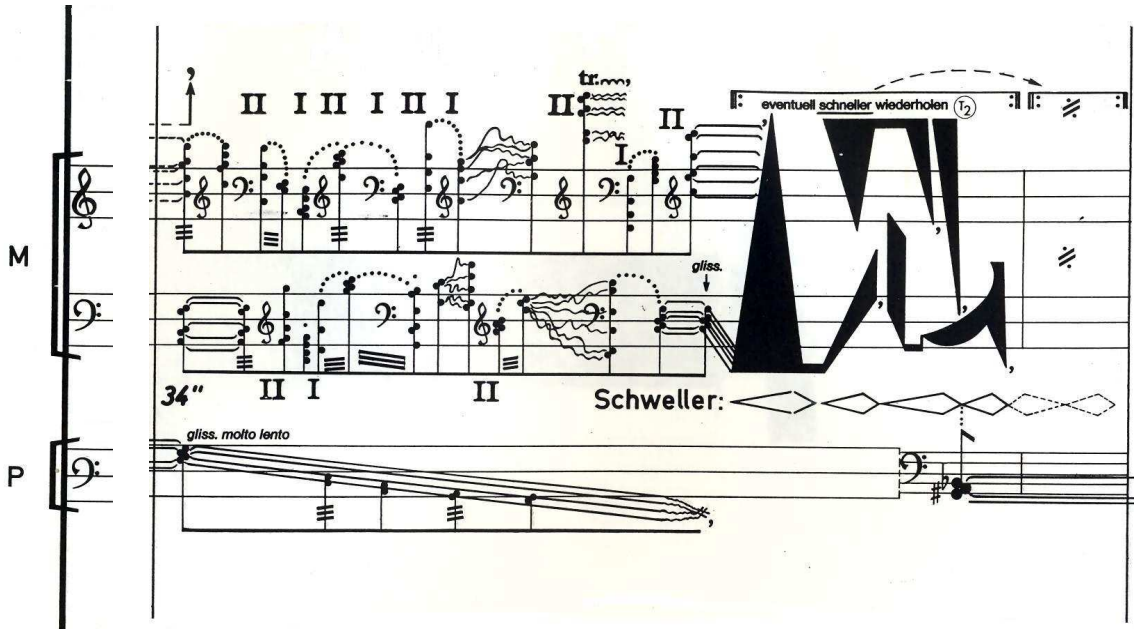


Example 3.978. G. Ligeti: *Volumina* for organ (1961-61/66), p. 16. © With kind permission by UNIVERSAL EDITION A.G., Wien.

[1607] P. 1 of the score.

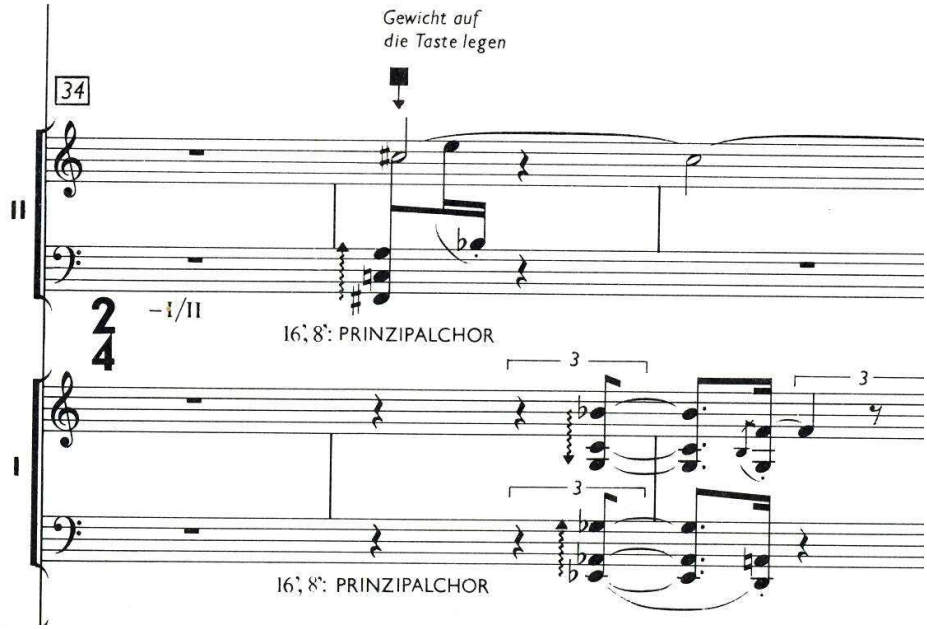
3.4.7.3.2 Mauricio Kagel: *Phantasie* (1967) and *Improvisation Ajoutée* (1962, revised 1968)

Like Ligeti's *Volumina,* Kagel's *Improvisation Ajoutée* was written at the beginning of the decade and revised near the end. In the mean time, Kagel had written another organ work: the 1967 *Phantasie für Orgel mit Obbligati.* This piece for organ and tapes, composed « Dei gratia ex machina,» has some of the features that characterise *Volumina,* like cutting of the motor to reduce air pressure, clusters on pedals and manuals and moving clusters. Although some of the notation is also conceptually close to Ligeti's (compare the amorphous moving clusters in ex. 3.979 with ex. 3.967), Kagel is generally more conservative in his notation. Although he uses three-line staves to limit the pitch information to approximations, the performance information is mostly communicated in the traditional ways. On the one hand these convey actions rather than specific pitches, and on the other hand the graphics are often just too abstract to relay real practical information. The moving cluster notation is more conceptual than realistic, as are the little curvy lines each individually representing a "trill-glissando" and the slow glissando in the pedal (ex. 3.13) or the absurd simultaneity on two manuals and pedal of Chopin's three studies opus 25 in thirds, sixths and octaves.



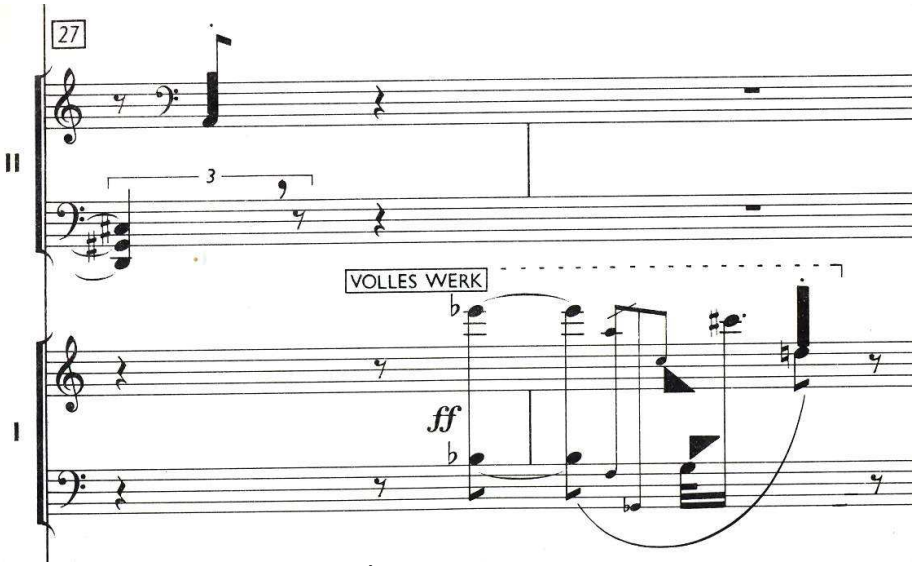
Example 3.979. M. Kagel: *Phantasie mit Obbligati* for organ (1967), page 12. © With kind permission by UNIVERSAL EDITION A.G., Wien.

In contrast, the *Improvisation Ajoutée* (1962, revised 1968) for one performer and two assistants demonstrates a wholly different attitude towards notating clusters.
The piece also replicates some of Ligeti's ideas, such as – again – the shutting off of the motor or a giant keyboard-covering cluster that diminishes in size. But Kagel demands much more improperness. There is proper key technique but also inaccurate ("off-key") playing, and undefined pitch or the noise of action (no organ sound). The organist has to utter vocal sounds and use two small weights to hold down keys (ex. 3.980).

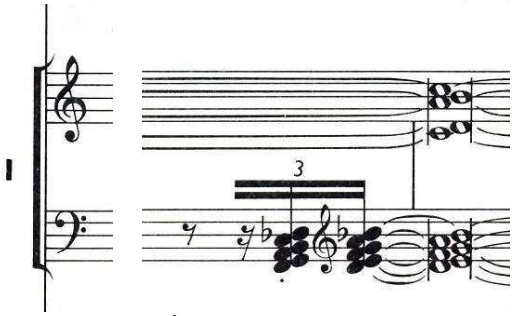


Example 3.980. M. Kagel: *Improvisation Ajoutée* for organ (1961-62, version 1968), bars 34-36. © With kind permission by UNIVERSAL EDITION A.G., Wien.

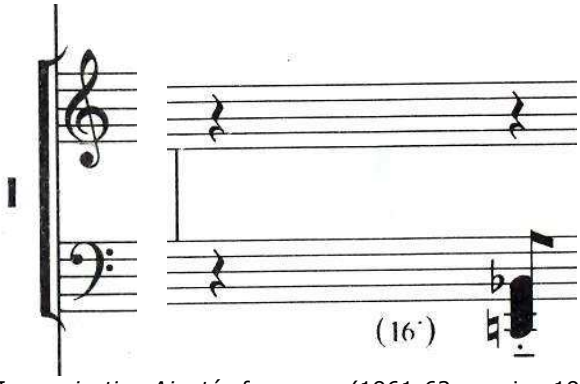
Most of *Improvisation Ajoutée* is devoted to cluster playing. Oddly, the first half of the piece uses proper mainly finger technique and some clusters that are notated as we can expect from Kagel (ex. 3.981), though, at one instance, one wonders why he makes a distinction between a cluster chord that is easier to play with half a palm technique than with fingers alone (ex. 3.982) and a cluster of nearly the same size (ex. 3.983).



Example 3.981. M. Kagel: *Improvisation Ajoutée* for organ (1961-62, version 1968), bars 27-28. © With kind permission by UNIVERSAL EDITION A.G., Wien.

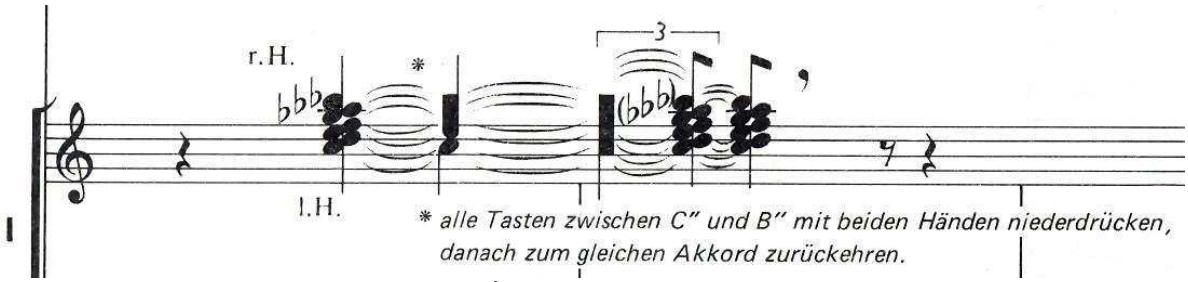


Example 3.982. M. Kagel: *Improvisation Ajoutée* for organ (1961-62, version 1968), bars 8-9. © With kind permission by UNIVERSAL EDITION A.G., Wien.



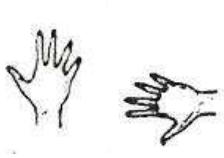
Example 3.983. M. Kagel: *Improvisation Ajoutée* for organ (1961-62, version 1968), bar 18. © With kind permission by UNIVERSAL EDITION A.G., Wien.

One other instance has a very rare example of something very specific that Cowell described in *New Musical Resources*: a chord that moves to be a cluster and is then filtered back to a chord. (Ex. 3.984.)

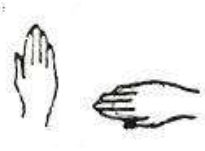


Example 3.985. M. Kagel: *Improvisation Ajoutée* for organ (1961-62, version 1968), bars 61-62. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Despite these instances of cluster types and notations that look back into the past, *Improvisation Ajoutée* presents the performer with an important novelty: ergonomical cluster notation. In the performance notes, Kagel lists the types of clusters with the little drawings that would become a hallmark of his scores:



Palm with splayed fingers



Palm with fingers together



Fist (thumb upwards)



Fist (knuckles on keys)



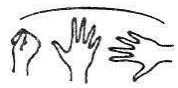
Inversions: back of the hand on keys



Inversions: fist (thumb downwards)



Inversions: fist (back of the hand on the keys)



Unbroken transition from one position to the other without taking the hand off the keyboard



With lower arm and hand (fingers together)



Lower arm only (hand raised)



Arpeggiated arm clusters: press keys beginning with wrist or beginning with elbow

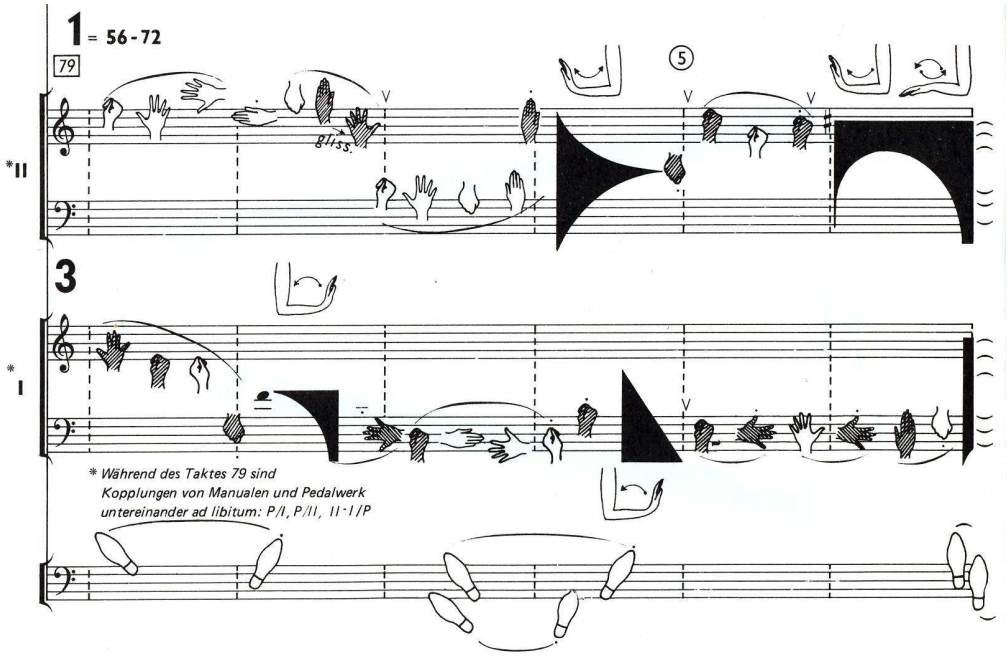


Arpeggiated arm clusters: release keys beginning with wrist or beginning with elbow

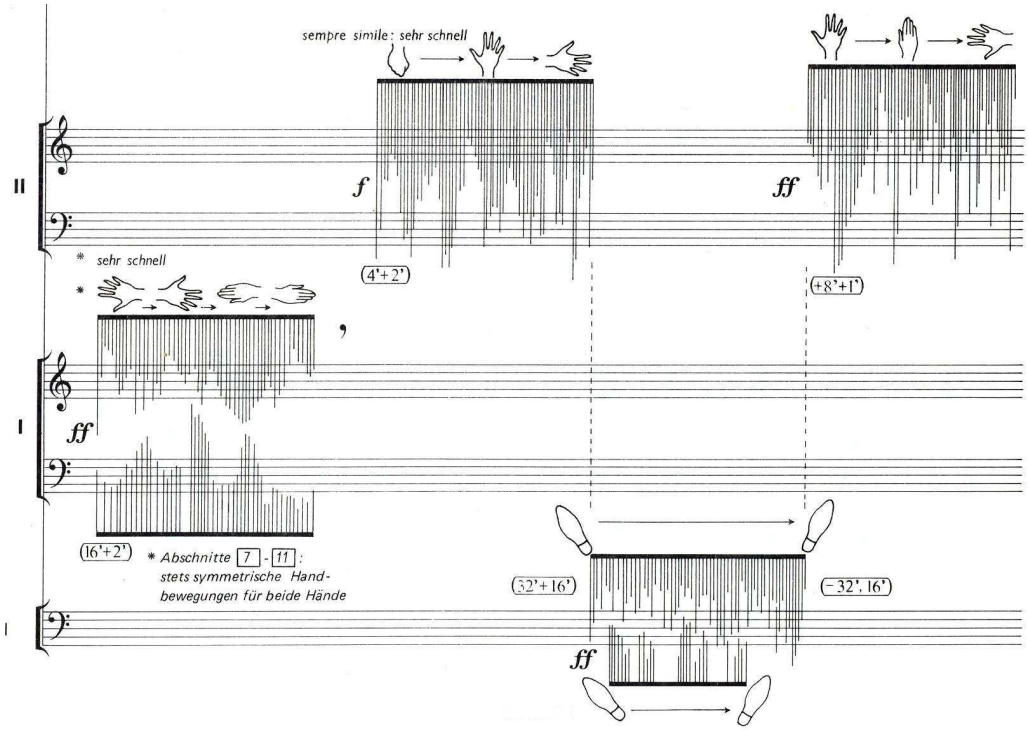


On pedals with the full sole of the foot and the heel

Kagel then uses these ideograms to notate cluster passages from the second half onwards. (Ex. 3.986 and 3.987.)

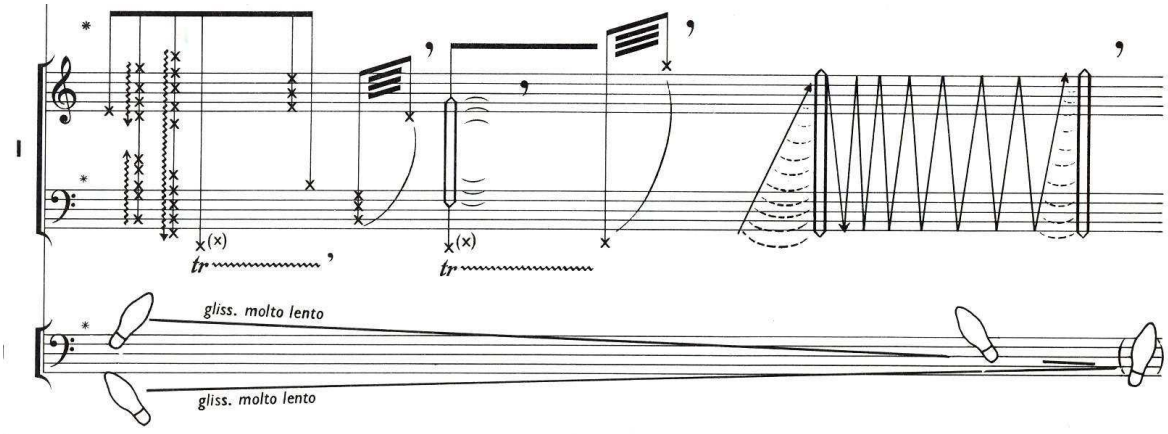


Example 3.986. M. Kagel: *Improvisation Ajoutée* for organ (1961-62, version 1968), bar 79. © With kind permission by UNIVERSAL EDITION A.G., Wien.

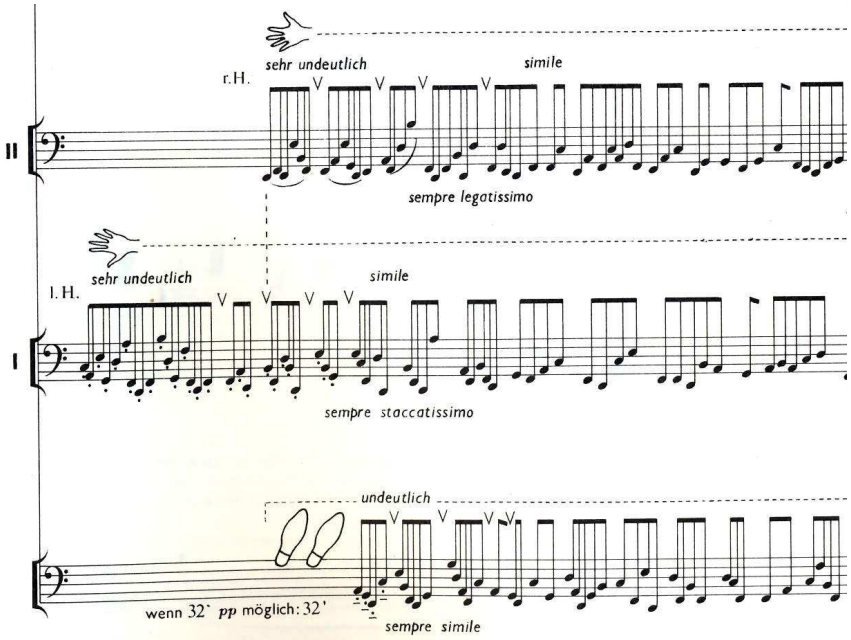


Example 3.987. M. Kagel: *Improvisation Ajoutée* for organ (1961-62, version 1968), bar 106, subsections 7-10. © With kind permission by UNIVERSAL EDITION A.G., Wien.

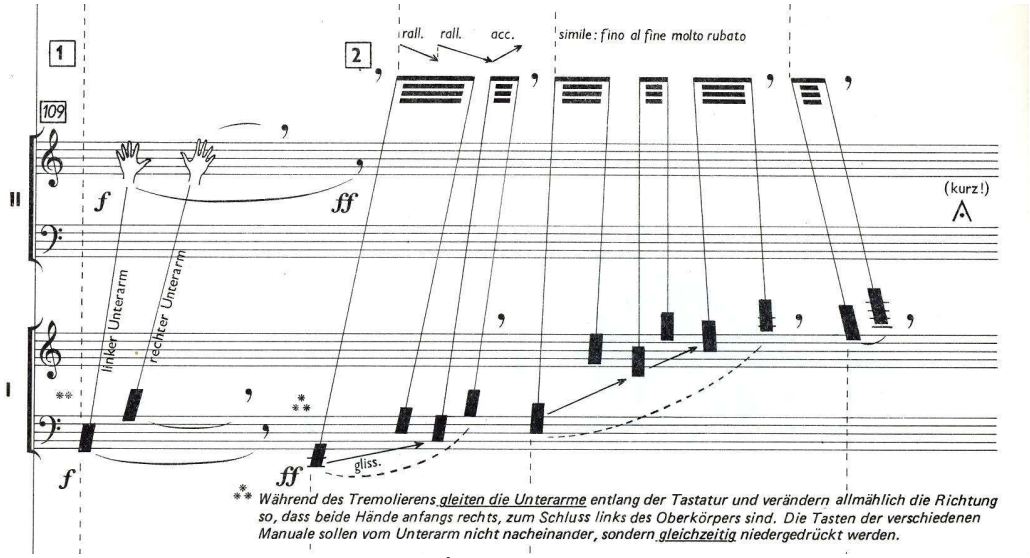
The innovation of notating the body parts and their movements instead of abstract representations of sound was not all that Kagel came up with. A whole array of new cluster techniques fills the pages of *Improvisation Ajoutée*: repeated arm-rotation arpeggios (ex. 3.988), playing individual notes by moving fixed stretched fingers over the keys (ex. 3.989), moving arm tremolos over two keyboards simultaneously (ex. 3.990) and elbow clusters on the lower manual while the fingers of the same arm play keys on the upper manual properly (ex. 3.991).



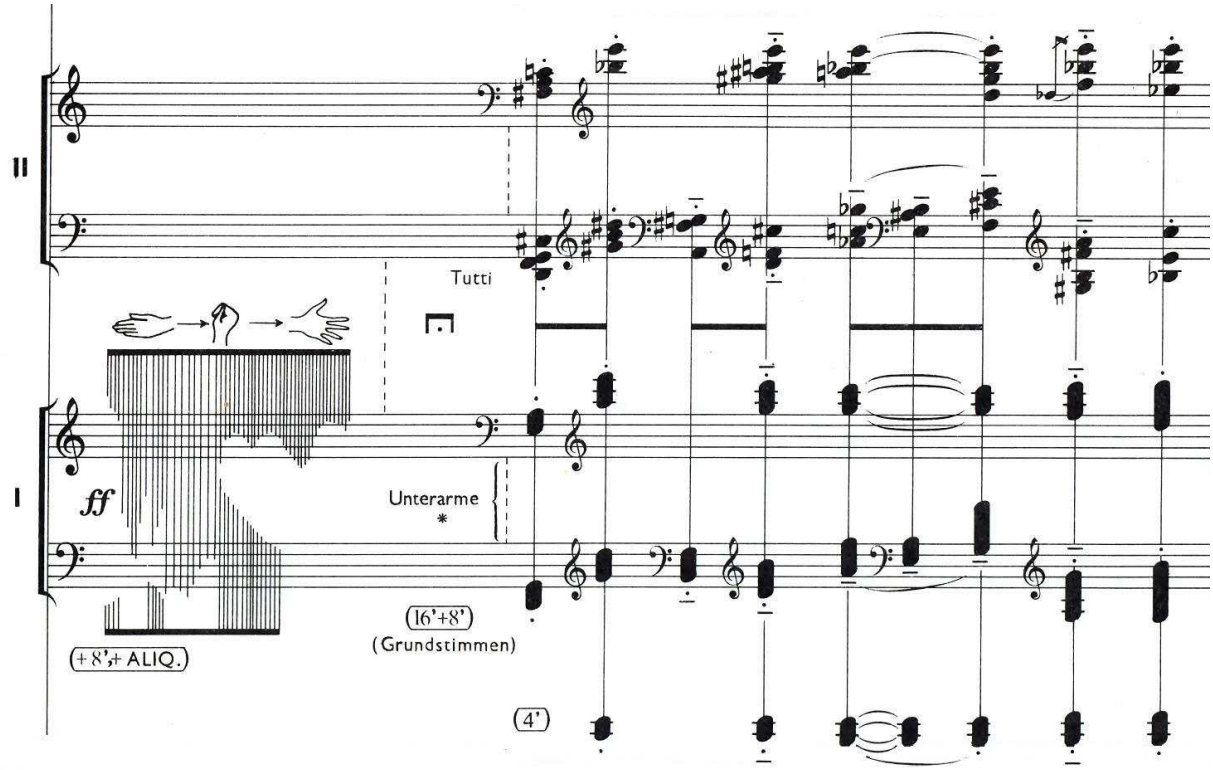
Example 3.988. M. Kagel: *Improvisation Ajoutée* for organ (1961-62, version 1968), bar 106, subsection 13. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.989. M. Kagel: *Improvisation Ajoutée* for organ (1961-62, version 1968), bar 108, subsection 3. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.990. M. Kagel: *Improvisation Ajoutée* for organ (1961-62, version 1968), bar 109. "During the tremolo, the lower arms are slid along the keyboard in such a way that both hands begin to the right of the player's torso and end up to the left. The keys on the various manuals should be depressed by the lower arm simultaneously, not one after the other." © With kind permission by UNIVERSAL EDITION A.G., Wien.

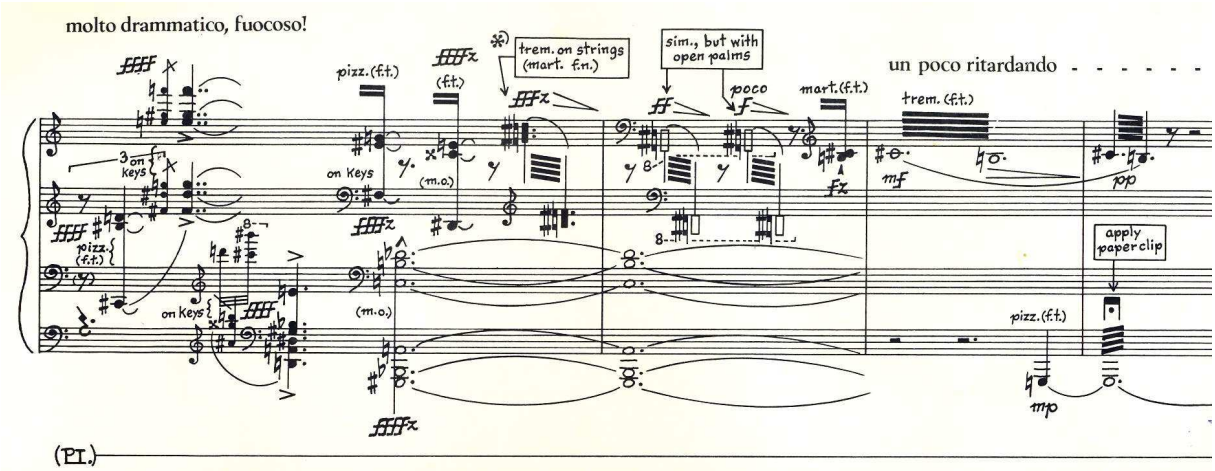


Example 3.991. M. Kagel: *Improvisation Ajoutée* for organ (1961-62, version 1968), bar 106, subsection 12. © With kind permission by UNIVERSAL EDITION A.G., Wien.

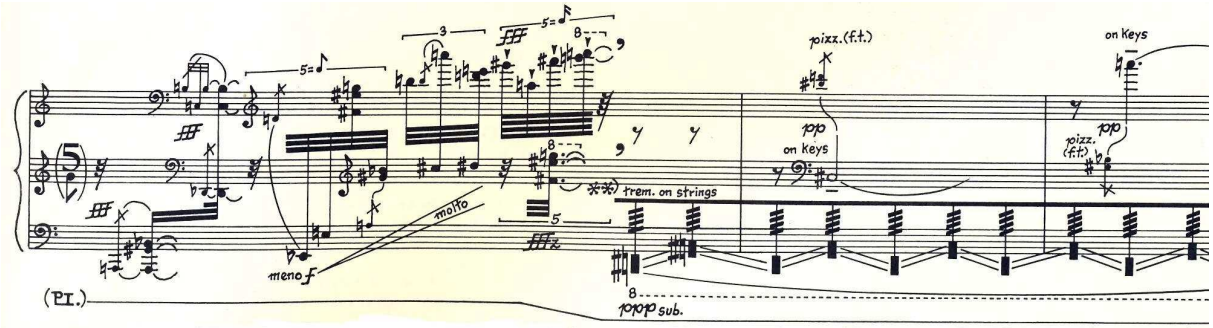
Just as one would expect no more novelties after Ligeti's brilliant *Volumina,* Kagel completely rethinks the keyboard cluster. More importantly than the new types of playing, is the concept of notating clusters on the basis of how they are played, and not what they are. Both Ligeti and Kagel have moved to notational types that are similar (graphic) but also at opposite extremes (sound vs. action). Both ways are equally valid in replacing the deficient traditional notation of and composition with clusters, which unjustly tried to match a bodily reference (such as the size of a palm) with a tonal reference (e.g. the octave).

3.4.7.4 1962- George Crumb

George Crumb (°1929) started using extended piano techniques in 1962 when he wrote *Five Pieces for piano*. To facilitate the performer's preparation of the instrument Crumb lists sixty pitches of which the strings are played upon and that should be marked. Only three are used to produce harmonics on, all second partials, i.e. the octave above the fundamental. Apart from silently depressed keys, most techniques involve direct manipulation of strings with fingers and palms: glissandos over opened strings, martellato and tremolo (ex. 3.992 and 3.993), finger muting, fingertop and -nail pizzicatos (the former towards the center of the string, i.e. where the timbre is fullest and closest to or on the second harmonic, the latter as close as possible to the tuning pegs, i.e. where the sound is pitchless). One mobile preparation technique is asked for: a paper clip is to be bent into such a shape that it can be hung on a string that is already sounding, resulting in a "metallic vibrato."[1608] (Ex. 3.994.)

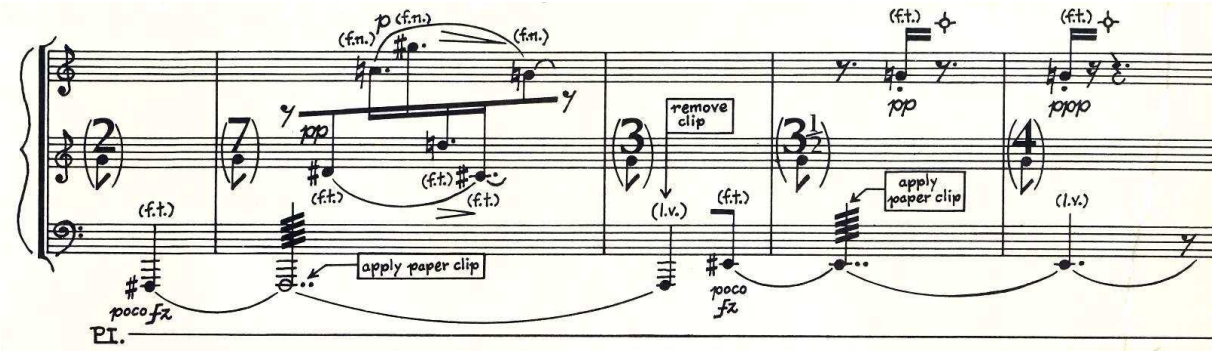


Example 3.992. G. Crumb: *Five Pieces for Piano* (1962), 5th movement, bars 15-18. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



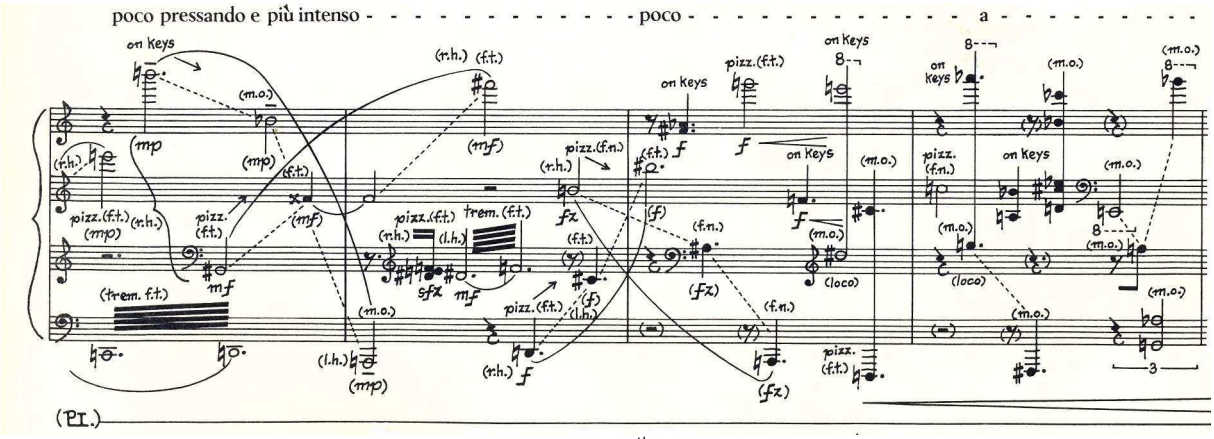
Example 3.993. G. Crumb: *Five Pieces for Piano* (1962), 1st movement, bars 11-13. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

[1608] As detailed in the performance notes.



Example 3.994. G. Crumb: *Five Pieces for Piano* (1962), 3rd movement, opening bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Strikingly, Crumb strongly recommends that the piano be amplified if the music is not performed in a very small hall, so that the many delicate sounds will project. To that effect, a microphone should be suspended over the bass strings. Regardless of the amplification, he advises the pianist to "overplay" many of the inside effects, in order to sounds as indicated and produce the proper dynamic balance with keyboard-produced sounds. That balance is crucial to *Five Pieces for Piano.* Crumb specifically composed the work as an organic whole, but this was not only a question of structure (some of it is palindrome, motifs and characteristic effects return throughout the set): all sounds are integrated into one atmosphere as much as possible. One result of this integration is the virtuoso level at which the extended techniques are used. The pianist must not just be able to switch quickly between string manipulation techniques and locate strings and nodal points easily; he also has to switch effortlessly and rapidly between strings and keyboard. (Ex. 3.995.)



Example 3.996. G. Crumb: *Five Pieces for Piano* (1962), 5th movement, bars 10-13. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Before the next decade was finished, Crumb had composed at least another thirteen pieces for or including the extended piano, often listed as being amplified.

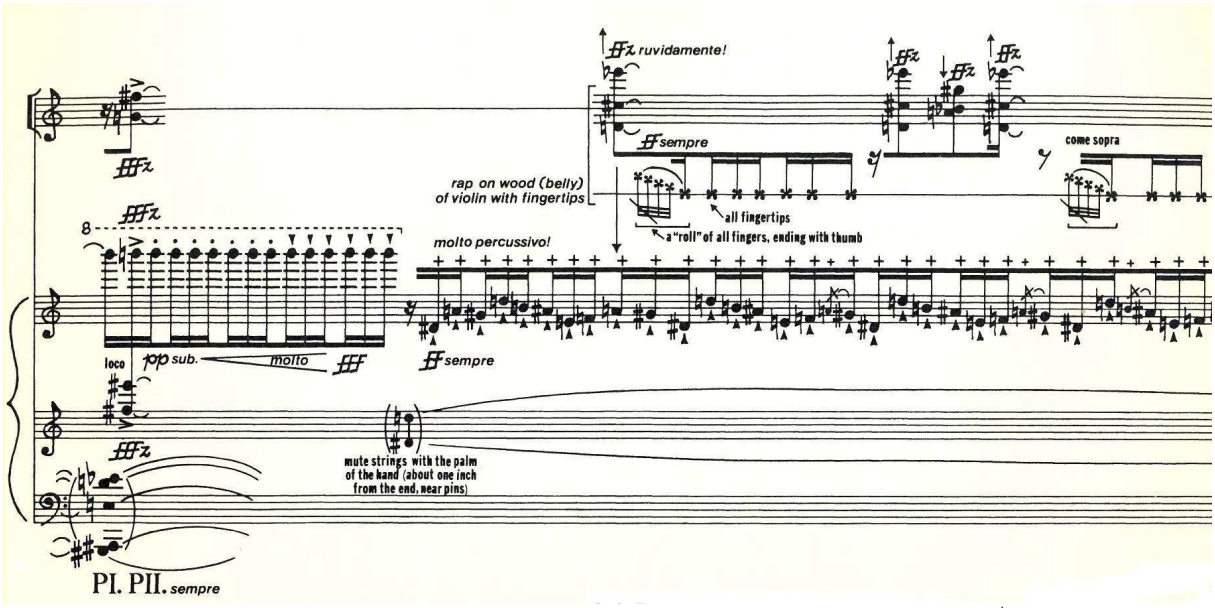
- *Night Music I* for soprano, piano/celesta, and two percussionists (1963)
- *Four Nocturnes (Night Music II)* for violin and amplified piano (1964)
- *Eleven Echoes of Autumn (Echoes I)* for violin, alto flute, clarinet, and piano (1966)
- *Echoes of Time and the River (Echoes II)* for orchestra (1967)
- *Songs, Drones, and Refrains of Death* for baritone, electric guitar, electric double bass, amplified piano/amplified harpsichord, and two percussionists (1968)
- *Ancient Voices of Children* for mezzo-soprano, boy soprano, oboe, mandolin, harp, amplified piano (and toy piano), and percussion (three players) (1970)

- *Vox Balaenae* (Voice of the Whale) for electric flute, electric cello, and amplified piano (1971)
- *Makrokosmos*, Volume I for amplified piano (1972)
- *Makrokosmos*, Volume II for amplified piano (1973)
- *Music for a Summer Evening (Makrokosmos III)* for two amplified pianos and percussion (two players) (1974)
- *Dream Sequence (Images II)* for violin, cello, piano, percussion (one player), and off-stage glass harmonica (two players) (1976)
- *Star-Child* for soprano, antiphonal children's voices, male speaking choir, bell ringers, and large orchestra (1977)
- *Celestial Mechanics (Makrokosmos IV)* for amplified piano (four hands) (1979)
- *Apparition* for soprano and amplified piano (1979)

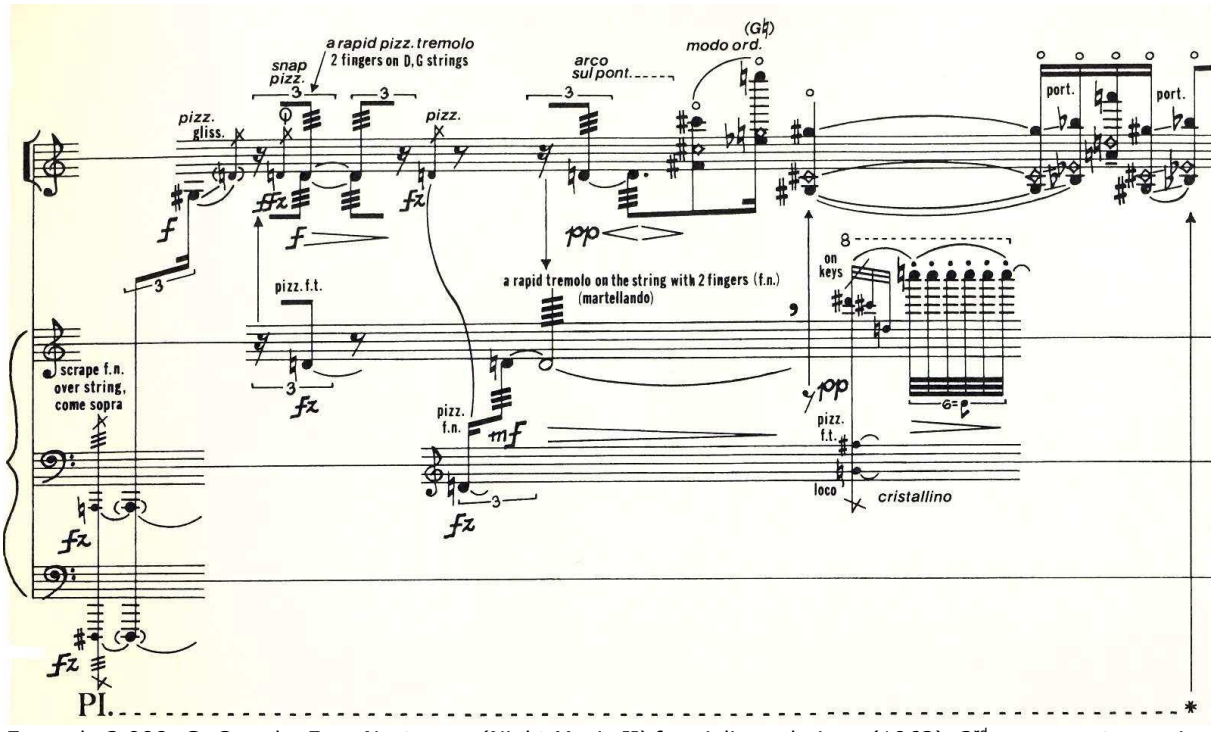
With the *Four Nocturnes* (1964), Crumb continues the path he had set out with the piano solo pieces. There are fewer pitches that need markings inside the piano (47 in total) but Crumb now wants a fifth partial next to second partials (five of them). The direct manipulation techniques (and the silently depressed keys) are the same as in the *Five Pieces for Piano*, but the mobile preparation (paper clip) is replaced with a wire brush. Its strands are placed in between the strings so that a gentle lateral tremolando produces a "rustling" effect. Some new techniques (for Crumb at least) include short fingernail scratches of wound strings, sharply striking the soundboard through an opening in the frame, and striking the metal crossbeams of the piano frame.

Crumb searches for effective combinations of techniques, whereby one technique colors or enhances the attack of another, e.g. a pizzicato simultaneously with the same pitch played on the keyboard, knuckles hitting a crossbeam together with a palm cluster in strings, striking the soundboard when pulling a string.

The opportunity to match his extended piano idiom with what the violin can do in that field is a clear concern in this composition. Besides flageolets, glissandos, Bartók pizzicatos and con sordine, sul ponticello and col legno playing, the violinist is required to rap with his fingers on the wooden belly of the instrument. Many of these techniques occur solely to be combined with similar effects in the piano part. (Ex. 3.997 and 3.998.)

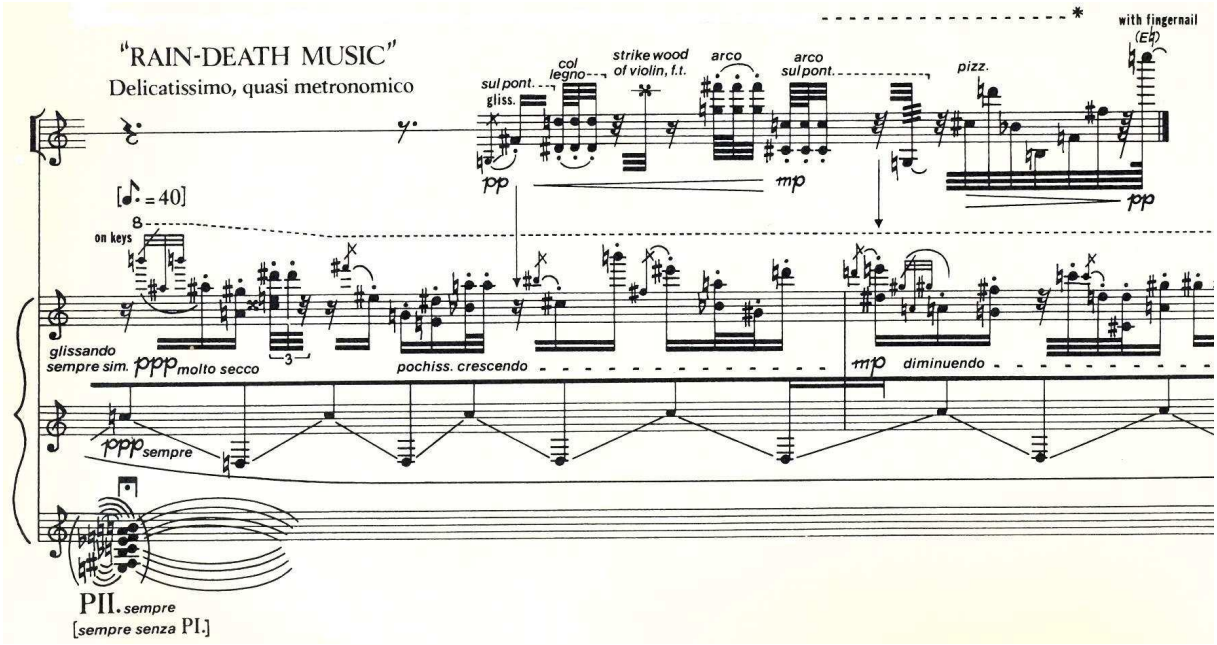


Example 3.997. G. Crumb: *Four Nocturnes(Night Music II)* for violin and piano (1962), 3rd movement, 2/4. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

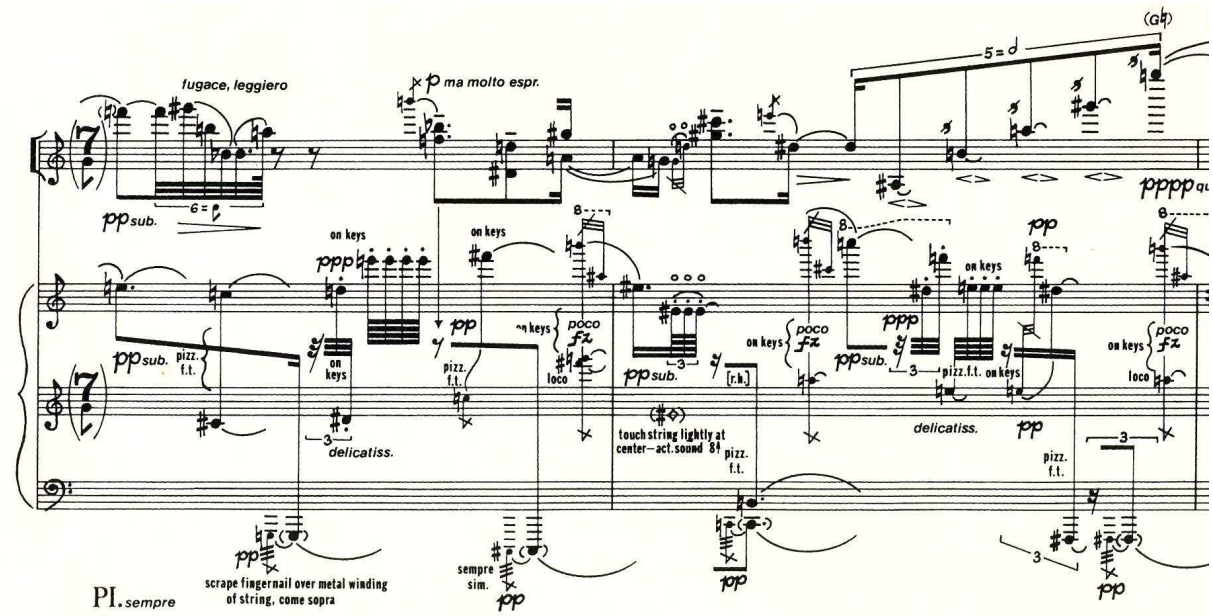


Example 3.998. G. Crumb: *Four Nocturnes (Night Music II)* for violin and piano (1962), 3rd movement, opening bars. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

As with the *Five Pieces for Piano*, the technical demands for the pianist are considerable when combining improper sound production and keyboard playing. (Ex. 3.999 and 3.1000.)



Example 3.999. G. Crumb: *Four Nocturnes (Night Music II)* for violin and piano (1962), 3rd movement, 3/3. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

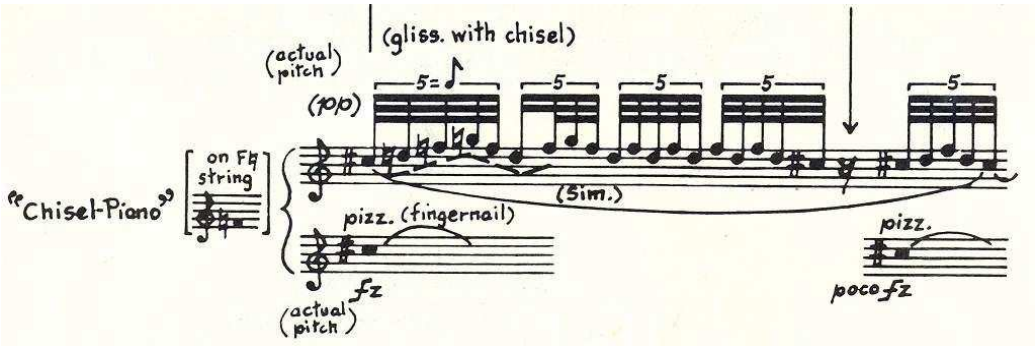


Example 3.1000. G. Crumb: *Four Nocturnes (Night Music II)* for violin and piano (1962), 3rd movement, 4/2. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

In another chamber music work, *Ancient Voices of Children* (1970), Crumb sought "musical images to enhance and reinforce the powerful yet strangely haunting imagery of [Federico García] Lorca."[1609] He had chosen the instruments "for their particular timbral potentialities," and extended techniques are used to heighten the expressive intensity of the piano, harp and oboe, although the pianist also plays toy piano (of "fine quality" and a 2.5 octave range), the mandolinist musical saw and the oboist chromatic harmonica. The harpist has paper threaded through certain strings, which is to be ripped out at one point, and plays with knuckles on the instrument; there is pitch bending in the oboe, mandolin and harp parts, and the latter has one of each pair of strings tuned a quarter-tone low. The mandolin has a particular "bottle-neck" technique prescribed: a glass rod is held (lightly) against the E-string and slid in between plucked pitches, producing glissandos. The boy soprano sings through cardboard speaking tube, and the soprano sings into piano (while the sustaining pedal is depressed) to produce sympathetic vibrations. All three instrumentalists are called to shout, sing and whisper.

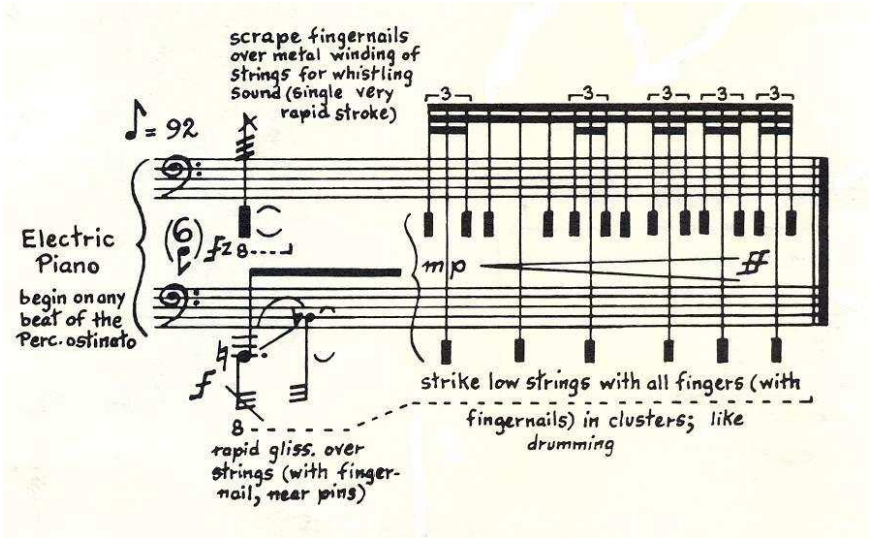
The piano is specified as "Electric Piano", meaning that it is amplified by means of a contact microphone taped to the soundboard. The term "Chisel-Piano" refers to a 5/8" chisel of which the edge is applied to a nodal point on a string. After plucking that string, the chisel is moved along it to produce the various written pitches. Between pitches, the movement of the chisel should be rapid and decisive in order to produce a distinct sound, i.e. the tool is used to produce melodies. (Ex. 3.1001.)

[1609] Quotes for *Ancient Voices of Children* are taken from the foreword in the score.

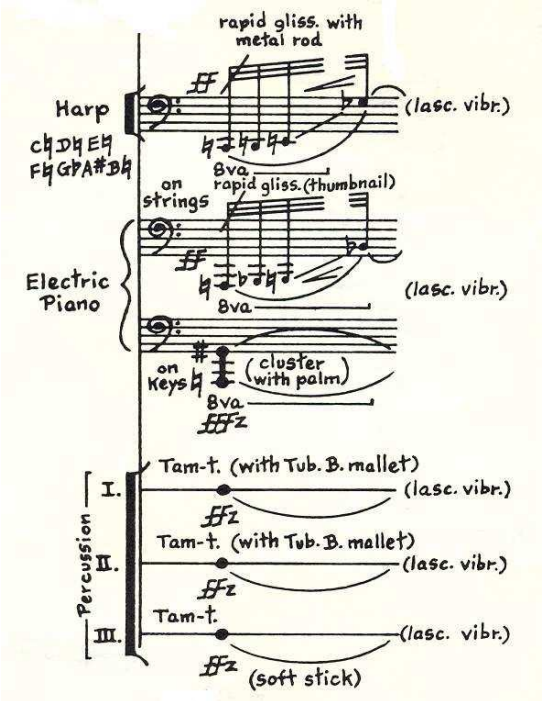


Example 3.1001. G. Crumb: *Ancient Voices of Children* for voices and ensemble (1970), 2nd movement *I have lost myself in the sea many times*, excerpt. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Further single techniques are: muting strings, scraping along the metal winding of one or more strings with the nail of one or more fingers (single, light, very rapid strokes, about 3 inches to produce a nasal whistling sound – immediately muffled by touching the string at its end), glissandos over strings, drumming (striking adjacent string choruses with fingers) and 5th partial harmonics. Crumb also developed compound piano techniques like the combination of a string or keyboard cluster with a string glissando. (Ex. 3.1002 and 3.1003.)

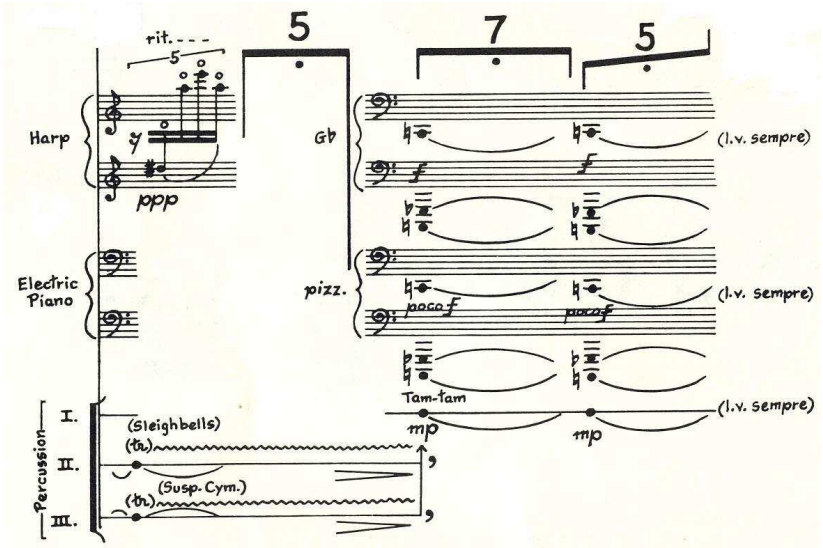


Example 3.1002. G. Crumb: *Ancient Voices of Children* for voices and ensemble (1970), 3rd movement *From where do you come, my love, my child?*, excerpt. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



Example 3.1003. G. Crumb: *Ancient Voices of Children* for voices and ensemble (1970), 5th movement *My heart of silk is filled with lights*, excerpt. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Fusion of effects by different instruments is realized by for instance combining glissandos in harp and piano, and piano string cluster with tam-tams (ex. 3.1003), or pizzicato chords on the piano strings with simultaneous pizzicatos on the harp (ex. 3.1004).

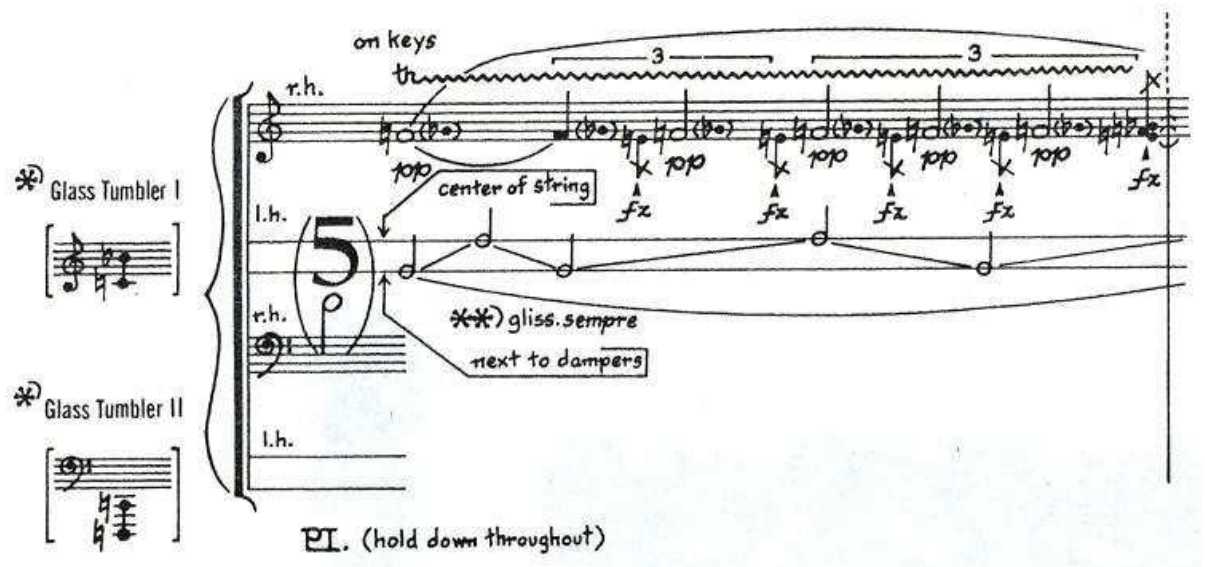


Example 3.1004. G. Crumb: *Ancient Voices of Children* for voices and ensemble (1970), 5th movement *My heart of silk is filled with lights*, excerpt. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Makrokosmos I (1972) and *II* (1973) are Crumb's most ambitious works for the extended piano. According to Crumb they grew out of the attempt to write a sequel to the *Five Pieces for Piano* and the title and format reflect his admiration for Debussy (24 preludes) and Bartók (*Mikrokosmos*): both *Makrokosmos* sets consist of in total 24 pieces. Above such "external associations" are the "spiritual impulses" that Crumb considered more akin to what he called "Chopin's darker side" and the "child-like fantasy of early

Schumann."[1610] On top of the references in the titles, format and content to the traditional repertoire of proper piano playing, Crumb mentions how his language had been influenced by "haunting images" coalesced around larger concepts, e.g. of music's "magical properties," the problem of the origin of evil, the "timelessness" of time; ironies of life as expressed in the music of Mozart and Mahler, and some quotes from Pascal ("The eternal silence of space terrifies me") and Rilke ("And in the nights the heavy earth is falling from all the stars down into loneliness. We are falling. And yet there is On who holds this falling endlessly gently in his hands").[1611] Each *Makrokosmos* set consists of twelve "fantasy pieces" that are associated with the signs of the zodiac and persons born under those signs. As in all pieces of Crumb's, the notation is very exact and shows considerable effort to accommodate the performer's need for practical information on matters of sheer technique as well as timing and physical choreography. On top of that, Crumb made a point of showing off his graphic skills (the published scores are mere reproductions of the manuscripts!) by incorporating a few graphically symbolic score in each set. One depicts twin suns, others e.g. a spiral galaxy, the piece sign and a crucifix.

As is logical, many of the techniques of the previous pieces return in the *Makrokosmos* cycles. New is that the muting of strings (before they are set off) and the dampening of vibrating strings is specified to be at one inch from the end of the string, obviously wanting to make sure that only a pitchless sound is audible. The ratio between second and fifth partials is now in favor of the latter, with 17 to 9 in *Makrokosmos I* (in a total of 57 marked pitches) and 14 to 5 in the second set (48 manipulated pitches). In place of the paper clip or the wire brush now comes a metal chain to lay on vibrating strings, two thimbles to scrape, strike or trill with on strings, and a metal plectrum (*Makrokosmos I*); a sheet of paper to be laid on the strings (to produce a "sharp percussive sound" followed by a "buzzing" effect when the hammer hits the string[1612]), glass tumblers (to be rolled over strings while a trill is played on the keyboard – ex. 3.1005) and – again – the wire brush (*Makrokosmos II*). The glass tumbler and paper techniques remind us of resp. Ravel and Cage.

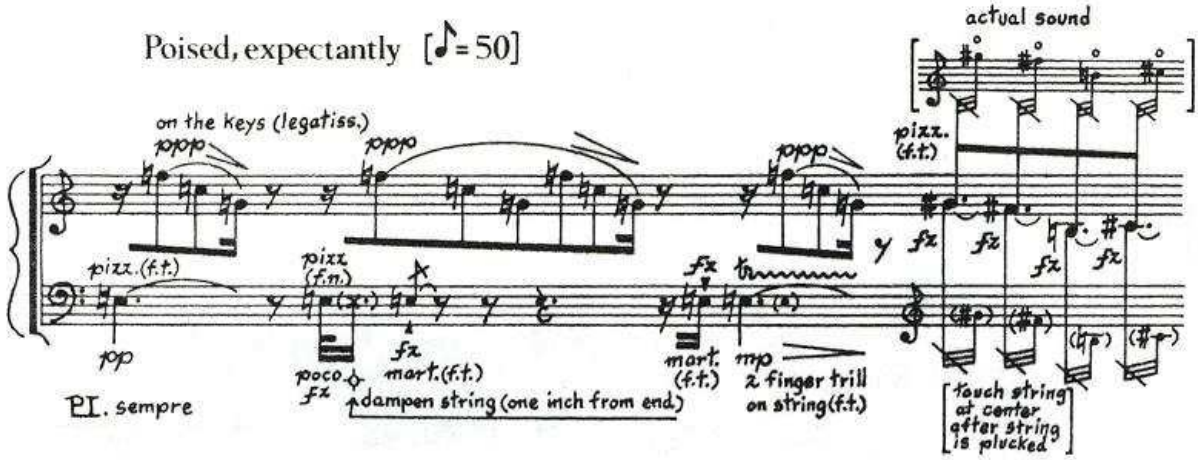


Example 3.1005. G. Crumb: *Makrokosmos II* (1973), 5th movement *Ghost Nocturne: for the Druids of Stonehenge (Night Spell II)*, opening. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

[1610] As written in the performance notes.
[1611] Quoted from the preface.
[1612] Performance note 8.

Vocal techniques are added as well: half and unvoiced singing, humming, making a wind sounds, warbling (a rapid series of staccato ejections of breath "like a Monteverdi trill"), whistling (with a "vibrato like a theremin"), shouting and "legato whispering." Some of the vocal utterances are extra atmospheric as they set off sympathetic resonance of open strings when executed over the inside of the piano. Crumb now – for the first time – uses keyboard clusters and glissandos, including a pseudo-chromatic one.

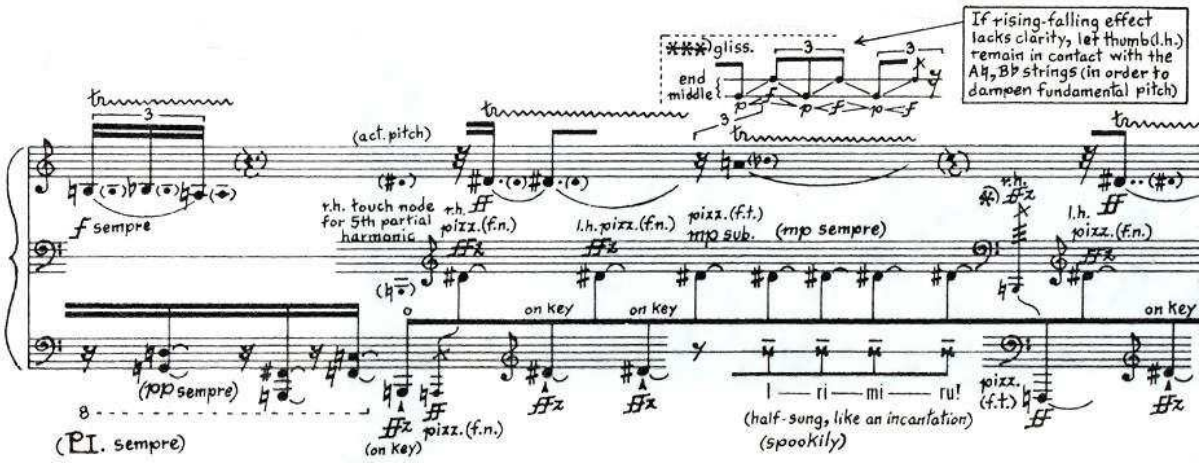
Besides the new techniques, Crumb adds sophistication to the known ones by manipulating strings' overtones. Instead of merely muting as string after it has been plucked, it is now muted at a nodal point after being plucked, so that pizzicato sounds are converted into their partials. (Ex 3.1006.) Similarly, strings' overtones are plucked or scratched instead of their fundamentals. Glissandos over strings are now not indicated as back and forth anymore (as in ex. 3.999, see above) but in a circular manner[1613], perhaps to link the added ∞-sign to the mystical associations that surround the music in general, but certainly to enhance the continuity of the glissando sound. Furthermore, strings can be strummed in front of or behind the dampers, "depending on considerations of *timbre* and ease of performance."[1614] The choice is the performer's.
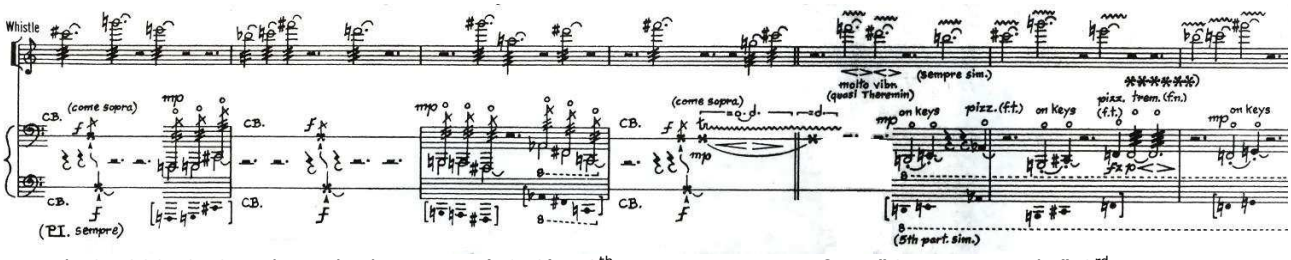


Example 3.1006. G. Crumb: *Makrokosmos I* (1972), 6th movement *Night-Spell I*, opening. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

As could be expected from these large-scale works, the level of technical mastery is considerable, with virtuosity required not only for producing the extended sounds and the switching between inside and keyboard action, but also for all the fast runs, repeated notes and big leaps that the fingers have to play on the keyboard. According to Crumb, it was David Burge's total mastery of the extended techniques in the *Five Pieces for Piano* (Burge premiered them) that implied an organic synthesis of the proper and improper piano techniques.[1615] (Ex. 3.1007 and 3.1008.)

[1613] In *Makrokosmos I*, 7th movement *Music of Shadows (for Aeolian Harp).*
[1614] Performance note 5.
[1615] Opening paragraph of the preface in the score, which is in turn based on notes that Crumb had written for the Nonesuch recording of *Makrokosmos I* (Nonesuch H-73293).



Example 3.1007. G. Crumb: *Makrokosmos I* (1972), 5th movement *The Phantom Gondolier*, 2nd system. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.



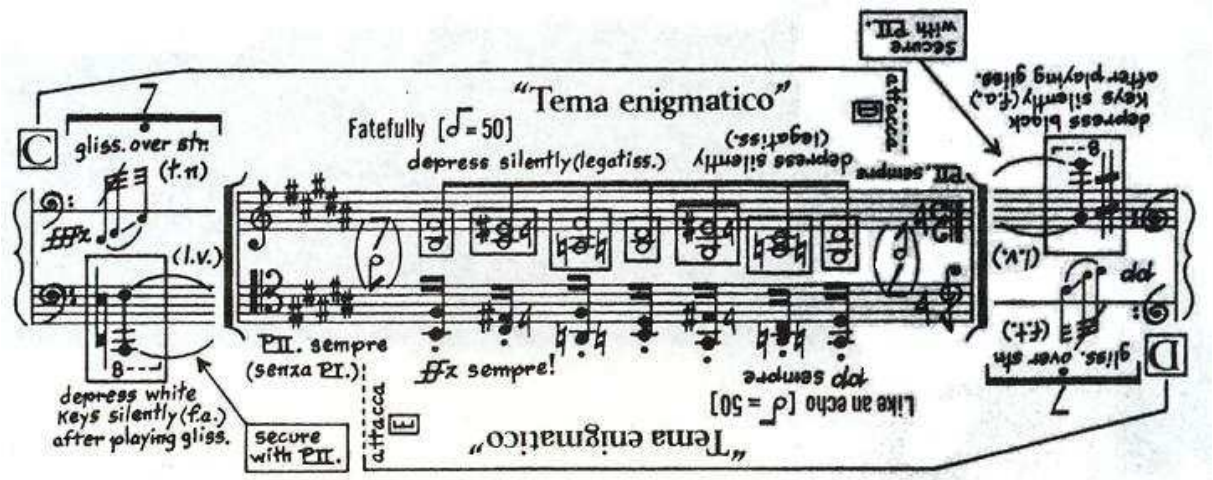
Example 3.1008. G. Crumb: *Makrokosmos II* (1973), 10th movement *Voices from "Corona Borealis"*, 3rd system. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

Many of the individual pieces of the two sets are composed to highlight specific techniques. The effects of the metal chain and the sheet of paper affect most or all of the first pieces of each respective set, but they do not return in the rest of the music.[1616] Likewise, each set has pieces that are solely based on staccato keyboard playing over the sympathetic resonance of a silently depressed cluster that keeps strings opened from beginning to end.[1617] One movement consists almost exclusively of string glissandos (with silently depressed keys)[1618], another is limited to the glass tumbler, damped pizzicatos and vocals[1619], yet another only combines the wire brush with vocals and string strumming[1620] or whistling with string scratching[1621], others are completely void of extended techniques[1622]. In each set Crumb looks back at famous repertoire from the past, with reminiscences of a Chopin Impromptu[1623] and Beethoven's *Hammerklavier* sonata[1624].

Both the *Makrokosmos* sets demonstrate Crumb putting extended techniques to melodic use as much as for the sheer effect of an atmospheric timbre. Typical are the silently

[1616] The chain is used in *Makrokosmos I*, 1st movement *Primeval Sounds*; the paper in *Makrokosmos II*, 1st movement *Morning Music (Genesis II).*
[1617] *Makrokosmos I*, 2nd movement *Proteus* and 3rd movement *Pastorale; Makrokosmos II*, 3rd movement *Rain-Death Variations.*
[1618] *Makrokosmos I*, 7th movement *Music of the Shadows (for Aeolian Harp).*
[1619] *Makrokosmos II*, 5th movement *Ghost-Nocturne: for the Druids of Stonehenge.*
[1620] *Makrokosmos II*, 9th movement *Cosmic Wind.*
[1621] *Makrokosmos II*, 10th movement *Voices from "Corona Borealis."*
[1622] E.g. *Makrokosmos I*, 8th movement *The Magic Circle of Infinity.*
[1623] *Makrokosmos I*, 11th movement *Dream Images (Love-Death Music).*
[1624] *Makrokosmos II*, 11th movement *Litany of the Galactic Bells.*

depressed keys that he wants to connect in legato, with the glissandos over the open strings producing the melody. (Ex. 3.1009.)



Example 3.1009. G. Crumb: *Makrokosmos II* (1973), 8th movement *A Prophecy of Nostradamus*, excerpt. Reprint with permission of C. F. Peters Music Publishers Frankfurt, Leipzig, London, New York.

A last important difference with the previous pieces is the requirement of the amplification. Again, a microphone is suspended over the bass strings, but now the level of amplification is to be set "rather high so that the loudest passages are very powerful in effect."[1625] Apparently, the amplification is not only needed to project the most delicate effects (also the vocal ones), but rather to emphasize the grandeur of the overall concept of the work. Curiously, the second set (written a year later) has an elaboration to the effect that the setting should not cause distortion of the sound.

One year after *Makrokosmos II*, Crumb wrote a third part for two amplified pianos and two percussionists, called *Music for a summer evening* (1974). For the pianists, the techniques are basically the same as for the previous pieces: silently depressed-, keyboard- and string-clusters, pizzicatos, two types of partials (five 5th and seven 2nd partials on a total of 2x29 tones to be marked), scraping bass string windings, bass string and keyboard glissandos, and Cowell's Aeolian Harp technique. Replacing the paper, chain, wire brush and glass tumblers are the African thumb piano, and striking bass strings and crossbeams with a crotales stick. The pianists still have to speak, but the singing and the whistling is now left to the percussionists. Strikingly, Crumb asks for a "continuous gliss over strings", which has to be executed with alternate hands to avoid the crossbeams to produce gaps in the sound. Since the exact location of the crossbeams depends on the pianos at hand, Crumb does not notate the exact alternation of the hands. Again Crumb concentrates on just a few techniques per movement.

The amplification is also the same as for the previous Makrokosmos sets, including the demand for projecting the vocal utterances into the microphones. The African Thumb piano must be held against a crossbeam for magnification of sound.

A fourth *Makrokosmos – Celestial Mechanics: Cosmic Dances* (1979) – is for amplified piano four hands. It is becoming clear which techniques have become classics in Crumb's works: silently depressed keys, scraping windings of strings, dampen strings before or after the sound is produced, 5th and 2nd partials, glissando over strings, keyboard clusters and striking parts of the frame.

[1625] From the performance notes.

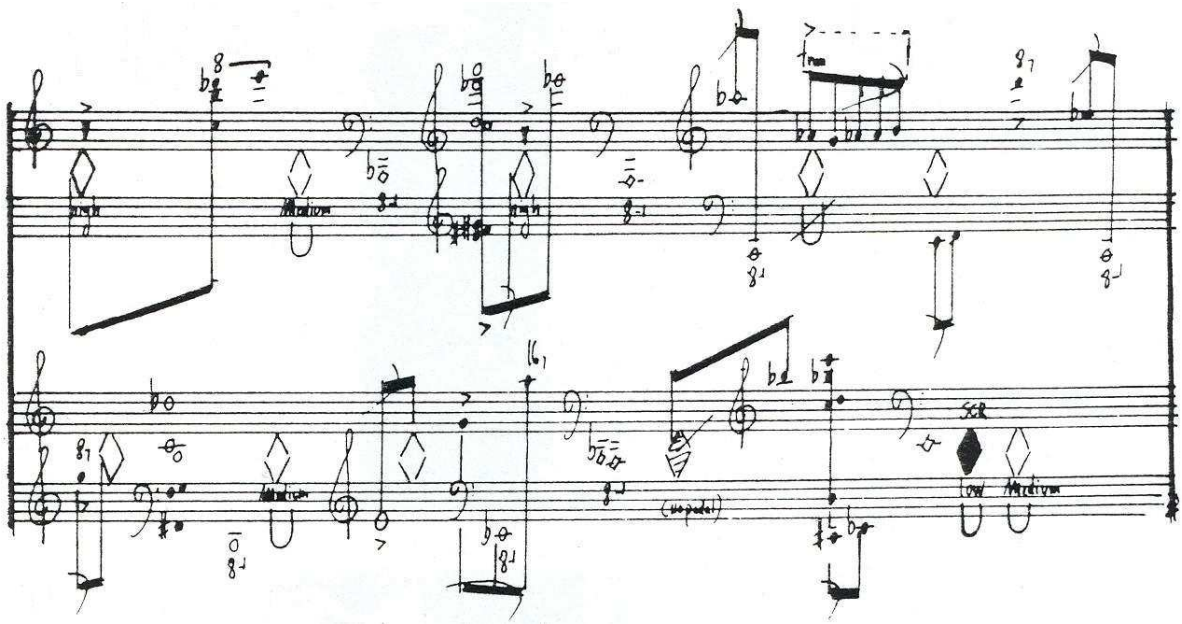
There are no more vocal expressions. New is the touching of the 2nd partial node only to slide the fingers towards the center of the strings "to produce a rising-falling glissando of various partials". Again, a tool is prescribed. This time it is a ruler with a cork stripping. It is to be dropped on a specified range of strings (actually, three rulers of different sizes are needed), and then struck with fingers while trilling with two fingers on top of it (making an indicated glissando along the ruler). At one point, the page-turner is asked to strike on the ruler. In the end, the tool is pulled off the strings, scraping them, or letting the end drag over the strings to produce a glissando.

During the 1960's and 1970's, George Crumb established his own idiom for working with extended techniques. From the beginning, producing partials, cluster-playing, muted strings, finger pizzicatos and silently depressed keys were in his repertoire of favored techniques. With each new composition, he tried out new techniques or elaborated on previously used ones, and he introduced one or more different objects to manipulate strings with. In the course of the 1970's, he experimented with different types of vocal sounds and refined his demands for amplification. The four-part *Makrokosmos* cycle is the high point of his efforts to come to a personal style and attitude towards the extended piano.

3.4.7.5 1964-71 Michael von Biel

Born in Hamburg, Von Biel (°1939[1626]) studied composition, theory and piano in Toronto, Vienna, New York, London and Cologne with teachers like Feldman, Cornelius Cardew and Stockhausen. In the 1960's, while living in Cologne, he came into contact with Fluxus artists and studied with Joseph Beuys. Next to composing, he has been active notably as a visual artist. Von Biel is of interest here because of his consistent and highly personal interest in extended techniques for his piano music and for his development of the perpendicular keyboard slide.

The early pieces *Für 2 Klaviere I, II, III* (1961) are confusing in that they are published without performance notes. From later pieces by Von Biel we can deduce that the larger diamond shapes signify muted strings or slapping the hand on strings (high, medium, low), but how to interpret the diamond shaped notes is unclear, as are the black and grey diamonds and the large letters "U." (Ex. 3.1010.)

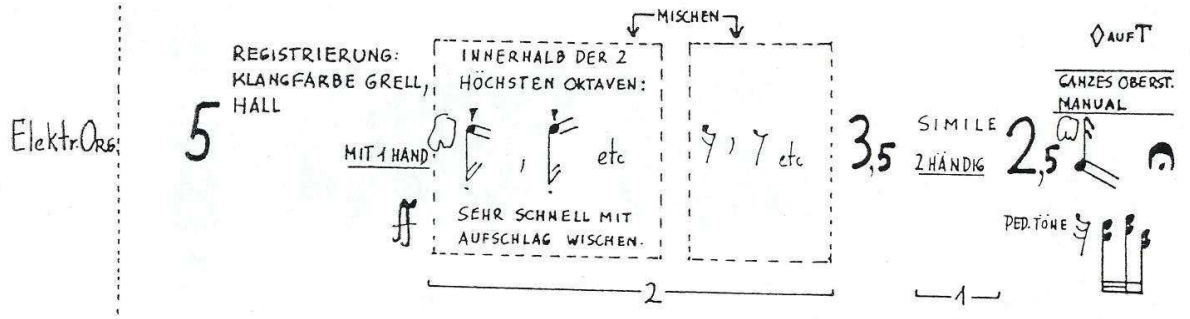


Example 3.1010. M. Von Biel: *Für 2 Klaviere* (1961), 3rd movement, 6th system. Reproduced with permission of Feedback Studio Verlag.

In *Deklination* (1965) for alto voice, seven instrumentalists and electronics, Von Biel prescribes a hard cardboard roll to depress keyboard cluster stretches of d^{3}-c^{5}, e^{1}-f^{3} and f^{2}-g^{4}. As two of these cluster widths are different, more than one cylinder is necessary. On the electronic organ (part of the pianist's responsibility) the roll is to be applied to the complete "middle and low middle-range" manual (possibly with a third roll) and depressed with "often uneven pressure."[1627]

In complementary fashion, the harp has two long wooden pieces for cluster-playing, one that has to cover at least 20 strings, the other "essentially shorter."[1628] Both players need a piece of cloth to wipe over the keys, resp. the strings. (E.g. in the part for electric organ, ex. 3.1011.)
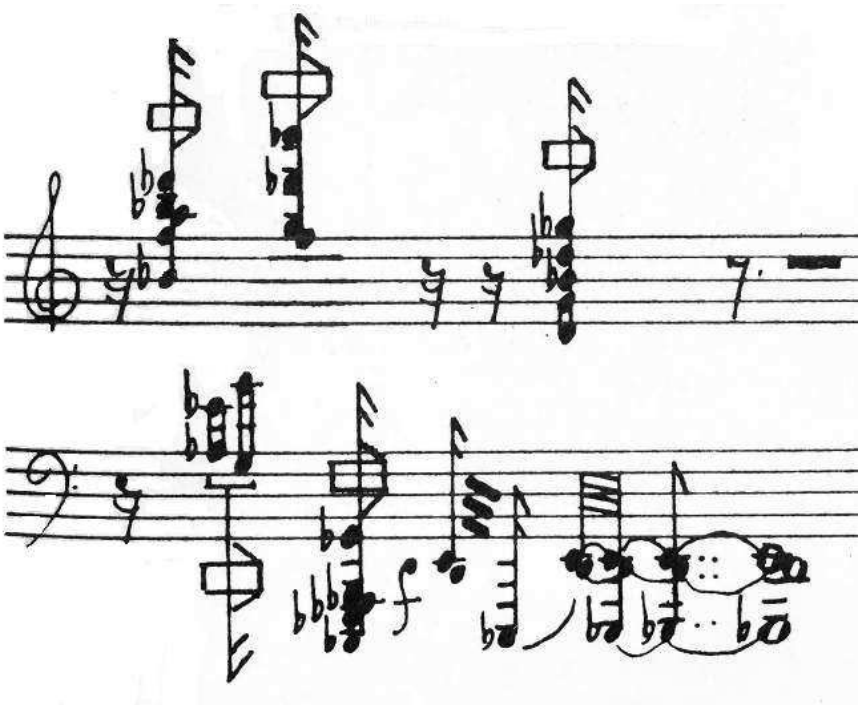
[1626] Henck 2004 states 1939, whereas different internet references cite 1937.
[1627] P. 34 of the score, published by Feedback Studio Verlag (FB 7126).
[1628] Quoted from the performance practical notes in the score.



Example 3.1011. M. Von Biel: *Deklination* (1965), p. 38, excerpt. Reproduced with permission of Feedback Studio Verlag.

Von Biel prescribes other extended techniques as well, like finger mutes and palm-clusters. He seems to have liked the idea of the cluster-board, however. In the same year 1965, he uses it again in his *Klavier-Duo Nr. 2*, this time for clusters of a double fifth wide.

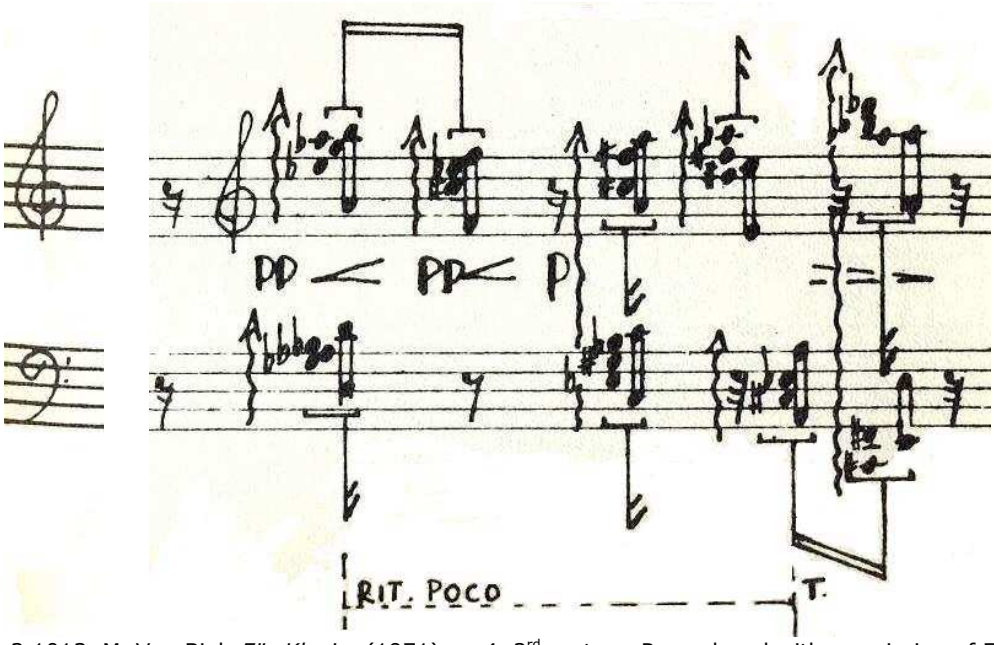
Für Klavier (1971)[1629] is the only published score of Von Biel that carries some performance practical notes to explain the techniques in the score. Different combinations of proper notes and diamonds indicate strong muting of strings, muting immediately after, simultaneously with, or before the attack of the note on the keyboard. There are also arpeggiated clusters, pseudo cluster-glissandos, first with the palm and then with a cloth. A new technique is the gliding from black to white keys, notated with a square through the stem. (Ex. 3.1012.) This technique is not used so much for pentatonic clusters from which to glide towards the body to play diatonic clusters, rather individual fingers that are on black keys glide to their white counterpart.



Example 3.1012. M. Von Biel: *Für Klavier* (1971), p. 3, 3rd system. Reproduced with permission of Feedback Studio Verlag.

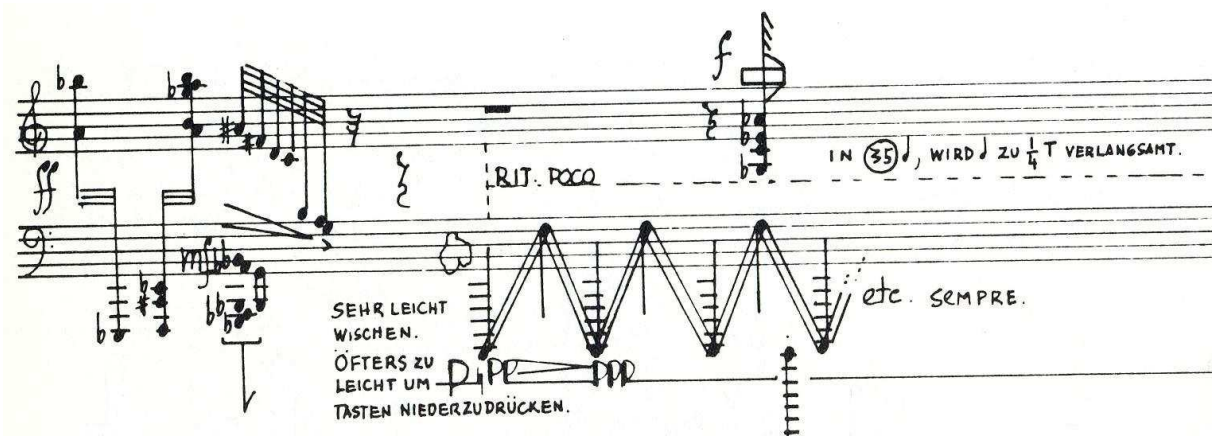
[1629] Title and date according to the publication of Feedback Studio Verlag (FB 7124). The music is the same as what Henck 2004 (p. 20-21) discusses as *Für Klavier Nr. 2.*

Von Biel uses Antheil-like cluster combinations of individually articulated black keys and the palm or other hand part depressing white keys. (Ex. 3.1013.)

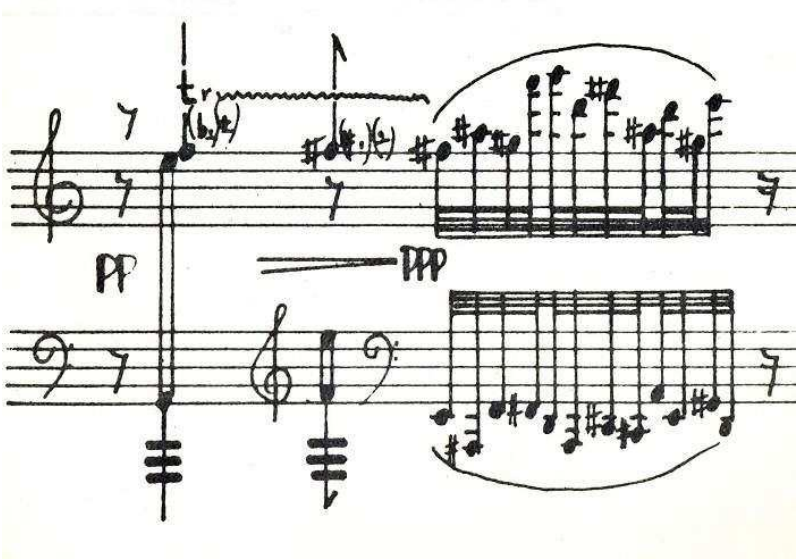


Example 3.1013. M. Von Biel: *Für Klavier* (1971), p. 4, 3rd system. Reproduced with permission of Feedback Studio Verlag.

Not all instances in Von Biel's extended techniques notation unequivocally tell the performer what to do. The cluster glissandos are notated like the arpeggiated clusters in Stockhausen's *Kontakte* (see above, 3.4.6.7.3) but the extremities are single notes, so it is not clear how wide the cluster is supposed to be, whether performed with the hand or a piece of cloth (ex. 3.1014). Equally doubtful is the manner in which the cluster tremolos can be executed realistically. (Ex. 3.1015.)

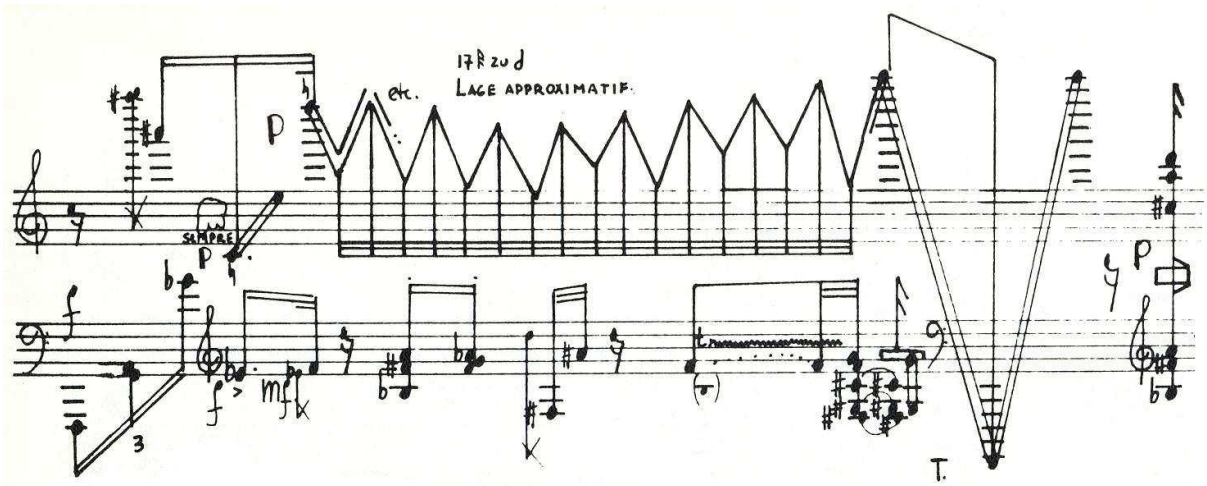


Example 3.1014. M. Von Biel: *Für Klavier* (1971), p. 8, 1st system. "Wipe very lightly. Often too lightly to depress the keys." Reproduced with permission of Feedback Studio Verlag.



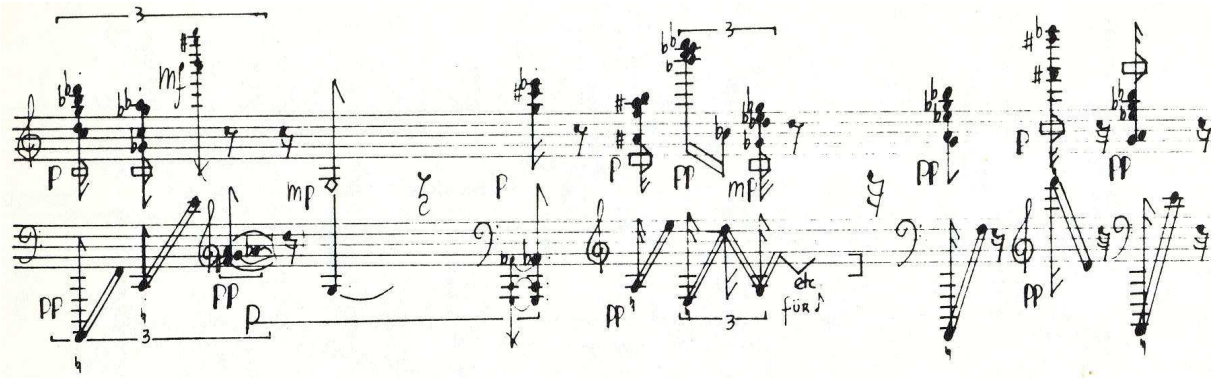
Example 3.1015. M. Von Biel: *Für Klavier* (1971), p. 2, 3rd system. Reproduced with permission of Feedback Studio Verlag.

At times the coordination between (vertical) individual finger articulation and (horizontal) extended techniques requires considerable agility. (Ex. 3.1016.)



Example 3.1016. M. Von Biel: *Für Klavier* (1971), p. 10, 1st system. Reproduced with permission of Feedback Studio Verlag.

If the pseudo cluster-glissandos and their notation betray Von Biel's influence of Stockhausen, its combination with the perpendicular slide is original. (Ex. 3.1017.)



Example 3.1017. M. Von Biel: *Für Klavier* (1971), p. 12, 1st system. Reproduced with permission of Feedback Studio Verlag.

Almost two decades later, Von Biel wrote *11 Stücke für Klavier* (1989-92), with an extremely slow keyboard glissando (see above, ex. 2.17 under 2.5.1.8) and once more the cardboard (or wood) cylinder, though this time for a cluster of "almost" the complete keyboard length. Again, there is no specification of whether it should be diatonic, chromatic or pentatonic, but one other factor is of interest: after playing the cluster, he asks to lift the roll upwards from left to right at medium speed, if possible in such a way that the piano sounds "in wide keyboard spheres from the long to the short strings." The release in a sequence of twenty such sound areas is to spread over time as equally as possible.[1630]

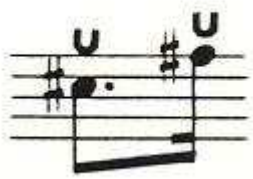
[1630] Henck 2004, p. 130: "[…] herunterdrücken und die Rolle oder Holzstück von links nach rechts in mittlerer Geschwindigkeit von dem Keyboard aufheben. Möglichst so, daß das Klavier in breiten Tastaturflächen von den langen Saiten zu den kürzeren klingt. 20 Brechungen, in möglichst gleicher Geschwindigkeit."

3.4.7.6 1964- Extended techniques and education

From the 1960's onwards the extended techniques appeared in educationally oriented publications. The glissando had already made its entry into pedagogy as early as the early 18th century (e.g. Pasquali, see 3.2.4.3) and had been most present in the 19th century (see above, 3.3.2.2.4); now the other extensions were deemed worthy to be taught to students.

3.4.7.6.1 1964- Alain Louvier: etudes for aggressors

Besides earning high credentials as a composer[1631] and being appointed director of the *Conservatoire National Supérieur de Musique et de la Danse* in Paris in 1986, French composer Alain Louvier (°1945) has been noted for his efforts in renewing the instrumental repertoire in music schools, commissioning pedagogical works as well as writing them himself. Most notably are his *Studies for Aggressors.* These were composed between 1964 and 1983 and are bundled in two volumes for piano, one for the harpsichord, one for two pianos, one for harpsichord and string ensemble, and one for organ. They were "conceived for the training of pianists in view of the modern aggressive approach of the key-board."[1632] Louvier distinguishes a total of 16 "aggressors": 10 fingers, 2 palms, 2 fists and 2 forearms. The goal was not to achieve "gratuitous violence" but rather an "increased fullness of sound of the instrument." All the known ways of playing the keyboard with those aggressors are present – palm and forearm clusters as well as glissando-clusters (with palm or wrist) for which Louvier advises to wear gloves or to glide with the elbow[1633] – as well as silently depressed keys, gradual pedal releases and caught resonance. But Louvier adds techniques of his own devising, e.g. bending the palm or the fist backwards to hit the key with the reverse of a third knuckle (ex. 3.1018 and 3.1019), and hitting the key by "crushing down the fist resting on the 5th finger" like a karate-chop (ex. 3.1020). Interestingly, he developed specific notations for the forearm being put parallel to the keyboard vs. across the keyboard, and for gliding with the forearm from black to white keys. (Ex. 3.1021, 3.1022, 3.1023.)



Example 3.1018. A. Louvier: *Studies for Aggressors* (1964-1983), volume 1, from the chart of notations. "Palm bent backwards, hit the key with the reverse of the third knuckle." © Editions Alphonse Leduc.

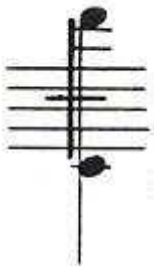
[1631] Louvier obtained the Premier Grand Prix in Rome (1968), was composer in residence at the Villa Medici (1969-1972), Laureate of the Fondation de la Vocation (1966), and was awarded the Prix A. Honegger (1975), Prix P. Gilson (1981), Prix G. Enesco (SACEM) (1986).
[1632] All quoted are taken from the preface to volume I of the collection, published Paris: Alphonse Leduc, A.L. 24087. The texts in the edition are in French, German and English.
[1633] Performance note "L."



Example 3.1019. A. Louvier: *Studies for Aggressors* (1964-1983), volume 1, from the chart of notations. "Turned over fist (with knuckle)." © Editions Alphonse Leduc.
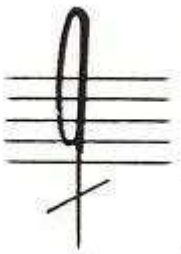


Example 3.1020. A. Louvier: *Studies for Aggressors* (1964-1983), volume 1, from the chart of notations. "Crush down the fist resting on the 5th finger." © Editions Alphonse Leduc.



Example 3.1021. A. Louvier: *Studies for Aggressors* (1964-1983), volume 1, from the chart of notations. "Arm parallel to the keyboard." © Editions Alphonse Leduc.



Example 3.1022. A. Louvier: *Studies for Aggressors* (1964-1983), volume 1, from the chart of notations. "Arm across," i.e. the hand on the black keys and the elbow on the white keys.[1634] © Editions Alphonse Leduc.



Example 3.1023. A. Louvier: *Studies for Aggressors* (1964-1983), volume 1, from the chart of notations. "Arm sliding from the black upon the white keys." © Editions Alphonse Leduc.

[1634] Performance note "G."

Louvier's studies are more than just that. On top of the categories of aggressors, he devises nuances for these techniques to compose with. Instances occur where for instance, "while the palm hits the cluster marked fff, lightly brush the black keys below with the left forearm,"[1635] holding a cluster with a body part and individually articulate notes with those fingers that are left free[1636] or using the fist of one hand to hit fingers of the other hand that are depressing keys. Some of these seem to show that Louvier knew the published works of Cowell.[1637]

Louvier's level of virtuosity is visible in his solution to the problem of a piano not having a third pedal, writing the music specifically so that individually articulated notes can be played with the fingers that are left free while the arm depresses a cluster silently.[1638]

3.4.7.6.2 1972 Breitkopf & Härtel: *Studies for Playing Avant-garde Music*

In 1972 German avant-garde specialist pianist Aloys Kontarsky served as the editor to a Breitkopf & Härtel collection of piano solo pieces titled *Studies for Playing Avant-garde Music*.[1639] The basic intent was to "facilitate the performance of piano works written since about 1950." Pieces by eleven composers are included in the collection, purposefully restricting the "great variety of musical forms of expression during this era" to a few "pregnant examples." The prepared piano was "intentionally not realized" since "the manifold possibilities of preparation would far exceed the basic outline" of the collection. Nevertheless, and regardless of the fact that the sequence of pieces progresses "from the traditional to the unconventional modes of playing," more than half of the collection contains extended techniques. Five of them use clusters or cluster-glissandos – one composition is a full-fledged *Piece for the fist*[1640] – and one is Helmut Lachenmann's *Guero* (see below).

3.4.7.6.3 1973- György Kurtag: *Játékok*

In 1973, György Kurtag started composing a collection of short pieces, *Játékok* ("Games"), "suggested by children playing spontaneously, children for whom the piano still means a toy. They experiment with it, caress it, attack it and run their fingers over it."[1641] The series is not meant to be a tutor to learn and play the piano, but rather "a possibility for experimenting." Nevertheless, a pedagocal collaborator was listed on the second page of the publication, and references to lessons and learning of surmounting difficulties are at the basis of the preface.
Kurtag composes pieces with a wide variety of extended (and proper) techniques. Next to "approximate" pitches, there are silently depressed keys, individual notes "to be played with the edge of the palm (or fingers held like drumsticks)," clusters for the palms, (edge of) fists, forearms, "circling" palms (the palms turn on white keys while fingers remain fixed on black keys) and "rotating" palms (the palms turns by rotating the under arm), glissandos, and gradually depressed and released sustaining pedal. There are no

[1635] Performance note "B."
[1636] Performance note "J" and "R."
[1637] Compare the technique of hitting fingers with the fist of the other hand with the above ex. 3.663 of Cowell's *Dynamic Motion*.
[1638] Performance note "C."
[1639] Wiesbaden: Breitkopf & Härtel, BG 780. Quotes are taken from the preface by Kontarsky.
[1640] Fauststück (1970) by Werner Heider.
[1641] Quotes are taken from the preface to the edition of the first volume, published by Editio Musica Budapest (Z. 8377).

techniques for playing directly on the strings or any parts of the piano other than the keyboard.

3.4.7.6.4 1975 *Report on New Musical Notation*

The need for disseminating knowledge about these techniques was felt on the highest level of the educational system. In 1974, the *Seminar for Musicology* of the State University Ghent (Belgium) and the *Index of New Musical Notation* (a project of the New York Public Library) invited seventy European and North American specialists to a conference to vote on proposals and counterproposals for new musical notation, based on analysis of scores and *Notation Questionnaires* that had been sent to composers from all over the world. A report was published afterwards[1642], intended as a tool for composers, conductors, performers, editors or educators and a practical survey for musicologists. In 1966 Erhard Karkoschka had already published, for the same target group, a systematic catalogue of notational signs as found in scores of then contemporary compositions.[1643] But for the conference it was felt that the traditional notation system was in need of completion by a set of new elements, for:

> […] new notational signs and approaches have flooded the field, not only because of the many new sounds and unprecedented compositional methods, but also because everyone invented his or her own notation for musical phenomena and playing techniques […] As more and more new notational devices were invented, efficiency of communication declined, resulting in poorer and probably fewer performances of new music that there could and should have been. [1644]

It is striking that the part of the report on clusters starts with the statement that "No agreement was reached on any *general* system of cluster notation" and only proposals for chromatic clusters were submitted to the conference. These are based on two of Cowell's chromatic cluster notation (see above, ex. 3.635 and 3.655) and the graphic notation, such as had been used by Ligeti and Kagel in their organ works (see above, 3.4.5.3). Specifically for piano, the report lists notations for all the improper pedalling as we have seen in the works by Boulez and Stockhausen (see above, 3.4.6), silently depressed keys, the basic modes of playing on the inside of the piano (muting and pizzicato), black-, white-key and chromatic clusters (large accidental in front of the cluster to indicate its gender, smaller accidentals before the notes that show the width). Remarkably, the report closes of the piano-cluster part with the statement:

> Symbols for cluster playing-techniques (relaxed or tightly closed fist, palm, or edge of the hand, forearm, etc.) are not yet widely enough in use to be suitable for standardization.[1645]

[1642] Sabbe & Stone & Warfield 1975.
[1643] Karkoshka 1966.
[1644] Sabbe & Stone & Warfield 1975, p. 17-18.
[1645] Sabbe & Stone & Warfield 1975, p. 99.

3.4.7.7 Mauricio Kagel II

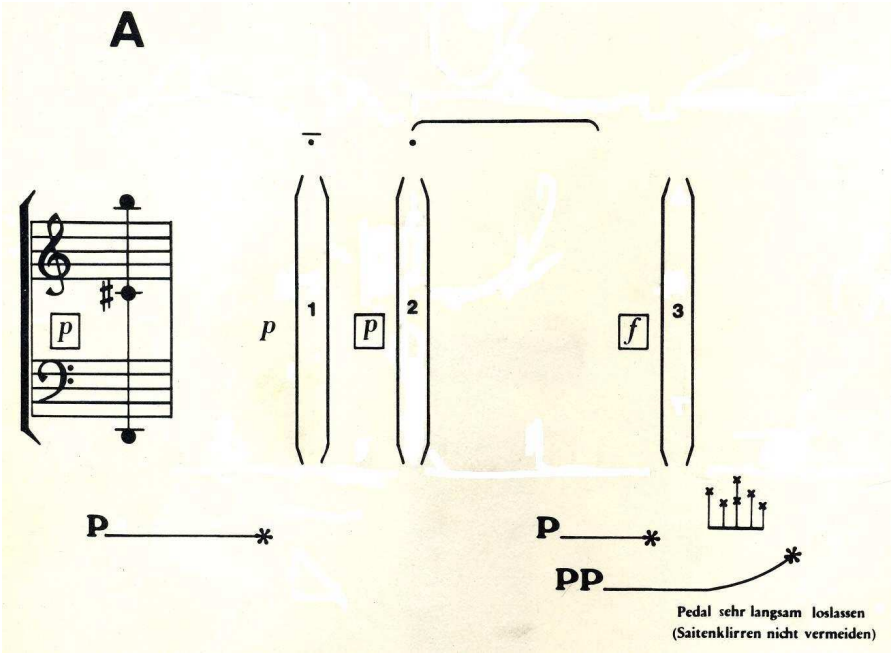
3.4.7.7.1 1965 *Metapiece (Mimetics)*

Metapiece (Mimetics) can be performed as a piece on its own, solo or for four hands, on one or two pianos, possibly including various other keyboard instruments. It can also be interspersed among and interrupted by other works (for keyboard or any other instrumental, vocal, electronic or concrete setting) on the same program or played simultaneously with other such works by Kagel or any living composer. In the latter case, the title is altered to *Mimetics (Metapiece)*.

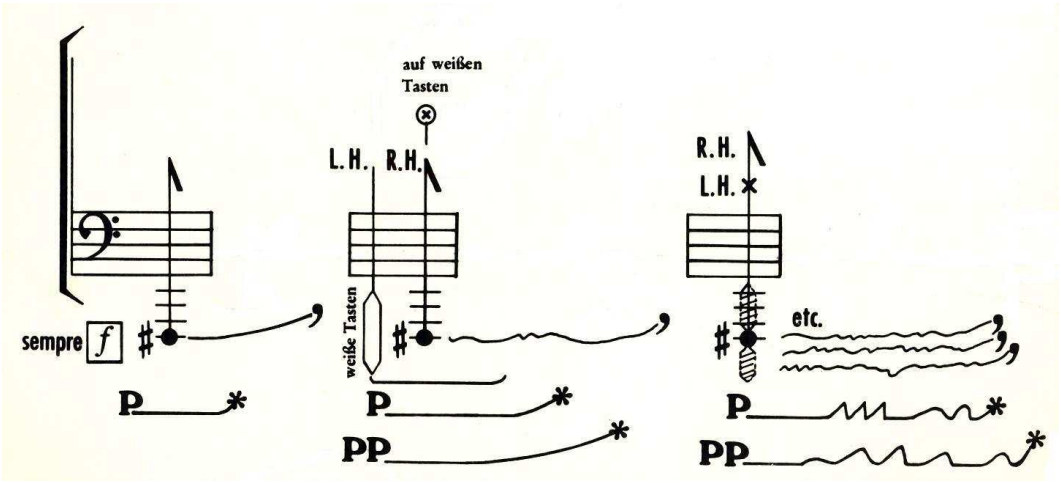
The score is "open" in its form and graphic in its notation. The pages do not all have to be played and they do not have a particular order; there is no definite tempo or unit duration. In general, the composition offers the material from which the performer choses what to play in keeping with rules that Kagel set or with indications in the score. Like in Wolff's *Duo for Pianists (I)* (1957 – see above, 3.4.5.2.1), pitch collections are given (at the beginning of each page) and numbers in the score indicate how many the pianist can chose from the collection at any particular instance that something needs to be played. (Ex. 3.1024.) The performer is furthermore free to include "obsessive-sounding repetitions of short fragments", like the aperiodic mechanical rhythms of a cracked record.

As for the performance techniques, Kagel used about all that had been achieved at that time, excepting any direct manipulation of the strings. There are silently depressed keys, clusters (of indeterminate size and therefore for indeterminate body parts), noises (e.g. "clapping: as a key is depressed with one hand, the palm is struck" and foot-stamping) and improper pedal uses. Even prepared piano sounds are included, as the stones that he allows the performer to put on the strings were intedended to be his way of mimicking Cage's invention[1646]. Some techniques are new, like "Play uncleanly" or "Key-vibrato after striking (*without* [the hammer] touching the strings again)". Obviously, some are absurd from the auditory perspective, like the key-vibrato, but also like combinations of pedal actions, as in ex. 3.1, where the sostenuto pedal is to be released very slowly. On its own, the latter technique makes no sense, but the actual objective of letting strings rattle (as at the end of Boulez' third sonata – see above, 3.4.6.4.) cannot be realistically expected from the sostenuto mechanism.[1647] There are more such instances of impossible or at least ineffective combinations of techniques (see also ex. 3.1025). This is the result of Kagel's practice to catalogue an instrument's performance technical potential (especially the improper techniques) before starting a composition.[1648] While composing, Kagel often put together items from that catalogue with other parameters, possible resulting in combinations where they have no bearing on each other.

[1646] Personal communication with author during rehearsals for concerts in 1998. The stones may also be put on the keyboard, at which time they serve to open strings that can vibrate sympathetically.
[1647] Kagel also confuses the sostenuto and sustaining pedal, explaining the "prolongment pedal" (PP) as the sustaining pedal in the performance practical notes.
[1648] Heile 2006, p. 43.



Example 3.1024. M. Kagel : *Metapiece (Mimetics)* (1961), excerpt from p. 1. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.1025. M. Kagel : *Metapiece (Mimetics)* (1961), excerpt from p. 10. The "x" in the circle (above the second *F#*[1] is the symbol for a noise, the crossed out stem of the third *F#*[1] a sign for unclear playing. © With kind permission by UNIVERSAL EDITION A.G., Wien.

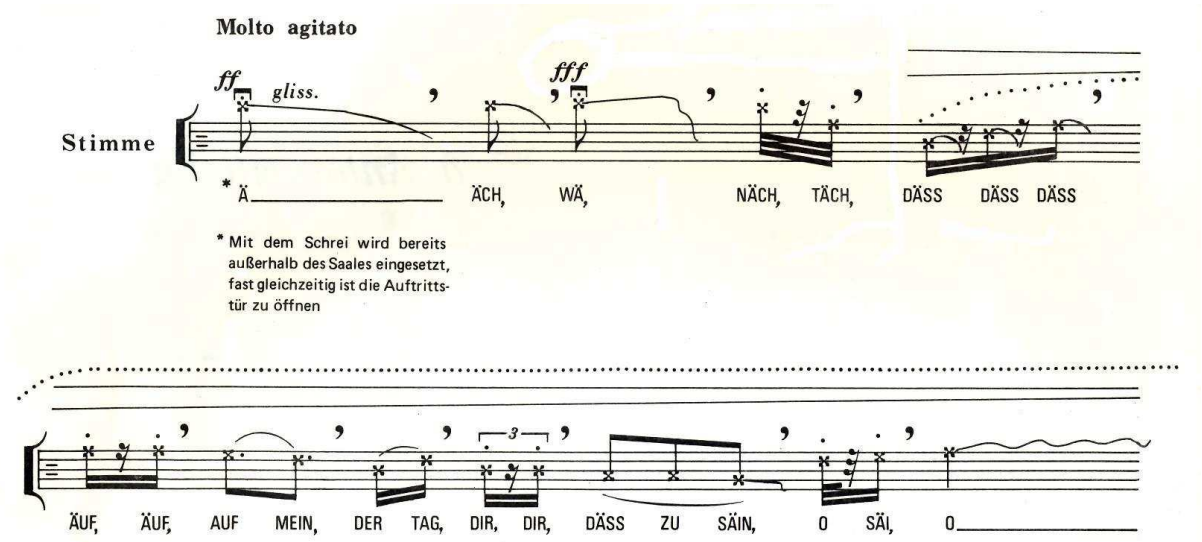
3.4.7.7.2 1972 *Recitativarie*

In 1972 Kagel composed a complete evening program called *Program – talks with chamber music.*[1649] Among pieces for different types of vocal ensembles, for unique settings such as accordeon quintett or zither quartett, for "continuous sounds" (figured bass instruments), plucked orchestra (a mandolin ensemble played the premiere), and cello solo, there are two pieces of interest to the study at hand: *Recitiativarie* for singing harpsichord player and *Unguis Incarnatus Est* for piano and unspecified instrument.

[1649] "Programm. Gespräche mit Kammermusik."

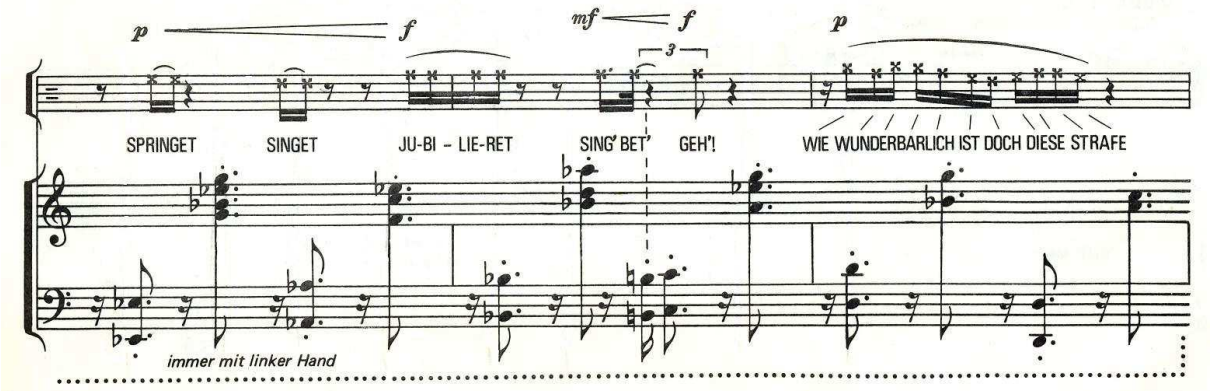
Recitativarie was written for harpsichordist Antoinette Vischer and was called a "linguistic-semantic analysis of our relation to faith" by Kagel.[1650] The piece consists of a recitative, followed by an aria and introduced by a sort of prelude, with the performer singing (more or less exactly pitched) from beginning to end. The text is a collage of words from Bach's four-part chorals, the music is on the one hand a collage of literal fragments from the left hand part of Chopin's nocturne opus 48 nr. 1 and atonal reflections of that material, and on the other hand the bass of a 1714 chorale.

Kagel integrates all the performance presentation aspects – such as entry and exit – into a completely dramatised score. The performer has to enter the stage from either backstage or from among the public. While the performer starts the vocal part already from outside the hall (when the door to the stage is opened), the tempo of the entrance ("extremely excited, with short, fast steps") and the posture ("with the right arm held out stiffly as in harpsichord playing") is prescribed in the score. (Ex. 3.1026.)



Example 3.1026. M. Kagel: *Recitativarie* (1972), opening. © With kind permission by UNIVERSAL EDITION A.G., Wien.

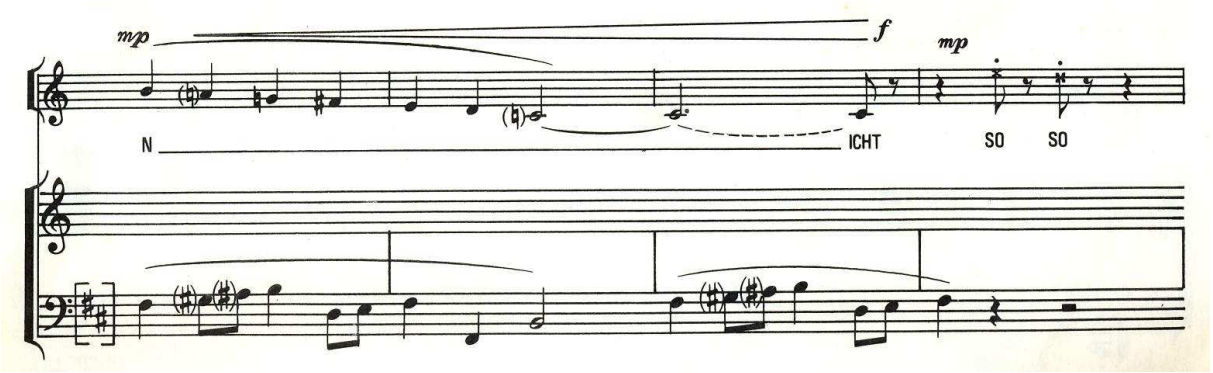
Arriving at the harpsichord, the player kneels in front of the instrument with hands in prayer pose and the eyes directed upwards, and starts to "psalmodise with thin voice." After having reached a highpoint of extasy at the words "Jew Sweet Taste," the performer sits down with determination (hands still in prayer pose) and starts to execute the recitative in Sprechstimme, accompanying herself with the left hand. (Ex. 3.1027.)



Example 3.1027. M. Kagel: *Recitativarie* (1972), opening. © With kind permission by UNIVERSAL EDITION A.G., Wien.

[1650] Klüppelholz 1981, p. 56.

The aria accompaniment is an 8-fold repetition of a 1714 Freylinghausen bass line, with the voice uttering different mixed up versions of the original text "if you have god you have no distress."[1651] At the middle of the aria, the harpsichordist has to show that she can actually sing and hold fixed pitches. (Ex. 3.1028.) At the end of *Recitativarie* the performer freezes the last position of the head and hands, stands up energetically, stands still for a moment with the eyes toward the keyboard, and puts the right hand behind her back. After 7 seconds, she leaves the stage with fast steps (a little larger steps than during the entry), with all five fingers of the right hand pointed towards the instrument and the head "strongly turned to the right," taking the applause only after a renewed entrance.[1652]



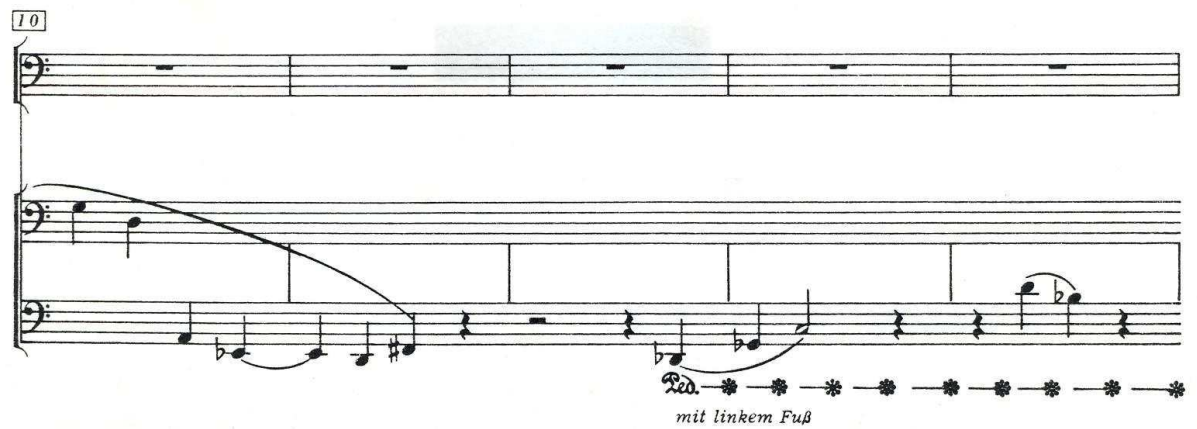
Example 3.1028. M. Kagel: *Recitativarie* (1972), opening. © With kind permission by UNIVERSAL EDITION A.G., Wien.

Recitativarie is the first keyboard piece in which the complete presence of the performer is prescribed and dramatised. Already in his *Phantasie* for organ and obligatories (1967) Kagel had asked the performer to leave the organ bench at the end of the piece and to proceed as quietly as possible to the nave of the church, slowly and with bowed head, walking without shoes up to the centre aisle to the front row to take a seat. (If performer on a concert hall organ, the performer has to take a seat in the back of the hall.) For the *Improvisation Ajoutée* (1962/68), the assitants and organist are required to clap and perform a series of "vocal events" such as whistling, singing, coughing, shouting, talking, laughing and shouting. But it is only with *Recitativarie* that the complete performance practical attitude is prescribed from beginning to end. Like for some of Cage's pieces from the late 1950's (which Kagel knew), the instrument has become a prop on the stage that is set for a performance that consists entirely of prescribed actions. Unlike those Cage pieces, *Recitativarie* integrates that prop as the central object of the critique that the composition represents. The harpsichord is the object of the performer's adoration, it is the altar at which she expresses her faith. Musically, the keyboard instrument is not used improperly at all. Conceptually, it is on the same level as many fluxus composers worked at. As much as they criticised the piano as a bourgeois status symbol (e.g. Brecht's word piece asking the performer to put a vase on the piano), Kagel throws light on the harpsichord (and the repertoire associated with it) as representative of religious fanaticism.

[1651] "Hast du Gott, so hat's nicht Noth."
[1652] All descriptions of actions are taken from the score.

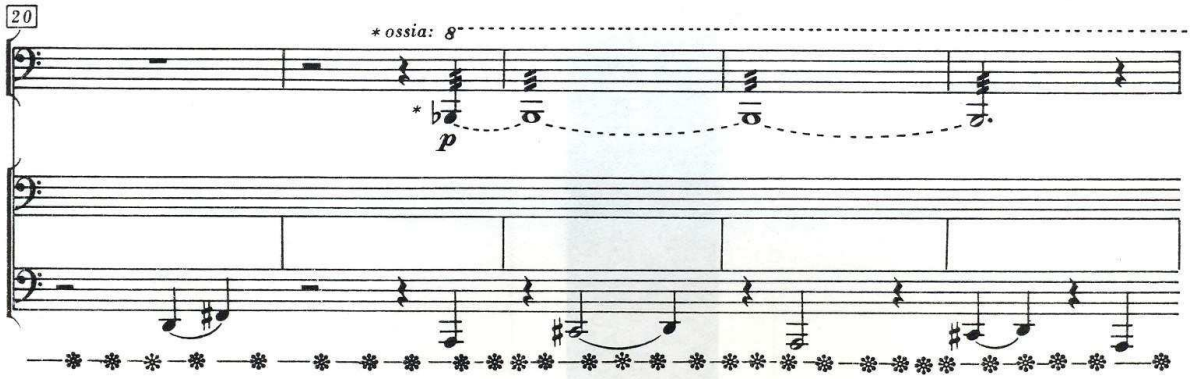
3.4.7.7.3 1972 *Unguis Incarnatus Est*

Included in the same evening filling *Program* that *Recitativarie* was part of, the piece called *Unguis Incarnatus Est* ("for piano and…") suggests a similarly devout perspective. But the latin title is misleading, and if the music is intended to worship anything or anybody, it is Franz Liszt. As *Recitiativarie*, *Unguis Incarnatus Est* is built from musical material from another era, in this instance Liszt's piano piece *Nuages Gris* (1881). The latter's opening motif, its tremolos in the bass, and some of the nearly-atonal chords are all that *Unguis Incarnatus Est.* Kagel admired this type of late Liszt piece for its precedental function in music history, as it shows extreme intensity of expression while profoundly reducing the means. Kagel's piece can therefore be compared to Liszt's own parafhrases of other composer's works. But the title of Kagel's composition does not refer to Liszt, not even at the catholicism that the old Listz had embraced. In fact, "unguis incarnatus" is a medical term for an ingrown toe-nail. And that is what's at the heart of this composition. The opening is without pedal, and once the Liszt motif has been introduced and turned inside out, fragments of it return, this time with sustaining pedal. Instead of the right foot, the left one is used. Instead of pedalling to sustain actual sounds, the silences are subjected to the same action. (Ex. 3.1029.) With the *p* dynamic, the lifting and dropping of the dampers can be heard on many pianos when the felt activates the strings by rubbing against them.



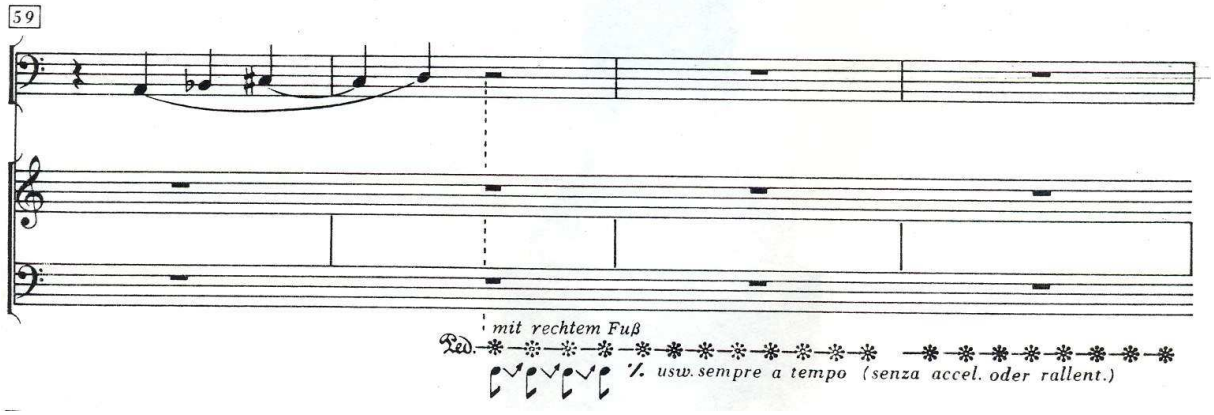
Example 3.1029. M. Kagel: *Unguis Incarnatus Est* (1972), bars 10-14. "With the left foot. »© With kind permission by UNIVERSAL EDITION A.G., Wien.

Soon afterwards, when the second instrument starts to play (it is undetermined but has to be able to sustain long bass notes, e.g. a double bass, organ, accordeon) the deficiency of the traditional pedal notation starts to show: it is increasingly hard to know when exactly to pedal, and there are certainly more pedal indications than there are quarter notes. The deep bass tremolos remind us of Liszt's grey clouds and predict that something is not right. (Ex. 3.1030.)

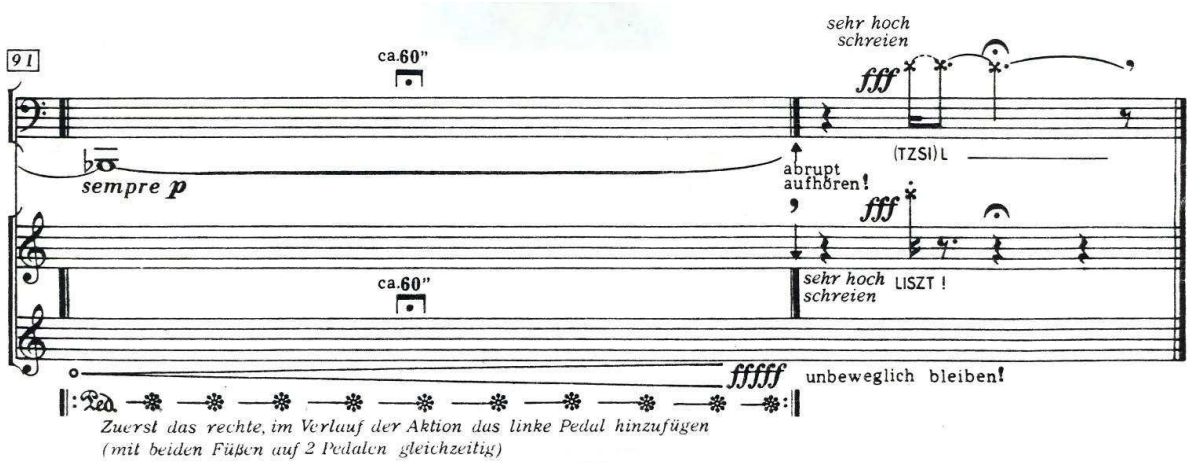


Example 3.1030. M. Kagel: *Unguis Incarnatus Est* (1972), bars 20-24. © With kind permission by UNIVERSAL EDITION A.G., Wien.

As if starting all over again with fresh courage, the pianist now applies the right foot to the right pedal and sets in a steady tempo and a regular cadence. (Ex. 3.1031.) This rhythm remains for some 23 bars, is interrupted by non-activity, and finally resumes for the final episode. The steady 8th-note pedal rhythm is now to be kept in pace for a full 60 seconds, during which both feet and both pedals are gradually put to use to produce an enormous crescendo, all the while sustaining no piano sound. (Ex. 3.1032.) As the pedal mechanisme is factory-fitted with felt to absorbe unwelcome noises from its action, such a crescendo is impossible without violently hitting the pedals. When the excruciating exercise is over, the pianist stays motionless but shouts (at) Liszt while the second instrumentalist utters the inverse, perhaps reflecting the pain that the pianist must suffer from the ingrown toe-nail.



Example 3.1031. M. Kagel: *Unguis Incarnatus Est* (1972), bars 59-62. « With the right foot." © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.1032. M. Kagel: *Unguis Incarnatus Est* (1972), final bars. « First the right, in due course of the action add the left pedal (with both feet on 2 pedals simultaneously).” “Remain motionless.” “scream at very high pitch.” “stop abruptly.” © With kind permission by UNIVERSAL EDITION A.G., Wien.

3.4.7.7.4 1976 *M.M. 51*

M.M. 51, A piece of film music for piano, refers to Schoenberg’s 1930 *Begleitmusik zu einer Lichtspielszene*, with its subtitle “Threatening danger, fear, catastrophy.”[1653] If the expression of the threat that comes from undefined danger and anxiety is the same in both pieces, Kagel writes a score that is very different from Schoenberg, in that he puts it together with the clichés that audiences know from the commercial movie industry.[1654] Besides these “acoustical anecdotes” from the horror movie genre, such as slow chromatically rising seventh chords or sudden accents in irregular deep bass note rhythms, Kagel requires from the pianist two specific techniques to add to the repertoire of effects and to enhance the dramatic tension: improper handling of a metronome and laughter.

A metronome is to be attached to a contraption that allows it to be tilted at will of the pianist who must control the mechanism by the left foot. The metronome can either be controlled remotely (ex. 3.1033) or by attaching it to the foot (ex. 3.1034).
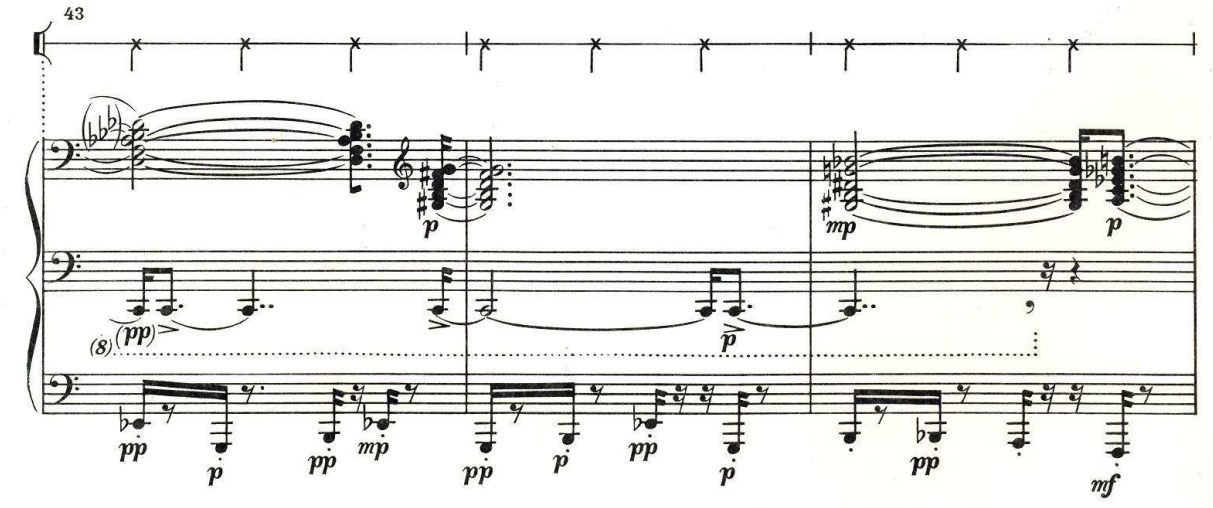


Example 3.1033. M. Kagel: *M.M. 51.* (1976), drawing of the remote-operated metronome control mechanism, as in the performane notes. © With kind permission by UNIVERSAL EDITION A.G., Wien.



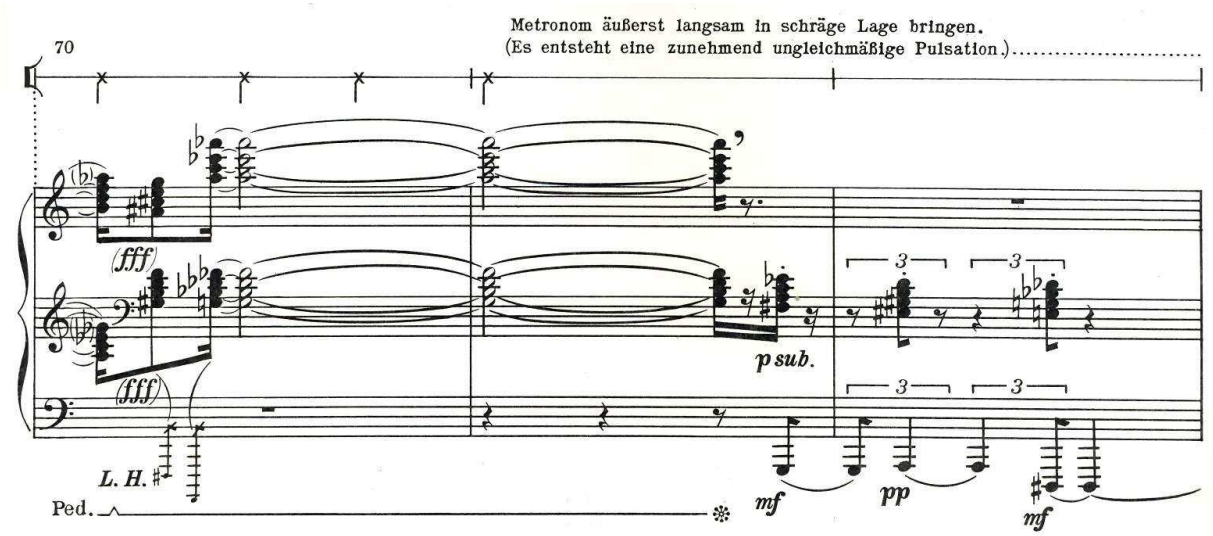
Example 3.1034. M. Kagel: *M.M. 51.* (1976), drawing of the direct-operated metronome control mechanism, as in the performane notes. © With kind permission by UNIVERSAL EDITION A.G., Wien.

[1653] The full original title is *Begleitungsmusik zu einer Lichtspielscene (Drohende Gefahr, Angst, Katastrophe) op. 34.*
[1654] Klüppelholz 1981, p. 139.

The working of the metronome is indicated in the score, where Kagel composes with the effect of contrasting the metronome's regularity with the unsteady meter of the piano part. (Ex. 3.1035.) In *M.M. 51* – subtitled *A piece of film music for piano*[1655] – the metronome represents the steadiness of evil (Kagel once compared it to the archetypical movie-vilain who is never out of breath[1656]) whereas the pianist expresses the victim's anxiety. When the metronome is tilted sideways, the balance between the two weights that are crucial to the working of the tool is disturbed, whereby the ticking becomes irregular.[1657] (Ex. 3.1036.)
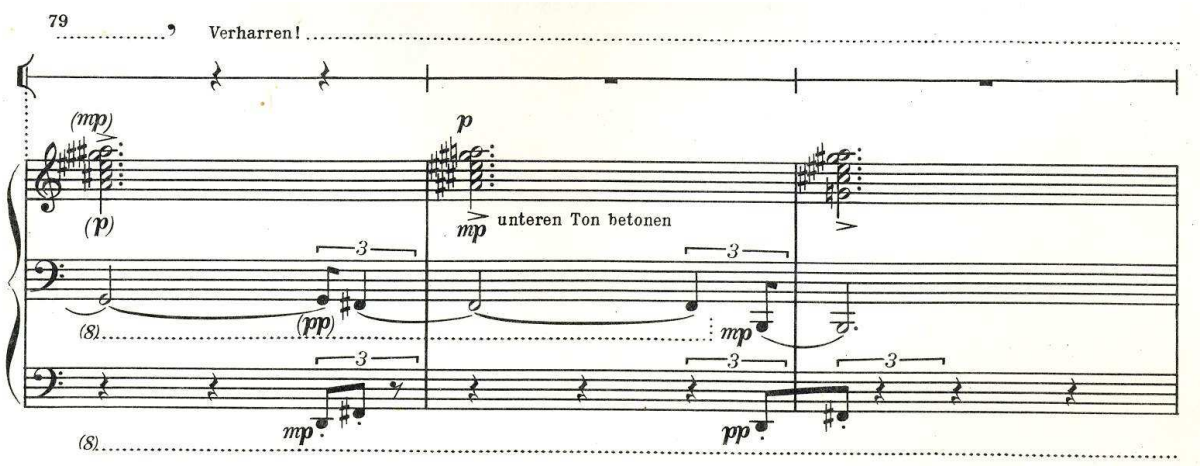


Example 3.1035. M. Kagel: *M.M. 51.* (1976), bars 43-45. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.1036. M. Kagel: *M.M. 51.* (1976), bars70-72. © With kind permission by UNIVERSAL EDITION A.G., Wien.

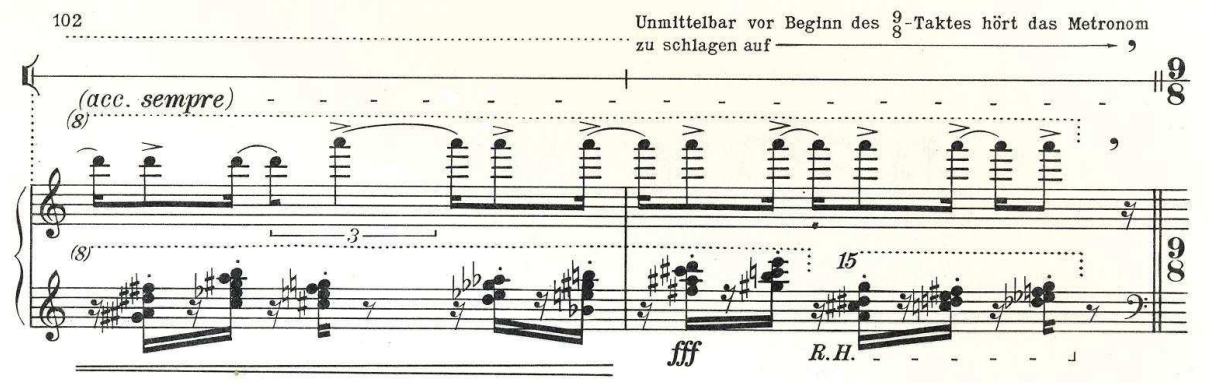
When the inclination exceeds a certain angle, the metronome stops working altogether. The ensueing silence is one of only three moments in the piece where the evil is out of hearing. (Ex. 3.1037.) By operating the control mechanism to direct the metronome towards its upright position, the latter starts to beat (irregularly) again by itself.

[1655] *Ein Stück Filmmusik für Klavier.*
[1656] Personal communication with author during rehearsals for concerts.
[1657] Kagel had used this technique already in *Staatstheater* (1970), where the metronome is attached to the head of a performer.



Example 3.1037. M. Kagel: *M.M. 51.* (1976), bars 79-81. © With kind permission by UNIVERSAL EDITION A.G., Wien.

As the tilting of the metronome is to be slow and gradual, the method of operating directly with the foot (ex. 3.1034) is easily in conflict with the piano part. As long as the metronome has to beat irregularly, it must remain in its exact position. Only with the remote control can it be left in its position so that the foot is free to operate pedals or to balance the body when playing high up the keyboard. (Ex. 3.1038.) Kagel does not prescribe una corda, but he does indicate the "prolongment pedal" (again, erroneously called sustaining pedal). In the case of the foot-attached metronome, the sostenuto pedal can only be operated by the right foot, an action which is as awkward and cumbersome as operating the brakes in a car with the left foot.

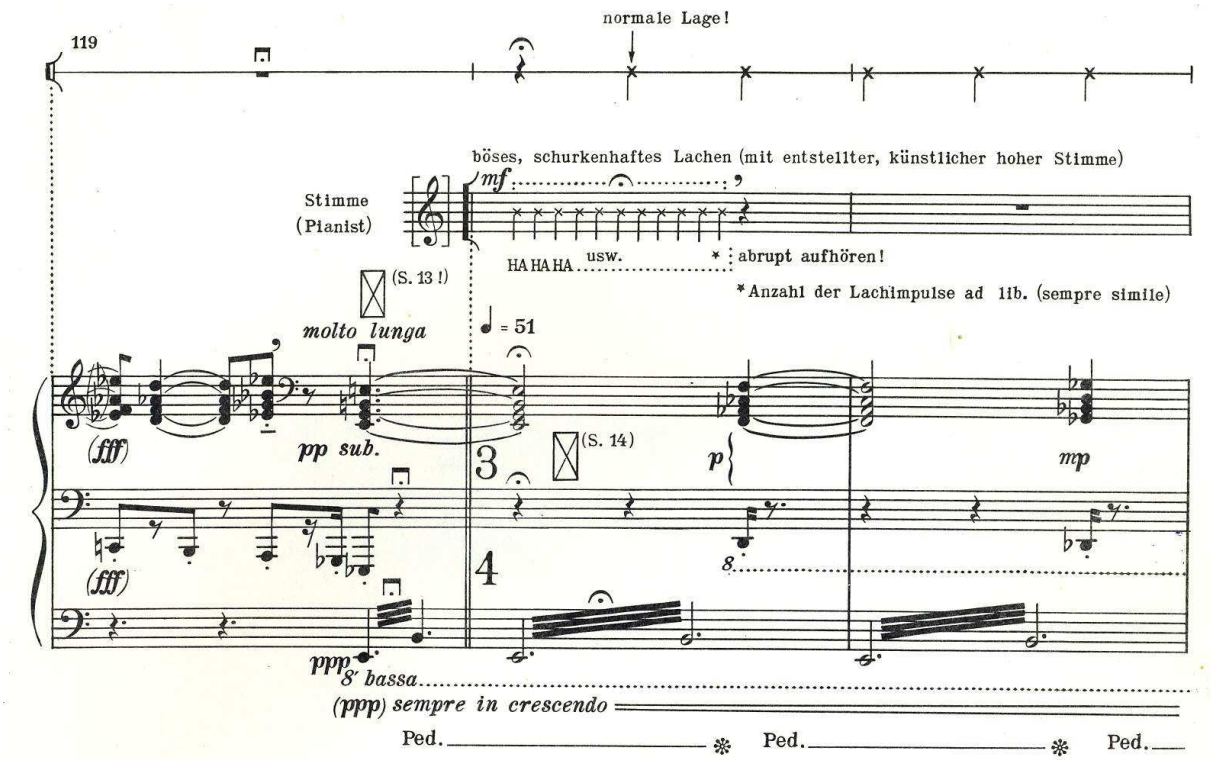


Example 3.1038. M. Kagel: *M.M. 51.* (1976), bars 102-103. © With kind permission by UNIVERSAL EDITION A.G., Wien.

The second improper technique in *M.M.51* is that of laughing. The piece was published as a solo for piano, but Kagel conceived it also to be music for a film that he made for the Swiss TV in 1981.[1658] The first film version is a registration of Aloys Kontarsky playing the music at a grand piano in concert dress; the second version shows him at an upright piano, dressed as a period silent movie accompanist, with Friedrich Wilhelm Murnau's 1922 *Nosferatu* in the background. When the camera is not focusing on the pianist or the metronome (Kontarsky uses remote- control), excerpts of *Nosferatu* are shown in more or less synchrony with the music of *M.M. 51* that is heard. But the pianist is responsible for audibly personifying *Nosferatu* as well. An "evil, villainous laughter (with deformed,

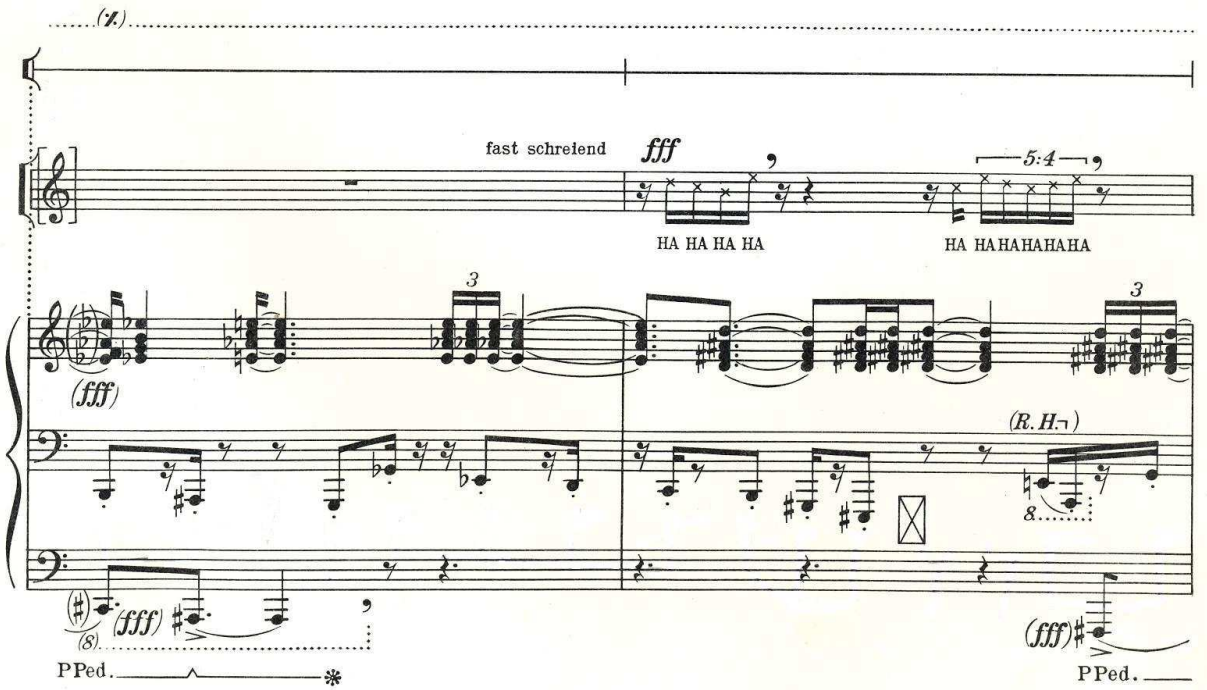
[1658] The production was finished in 1983; the first broadcast was in 1984.

artificially high voice)" rises ever more threateningly above crescendo tremolos. (Ex. 3.1039.)

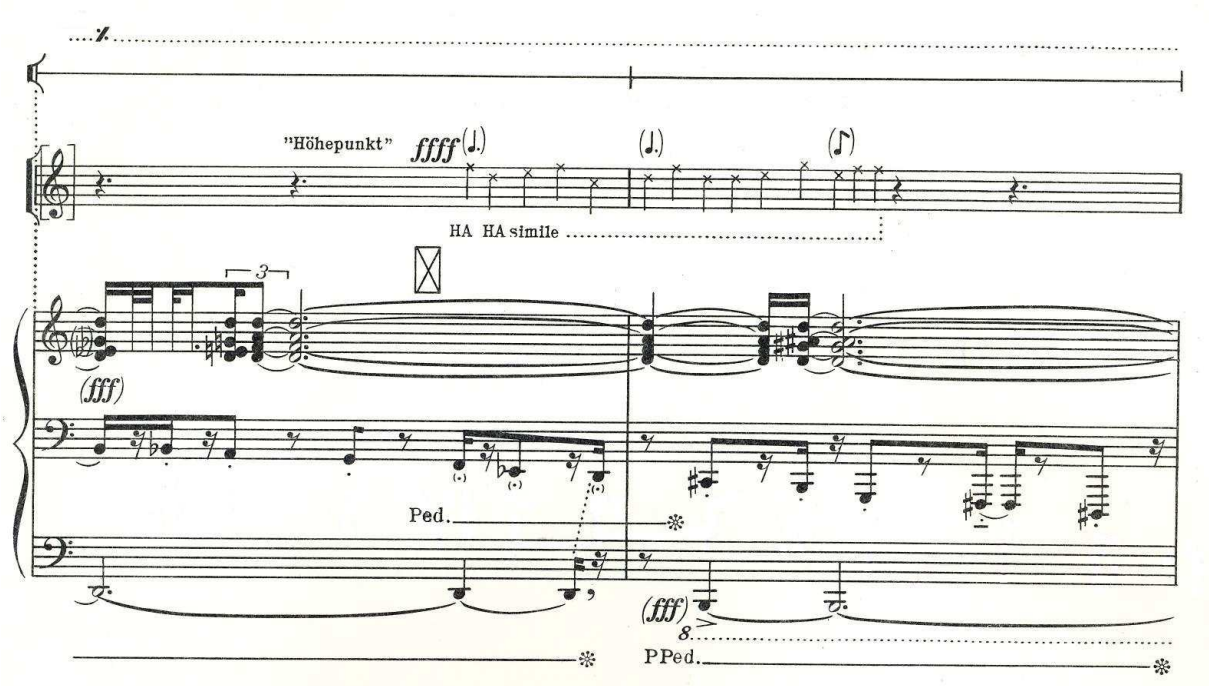


Example 3.1039. M. Kagel: *M.M. 51.* (1976), bars 119-121. © With kind permission by UNIVERSAL EDITION A.G., Wien.

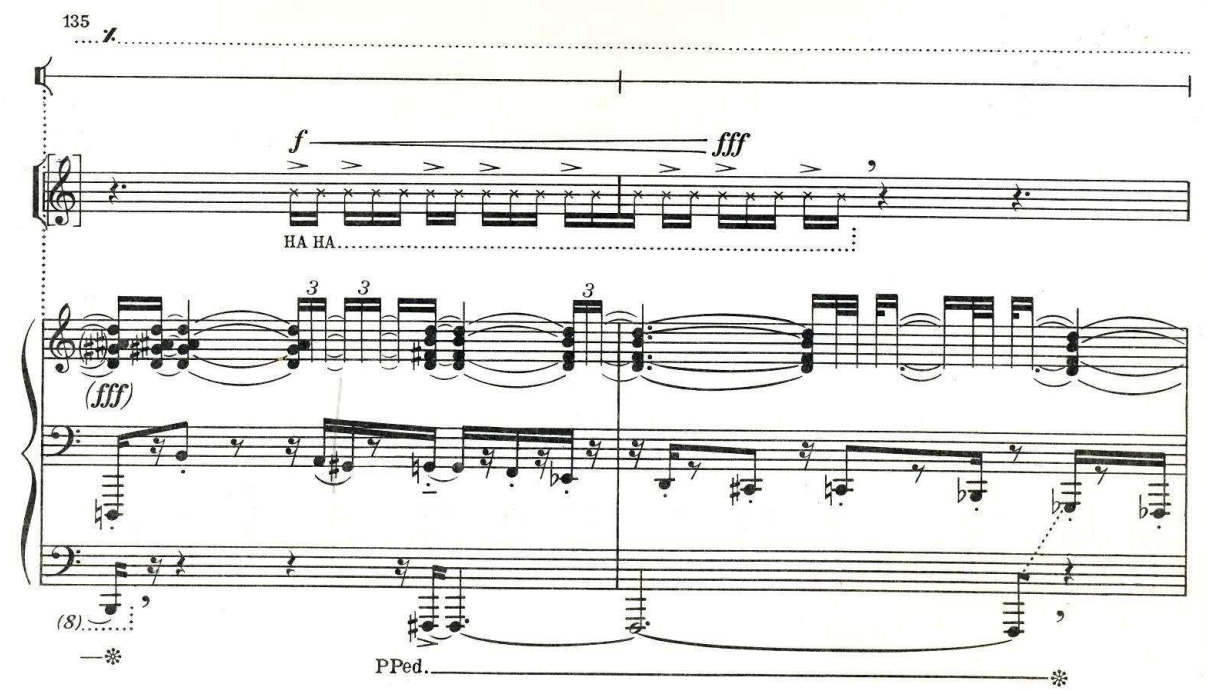
The introductory laughter – written out in a steady rhythm and pitch – evolves towards "almost screaming" (ex. 3.1040) and reaches a highpoint (ex. 3.1041) after which it seems to be sheer madness (ex. 3.1042).



Example 3.1040. M. Kagel: *M.M. 51.* (1976), bars 127-128. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.1041. M. Kagel: *M.M. 51.* (1976), bars 133-134. © With kind permission by UNIVERSAL EDITION A.G., Wien.



Example 3.1042. M. Kagel: *M.M. 51.* (1976), bars 135-136. © With kind permission by UNIVERSAL EDITION A.G., Wien.

The number of laughter impulses is not to be taken literally, according to the score. Nor should the notated rhythm of these impulses be considered exact, as the human voice is not equipped to produce such fast repeated laughs.

At the end of the piece, when releasing the key of the last sounding notes, the pianist has to breathe in strongly (as when startled) and freeze his pose with the left hand at the keyboard and the right hand clutched to his heart.

3.4.7.8 1965- The bowed piano

A last important development of the extended piano resulting in a specifically named sub-extension for which a specific repertoire has been created, is the "bowed piano."

For "bowing" a piano, the pianist has to make bows that resemble the bow of the traditional stringed instruments, but without the wooden handle. A ribbon or a bunch of nylon fish line strands put together with tape at the ends are used to play one or more notes (chromatically adjacent) by weaving the bow through strings and then pulling it from one to the other side and back. With the use of rosin, the friction between the bow and the string is facilitated to the point that smooth sustained sounds can be played.

3.4.7.8.1 1965-67 Luc Ferrari: *Société II – et si le piano était un corps de femme*

The first known composition for which a "bow" was required is *Société II – et si le Piano était un corps de femme* (1965-67) for four soloists (pianist and three percussionists) and ensemble by French composer Luc Ferrari (1929-2005). The whole piece is abundant with extended techniques, requiring the pianist to use percussion sticks, a piece of wood to glide over strings, a ruler, a metal bar, play keyboard clusters and directly manipulate strings in most of the ways that have been explored before. He also has to play crotales, scrape on the soundboard, play on the frame and outside parts of the piano, and sing into the piano. Interestingly, gliding and plucking of strings is also meant to affect the parts of the strings before the bridge, i.e. the non-tempered part. At one point a percussionist has to play with fingers, palms and sticks on different parts of the strings, soundboard, and side of the piano, and "tries to hit the same notes of the pianist and as such to change their timbre,"[1659] a collaboration reminding us of Kagel's *Transición II* (see above 3.4.6.7.2). Later in the piece, all three percussionists have to work their way around the stage to take place around the piano and play its in- and outsides.[1660] Much of the score is more or less indeterminate (notated graphically and partly verbally) and theatrical effects regarding the clothing, choreography and presentation actions are prescribed. A degree of improvisation is contrasted with accurately notated actions. Live electronics are asked for in as much as they were possible in the mid-1960's (see below, 3.4.7.9).

This concerto grosso is a veritable compendium of extensions that had been, in one or other way but never accumulated to this extent, devised and used in other composer's music previously written. One technique is new, however: a ribbon "of large red grain," 100cm by 2cm and "very rosined" is passed underneath the two lowest strings.[1661] It has to be held stretched with both hands at each end and slowly pulled to obtain a harmonic sound, rich and continuous.[1662] The technique is used only once in the piece, for one extended note (during a fermate, with orchestra holding their notes *p* and percussion playing fast but soft alternating rhythms) and with a crescendo and diminuendo between *p* and *f*.

[1659] On p. 7: "Contradiction entre P[ercussioniste] I et pianiste. PI essaie d'attraper les mêmes notes que le pianiste et d'ainsi transformer leur timbres." This collaboration goes on until p. 16.
[1660] P. 27.
[1661] Cited from the performance practice notes listing the materials used by the pianist: "ruban de gros grain rouge, très collophané (100cm x 2cm)."
[1662] P. 37: "Ruban passé sous les 2 plus graves cordes. Tenir tendu une main à chaque bout et tirer lentement pour attenir un son harmonique riche et continu."

3.4.7.8.2 1972- Curtis Curtis-Smith

As a student of pianist David Burge in 1960-'62, pianist-composer Curtis O.B. Curtis-Smith (°1941) may have been exposed to an interest in improper playing attitudes early on, as Burge had already premiered George Crumb's *Five Pieces* in 1963. At any rate, in 1972 Curtis-Smith developed his own method for bowing the piano strings, unaware of Ferrari's earlier attempt.[1663] Contrary to Ferrari's ribbon bow, Curtis-Smith put together 6 to 30 strands of a specified type of monofilament fishing line to create a bow of about 14" to 60" (depending on the required length of the bowed sound, or the weight of the string).

Curtis-Smith wrote several works for the bowed piano, starting with *A Song of the Degrees* for two pianos and percussionist (1972-73[1664]) and continuing with *Five Sonorous Inventions* for violin and piano (1973), the *Rhapsodies* for piano solo (1973), *(Bells) Belle du jour* (1975[1665]) and the *Unisonics* (1977[1666]) for saxophone and piano. A decade later, in *Fantasy Pieces* for violin and piano (1987), Curtis-Smith uses the bowing again, after which he stopped using the technique, "as I did not want to get "Stuck" doing the same thing too often; though I am not against using it again in the future perhaps."[1667]

Curtis-Smith happened across the idea of bowing the piano

> simply by experimenting with new inside-the-piano effects. I was trying to find something new, something which had not already been done by John Cage, Henry Cowell, or George Crumb. My first attempt was with an old violin bow, which I took apart and threaded between the piano strings. I switched to monofilament nylon fishing line, because the horsehair of the violin bow broke too easily---and the length of the violin bow was too short (and too many strands).[1668]

In *A Song of the Degrees*, the bowing technique is one of several extensions: next to fingernail and -flesh pizzicato, and playing on strings with mallets, Curtis-Smith prescribes "a special pick made from a blunted needle to produce a very metallic, clear sound," a standard plastic guitar pick, rubber tuning mutes to produce the 14th partial by applying rosin to them and sliding them rapidly between two of the three parallel strings of high treble choruses, a small wine bottle to glide across and alongside strings, a golf ball that is to be dropped onto strings through a tube, and a rubber wedge to be inserted in the pedal mechanism.

In the score, the performance notes for the bows detail the performance practice (preparation algorithm and timing, color-coding, placement on the piano, "up"- and "down"-bowing, method for pulling the bows up through the strings) and manufacturing specifics (including the brand of the best suited rosin), adding that the "specially made 'bows' [are] available from the composer."

No less than fifteen different bows are needed for two of the five movements of *A Song of the Degrees,* most of them for the third movement *…O confusion of colors.* The titles of all movements are taken from the poem of Ezra Pound that lies at the basis of the whole work:

> Rest me with Chinese colours, [Movement I and V]

[1663] E-mail to author, September 18, 2009.
[1664] Date according to the score. The (later) official work list gives 1972.
[1665] Date according to the work list. An e-mail to author (September 18, 2009) mentions 1976.
[1666] Date according to the work list. E-mail to author (September 18, 2009) mentions 1976
[1667] E-mail to author (September 18, 2009).
[1668] E-mail to author (September 18, 2009).

For I think the glass is evil.

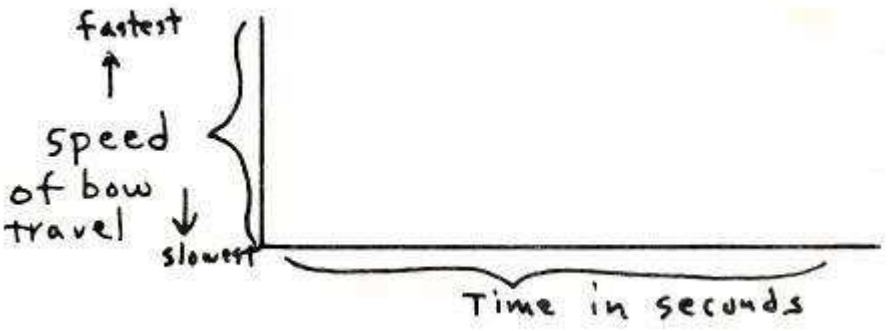
The wind moves above the wheat… [Movement II and IV]
With a silver crashing,
A thin war of metal.

I have known the golden disc,
I have seen it melting above me.
I have known the stone-bright place,
The hall of clear colours.

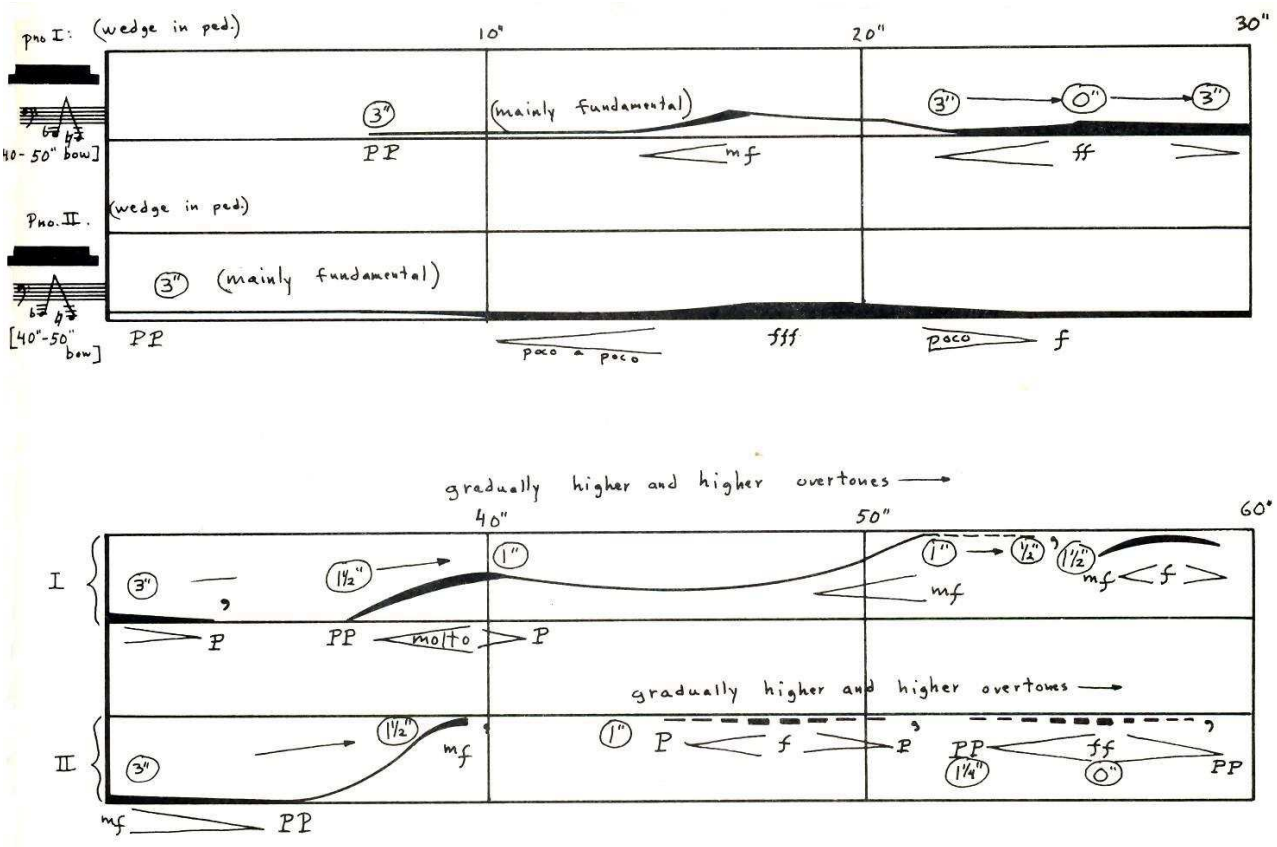
O glass subtly evil, O confusion of colours! [Movement III]
O light bound and bent in, O soul of the captive,
Why am I warned? Why am I sent away?
Why is your glitter full of curious mistrust?
O glass subtle and cunning, O powdery gold!
O filaments of amber, two-faced iridescence!

For the third movement, only two bows are prescribed: one for the A^1-$B\flat^1$ dyad in the first piano, one for G^1-$A\flat^1$. These bows are to be made with 20 strands of the filament, weighing six pounds in total and with a length of 59".

The notation for the third movement is developed specially for the bowing technique. (Ex. 3.1043.) The bottom graph line represents the slowest possible speed without stopping; the thicker the line, the more pressure is to be applied; a dotted line means very fast, "quasi flautando" bowing; the distance from the agraffe is indicated in encircled inches; an encircled "o" means right next to the agraffe; arrows show a gradual transition from one figure to the next. (Ex. 3.1044.)



Example 3.1043. C. Curtis-Smith: *A Song of the Degrees* for two pianos and percussion (1972-73), 3rd movement *…O confusion of colours,* performance note above the opening bars. Reproduced by permission of the composer.



Example 3.1044. C. Curtis-Smith: *A Song of the Degrees* for two pianos and percussion (1972-73), 3rd movement *…O confusion of colours,* opening bars. Reproduced by permission of the composer.

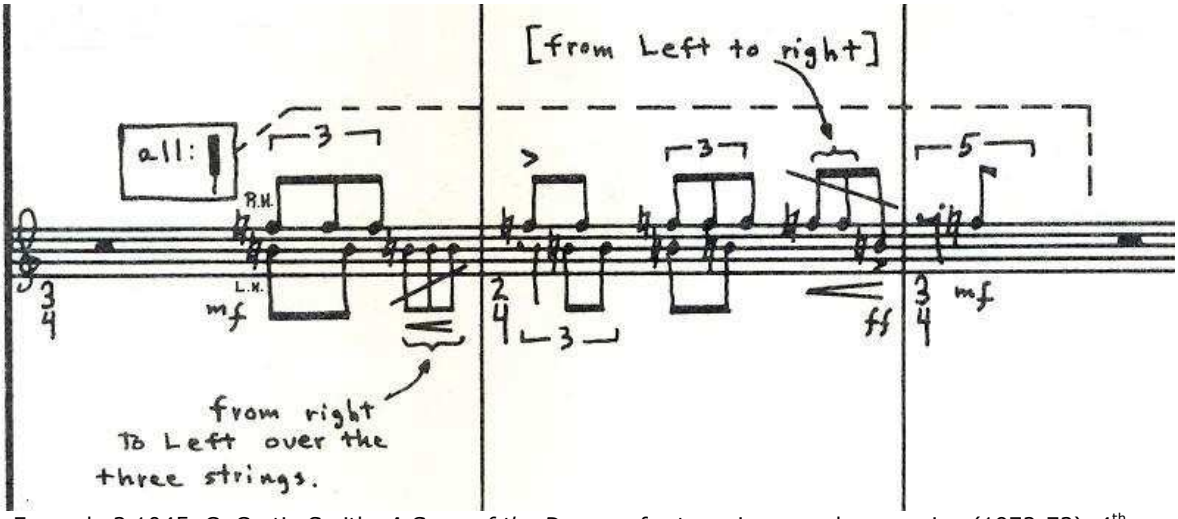
The percussionists literally "chime" in by bowing with a double-bass bow the bottom of the chime tubing.

Curtis-Smith takes into consideration the performance practice of the piano bowing when notating the bow technique: according to a performance note, the score is not to be adhered to rigidly, a considerable degree of freedom is essential to interpreting the score, as the bowed production of overtones is largely unpredictable. As for the sound specifications, Curtis-Smith furnishes performance practical advice so as to avoid "at all costs" a "rough, grating sound," comparing the need to have firmly in mind the envelope of the bowing sound "as one must precisely determine the envelope of electronically (Moog) generated sounds." The composer elaborates on the general sound atmosphere:

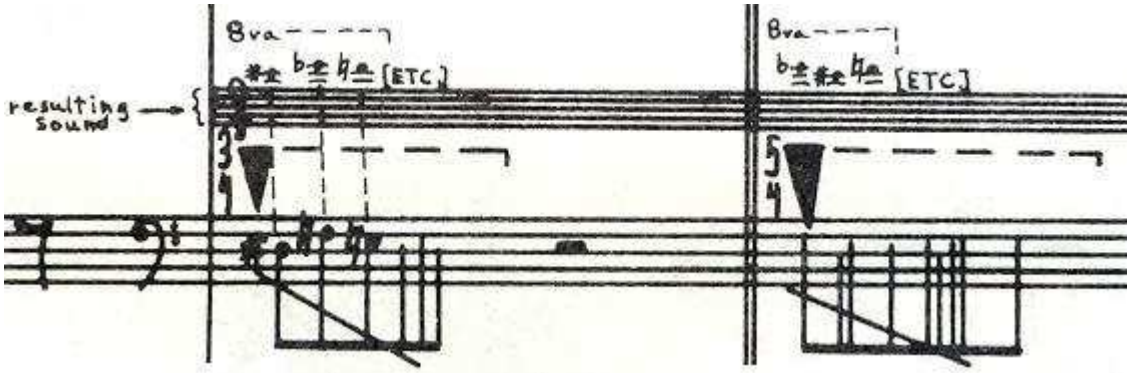
> All events must flow into each other or emerge from each other, somewhat as in electronic music, where the various "layers" of sound are mixed in and out with the aid of potentiometers or a mixing board.[1669]

In the fourth movement, *The hall of clear colours,* Curtis-Smith uses traditional notation for the bowing to match the notation of the other performance techniques. The previous movement only had bowing on pianos and percussion, here the bowing is combined proper playing on the celesta, the pianos and percussion as well as pizzicatos, glissandos over single choruses with the blunted needle pick (ex. 3.1045, compare to Hovhannes above, 3.4.5.1), both in indeterminate and determinate notation, the rosined rubber wedge screeches (ex. 3.1046) and keyboard clusters.

[1669] Performance practical note on p. 8 of the score.

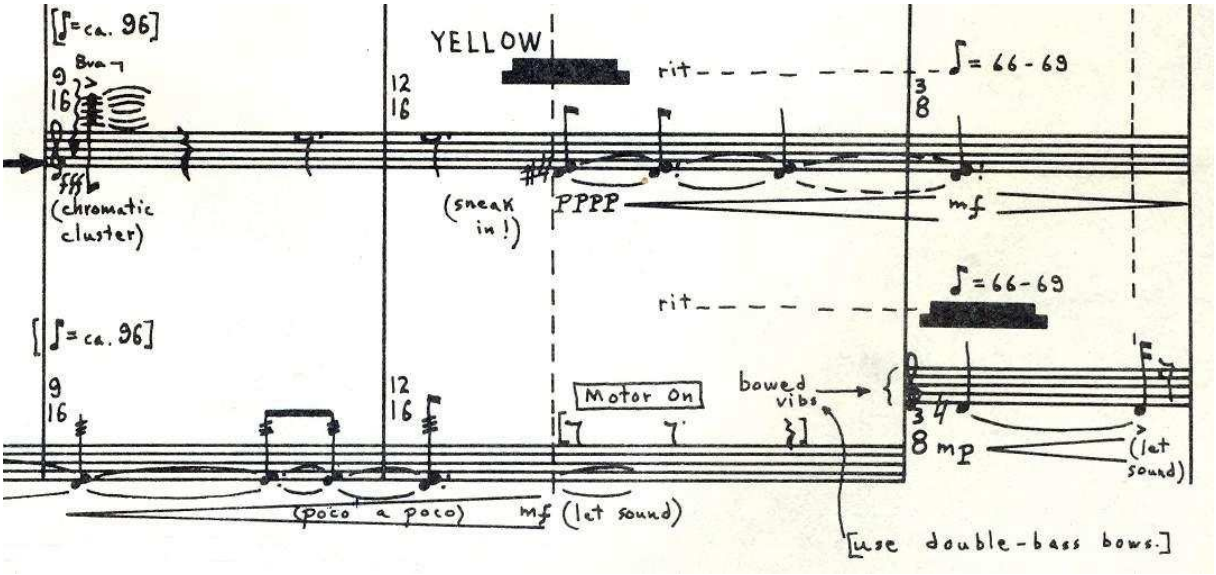


Example 3.1045. C. Curtis-Smith: *A Song of the Degrees* for two pianos and percussion (1972-73), 4th movement *The hall of clear colours,* bars 10-12. Reproduced by permission of the composer.

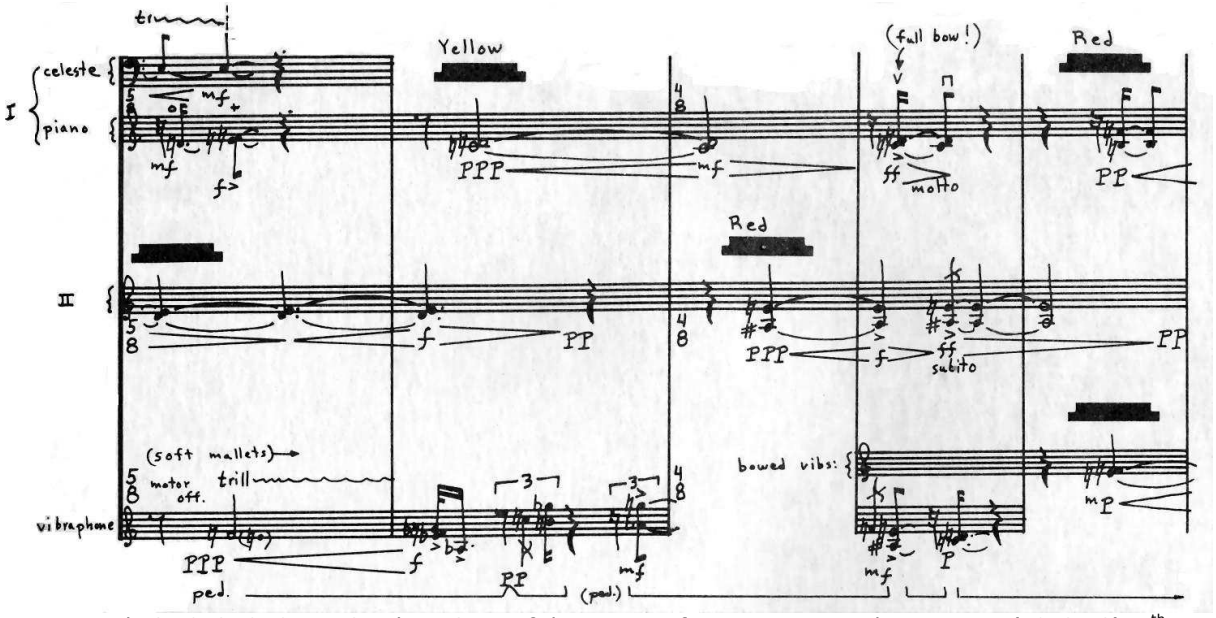


Example 3.1046. C. Curtis-Smith: *A Song of the Degrees* for two pianos and percussion (1972-73), 4th movement *The hall of clear colours,* bar 23. Reproduced by permission of the composer.

The bowing comes sneaking in during the vibraphone tremolos that are to be a continuous growth without individual repetitions being audible. (Ex. 3.1047.) Immediately, Curtis-Smith has the percussionist play the vibraphone with a double-bass bow so that three people are available to bow simultaneously. (Ex. 3.1048.)
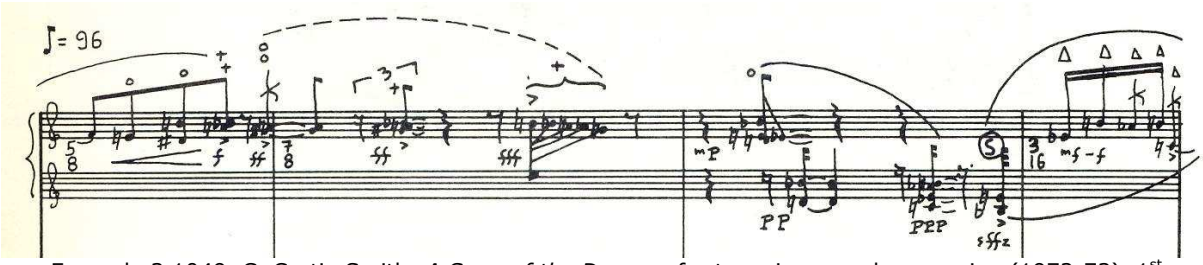


Example 3.1047. C. Curtis-Smith: *A Song of the Degrees* for two pianos and percussion (1972-73), 4th movement *The hall of clear colours,* bars 33-35. Reproduced by permission of the composer.



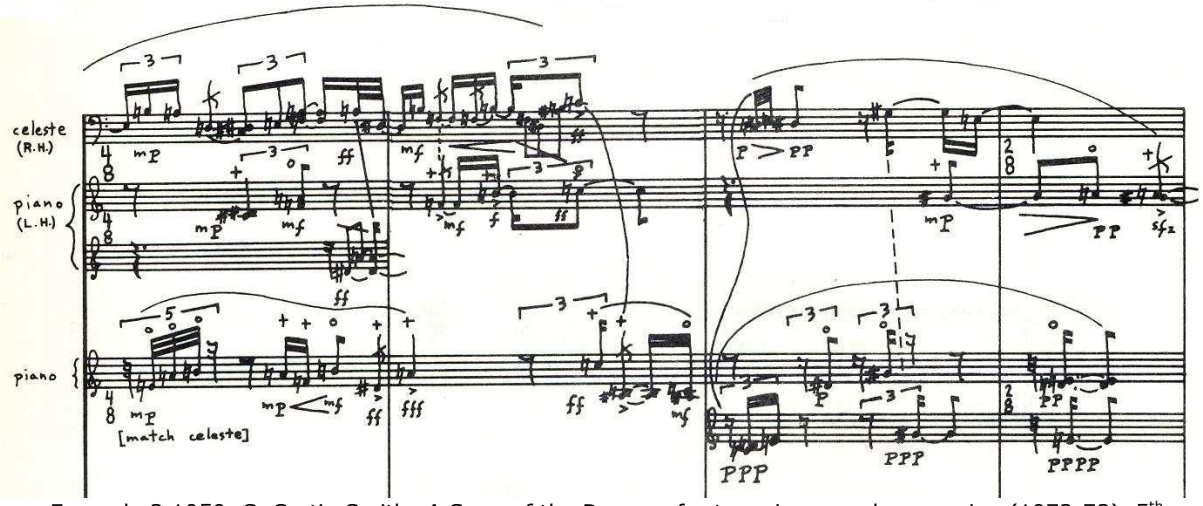
Example 3.1048. C. Curtis-Smith: *A Song of the Degrees* for two pianos and percussion (1972-73), 4th movement *The hall of clear colours,* bars 36-40. Reproduced by permission of the composer.

Remarkably, all bowed notes in *A Song of Degrees* are double notes. Contrary to the third movement, pressure, speed and place of bowing are not indicated in the fourth movement, only the traditional dynamics.

It is worthwhile to go into some of the other techniques that Curtis-Smith prescribes in *A Song of the Degrees*. If pizzicatos were a common and simple extended piano technique by the 1970's, Curtis-Smith demanded a level of virtuosity from it that was unseen. The score shows a complete disregard for the performer's need to take his time in finding the right string to pull. In *A Song of the Degrees,* double notes (even clusters) and switching from flesh to nail to guitar pick or combining them with celesta keyboard playing is prescribed as if they were to be played on the keyboard. (Ex. 3.1049 and 3.1050.)
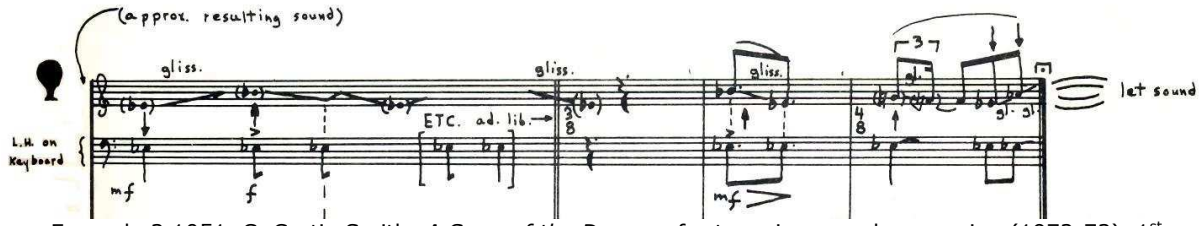


Example 3.1049. C. Curtis-Smith: *A Song of the Degrees* for two pianos and percussion (1972-73), 1st movement *Rest me with Chinese colours…,* bars 15-18. Reproduced by permission of the composer.

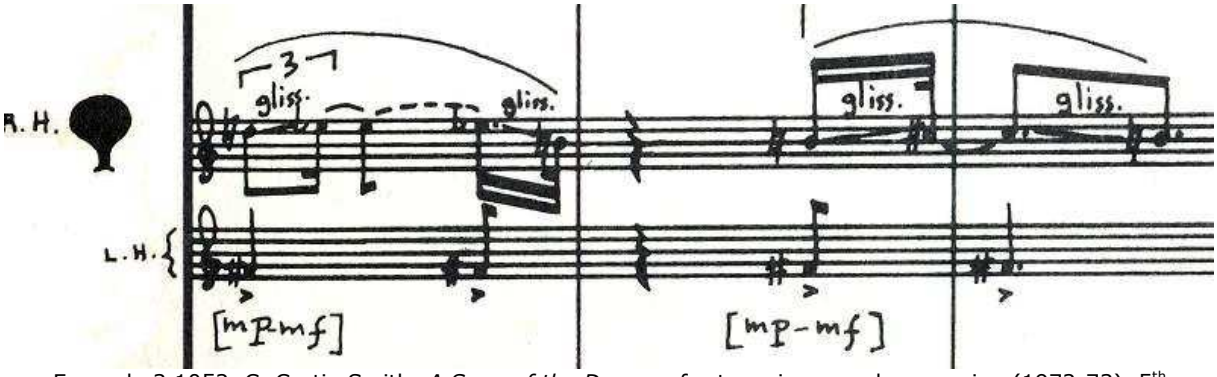


Example 3.1050. C. Curtis-Smith: *A Song of the Degrees* for two pianos and percussion (1972-73), 5th movement *For I think the glass is evil,* bars 8-11. Reproduced by permission of the composer.

At around the same time of *A Song of Degrees,* in the early 1970's, Crumb asked for a cocktail glass to be rolled over strings while playing a trill on the relevant keys (see above 3.4.5.4). Curtis-Smith's wine-bottle technique is a similar but more intricate use of the sliding effect. No trill is played, only a single keyboard-attack or a pizzicato of the same pitch. Again, the virtuoso level at which the technique is brought is remarkable: instead of the mere gliding back and forth between indicated pitches (which are either fundamentals or easily found partials), Curtis-Smith expects the pianist to be able to enter on any partial as he needs for his melody-constructing purposes. (Ex. 3.1051 and 3.1052.)

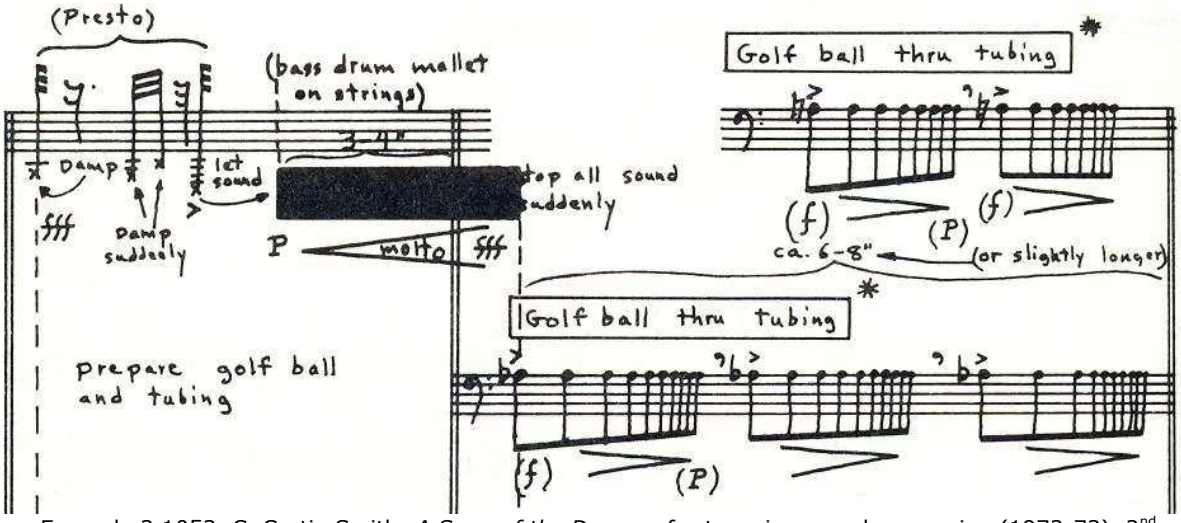


Example 3.1051. C. Curtis-Smith: *A Song of the Degrees* for two pianos and percussion (1972-73), 1st movement *Rest me with Chinese colours…,* final bars. Reproduced by permission of the composer.



Example 3.1052. C. Curtis-Smith: *A Song of the Degrees* for two pianos and percussion (1972-73), 5th movement *For I think the glass is evil,* bars 21-23. Reproduced by permission of the composer.

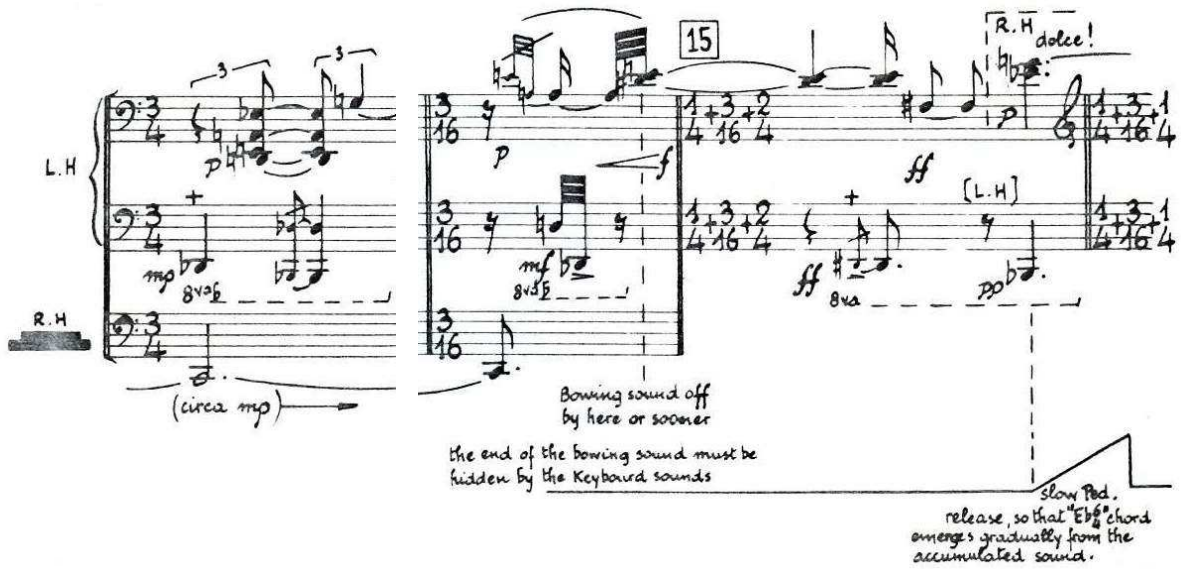
A technique completely of Curtis-Smith's own invention is the "Golf ball thru tubing" effect. A tube of ca ¼"-½" larger bore than the diameter of a golf ball, and 12"-14" in length, is held just slightly off (above) the surface of the strings at right angles. Through it, a golf ball is dropped and allowed to rebound several times, as suggested in the notation. (Ex. 3.1053.) As with many of the extended techniques, Curtis-Smith searches for integration of the golf ball dropping: the vibraphone is to imitate the effect with plastic mallets.



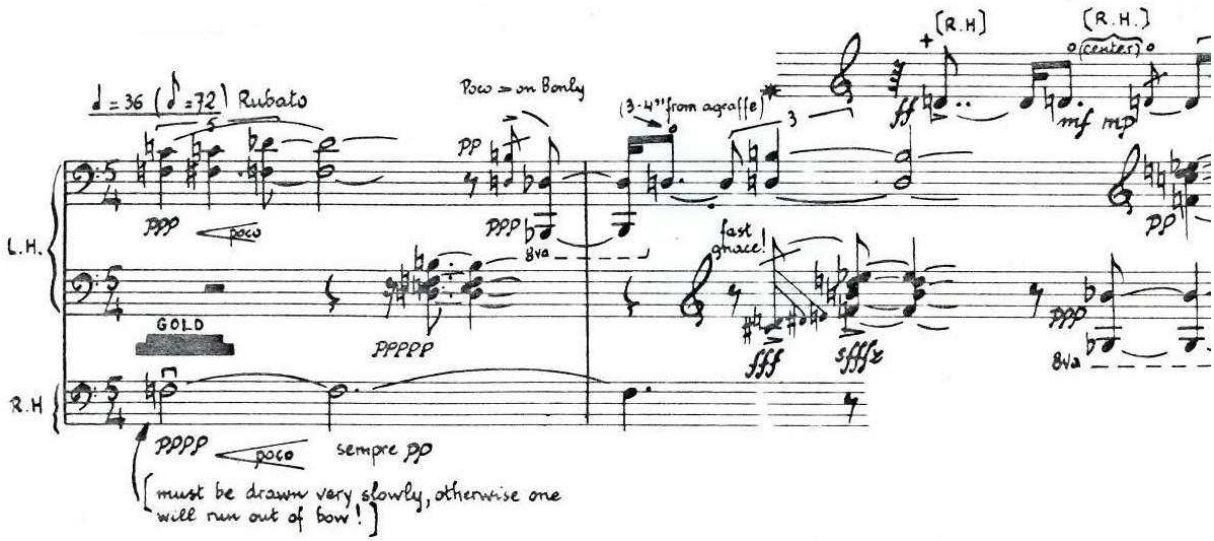
Example 3.1053. C. Curtis-Smith: *A Song of the Degrees* for two pianos and percussion (1972-73), 2nd movement *…a silver crashing,* bars 9-10. Reproduced by permission of the composer.

In the *Rhapsodies*, commissioned by Burge, Curtis-Smith again lays a foundation of known extended techniques such as silently depressed keys, half and gradual pedal release and some "flutter" pedal to "clear the air" of accumulated sound mass, pizzicatos with a thumb pick, the flesh or the nail of the finger, mallets to play tremolos on the bass strings, rubber wedges for in between strings, a glass bottle pressed against and rolled over strings, a golf ball rolled across bass strings, and whistling. Remarkable is the degree of precision in the composer's indications. Besides the six full pages of elaborate performance notes (including information on how to construct the bows and which brand of hardware is better than another), the score is extremely detailed. Many actions are annotated with verbal commentaries warning against unwanted aspects of sound production, specifying exact places along the strings for pizzicatos and bows (measured in inches from the agraffe). For the pizzicatos even the specific string of the chorus to be pulled is noted.

The first *Rhapsody* has no inside-techniques but the second one contains the known string playing techniques as well as bowing. Three separate notes have a bow designated to them: *f, C#,* and *C*. The technique is still rather basic, with long single bowed tones and some cross fade between proper tones and bowed tones. (Ex. 3.1054.) Nevertheless, this pieces makes it clear how, contrary to two pianists and a percussionist bowing double notes, for a solo pianist carefully exercised coordination is a prerequisite to balance the actions between one hand pulling the bow and the other hand playing the keyboard or the strings. (Ex. 3.1055.)



Example 3.1054. C. Curtis-Smith: *Rhapsodies* (1973), 2nd movement *But Wait! Low in dark middle earth. Embedded ore*[1670], bars 12-15. Reproduced by permission of the composer.

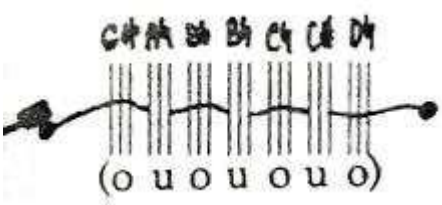


Example 3.1055. C. Curtis-Smith: *Rhapsodies* (1973), 2nd movement *But Wait! Low in dark middle earth. Embedded ore,* opening bars. Up-bow (V) = left hand pulls; down-bow (Π) = right hand pulls. Reproduced by permission of the composer.

In the second *Rhapsody*, Curtis-Smith goes one step further and has bows woven over and under adjacent choruses so that actual chromatic cluster-chords ($a^1 \rightarrow c\#^2$ and $d^1 \rightarrow$

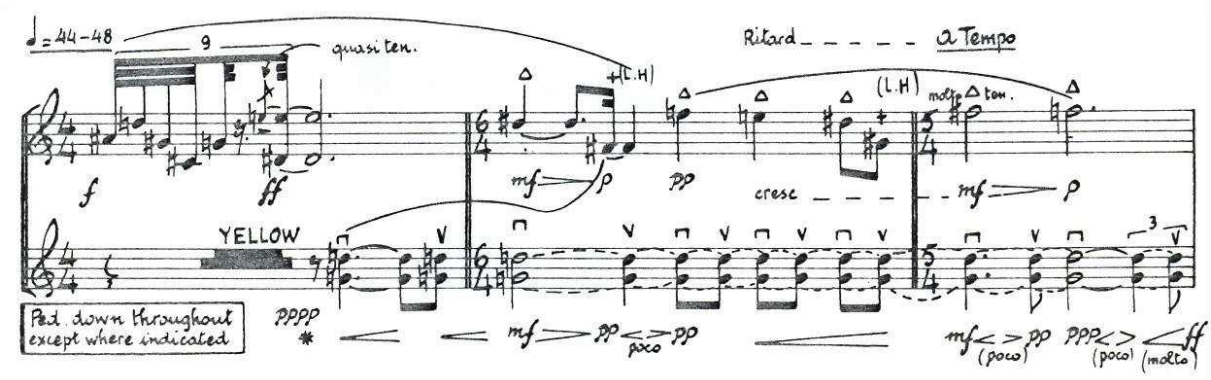
[1670] The titles of the movements are extracts from the Sirens chapter of Joyce's *Ulysses*.

e^1) can be sounded. (Ex. 3.1056.) All bowed notes in the second movement occur in the treble.

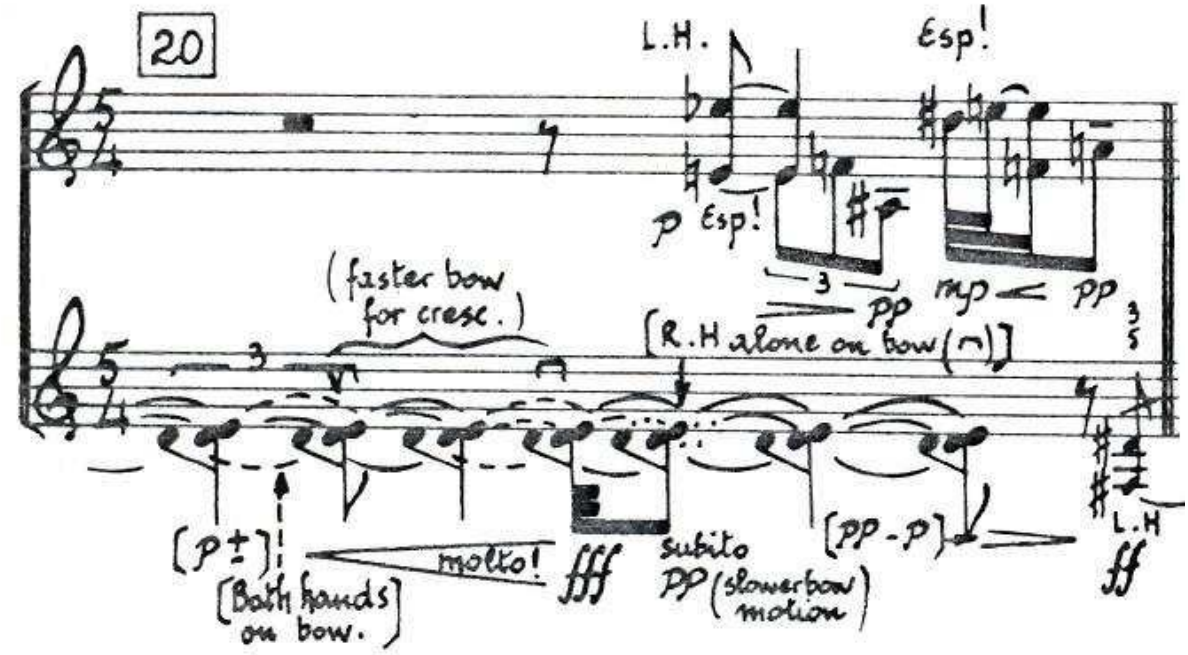


Example 3.1056. C. Curtis-Smith: *Rhapsodies* (1973), 3rd movement *And a call, pure, long and throbbing. Longingdying call*, bow-placement for clustered sound. Reproduced by permission of the composer.

Again, the degree of virtuosity needed to move between the keyboard and the strings, grabbing or putting down a bow is striking. (Ex. 3.1057.) Yet, the composer is expertly aware of where the limits lay: when a crescendo towards *fff* is prescribed, he allows for both hands to be free to pull the bow with enough speed and tension. (Ex. 3.1058.)

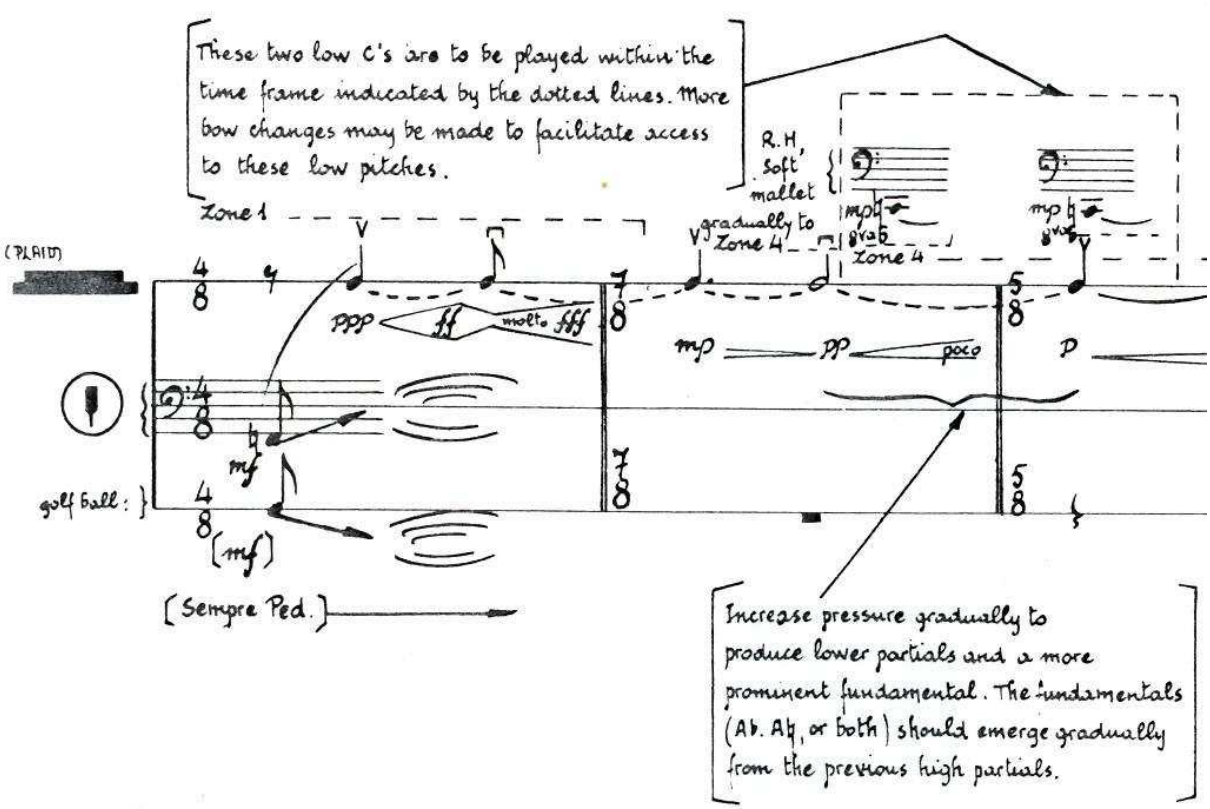


Example 3.1057. C. Curtis-Smith: *Rhapsodies* (1973), 3rd movement *And a call, pure, long and throbbing. Longingdying call*, opening bars. Reproduced by permission of the composer.

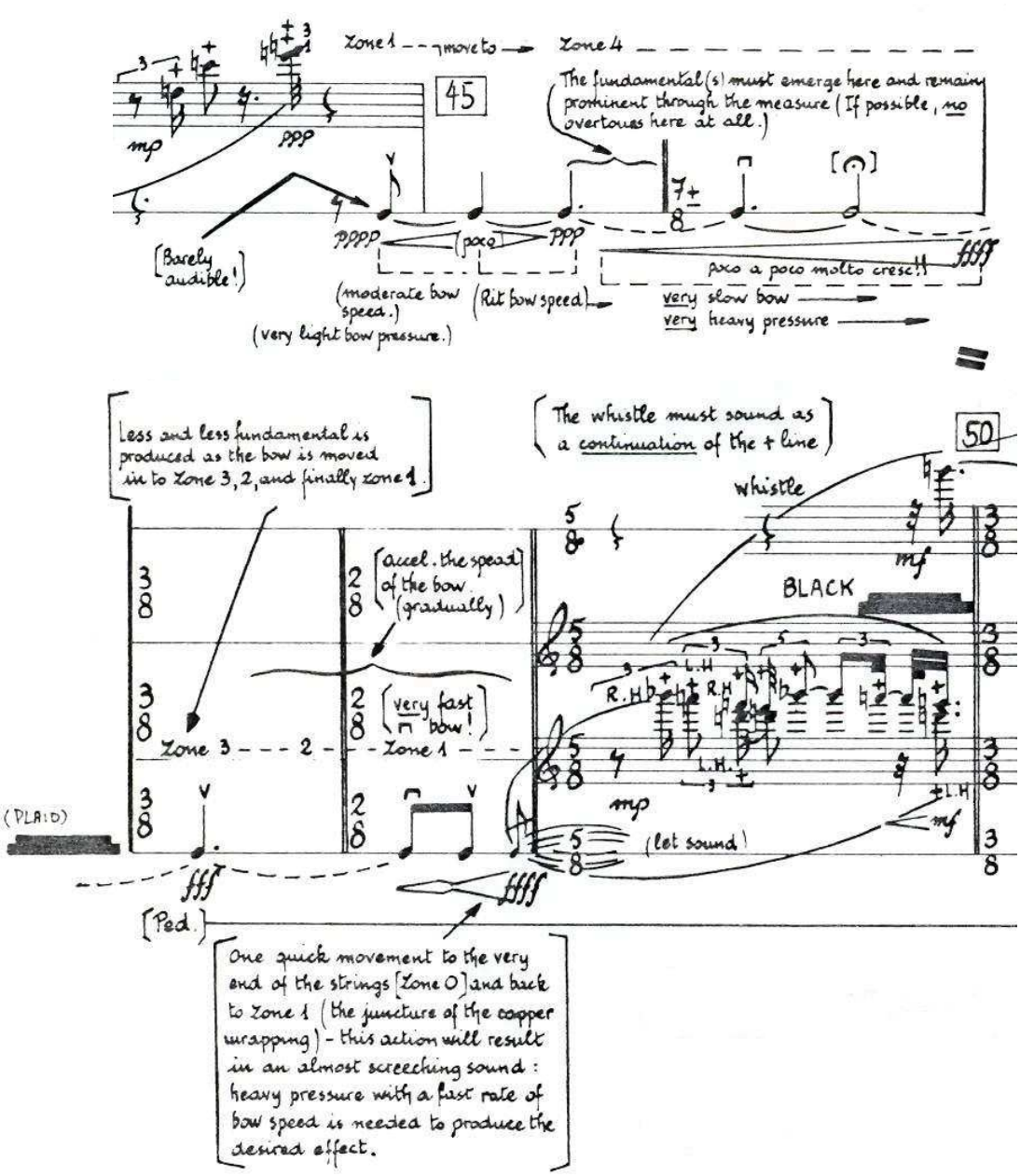


Example 3.1058. C. Curtis-Smith: *Rhapsodies* (1973), 3rd movement *And a call, pure, long and throbbing. Longingdying call*, bar 20. Reproduced by permission of the composer.

For the final *Rhapsody* (*Listen! The spiked and winding cold seahorn*), only two bowed intervals are needed: a major second up high in the treble, and a minor second low in the bass. But now the place along the string where it is to be bowed is specified as belonging to five zones: right at the end of the string, the last ¼″ of bare wire before the copper wire begins, the first ½" of the wrapping, ½" to 2" into the wrapping, and approximately the last inch before and including right up the first metal frame. This way, the composer has more control over what kind of harmonics is produced by bowing. (Ex. 3.1059 and 3.1060.)

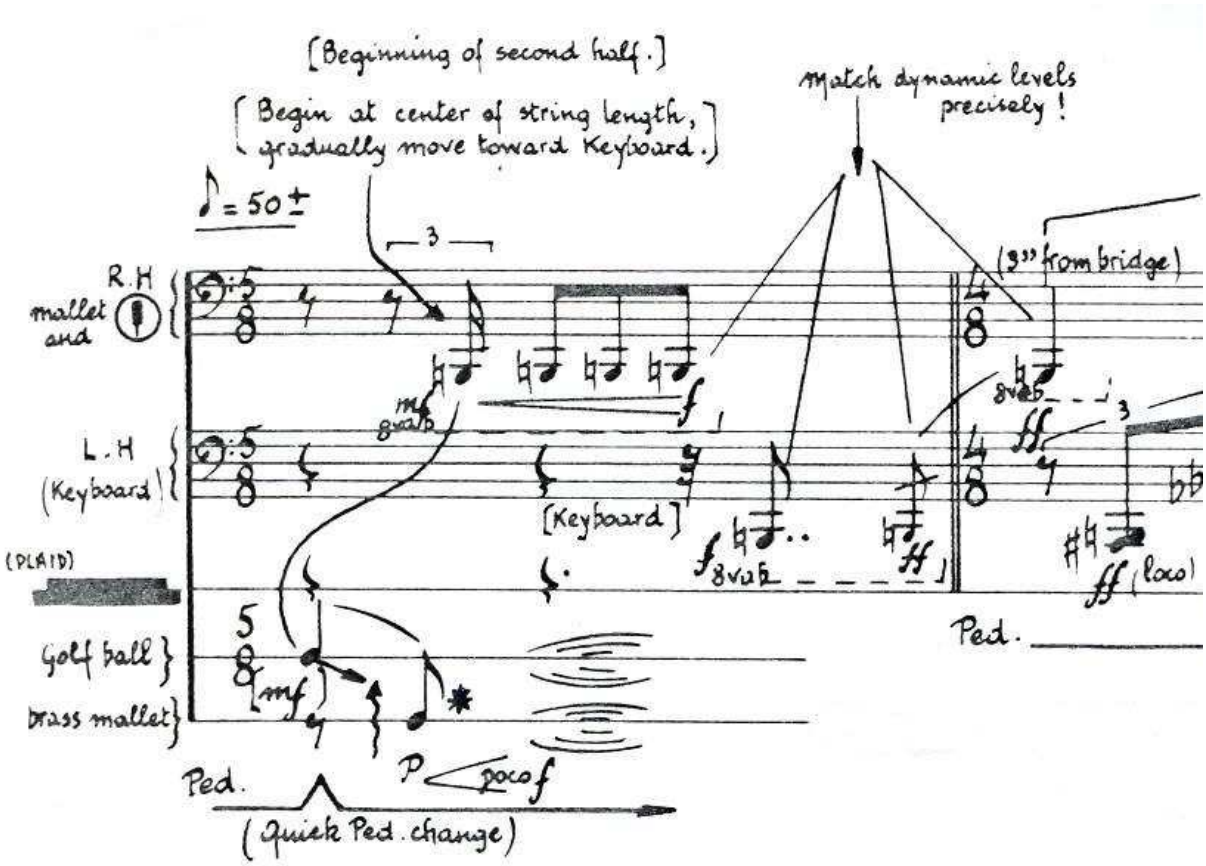


Example 3.1059. C. Curtis-Smith: *Rhapsodies* (1973), 4th movement *Listen! The spiked and winding cold seahorn*, bars 12-14. © Editions Salabert.



Example 3.1060. C. Curtis-Smith: *Rhapsodies* (1973), 4th movement *Listen! The spiked and winding cold seahorn*, bars 44-49. © Editions Salabert.

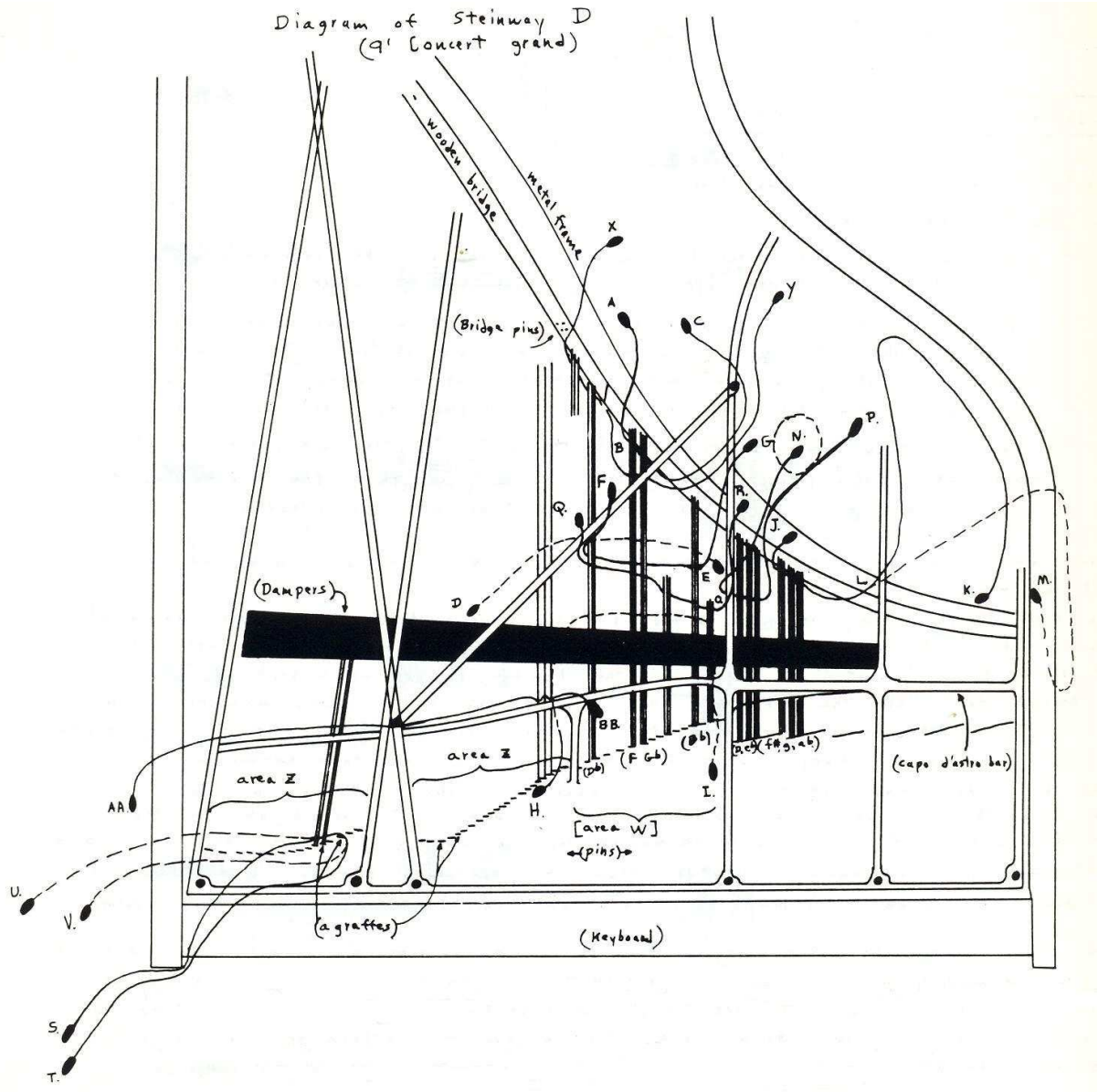
Curtis-Smith's control over sound leads to rare occasions where the dynamic levels of very different timbres have to match. (Ex. 3.1061.)



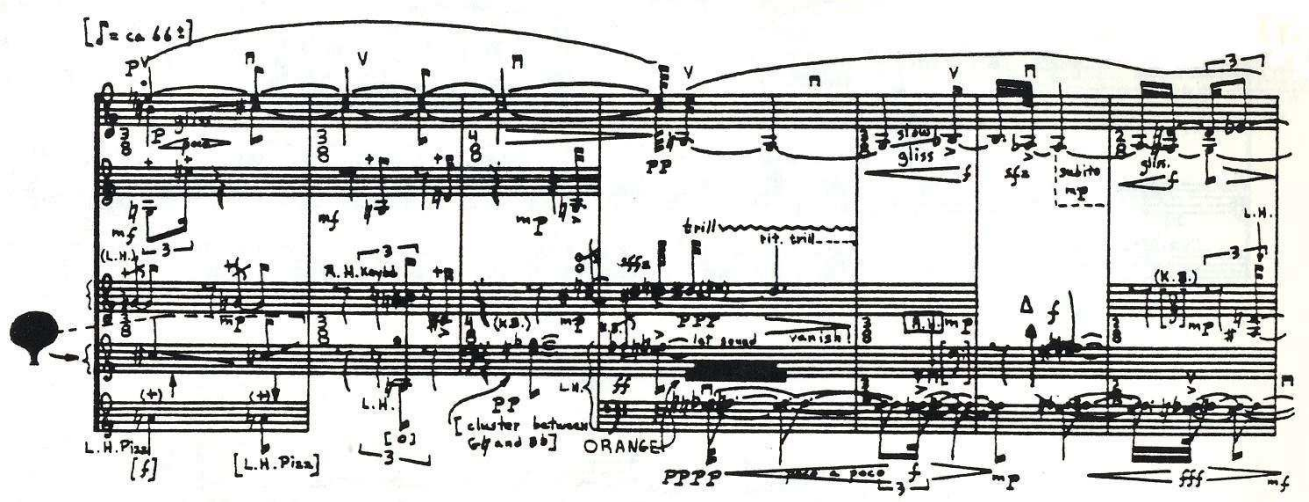
Example 3.1061. C. Curtis-Smith: *Rhapsodies* (1973), 4th movement *Listen! The spiked and winding cold seahorn*, bars 22-23. © Editions Salabert.

In the same year of the *Rhapsodies,* Curtis-Smith tried out his bowing techniques in a setting that anyone would have expected him to venture upon sooner than later. The *Five Sonorous Inventions* for violin and piano exploit the similarities between the two stringed instruments to great effect. The convulsive swellings of the bowed double notes in both instruments, accumulating in polyphonic streams that travel through registers, are interspersed with pizzicato flurries to great effect.

The level of virtuosity is very high, as witnessed not only by the proposed performance practical layout of the piano's insides (ex. 3.1062) but also from the accumulation and rapid succession of techniques in the parts for both the violin and the piano. (Ex. 3.1063.)

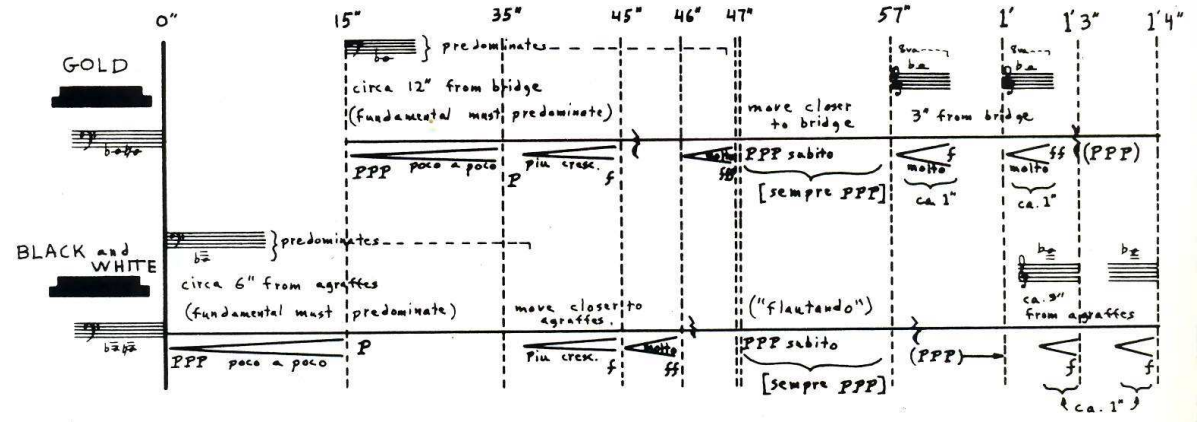


Example 3.1062. C. Curtis-Smith: *Five Sonorous Inventions* for violin and piano (1973), from performance notes. © Editions Salabert.



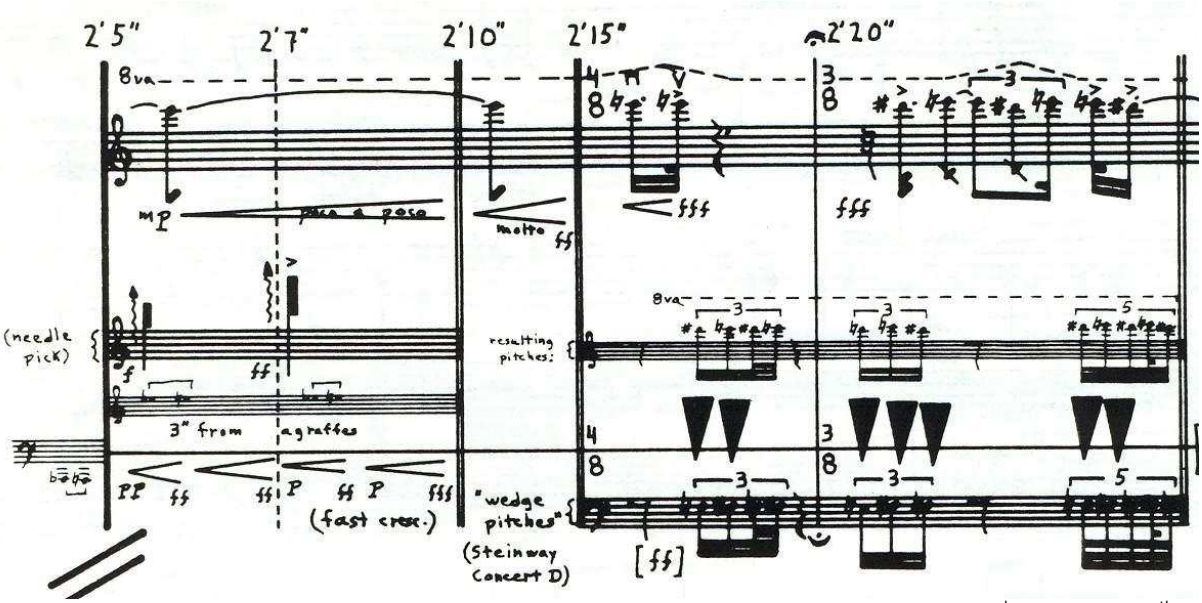
Example 3.1063. C. Curtis-Smith: *Five Sonorous Inventions* for violin and piano (1973), 4th movement, bars 29-35. © Editions Salabert.

The bowing is shown both in traditional notation and by way of verbal and less precisely timed indications. (Ex. 3.1064 – in the second movement the violinist plays bowed piano as well.) If a certain degree of freedom is inherent to the latter notation, Curtis-Smith is very precise in other aspects. The (changing) place of the bow along the string is indicated in inches from agraffe or bridge, whether the fundamental or specified higher partials of the bowed pitch must predominate is specified.



Example 3.1064. C. Curtis-Smith: *Five Sonorous Inventions* for violin and piano (1973), 2nd movement, opening. The GOLD bow is for the violinist (standing at the end of the grand piano); the BLACK and WHITE bows are for the pianist. © Editions Salabert.

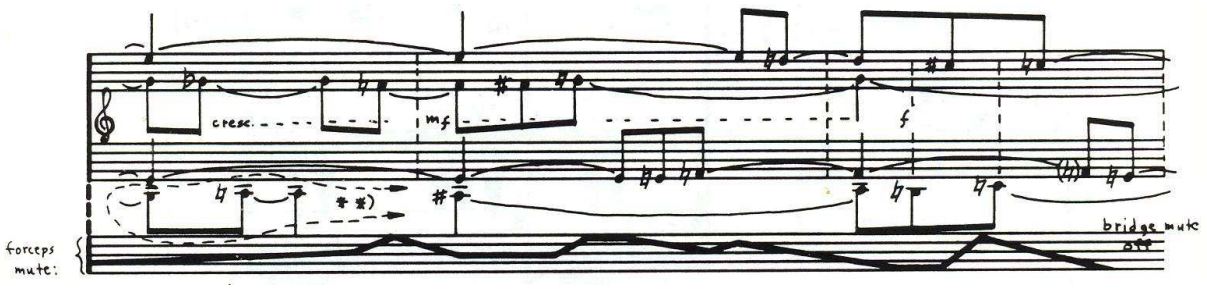
In the *Five Sonorous Inventions*, the pizzicatos in both instruments are juxtaposed, as are the bowing and other techniques. The rosined rubber tuning-wedges that make the 14th partials are fitted in with the high position violin tones to great effect. (Ex. 3.1065.)



Example 3.1065. C. Curtis-Smith: *Five Sonorous Inventions* for violin and piano (1973), 2nd movement, 5th system. © Editions Salabert.

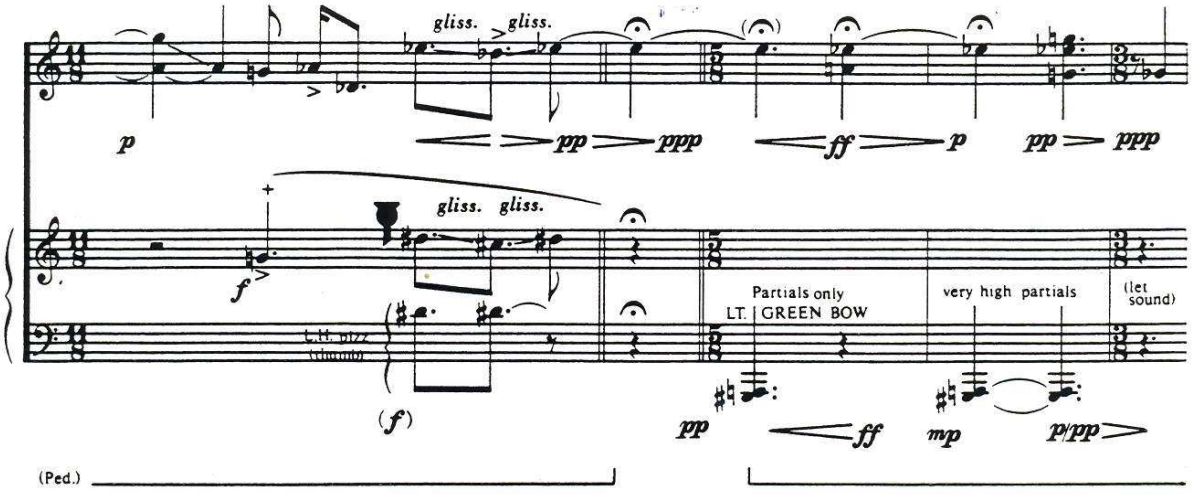
For the second invention, the violinist comes to the piano to bow strings, for the third movement the pianist is to leave his instrument alone and join his colleague to play on the violin. A different, inexpensive violin is prepared with a flat bridge that lifts the G string and allows for the violinist to bow all four strings simultaneously (with one violin bow) without "breaking" the four-part chords. The pianist handles the tuning pegs to

produce glissandos and the forceps and bridge mutes to control the vibrato, while the violinist plays one of the four voices. (Ex. 3.1066.)



Example 3.1066. C. Curtis-Smith: *Five Sonorous Inventions* for violin and piano (1973), 3rd movement, 3rd system. The encircled notes are the ones the violinist articulates on the G-string. The other voices' movements are executed by the pianist turning the tuning pegs. © Editions Salabert.

In *Unisonics* for alto saxophone and piano (1977), Curtis-Smith prescribes the same techniques of bowing, tuning wedge shrieks and bottle-glissando. As in the *Five Sonorous Inventions,* he attempts to integrate the piano sounds with those of the saxophone into one coherent texture. The movements that use these techniques (the first and third rely only on proper piano keyboard playing) fuse bowing with multiphonics and small glissandos in the saxophone part. (E.g. ex 3.1067.)



Example 3.1067. C. Curtis-Smith: *Unisonics* for alto saxophone and piano (1977), 4th movement, bars 13-17. Reproduced by permission of the composer.

3.4.7.8.3 1976- Stephen Scott and the *Bowed Piano Ensemble*

While hearing David Burge play Curtis-Smith's *Rhapsodies* in 1976, Stephen Scott (°1944) already imagined the effect of more than one performer simultaneously bowing piano strings to produce sustained chords.[1671] Scott started his *Bowed Piano Ensemble* in 1977. Consisting of up to ten musicians performing on one concert grand piano, the ensemble tours around the world regularly, mainly playing music by Scott, who is also the ensemble's conductor, manager and composer.

The bows are of two types: soft and flexible (made of 30" rosined nylon fish line strands) to create long sustained chords, and small but rigid (rosined horsehair glued to wooden popsicle sticks) to rub against the strings with short flicks of the wrist in order to produce short, staccato-like sounds. Both bows are already used in the earliest pieces, e.g. *Music One for Bowed Strings* (1977) and *Music Three for Bowed Strings* (1979).[1672]

The bowing technique are integrated into a unique chamber music setting around one instrument, requiring a new way of ensemble playing. Dozens of bows lie around the framework of the piano and musicians continuously move around the instrument to switch technique. Choreographed patterns are necessarily worked out to coordinate these moves, considering that chords are operated by one musician per bowed note and that the musicians are often close together to operate adjacent string choruses.

Scott sees Guillaume de Machaut, Central African polyrhythm, Steve Reich and Terry Riley as the main influences on his music. Consequently, and contrary to the aesthetic of Curtis-Smith, the music Scott writes for his *Bowed Piano Ensemble* is often minimalist and repetitive. Instead of the agile sound masses, complex rhythms and modernist dissonances in Curtis-Smith's music, Scott uses the ensemble's bow-technical characteristics to his advantage for creating more consonant, droning harmonies and hockets.

3.4.7.9 Electronics operated by the pianist

A final category of piano extensions is formed by the use of electronics that the pianist operates himself.[1673] Live electronics had already been part of the repertoire for a long time (see above, 3.4.3.2.2) but electronic devices specifically operated by the pianist to make sounds at the piano – as opposed to for instance Cage's *Cartridge Music* (1960) – are found only from the middle of the 1960's onwards.

3.4.7.9.1 1967 David Behrman: *Wave Train*

Behrman (°1937) wrote *Wave Train* in 1967 for two to four pianists, standing around the piano and operating electromagnetic pick-up devises to catch the resonance of strings

[1671] Scott 1983.
[1672] From the program notes to *Stephen Scott. New Music for Bowed Piano* (1990) from New Albion Records, Inc (NA 107 CD).
[1673] As essentially different from electronics that are remote-operated by technicians.

that they set in motion themselves. The signal is transmitted to two amplifiers, one of which is connected to a loudspeaker in the piano near the strings, the other one directed towards the audience. By bringing the pick-up close to the steel strings, an electric feedback loop is created, of which the strings are part and determine the frequency. The exact place on the strings, above which the pick-up device is hold, determines the partials that arise.

Musically, the structure follows from the performance technique. It takes time to excite the strings, and once a one-dimensional feedback tone is sounding, the performer can manipulate its nature by changing the position of the device and the angle towards the strings. Moving to another place to excite different strings stops the sound. To achive continuity, the players overlap each other's sounds, resulting in a "wave-train". A single performer may play the piece using a recording to assure the overlap of sounds.

As the sounds depend on the manner of their creation and cannot be determined in advance, the score only provides models of the sound structure that Behrman had in mind. This type of performance practice has been called 'apparative' music since the apparatus determines the aesthetic and structure of the music.

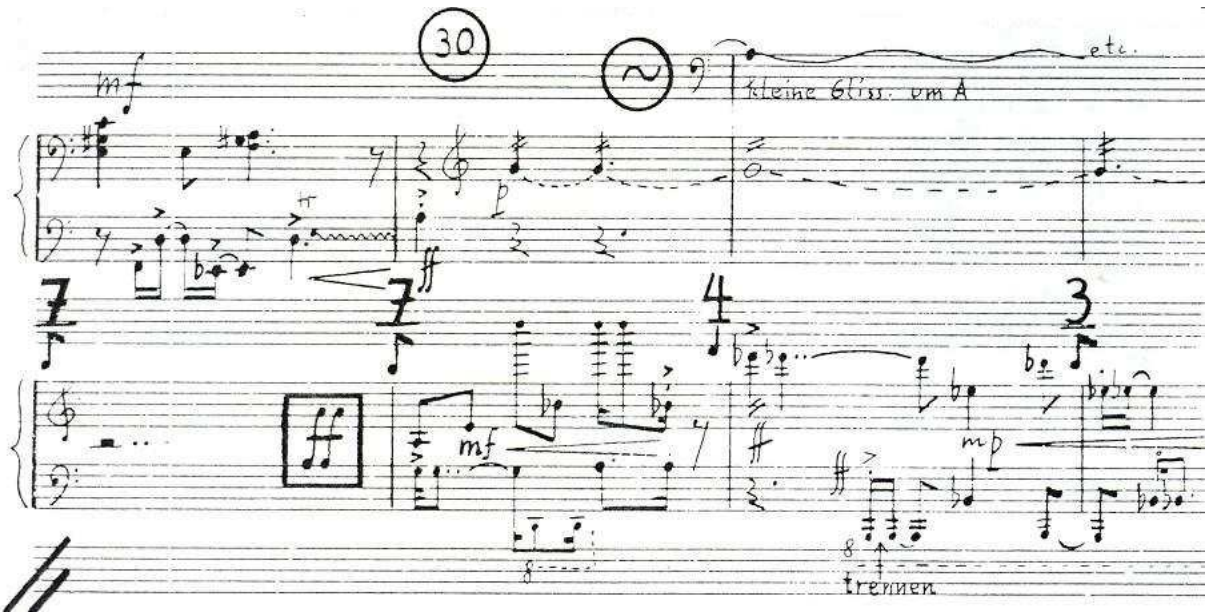
3.4.7.9.2 1970 Karlheinz Stockhausen: *Mantra*

Mantra is for two pianists (at two pianos) who also play on some percussion instruments (a woodblock and a chromatic set of crotales for each), utter vocals and operate ring modulators and a device that produces Morse-code (radio receiver or tape).

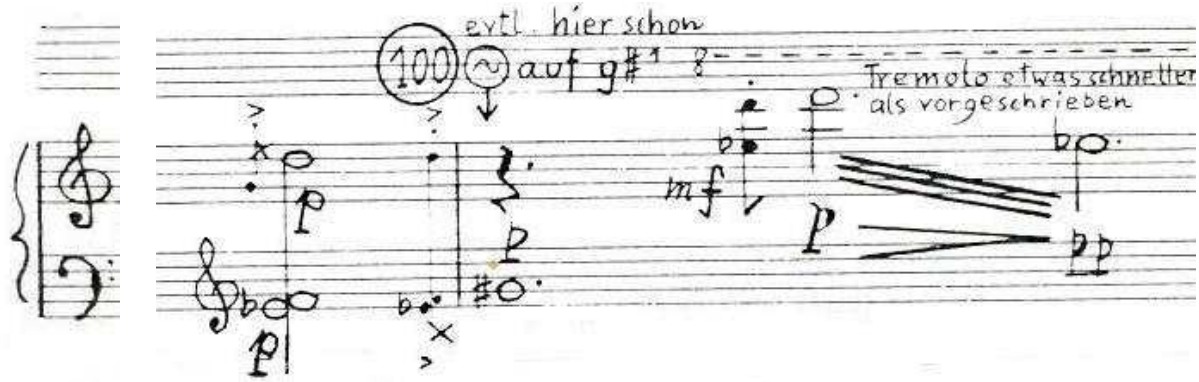
Unlike the percussion instruments and vocals (cf. above, 3.4.6.7.3), manually operating machines while playing at the keyboard is new in Stockhausen's works. The ring modulators essentially pick up the piano sound though microphones and send it to an amplifier to be mixed with a sine wave. The balance between the two signals can be changed by way of turning a dial to tune the scaled sine wave generator. Different timbres can thus be produced, much like Cage's prepared piano sounds, with added advantage that they can be altered during the playing. The final sound is played over loudspeakers that hang above and behind the pianists. The "mantra" on which the whole composition is based consists of thirteen notes with each its own characteristic (e.g. repeated, accentuated, tremolo) and its own dynamic related to its duration. Each of the thirteen segments of the structure is marked at its beginning by a crotale stroke on a pitch corresponding to a successive note of the mantra. Operating the dial, each pianist changes the sound of his piano by tuning the sine tone to the central pitch corresponding to the note of the mantra formula that governs the given section of the composition. "Hence one perceives a continual 'respiration' from consonant to dissonant to consonant modulator sounds, resulting from the precisely tuned relationships between the modulating sine tones and the modulated piano notes"[1674].

The ring modulators are set-up to the left of the performers, who operate the dial according to instructions in the score. Often, the changes occur at moments when the pianist has no note to play, otherwise he turns the dial while playing with the right hand. The changes can be continuous, to produce glissandos in the ring-modulated sounds (ex. 3.1067); at times the dial has to be set at a specific point in the sine wave's scale. (Ex. 3.1068.)

[1674] Stockhausen 1978, p. 155-156.

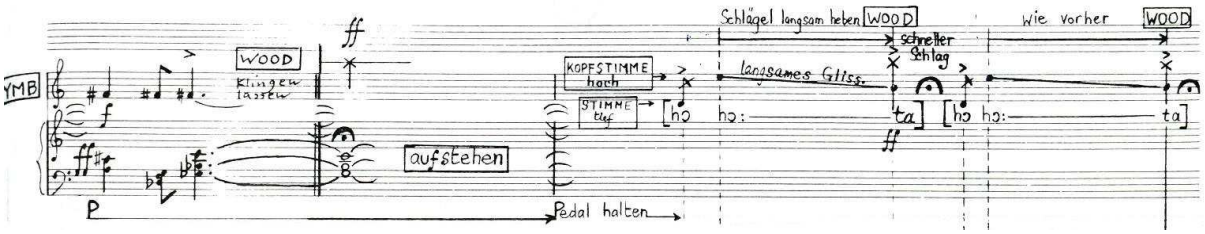


Example 3.1067. K. Stockhausen: *Mantra* (1970), bars 29-32. Reproduced with kind permission of Stockhausen-Verlag.



Example 3.1068. K. Stockhausen: *Mantra* (1970), bars 99-100. Reproduced with kind permission of Stockhausen-Verlag.

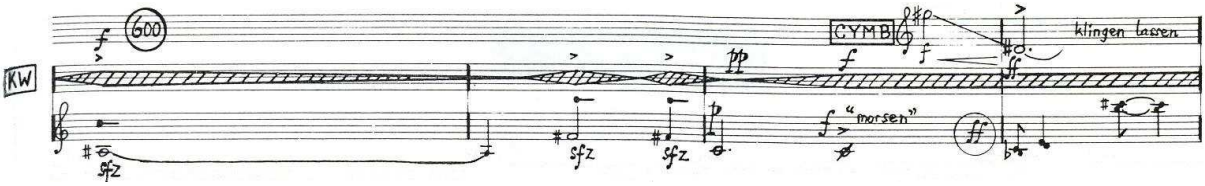
The ring modulation also serves to distort the vocal sounds, for which the pianist has to stand up and project into the microphone. (Ex. 3.1069.)



Example 3.1069. K. Stockhausen: *Mantra* (1970), bars 637-638. Reproduced with kind permission of Stockhausen-Verlag.

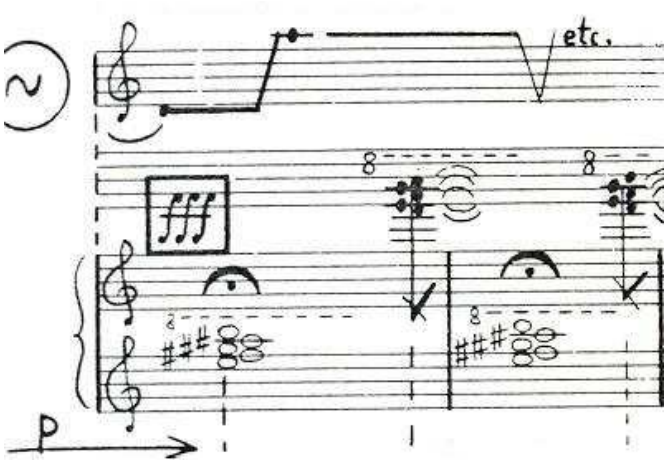
Besides the ring modulation, one of the pianists operates a short-wave radio (or a recording device) through which Morse-code sounds. The Morse-code refers to the many repeated notes in this composition (a characteristic of one of the notes in the mantra

formula) and the manipulation of the volume coincides with playing on the keyboard as well as on percussion instruments. (Ex. 3.1070.)



Example 3.1070. K. Stockhausen: *Mantra* (1970), bars 600-603. Reproduced with kind permission of Stockhausen-Verlag.

Mantra is not only a virtuoso piece from the perspective of proper keyboard playing. Operating the machines influences the way the keyboard or percussion instruments are played. It is not self-evident to turn a dial while simultaneously playing regularly repeated notes. At certain instances the combination is easy since the repeated notes are indicated as "morsing," i.e. irregularly (again a characteristic of one of the mantra-notes). At other times Stockhausen asks for the timbral changes to occur as quickly as possible after playing a chord, since the ring modulation will not convert sounds that have turned too soft to be picked up by the microphones. (E.g. ex. 3.1071.)



Example 3.1071. K. Stockhausen: *Mantra* (1970), bars 421-422. Reproduced with kind permission of Stockhausen-Verlag.

3.4.7.10 1969- Helmut Lachenmann and *Instrumental Musique Concrète*

In 1965, Lachenmann (°1935) worked briefly at an electronic music studio (Ghent University) but continued to focus almost solely on instrumental music. During that decade, he developed a musical concept that he called *musique concrète instrumentale,* in which

> the sound events are chosen and organized so that the manner in which they are generated is at least as important as the resultant acoustic qualities themselves. Consequently those qualities, such as timbre, volume, etc., do not produce sounds for their own sake, but describe or denote the concrete situation: listening, you hear the conditions under which a sound- or noise-action is carried out, you hear what materials and energies are involved and what resistance is encountered.[1675]

His increasing interest in the "anatomy" of sound made him integrate the mechanical and physical conditions of instrumental and vocal sound production into his compositions. Structure became less the means to expressive ends than a consequence of expressivity as a pre-existing factor; serial ideas of order became regulatory and not generative.

From the end of the 1960's onwards, Lachenmann's works exploitated sounds that he felt were "uncontaminated," not yet devalued by excessive use. Three solo pieces introduced this aesthetic in Lachenmann's oeuvre: *Pression* (1969–70) for solo cello, *Dal niente* (*Intérieur III*) for clarinet, and *Guero* (1970) for solo piano. For all three pieces, the instrument is treated as an object that has no musical past and to which any instrumental identity and performance practical attitude can be applied.

In *Guero* Lachenmann treats the piano as the percussion instrument of that name. Only two very basic performance techniques are used: gliding and plucking. No keys are struck: what is heard is the noise of fingernails gliding over the spaces in between the keys, tuning pegs or strings. Six gliding surfaces are determined, for which three glissando techniques are prescribed: with the nail of the thumb, of one extended finger, and of three curved fingers together. For the pizzicatos four types of objects can be plucked: the front, lateral edge of the key; the tip of the tuning peg; the strings, between the tuning pegs and the felt strip; the strings, in the normal (upper) area near the felt strip. In total, eleven symbols are distinguished for the graphic score[1676]:

Glissandos:



over the front surface of the white keys with the nail of the thumb (when towards the middle of the keyboard) or of the extended index finger (when towards the edge)



on upper surface of the white keys with fingernail of an extended finger



on the upper surface of the white keys with the fingernails of three curved fingers

[1675] Quoted from Mosch 2002.
[1676] Illustration are taken from the score published by Breitkopf & Härtel (Wiesbaden) – Edition Breitkopf 9018.



simultaneously over the upper surface of the white keys and the front of the black keys with the fingernail of an extended finger



over the upper surface of the black keys with the fingernail of one or possible several extended fingers



over tuning pegs, also possibly with several extended fingers



over strings between tuning pegs and felt strip

<u>Pizzicatos</u>:



at the front, lateral edge of the key



at the tip of the tuning peg

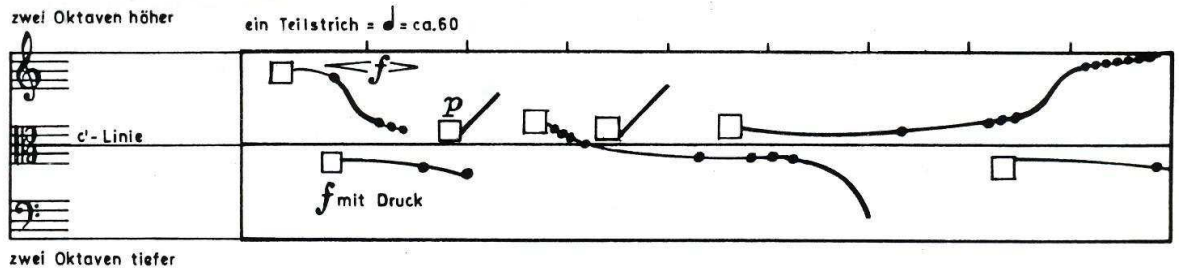


on the strings, between the tuning pegs and the felt strip

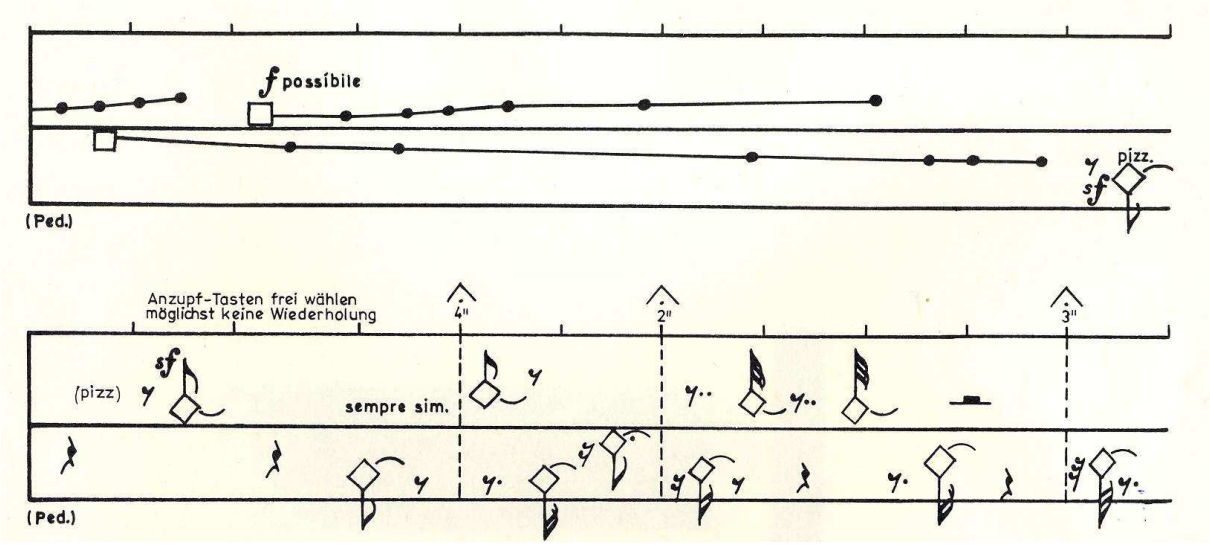


in the normal (upper) area of the strings, near the felt strip

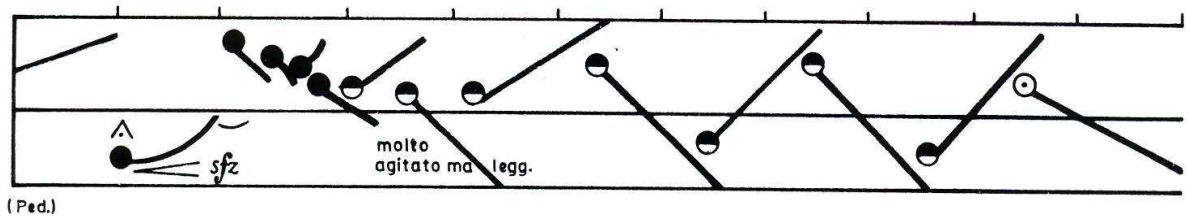
The graphic score shows the actions, with the above symbols indicating the type, and the curves the direction and speed. Volume and pressure are indicated independently. The steeper the curve, the faster the glide; "knots" correspond more or less to individual spaces between keys, pegs, strings and can produce a "slow motion" effect. For the pizzicatos, the choice of keys, pegs, strings is free and to be varied. (Ex. 3.1072 – 3.1075.)



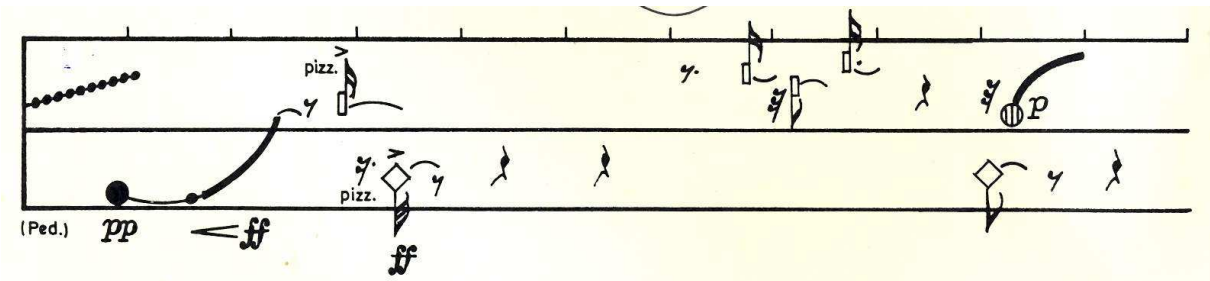
Example 3.1072. H. Lachenmann: *Guero* (1969), opening system. Reproduced with kind permission of Breitkopf & Härtel.



Example 3.1073. H. Lachenmann: *Guero* (1969), 6th and 7th system. 'Freely choose pizzicato-keys / if possible, no repetition." Reproduced with kind permission of Breitkopf & Härtel.



Example 3.1074. H. Lachenmann: *Guero* (1969), 14th system. Reproduced with kind permission of Breitkopf & Härtel.



Example 3.1075. H. Lachenmann: *Guero* (1969), 17th system. Reproduced with kind permission of Breitkopf & Härtel.

Besides the gliding and plucking sounds, Lachenmann includes noises that are related, e.g. by hitting the keyboard's wood rim when at the end of a fast sweeping and crescendo glissando (as when accidentally gliding too far); by hitting the front of the piano above the keyboard lid while passing with the hand in between glissando actions; by releasing or depressing the sustaining pedal audibly.

Before *Guero*, Lachenmann had already used extended techniques: already in the earliest *Fünf Variationen über ein Thema von Franz Schubert* (1956), there is a white-key glissando and a silently redepressed (to force a *sfz* into an immediate *p*); *Echo andante* (1961-62) shows intricate use of silently depressed keys, clusters (including for the forearm and of the Antheil-type[1677]) and gradual/note-by-note releases of pedals or chords in an aesthetic that betrays the influence of his studies with Nono just before; in *Wiegenmusik* (1963) the same techniques appeared with an occasional white key glissando; in *Air* for orchestra (1968-69), the piano part includes clusters and pseudo-chromatic glissandos on keys as well as glissandos on tuning pegs, pizzicatos, beating a strut with a percussion stick, "choked"[1678] strings, even retuning strings to obtain "interferences[1679]."

After *Guero*, Lachenmann returned to use extended techniques in combination with properly produced sounds. In the *Kontrakadenz* for full orchestra (1970-71) the majority of the sounds in the piano part are still improper, however. Notes are prepared with tuning wedges (either to stifle one of three strings of a chorus, or "almost completely" smother the sound), tuning pegs are "prepared" with tuning keys so that they can be tuned to produce glissandos ("suono fluido"); the pianist also operates a radio, alarm whistle, whip, booby pistol (to fire into piano housing), and percussion accessories such as sticks, plectrum, pocket comb to hit strings, frame and lid, sometimes specifically calling for a percussionist's technique[1680]. *Guero*-techniques are prescribed, now also with objects like a stick. More "traditional" extended techniques include pseudo-chromatic glissandos, (forearm) clusters, glissandos on strings (across and lengthwise, also between windings and pegs), scratching the windings of bass string, and the loud release and redepressed pedal (without any other sound production).

For *Klangschatten – mein Saitenspiel* (1972), Lachenmann combines almost exclusively improper noises made at 3 grand pianos with those made by 48 string players. Most of the piano techniques are familiar: finger-damped strings, striking resonant parts of the frame (with a plastic hammer), guero techniques (small plastic pots to slide across the edges of the forefront of the white keys / three fingers across their upper surface) and glissandos with a triangle stick across the tuning pegs or with a plectrum across the woundings of brass strings.

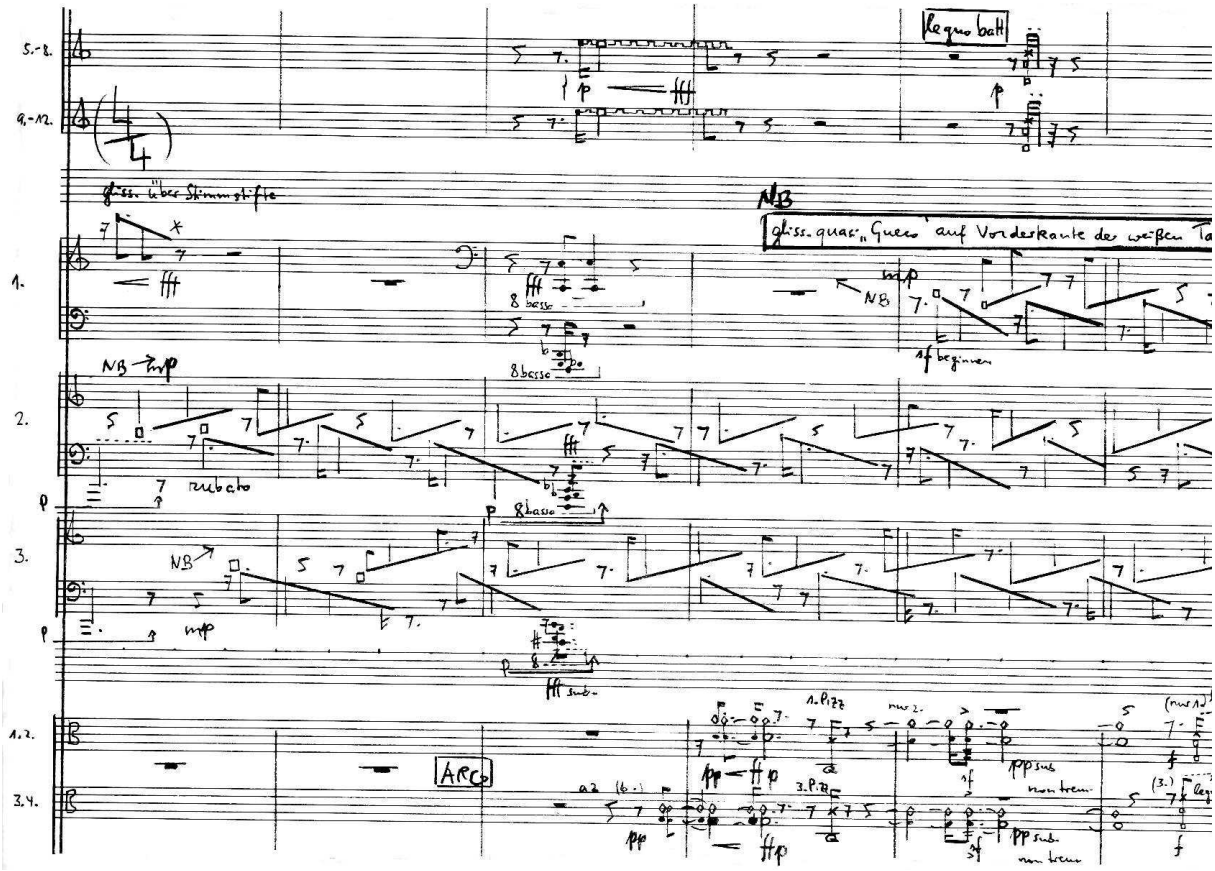
Many of the piano sounds are meant to be between soft and barely audible. "Choked" tones are now produced by either pressing a soft cloth down upon the strings, or – if the notes are not used again in another way – by preparing the strings with small pieces of felt. If the sound of gliding over keys with three fingers is too weak for the acoustics of the hall (which cannot be very small, given the setting), thin sticks or pencils are possible alternatives, but the sound "must be in the range of the barely audible."[1681] When gliding across the strings between the bridge and the tuning pegs, the stick must be applied

[1677] Using the ball of the hand for white keys and individual fingers for selected black keys – see above, 3.3.2.2.3.4.
[1678] "Saite erstickt", as in the piano part.
[1679] "Interferenzen", as in the piano part.
[1680] In the performance notes, the technique of "Prällerschlage" (by which the point of attack lies below the mallet's head so that the stick bounces back elastically and produces a shake) is explained in detail.
[1681] According to the performance notes on the score.

loosely and without pressure. slide with fingertip delicately over the woundings of a bass string, yielding soft, floating high tones

Lachenmann searches for new ways as well: thin, flat stripes of sheet metal are laid across the strings of specific tones and are caused to spring about and clatter when the corresponding key is depressed. A lead bar (30cm x 4cm x 2cm) is laid on the strings and jerked to the side to cause the strings to sound; pushing the bar forwards and back will produce the intended cluster-glissandos. This bar can also be held at one end, while the key is depressed that is corresponding to the strings on which the other end of the bar is laying; the bar is then pushed back and forth to produce glissandos.

The strings only rarely play proper sounds as well. Besides the well known Bartók pizzicatos, flageolets, col legno, legno battuto and legno saltando, Lachenmann asks for dampening after or during plucked or struck tones (with fingers, palm, screw of the bow) or for bowing at the neck, stringholder or other parts of the body of the instrument. For cellos and double basses, specifically designed pizzicato techniques are required, e.g. in the peg box. For the string players, Lachenmann asks to avoid all "occupational" noises.



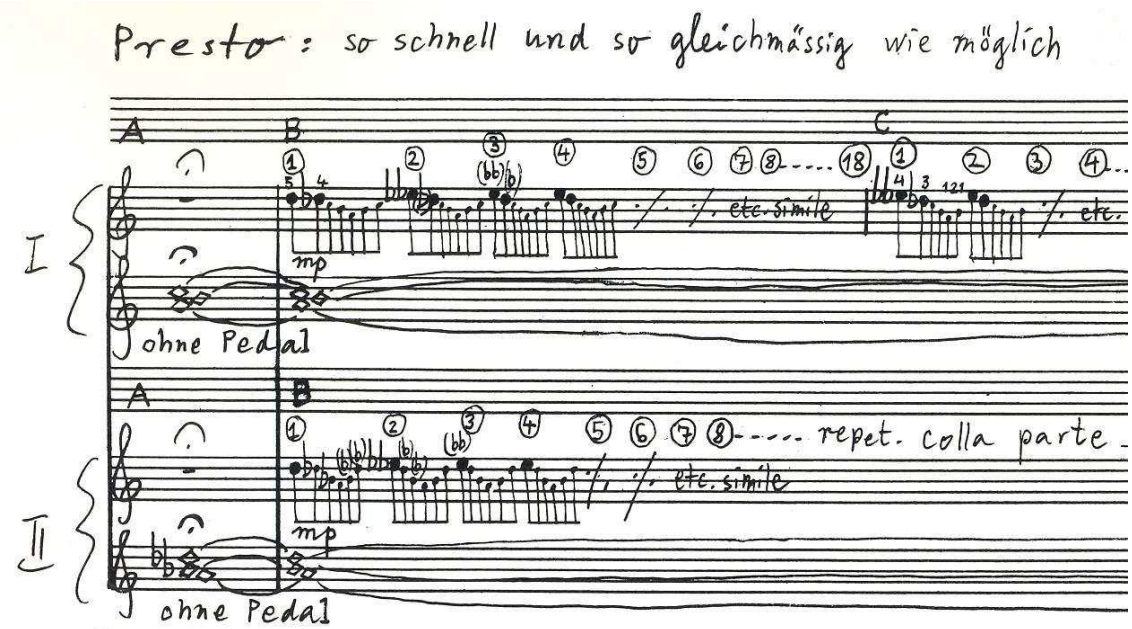
Example 3.1076. H. Lachenmann: *Klangschatten – Mein Saitenspiel* for 48 strings and 3 grand pianos (1972), bars 166-171. © Edition Gerig.

In *Accanto* for clarinet and orchestra (1975-76) the piano part also has mostly improper sounds, though less diverse: glissandos and pizzicatos on the strings (the latter often at the extreme, pitchless end of the string), rubbing strings at a nodal point, hitting tuning pegs and wooden parts with percussion sticks, scratching windings with plectrum, and

the guero technique of gliding over the groves between the keys with little plastic pots or pans[1682].

3.4.7.11 1976 György Ligeti: *touches blocquées*

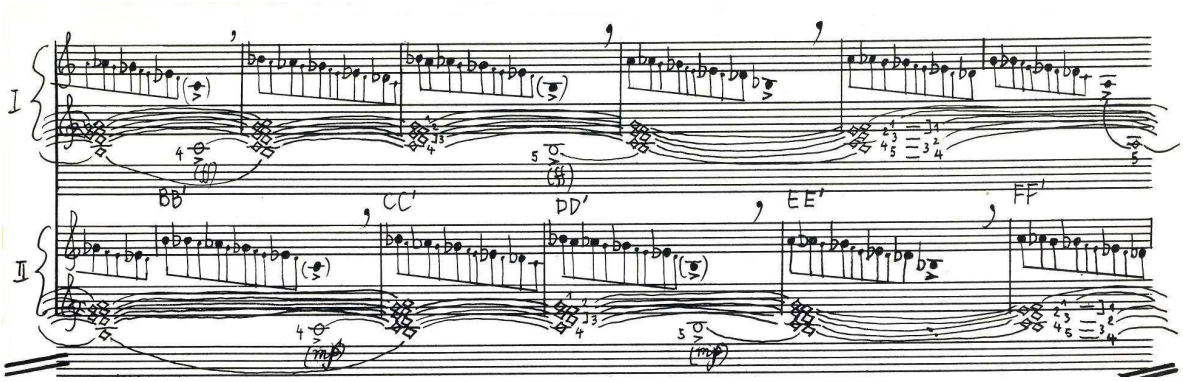
The second of three pieces for two pianos *Monument, Selbstportait* and *Bewegung* (1976), shows Ligeti developing what we can call an improper take on silently depressed keys. When playing a run on the keyboard, of which several keys are already depressed, rests break the sequence each time a non-sounding key is struck by a finger. Longer rests are the result of several depressed keys following one another. At high speeds, complexly irregular rhythms are thus possible without having to articulate them. A mere regular finger technique is sufficient.[1683] (Ex. 3.1077.)



Example 3.1077. G. Ligeti: *Three pieces* for two pianos (1976), 2nd movement *Selbstportrait mit Reich und Riley (und Chopin ist auch dabei),* opening system. The thick notes are the ones sounding; the small ones are the already silently depressed keys. © SCHOTT MUSIC GmbH & Co. KG, Mainz - Germany.
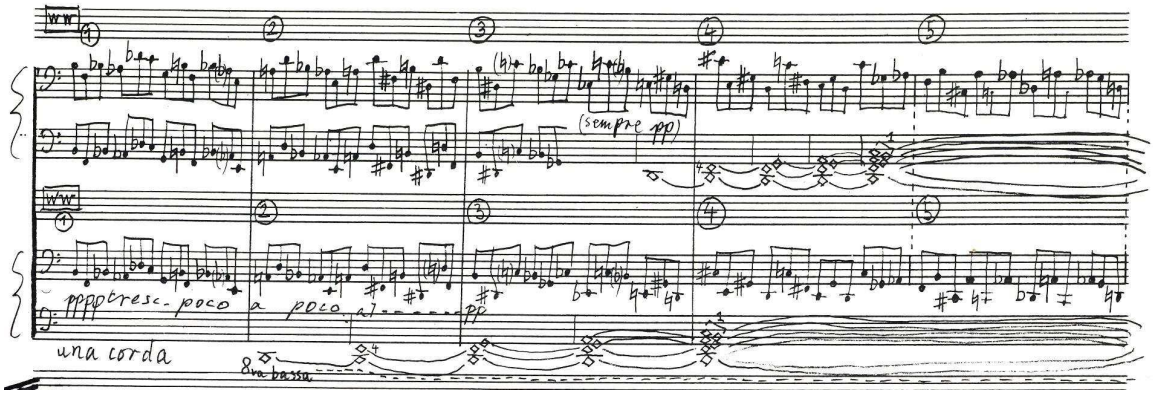
Throughout the piece, of which the title refers to two of the proponents of repetitive minimalism[1684], Ligeti modulates the rhythmic and pitch patterns as well as the constellation of the silently depressed notes. Selected properly depressed keys remain where they are and become silently depressed; depressed keys that are not struck anymore because of such changed patterns are dropped; to accommodate this mobile key blocking, fingers change position by taking over each other's places quietly. (Ex. 3.1078.)

[1682] "Plastictöpfchen" (As mentioned in the performance notes.)
[1683] In the performance notes, Ligeti indicated that he got the idea from a performer of his organ composition *Volumina* (Karl-Erik Welin) and from an article on new performance techniques by Henning Siedentopf. (*Neue Wege der Klaviertechnik* in the *Melos* magazine, 40th year, 1973, 3rd issue, p. 143-146.)
[1684] The Chopin reference regards the middle part of the piece, which has no blocked keys but which is based on the material of Chopin's third piano sonata's scherzo.



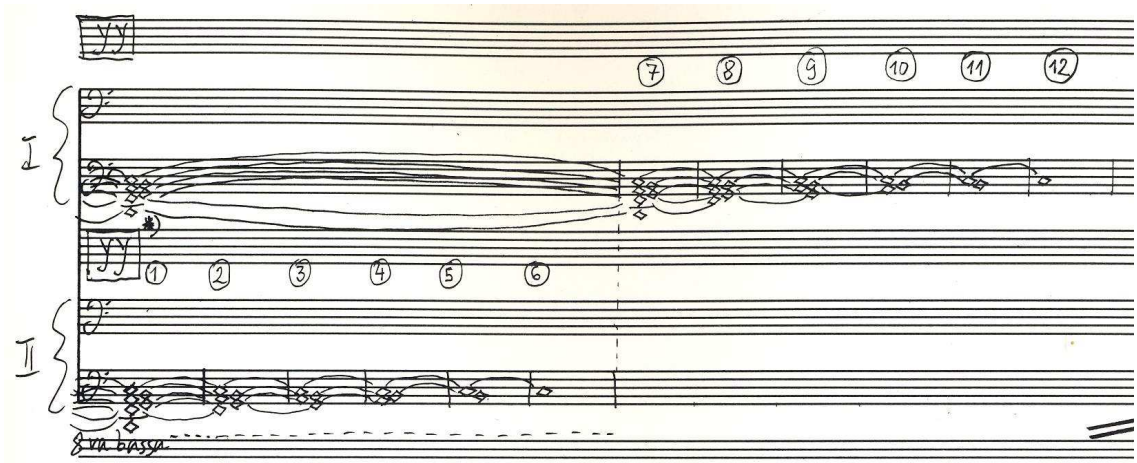
Example 3.1078. G. Ligeti: *Three pieces* for two pianos (1976), 2nd movement *Selbstportrait mit Reich und Riley (und Chopin ist auch dabei),* 4/2. © SCHOTT MUSIC GmbH & Co. KG, Mainz - Germany.

After a middle section with nothing but properly depressed keys, the blocked keys gradually resume their position. (Ex. 3.1079.)



Example 3.1079. G. Ligeti: *Three pieces* for two pianos (1976), 2nd movement *Selbstportrait mit Reich und Riley (und Chopin ist auch dabei),* 9/1. © SCHOTT MUSIC GmbH & Co. KG, Mainz - Germany.

By sympathetic vibration, the open strings of the silently depressed keys start resonating. If the fast runs cover most of that resonance during the piece, the ending leaves room for hearing it. Finally that remnant sound is broken down by a negative arpeggio of silently depressed keys. (Ex. 3.1080.)



Example 3.1080. G. Ligeti: *Three pieces* for two pianos (1976), 2nd movement *Selbstportrait mit Reich und Riley (und Chopin ist auch dabei),* ending. © SCHOTT MUSIC GmbH & Co. KG, Mainz - Germany.

3.4.7.12 1960's- Extended piano techniques in popular music II

In a 1964 television recordings, Jerry Lee Lewis (see above, 3.4.5.5.2) shows how his attitude towards the piano had evolved: the heel of the foot is now adequate to play a cluster on the keyboard in *Whole lot of Shakin' goin' on*, as is stepping on keys to get on top of the piano.[1685] In *Great Balls of Fire* the few glissandos have become fast sequences of sweeps with the flat of the hand.[1686]

A year before, a film was made of Thelonious Monk performing his *Off Minor* (1947), using a right forearm to play a cluster in between dissonant chords bringing his solo to its high point[1687]; by the end of the 1960's, the keyboard player of the *Doors*, Ray Manzarek, included palm clusters in his intro to *Light My Fire* (first recorded 1966)[1688]

For All Tomorrow's Parties (recorded in 1966) from The Velvet Underground & Nico, John Cale is said to have prepared the piano with a chain of paper clips[1689] and Tom Constanten of the Grateful Dead – a former student of Mills college, where he and fellow Dead member Phil Lesh had been part of performances of music by Cage[1690] – used prepared-piano techniques on That's it for the Other One, the opening track on the group's second studio album, Anthem of the Sun (released in 1968)[1691]. Prepared piano is also listed as used on the album Rubycon (1975) by the German electronic music group Tangerine Dream.[1692] On David Bowie's album Lodger (1979), Brian Eno is listed as performing on prepared piano for the rhythmic basis of the track African Night Flight.

By the end of the 1960's, free jazz pioneer Cecil Taylor (see above, 3.4.5.5.2) definitely played with open palms, fists, elbows and forearms for his "eighty-eight tuned drums" piano concept.[1693]

There is very likely to be much more influence of the extended piano onto other parts of the musical sector in this period. Unfortunately, many of the relevant techniques (especially clusters) have to be seen to identify them, and there are still few reliably dated videos around from these early days of popular music's world-wide distribution.

[1685] From the TV special "Don´t knock the Rock, U.K" (1964): http://www.youtube.com/watch?v=1dC0DseCyYE - last accessed September 2009.
[1686] From the TV special "Don´t knock the Rock, U.K" (1964): http://www.youtube.com/watch?v=HSoghD9uzb0 - last accessed September 2009.
[1687] http://www.youtube.com/watch?v=MI1tW-YykWQ - last accessed September 2009.
[1688] Hicks 1999, p. 85.
[1689] As referenced to Mitchell, Tim: *Sedition and Alchemy: A Biography of John Cale*, 2003 on http://en.wikipedia.org/wiki/Prepared_piano#cite_note-2 - last accessed September 2009.
[1690] Rubin 1994, p. 16.
[1691] http://en.wikipedia.org/wiki/Prepared_piano#cite_note-2 - last accessed September 2009.
[1692] The record indicates "Composed & played by […] Christopher Franke: Double Moog Synthesizer/Synthi A/Organ/Modified Elka Organ & Prepared Piano; Peter Baumann: Organ/Synthi A/E-Piano & Prepared Piano."
[1693] Dobbins 2002, p. 406.

3.4.8 1980's-ca2000 The extended piano as part of the whole world of music

3.4.8.1 General

From the 1980's onwards, there are no more great tales to be told in the history of the extended piano. This is surely not just a question of post-modernist reactions against the avant-gardist approaches that had made the previous decades such a hotbed of experiments with extended techniques. The fact is that these techniques continued to be used in the last two decades of the 20th century. Only, it seems that the modernist composers had charted so much of the terrain that there was not much new ground to be broken, especially when considering that it had become a tradition to commit to in-depth exploration – as had Cowell, Cage, Dlugoszewski, Kagel, Crumb, Curtis-Smith, Lachenmann, etc. – or at least to come up with a personal take of someone else's invention (Antheil, Wolff, Harrison, Ligeti, Scott, etc.).

In the last 20 years of the 20th century, the extended piano did not evolve in clearly discernable steps anymore, and nor were they large leaps. Some of those who had inovated, continued to use or refine their developments. Lachenmann did no go beyond a status quo. If, in the 1970's, his "anatomy of sound" had been limited mostly to the mechanical and physical conditions of its production, he then gave the sound material a philosophical framework combining the 'virgin' materials with references to the worn and outmoded sounds from the traditional repertoire. As for the individual techniques, even his piano concerto *Ausklang* (1984-85) contains little that is new for his oeuvre: double-note glissandos sometimes change width while being played, Antheil clusters, and rubbing strings with Styropor foam. In fact, the most notable aspect of the concerto is the virtuoso proper keyboard finger work.

Several composers' output saw a marked decline in interest for the extended techniques. Crumb experienced a dip with only five works for or including the exended piano. In *A Little Suite for Christmass A.D. 1979* (1980) and *Gnomic Variations* (1981) his use of the techniques is further crystallized to the most efficient ones that he always liked: silently depressed clusters to sollicit sympathetic vibrations, Aeolian harp melodies, plucked, muted and scraped strings, bass-string glissandos and 2nd and 5th partials. In *Processional* (1983) only the silently depressed keys are retained in the score – a few others (muted and plucked strings, 5th partials) can be found as alternate versions in the appendix. Cage's interest dwindled to a few pieces – *Nowth Upon Nacht* (1984 – tapped piano lid), *Music For* (1984-87, including bowed strings), *Ten* (1991 – plucked strings, struck construction), *Fourteen* (1990 – bowed), and the "shadow playing" technique for *Europera 5* (1991), which means "playing normally but without making any sound except accidentally (unintended depression of keys here and there)."[1694] Curtis-Smith has stopped writing for the bowed piano after his *Fantasy Pieces* for violin and piano (1987), which uses the bowing in the last movement, because he "did not want to get "stuck" doing the same thing too often."[1695] Except for an occasional cluster (*Passé Composé* - 1993) or hitting the wood of the piano (*Der Eid des Hippocrates* – 1983), Kagel virtually stopped writing with extended techniques for his piano music, sometimes including it as an option – e.g. the foot-operated controlled recording at the end of *Passé Composé* (1993).

Composers that did not have a great history of identifying with the matter, or that are too young to have witnessed the heydays, show an interest in the achievements often to turn it into a personal variant. Eric Oñia wrote his *Jodeln* for two pianists, one at the keyboard, the other depressing nodal points on strings that the first sets in motion;

[1694] Performance notes to the score.
[1695] E-mail to author, September 18, 2009.

Michael Finnissy asks for keys to be blocked with tuning wedges; Lou Harisson prescribed an octave-bar to be able to play octave clusters with greater speed and precision then ever before[1696]; reminding us of Behrman's *Wave Train*, Scott made an electromagnetic device to be positioned over the strings, which made them vibrate as soon as the dampers were lifted by the performer at the keyboard (*Resonant resources* – 1983); minimalist pioneer Tom Johnson wrote clusters growing larger and smaller by simple addition and subtraction in *Counting Keys* (1982); Richard Bunger wrote some prepared piano pieces to follow up on his publication on how to properly prepare the piano[1697].

In the realm of education, there was still movement, but nothing revolutionary. William Y. Elias wrote a book on notation of clusters "and other effects" (*Grapes* – 1984) and Lachenmann published a set for children, called *Ein Kinderspiel* (1980).

In the rest of the "whole world of music," clusters are used in many jazz pianists' works (e.g. Matthew Shipp, Don Pullen); the list of collaborators for the recording of Michael Jackson's *Smooth Criminal* (1987) includes Kevin Maloney on "muted Steinway piano"; improvising performance pianist A. Harold Bareiro made music for piano with its bass strings attached to empty bottles.

Perhaps under the influence of the extended piano's development, musicians had already begun to experiment with other instruments as well. Already in the 1960's, Keith Rowe devised improper guitar techniques, followed by Fred Frith in the 1970's. Eventually the "prepared guitar" became a name for an instrument that people like Kevin Hufnagel further worked with.[1698] The Belgian Wilfried Deroo made music for prepared violin in the late 1980's, putting paper and rubber in between the strings[1699].

3.4.8.2 Scott and more bowed piano

One of the developments worthwhile going into in some more detail, is the Bowed Piano Ensemble that Stephen Scott continued to refine. Following on his efforts in the 1970's, Scott continuously elaborated on the concept of multiple performers bowing one piano.

A variant of his rigid bow is the "double bow," which has horsehair on both sides so that it can be applied to the outside strings of two different choruses. This tool allows one performer to create dyads a minor second apart, offering the composer the advantage of writing more complex and denser chromatic chords involving fewer musicians, as in *Rainbows* (1981).[1700]

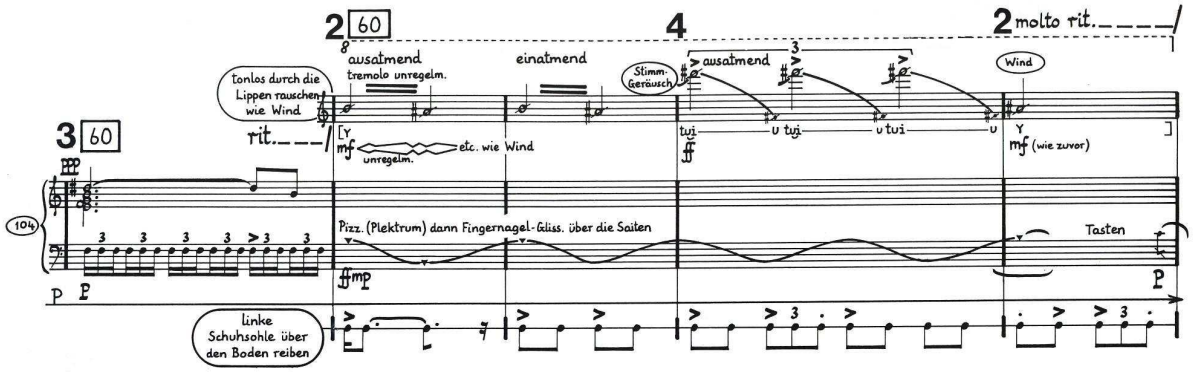
Like Curtis-Smith, Scott confronted the bowing with other piano playing techniques. The droning sound of the bows can then be contrasted and combined with proper keyboard-produced notes as well as with all types of common inside-piano techniques and variants that Scott developed himself, e.g. hitting strings with hand-held piano hammers or mutes made out of Plasticine-like modelling clay that are put on the agraffes (for quick handling without having to search for the right string and be in the way of the other players).

[1696] Miller & Lieberman 2004, p. 135.
[1697] Bunger 1981.
[1698] E-mail to author, September 8, 2008.
[1699] Personal experience, having attended one of Deroo's concerts.
[1700] From the program notes to *Stephen Scott. New Music for Bowed Piano* (1990) from New Albion Records, Inc (NA 107 CD).

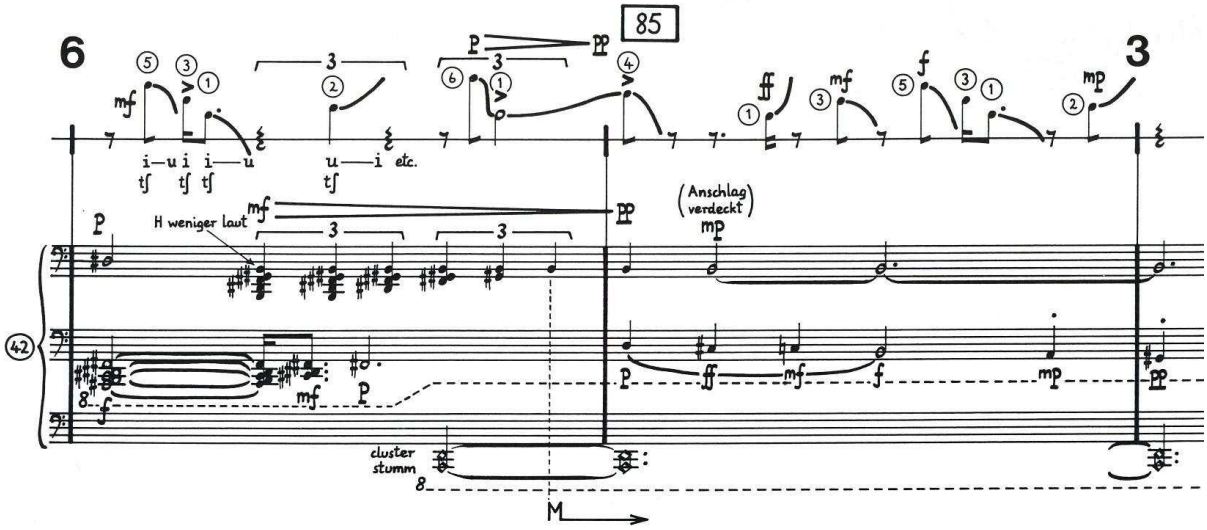
3.4.8.3 Stockhausen II: towards the keyboard instrument of the future?

Klavierstück XII - Examen from *Donnerstag aus Licht* (1983) is the third scene of Act I, *Michael's youth* from Stockhausen's the opera *Thursday from Light* arranged for piano solo. (The original version is for instruments, voices and dancers and dates from 1979.)

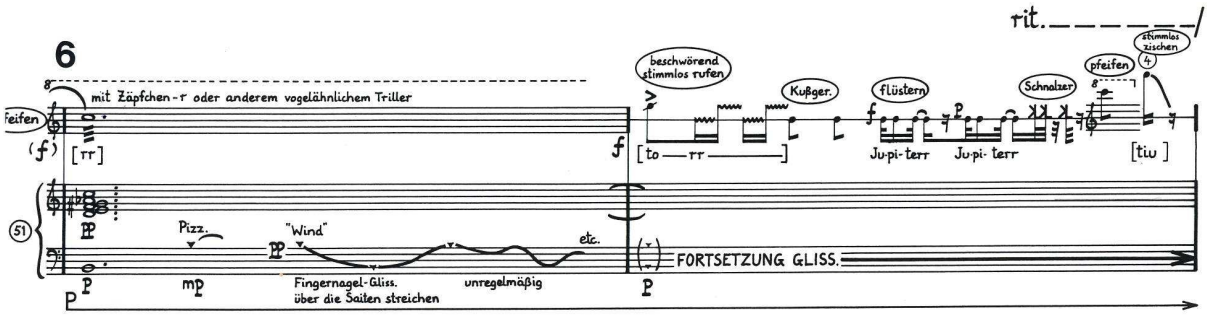
Besides the classic techniques of clusters, silently depressed keys, string-glissandos, -clusters and pizzicatos, rubbing strings back and forth and gradually released pedals, Stockhausen is interested a great deal in unpitched sounds made on the piano (edge of the lid, under the keyboard) and away from the piano (making clicks with the fingers, wit the tongue against the gums, hand-clapping, hand-kisses, rubbing the sole of left foot over the floor (ex. 3.1081)). Especially numerous are the vocal sounds and syllables made by voiceless shouting, voiced whispering, whistling, kissing, hissing (ex. 3.1082), singing, in- and exhaling, and vowel and consonant sounds (e.g. ex. 3.1081-3.1084). For larger auditoriums, the piano should be amplified with 2 or more microphones over strings and one for the knocking, whispering, etc., aimed at pianist's mouth.



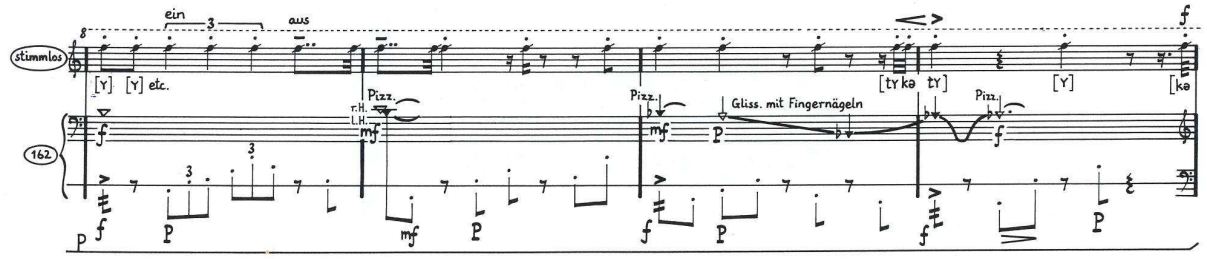
Example 3.1081. K. Stockhausen: *Klavierstück XII – Examen* (1983), bars 104-108. Top stave: Toneless blowing through the lips (like wind), inhaling, exhaling; left hand stave: string glissandos with plectrum and finger nail. Reproduced with kind permission of Stockhausen-Verlag.



Example 3.1082. K. Stockhausen: *Klavierstück XII – Examen* (1983), bars 42-44. Top stave: voiceless hissing. Reproduced with kind permission of Stockhausen-Verlag.



Example 3.1083. K. Stockhausen: *Klavierstück XII – Examen* (1983), bars 51-52. Whistling, voiceless shouting, kissing noises, tongue clicks, voiceless hissing. Reproduced with kind permission of Stockhausen-Verlag.



Example 3.1084. K. Stockhausen: *Klavierstück XII – Examen* (1983), bars 162-165. Top stave: voiceless in- and exhaling; bottom stave: string rubbing and string clusters. Reproduced with kind permission of Stockhausen-Verlag.

Fitting for a scene from an opera, *Klavierstück XII* contains theatrical indications ("suddenly look upwards"; "gradually look at the keys again") and is advised by Stockhausen to be performed from memory. This makes the piece one of the few that combine the "traditional" improper techniques with vocal and theatrical extensions.

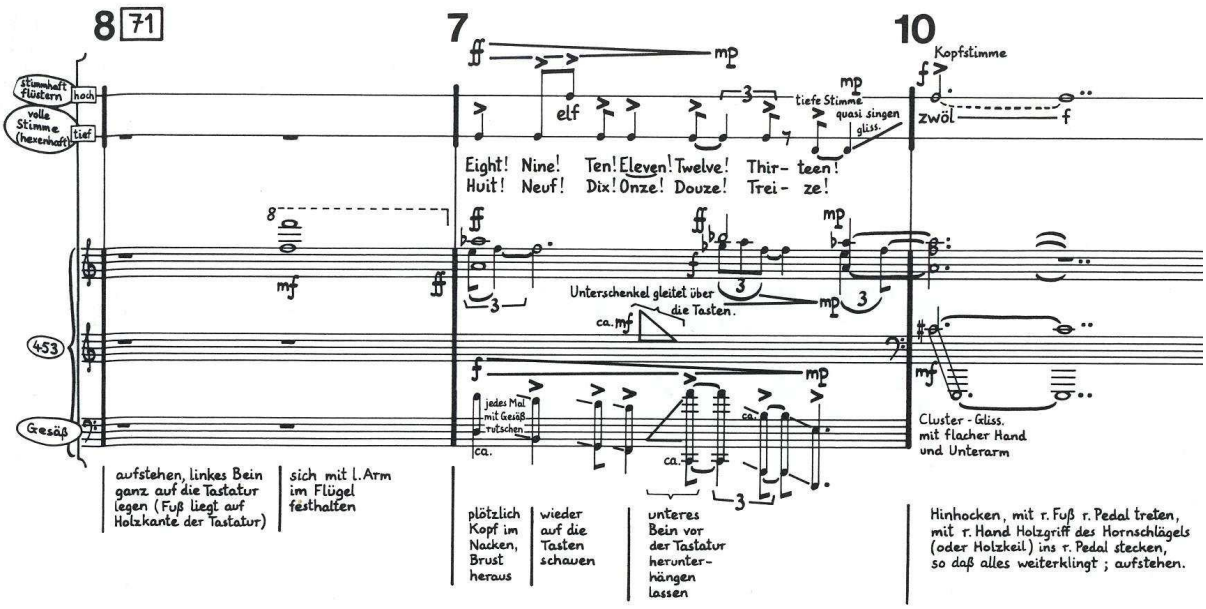
Klavierstück XIII – Luzifers Traum (1981), the solo piano version of the first scene from Stockhausen's opera *Samstag aus Licht,* is again amplified and – if possible – to be performed from memory. The same strings techniques are prescribed as in the previous piece; the vocal utterances are as numerous but more specifically detailed. Several types of techniques are added, however:

- Micro-clusters (thumb and middle finger on one key), cluster arpeggios, cluster-glissandos (for which Stockhausen advises the pianist to wear a cotton or synthetic glove with the fingers cut off);
- Percussion instruments (Indian bells), bone mallet (for striking and gliding on strings);
- Five toy- or self-made rockets that the pianist needs to fire. These should fly from (the inside of) the piano through the air across the stage in various flight paths, landing – optionally with parachutes – at various locations on the stage.
- More theatricals

The theatrical indications are detailed and consist of multiple actions, combined with keyboard and vocal writing, e.g. for buttock-clusters (ex. 3.1085):

- Stand up, lay entire left leg on the keyboard (foot rests on the wooden edge of the keyboard)
- Hold on to the inside of the piano case with the left arm
- Slide buttock each time
- Suddenly head pulled back, chest forward
- Look at keys again

- Lower leg glides over the keys
- Let lower leg hang down in front of the keyboard
- Squat down, press down right pedal with right foot
- Wwith right hand, place wooden handle of bone mallet (or wooden wedge) into socket of right pedal so that entire sound continues to ring
- Stand up



Example 3.1085. K. Stockhausen: *Klavierstück XIII – Luzifers Traum* (1981), bars 453-455. Reproduced with kind permission of Stockhausen-Verlag.

The piece continuous with the finale, for which the pianist makes a slow thigh-and-buttock cluster glissando from the high register as far as possible towards the low register, stays seated for a moment as though frozen, looks at the keyboard ("breathing ad lib."), stands up and walks around the piano with magical gestures, playing a pizzicato and arriving in front of piano to play while standing; whispers, quickly damps all strings from bottom to top with both hands, tiptoes out behind the piano, comes back, carefully close the lid of the piano about two-thirds, let it gently fall with a muffled noise, and leaves the stage.

The short *Klavierstück XIV – Geburtstag-Formel* from *Montag aus Licht* (1984) is no more than an interlude in the set of piano pieces (written for the birthday of Boulez), using the same categories of techniques as in the previous pieces (now featuring an elbow-cluster combined with a chord played by the hand of the same arm) but without any theatricals.

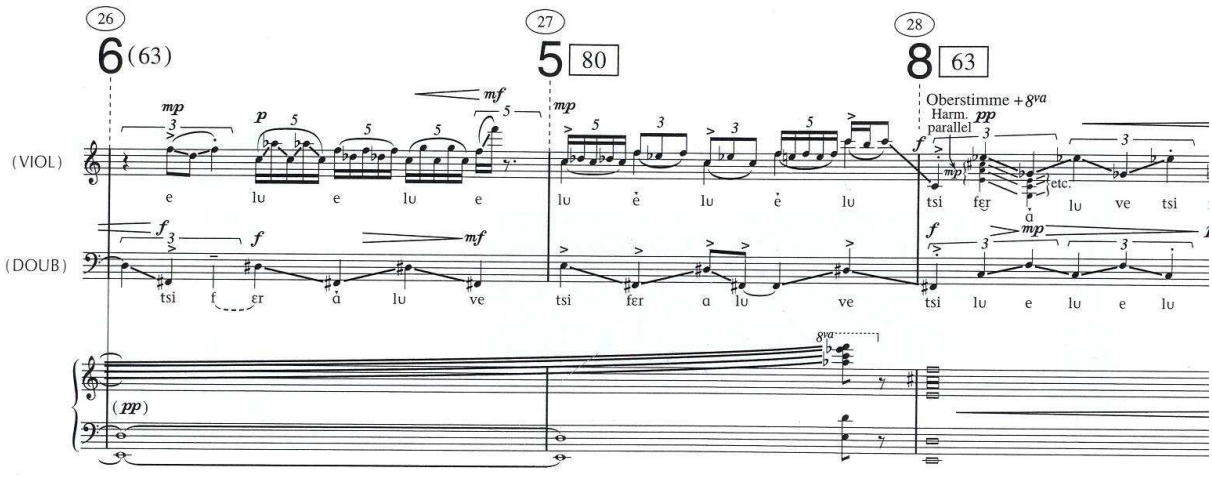
An important development in the history of the extended piano is *Klavierstück XV – Synthi-Fou* from *Dienstag aus Licht* (1991) "for a player of electronic keyboard instruments and electronic music." There are no extended techniques (all sounds are synthesized) but Stockhausen's introduction is revealing:

> [The pianist] plays different synthesizers and samplers while operating additional electronic equipment. This new interpreter-role is of course a continuation of the traditional keyboard player. That is why, after having composed 14 piano pieces, I have explicitly subtitled SYNTHI-FOU, the new keyboard composition, PIANO PIECE VX. The electronic "piano music," however, demands a completely new technique for programming and playing the sounds (including all sound-noises and

> noises), and controlling the envelopes, dynamic degrees, glissandi, resonance, spatial projection, etc.
> […]
> SYNTH-FOU was composed at the frontier of the border between mechanical piano music and an *electronic piano music*, and Simon is the first *piano electronician* who has participated in this musical revolution. PIANO PIECE XV marks the beginning of a new era of composed art music for clavier instruments, which means for keyboard instruments.

Stockhausen did not abandon the acoustic piano, however. The next piano piece, *Klavierstück XVI* (1995) from *Freitag aus Licht* is scored for tape, string piano, and electronic keyboards ad lib., and was dedicated "to all pianists who do not only play the traditional stringed-piano but also include electronic keyboard instruments in their instrumentation."

This piece was written for the *1997 Michele Competition* as a compulsory piece for the three finalists. According to Stockhausen it does not demand virtuosity but imagination and a sense of humor. A tape contains twenty-four recorded concrete sounds that have bee mixed and modulated with sung and electronic sounds. While the tape is played, the performer "plays and/or sings, whistles, plucks etc. any number of pitches synchronous with the tape." Glissandos ought not to be on the keyboard but on the strings. The electronic keyboard instruments are ad libitum, but Stockhausen clearly had them in mind rather than (or added to) the stringed piano, judging from the timbre glissandos that occur in the piano part. (Ex. 3.1086.) *Klavierstück XVI* has fewer extended techniques than the previous four pieces, but the clear intention of it being for synthesizer, possibly matching the taped sounds much better, rather than the stringed piano shows Stockhausen's belief in the new era of the keyboard instruments.



Example 3.1086. K. Stockhausen: *Klavierstück XVI* (1995), bars 26-27. Reproduced with kind permission of Stockhausen-Verlag.

4 IN PRACTICE: EXTENDED TECHNIQUES

Many performance practical aspects of extended piano playing have already been treated in the previous chapter. The repercussions of the techniques' notation on performance practice have been considered in detail when describing historical occurrences of extended techniques in scores. Per composition discussed, questions of what exactly a composer had written down (to glide or not, chromatic or diatonic cluster, etc.) have led to in-depth treatment of performance technique. But, as much as the historical chronology has already revealed performance practical information for individual pieces, a number of insights can still be formed on the basis of sources that have not been essential to writing that history. Besides the tutors (which are treated in the previous chapter), there are not many historical sources that specifically treat the performance practice of the extended techniques. We could find no 18th century source specifically commenting on how performers played glissandos and clusters, or, for instance, how and on what instruments Rust's clavichord sonata or Wernicke's variations would have been played. The only such source for the 19th century comes from Liszt, who is reported to have advised a student on how to practice the glissando without hurting the fingers. For these two centuries, then, the historically informed performance practice will have to be deduced from the information that was gathered in the previous chapter. As for the 20th century, a number of diverse sources are available to shed light on questions that were not treated in the historical overview, such as interviews with composers and performers, scores and other items from their estates, photographs, unpublished dissertations and insights from working relations with composers by the author.

4.1 The instrument

Together with the historically correct notes and the aesthetic context to interpret that score, the instrument is the main factor in working out a historically informed performance practice. Throughout its history, however, the piano underwent drastic changes in its construction and sound, and even if we know from quite a few composers what type of instrument they had at home, it is often far from easy to establish what instrument a particular composition was composed on or for, and on what type(s) of instruments they were generally played.

As it is often difficult, if at all possible, to program recitals with compositions all suited to one instrument, and as it is still very uncommon to tour with a several pianos at once to accommodate each piece that may need a different instrument, compromises are necessarily made in present-day concert practice. But this is not new: we have seen in the previous chapter how scores 18th century pianists were accustomed to switching between pianos to harpsichords, organs or clavichords. It has also been very clear how 19th century composers changed their predecessor's music as well as their own – be it for matters of taste or performance practice.

In principle, the use of the extended piano goes against the original design's intentions. As such, the repertoire often takes advantage of characteristics that were not consciously incorporated for that purpose: the chamfering of keys was not executed to facilitate glissando playing, the metal frame was never designed to allow easy access to nodal points on strings or put screws and bolts in between them. Because of that, pianos can differ more from each other with regard to extended techniques than for proper playing. There has been a noticeable standardisation of keyboard-, pedal- and action-design, but there was never any need to standardise the comfort necessary to improperly play the piano. As a consequence, perhaps paradoxically so, the choice of the right instrument for

any particular composition relying on extended techniques is at least, if not more, crucial than for the proper repertoire.

4.1.1 The piano for keyboard glissandos

Chosing the right instrument for the glissando repertoire is not just a question of knowing on which instrument a composer could have played at or around the time of composition. In 1791-1792 Haydn had lived in London for a year and a half (working for some months in a room provided for him by the Broadwood piano firm) and again in 1794-95. He therefore must have known the English pianos well. But this, together with the fact that he dedicated his trio in C Hob. XV:27 (1795-97, see above, 3.2.6.1.8) to Thérèse Jansen (whom he had met in London) is not compelling evidence enough to play the trio on an English piano. As a matter of fact, the passage with the octave runs cannot be played as glissandos on an English piano from that time: the action is far too heavy.[1700] Much to the contrary, a contemporary Viennese instrument (e.g. a 1795 Anton Walter) lends itself to octave glissando playing with great comfort, more so than individual articulation.

Present-day key-dip and -weight will prevent any pianist from playing octave glissandos in late 18th century Haydn and Beethoven without sacrificing any of the gallant qualities of the music to the brute force that would be necessary to glide over the keys of, say, a Steinway or Bösendorfer. If a pianist nevertheless wants to play this repertoire on such an instrument, there are only limited options. For the Beethoven trio (see 3.2.6.1.5) the glissando passage could be divided into two one-hand glissandos. This would be more true to the original intention of glissando sound than playing the passage with two hands and individual articulation. The Haydn trio leaves no such option, as both hands are busy. With a fast individually articulated octave technique, the Haydn trio octaves can be played at a tempo that may just be sufficiently high to accommodate for the *Allegro* character of the themes and motifs in that movement. But the imitations of the piano octave triplets in the violin (see above, ex. 367) should then sound like the octaves. Therefore, they should be played with the same non-legato articulation, i.e. with detached bowing. In case of glissando playing on an instrument that allows for this technique, the violin can play the triplets legato.

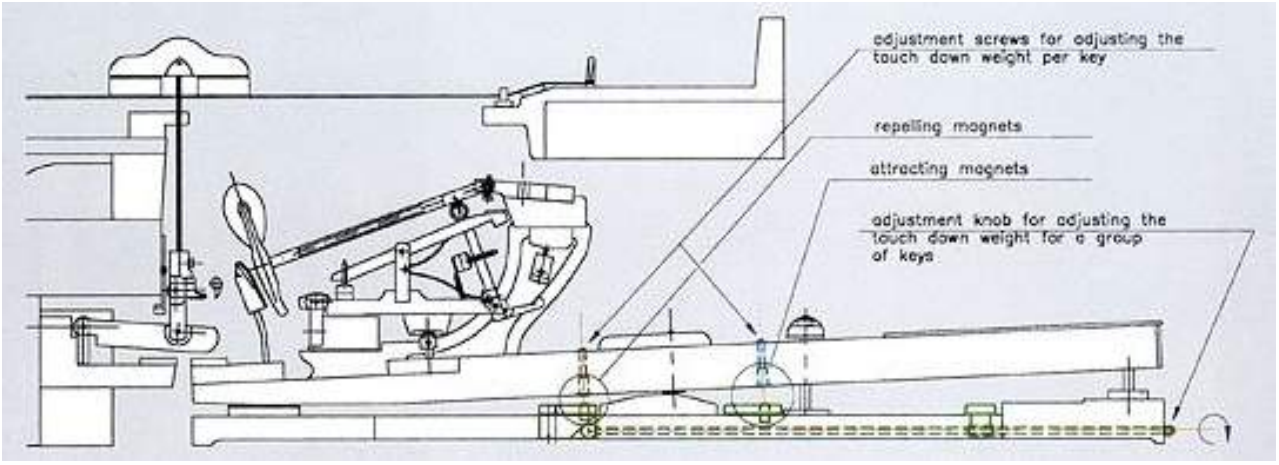
In many cases, the glissando performance can be adjusted to fit tempo and character needs. For instance, if the timely arrival of the octaves in Beethoven's opus 15 (see 3.2.6.1.7) is an issue, the cruising speed of the glissando can be delayed. The first couple of notes can even be played with individual articulation – as in a rubato – before an effortless transition to glissando technique can be made to gain momentum.[1701] But on a Viennese piano from the late 18th century – with its action being so light that the glissando may arrive too soon – the glissando momentum can be postponed just as easily by beginning with a slow glide.

Adjusted timing of the glissando's momentum can often also be used to play 19th century glissandos (e.g. in Liszt's *Lucrezia Borgia* fantasy) on instruments that are heavier than what the composer had in mind at the time of the composition.

There is one present-day piano action that allows for any glissando playing, however. In about 2000, the Dutch engineer Hans Velo[1702] and the piano restoration firm of Evert

[1700] We tried the passage on a Longman, Clementi & Co. (Londen, 1798 – 1799), the type of instrument Haydn is reported to have owned.
[1701] This interpretation is what Bart van Oort proposed to one of his students.
[1702] Velo 2009.

Snel[1703] invented and developed the *Magnetic Balanced Action*. A system consisting of attracting magnets (opposite polarity) at the front end of each piano key is counter-balanced by two repelling (same polarity) magnets at the rear end of the key, equalising the touch weight. This method described, in short, has several advantages. This balancing method dispenses with the increased key-weight of the traditional lead weights in the keys, making the action seem lighter and limiting the friction of the key at the fulcrum. The touch weight of the key can be adjusted more easily and more precisely, providing a more uniform static and dynamic response from all the keys. The method can make the required key force dependent on the extent to which the key is depressed (i.e. the key can have a lower starting force than normal and a higher force than normal when the key is fully depressed), producing better control for pianissimo playing. Its higher uplift weight also returns the key faster to its rest position. (Ex. 4.1.)



Example 4.1. Cross-section of a Magnetic Balanced Action bass key. Reproduced by permission.

Through a number of adjustment controls at the front of the instrument, the pianist can easily adapt the touch-weight to his own preferences. The margins above and below the nominal touch weight (typically around 50 grams) can be adjusted from +5 to –10 grams in relation to the nominal weight, possibly reducing the weight with about 20%. (Ex. 4.2.)



Example 4.2. Adjustment controls for the Magnetic Balanced Action.

[1703] www.evertsnel.nl. Last accessed September 2009.

4.1.2 The string piano

As much as playing Beethoven on a present-day Bösendorfer is different from playing his music on a period fortepiano, it is problematic to try and switch between, say, a 1974 Bechstein baby grand and a 1974 Bösendorfer Imperial when studying George Crumb's *Makrokosmos II* from that year.

The insides of pianos are designed on the basis of the metal frame that supports the tension of the strings and on the stringing, i.e. the way the strings are laid out over the soundboard. The wound strings of the bass are laid over the left-most steel strings to limit the total length of the piano. This makes access to those steel strings difficult for pizzicato playing or for pressing nodal points. The crossbeams are designed to fortify the frame and their layout can hinder easy access to strings' nodal points, or the muting of a string range with the palm of the hand. The precise frame design can vary from brand to brand, from model to model, and from year to year, depending on the manufacturers engineering preferences and on the number and length of the strings.

In Appendix 2, a number of present-day piano models are listed with measurements of such elements as framework layout, keyboard length, key-dip, etc. We will refer to the models in that list throughout the next paragraphs. An overview of the strut layout is presented here, as table 4.1.

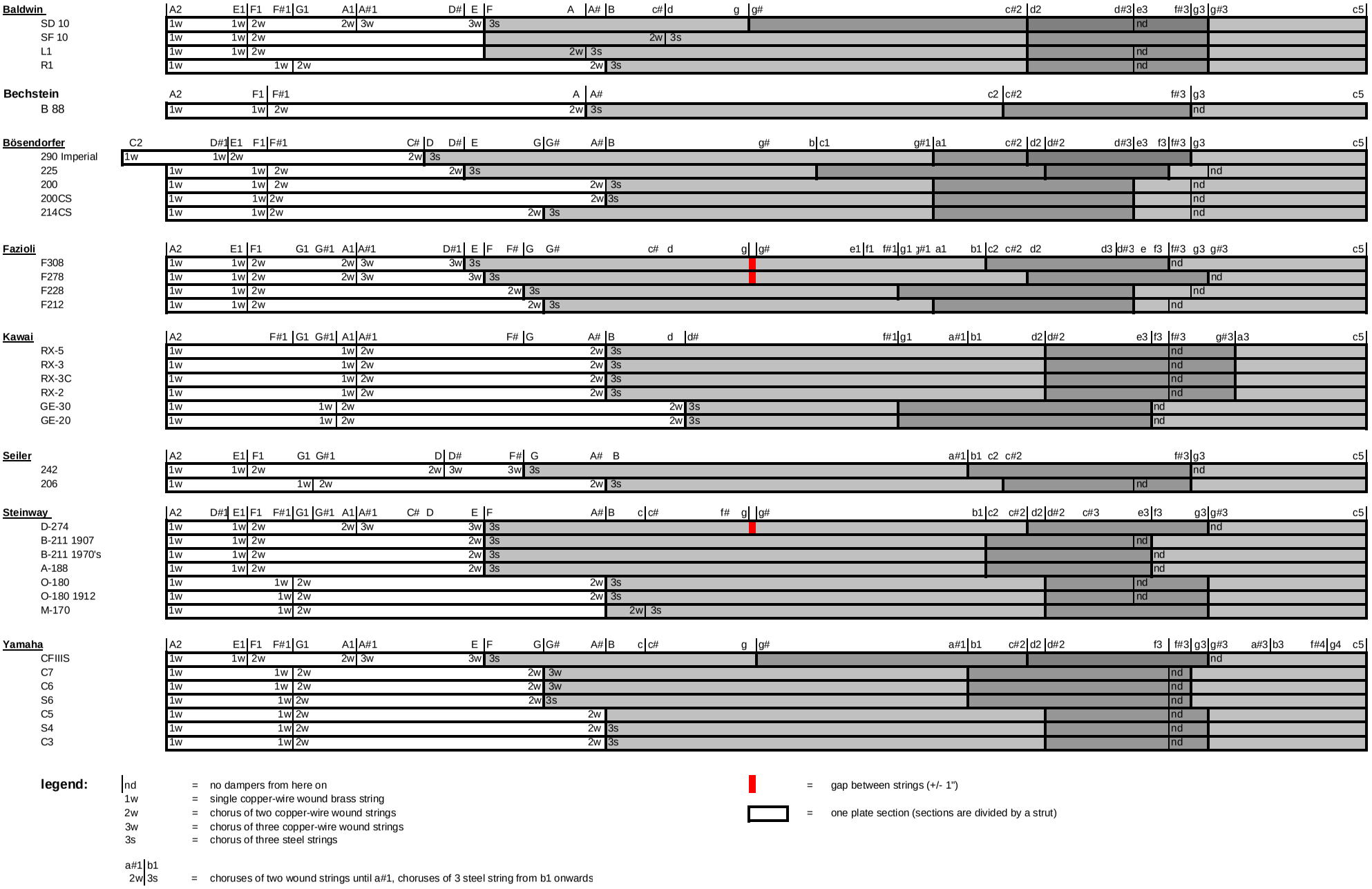


Table 4.1. Chart of piano's plate sections and string chorus divisions

In general, it seems that manufacturers can stick with a particular model's frame design for many decades. For instance, we found no differences in the division of plate sections between a Steinway B or O from the beginning or the end of the 20th century. Yet it can be striking how 20th century pieces that were performed for decades by the composer himself – e.g. Cowell's *The Banshee* (see above, ex. 3.683 and 3.720) – cannot be played as written on most pianos. We will here consider some of the best known and often-played works by Cowell and Crumb.

4.1.2.1 Cowell: *The Banshee* and *Aeolian Harp*

The Banshee requires three techniques:

- Lengthwise sweeping over strings from *F* to *b♭*;
- Pizzicato on strings of the range from *g* to d^1;
- Glissandos across strings from the lowest available notes (at least from C) up to *b♭,* apparently (as far as the notation is reliable) even up to d^1.

Glissando range: (*A*²)-----*C*----------*b♭*(----d^1)
Lengthwise sweeping range: *F*----------*b♭*
Pizzicato range: *g*--------$d♭^1$

There are two main problems with performing *The Banshee*: firstly, the gliding from low notes up to notes that are on other side of a strut prevent the glissando to be continuous up to that note; secondly, the lengthwise sweeping can only be done on wound strings (on steel strings there is not enough friction possible to make an audible effect; the steel strings in the relevant register are also mostly covered by the wound strings that run at an angle and do not allow sweeping over the steel ones). The first problem is not severe as a short interruption between the glissando over the strings and the one alongside the strings does not threaten the musical phrase – it is hardly audible. Regarding the lengthwise glissandos, the highest wound strings go up to *A#* on many pianos but that is just enough to accommodate the range *E♭-b♭* only if Cowell really had meant F^1-*B♭* and had forgotten to indicate the passages to be *8va basso*. When looking at a photograph of Cowell demonstrating *The Banshee* (ex. 4.3 – the hair of the assistant depressing the pedal is just noticeable), we can see how Cowell is gliding with his second, third and fourth finger along three lower double- and single-wound strings, with a chorus between each of the ones he glided over. The change from double to single wound string can be seen in the picture to be from E^1 to F^1 so that we can deduce that Cowell was playing the final chord (E-F#-G#) and therefore that this was in fact E^1–$F\#^1$–$G\#^1$ and that the perpendicular glissandos should be transposed an octave lower than notated.[1704] With this in mind, it looks as if Cowell could have written *The Banshee* on a smaller Steinway model. (Judging the frame in the photograph, he seems to be playing an older Steinway model.) However, most pianos have steel strings from around *F* upwards, which leaves either no notes that can be swept lengthwise as notated or only two-thirds of them when transposing the relevant sections an octave downwards (F^1–*E*). Much worse, even: if *The Banshee* is not transposed an octave downwards, the struts that lie on most pianos somewhere between *E* and *e♭* will make it very difficult for the hand to glide lengthwise over the strings of the clusters that Cowell prescribes (e.g. gliding along all the strings between *A* and *f#*). On most pianos an extra transposition provides the solution as their wound strings go up to *D#* or *E*: a total transposition of the published score to a

[1704] The deduction that the whole piece (including the pizzicatos) should be transposed an octave downwards is false, for then the pizzicatos would be moved to the range where their strings are covered by the wound strings.

diminished fifth below (plus another octave for just the glissandos) leaves just enough space to sweep over the lowest strings of the required range (i.e. A^2-$D\#^1$ in the transposed version). The wound strings of the Bösendorfer Imperial only go up to *C#* but a further transposition is possible since the lowest notes go deeper than any of the other pianos.



Example 4.3. Henry Cowell playing *The Banshee.* Photograph from the 1950's, © David Linton.[1705]

Cowell's other most famous piece – *Aeolian harp* (see above, ex. 3.674, 3.718 and 3.719) – presents similar problems of incompatibility with piano frames. Again, on most pianos the score has to be transposed to facilitate a performance.

The glissandos over the open strings of *Aeolian Harp* run from $e\flat$ to $b\flat^1$. Struts that prevent continuous glissandos form the biggest hindrance. Again, of the models that we measured and that were around in Cowell's days, the smaller Steinway models fit the glissando range best. Not only are there no struts in the way, there is also a margin on each side so that the fingers can start gliding beneath the lower notes of the chords and go up beyond the top notes. If a top note of a silently depressed chord lies right left of a strut, the finger will not be able to completely glide over that chorus because the hand will hit the strut first.

One particular problem is found on the Steinway D (also on the more recent Fazioli F308 and F278[1706]), namely the one inch gap between the strings of *g* and *g#*, preventing

[1705] Reproduced from Sachs 2001 p. 9-10.

[1706] The Fazioli company was started in 1978 (http://www.fazioli.com/eng/storia.php - last accessed September 2009), which is after Cowell's death in 1965, so he could not have known those models. Cowell must have known the Steinway D, however, and even if the early 20th century model D did not have the gap, it had a strut between the chorusses of *f#* and *g*, also in the middle of the glissando range.

smooth glissandos over those strings. This gap runs alongside the complete length of the strings and affects 8 out of the 38 glissandos. Transposing the whole piece a major third upwards is a possible solution: the lowest note would then be right above the gap, the highest note ($e\flat^1$) still within the plate section of the frame for the Steinway D. For the Yamaha CFIIIS, and the American Baldwin SD10, where the change of section plate lies between *g*/*g#,* the transposition has to be higher so that the finger can start enough to the left to fully glide over the lowest chord notes.

On some pianos the struts that separate the plate sections are placed between *b*/*c*^{1} (Bösendorfer 225) and higher (Bösendorfer 200, 214 and 290, Fazioli 278). For these the piece must be transposed *downwards*. In one case at least, there is a serious musical consequence, however, as the whole composition will sound decidedly low and perhaps less suited to the idea of a wind harp producing eerie sounds. Certainly the Bösendorfer 225 is not a piano on which to play this composition: it would require transposing the piece either a diminished seventh downwards or a diminished sixth upwards, either case outside of an acceptable balance between glissandos in the treble register pizzicatos in the bass.

4.1.2.2 Crumb: from *Five Pieces* to *Gnomic Variations*

Over the years, Crumb has grown aware of the difficulties that his performers often had with performances on piano models for which the scores were not specifically written. In the history chapter we have seen how his idiom gradually matured and left out the most risky techniques. At the same time, he started to warn performers that they should choose the right instrument for any particular piece of his, as in *Makrokosmos III* (1974). Additionally, he sometimes indicated alternatives for potentially troublesome techniques, as in *Makrokosmos IV* (1979). We will here give an overview of the techniques used in seven of Crumb's compositions that can present challenges depending on the model of piano that they will be performed upon. Each piece is evaluated according to which models it cannot be performed.

As muting strings near the tuning pegs is never problematic (the string sections do not cross at that point, there are no lateral crossbeams), we will indicate only the chords that need to be muted with one grip of several fingers or with the palm of the hand (possible prohibited by a vertical crossbeam over which the hand cannot position its fingers).

Touching the nodal points on strings to produce 2nd partials (at the middle of the string) and 5th partials (at 1/3rd of a string) can be a problem, however, especially when they need to be pressed on tenor strings that run underneath bass strings.

Glissandos over strings that are opened and need to be filtered by the silently depressed keys can present serious problems when a vertical crossbeam is in the way of the glissando, and/or when the top and/or bottom notes of the chord lies right next to a crossbeam: the glissando needs to start from before the lowest note and go up beyond the top note, or the performer runs the risk of not getting those two notes with the same intensity (not all three strings are glided over; these notes sound as if accentuated). The reader has to take into account that we will here indicate the notes that have to sound, not the ones that are needed extra below or above.

Glissandos over bass strings for the sake of the gliss sound (no silently depressed keys filter the sound) can be adjusted in range and/or ambit since their outer notes are not crucial. In the same way, string clusters normally do not need to be exact in range and/or ambit. These two techniques are most often not notated as exact intervals.

Chords are written with a hyphen in between the pitches, ranges with an arrow.

Five Pieces

- No problem for <u>partials</u>: there are only three between *d#¹* and *a¹*
- <u>Dampen vibrating strings</u> (negative arpeggio): *f, f#, g, a♭, a¹*
- <u>Glissando on strings</u>: *a♭→g¹, c¹→c#; b♭→a¹*
- <u>Tremolos on strings</u>: *D-E; g#-b♭; b-c#¹; d#¹-f¹*

Evaluation:
- Due to crossbeams in between the interval, the tremolo on D-E is problematic on:
  - Bösendorfer 225
  - Fazioli 308
- Due to crossbeams in between the interval, the tremolo on *b-c#¹* is problematic on:
  - Bösendorfer 225 (crossbeam in between)

Makrokosmos I

- <u>5th partials on</u>: on *A²* and *D♭ →F*
- <u>5th partial chord on</u>:
  - 4th movement *Crucifix*: *F¹-G¹-B¹, A¹-D♭* -E
  - 9th movement *The Abyss of Time: F#→A♭, E¹→D, C#¹→E♭, A¹→B¹, B¹→D, F¹→A♭, C→D* (too fast sequence to not grab them as chord)
- <u>2nd partials chord on</u>: *b→c#*
- <u>Glissando over opened strings</u>:
  - 7th movement *Music of Shadows*: *c→b¹ / F¹→C*
  - 12th movement *Spiral Galaxy*: *A²→B¹, E♭¹→F*

Evaluation:

- For the 7th movement *Music of Shadows:* the top note *b¹* is the last note before a crossbeam on:
  - Steinway B
- For the 12th movement *Spiral Galaxy*:
  - the score indicates the range of the glissando as *A²→ B¹* but the silently depressed keys are indicated as *A¹→B.* Most pianos have crossbeams in between C# and d#, therefore the silently depressed keys must also be an octave lower, i.e. *A²→ B¹*.
  - Due to a crossbeam before top note *F*, the glissandos between *E♭¹* and *F* are problematic on:
    - Baldwin SD20, SF10, L1
    - Bösendorfer 290, 225
    - Fazioli 308, 278
    - Steinway D, B, A
    - Yamaha CFIIIS

The best pianos for *Makrokosmos I* are:
- Baldwin R1
- Bechstein88
- Bösendorfer 200, 200CS, 214CS
- Fazioli 228, 212
- All Kawai
- All Seiler

- Steinway O, M
- Yamaha C7, C6, S6, C5, S4, C3

Makrokosmos II

- 5th partials on: $B^2 \rightarrow B^1$, *D*
- 2nd partials on: $g^1 \rightarrow b^1$
- Sheet of paper on strings: $e \rightarrow d^2$ (If there is no gap between the crossbeams and the strings (e.g. when a vertical support for a crossbeam sits between strings) so that the paper goes through. Otherwise, more than one sheet is to be used.)
- Glissando over opened strings:
  - 2nd movement *The Mystic Chord:* $e \rightarrow a^1$
  - 4th movement *Twin Suns*: at least between $d \rightarrow a\flat^1$
  - 6th movement *Gargoyles:* $g \rightarrow c^1$
  - 8th movement *A Prophecy of Nostradamus*: $B\flat^2 \rightarrow E$
  - 12th *Agnus Dei*: $D\#^1 \rightarrow F\#$
- Glass tumblers
  - 5th movement *Ghost-Nocturne: for the Druids of Stonehenge (Night-Spell II):* $c^1 \rightarrow b\flat^1$, $D^1 \rightarrow C$
- Pizzicato chords:
  - 9th movement *Cosmic Wind*: f^1-$g\flat^1$, $c\#^1$-d^1, g-$a\flat$

Evaluation:

- The sheet of paper is NO problem on:
  - Kawai RX5, RX3, RX3C
  - Steinway O, M
  - Yamaha C5, S4, C3

  On all the other piano models, two sheets may be necessary, depending on how much space there is between the strings and the crossbeams above. If there is enough space, the paper has to be slit underneath crossbeams. Placing and removing the paper will therefore be noisy.
- Due to crossbeams, the glissandos in the 2nd movement are problematic on:
  - Bechstein 88
  - Bösendorfer 290, 225, 200, 200CS, 214CS
  - Fazioli 228, 212
  - Kawai GE-30, GE-20
- Due to crossbeams, the glissandos in the 4th movement are problematic on:
  - Baldwin SD10
  - Bechstein 88
  - Bösendorfer 225
  - Fazioli 228
  - Kawai GE-30, GE-20
  - Yamaha CFIIIS
- Due to crossbeams, the glissandos in the 6th movement are problematic on:
  - Baldwin SD10
  - Yamaha CFIIIS
- Due to crossbeams, the glissandos in the 8th movement are problematic on:
  - Bösendorfer 290, 225
  - Fazioli 308
- Due to the top note laying right next to a crossbeam, the glissandos in the 8th movement are problematic on:
  - Baldwin SD10, SF10, L1
  - Fazioli 278
  - Steinway D, B, A

    - Yamaha CFIIIS
- Due to crossbeams, the glissandos in the 12th movement are problematic on:
    - Baldwin SD10, SF10, L1
    - Bösendorfer 290, 225
    - Fazioli 308, 278
    - Steinway D, B, A
    - Yamaha CFIIIS
- Due to the top note laying right next to a crossbeam, the glissandos in the 12th movement are problematic on:
    - Fazioli 228
    - Seiler 242
    - Yamaha CFIIIS
- For the glass tumbler in the tenor range, the range is only just possible on:
    - Bösendorfer 225 (crossbeam right before c^1)
- For the glass tumblers, the ranges are impossible on:
    - All Bösendorfer
    - Fazioli 308, 278
    - Kawai GE-30, GE-20
- Due to crossbeams in between the notes of the pizzicato chords in the 9th movement *Cosmic Wind*, and depending on the height of the crossbeam and the length of the performer's fingers, the dyad *g-a♭* may be impossible on:
    - Baldwin SD10
    - Yamaha CFIIIS

All in all, *Makrokosmos II* is only possible on
- Baldwin R1
- Kawai RX5, RX3, RX3C, RX2
- Seiler 206
- Steinway O, M
- Yamaha C7, C6, S6, C5, S4, C3

For recitalists who want to perform both *Makrokosmos I* and *II* in one and the saùe program, the best pianos to play both are:
- Baldwin R1
- Kawai RX5, RX3, RX3C, RX2
- Seiler 206
- Steinway O, M
- Yamaha C7, C6, S6, C5, S4, C3

Makrokosmos III

Piano I
- 5th partials on: F^1, $F\#^1$
- 2nd partials on: $c\#^1$, $d\#^1$, $f\#^1$, $a♭^1$
- glissando over opened strings:
    - 3rd movement *The Advent:* $f\# \rightarrow c^2$
- Sheet of paper over strings: $A\# \rightarrow a\#^2$

Piano II
- 5th partials on: C^1, $G\#^1$, B^1
- 2nd partials on: $c\#^1$, $d\#^1$, $f\#^1$
- Glissando over opened strings:
    - 3rd movement *The Advent:* $e♭ \rightarrow c^2$, $B♭^2 \rightarrow C\#$

- Sheet of paper: *A#→a#²*

Evaluation:

- Due to crossbeam, the glissandos in the 3rd movement *The Advent* (over *f#→c²*) are impossible on:
    - Baldwin SD10
    - All Bösendorfer
    - Fazioli 308, 228, 212
    - Kawai GE-30, GE-20
    - Seiler 242
    - Steinway B, A
    - Yamaha CFIIIS, C7, C6, S6
- Due to the top note laying right before a crossbeam, the glissandos in the 3rd movement *The Advent* (over *f#→c²*) are impossible on:
    - Bechstein 88
    - Seiler 206
- A single sheet of paper over *A#→a#²*is impossible on all pianos. Two are therefore needed
- Due to crossbeam, the glissandos in the 3rd movement *The Advent* (over *e♭→c²*) are impossible on:
    - Baldwin SD10
    - All Bösendorfer
    - Fazioli 308, 228, 212
    - Kawai GE-30, GE-20
    - Seiler 242
    - Steinway B, A
    - Yamaha CFIIIS, C7, C6, S6
- Due to the bottom note laying right after a crossbeam, the glissandos in the 3rd movement *The Advent* (over *f#→c²*) are impossible on:
    - Kawai GE-30
    - Kawai GE-20

All in all, foreseeing two sheets of paper for the 3rd movement *The Advent, Makrokosmos III* is best played on:

- Baldwin SF10, L1, R1
- Fazioli 278
- Kawai RX5, RX3, RX3C, RX2
- Steinway D
- Yamaha C5, S4, C3

Considering that Crumb wrote bass string glissandos specified to go up to Eb and back, for which there is no musical reason, this confirms that he wrote the piece for or on any of the above instruments

Makrokosmos IV - Celestial Mechanics

For piano four-hands (parts: I and II)

If the indicated effect of a scraped bass-string cluster does not sufficient project, a rapid fingernail glissando across several strings may be substituted.

- Dampen strings at center with palm:
  - 1st movement *Alpha Centauri* I: $d^1 \rightarrow b^1$, $d\#^2\text{-}a^2$ / II: $d \rightarrow e\flat^1$
- 5th partial chords on:
  - 1st movement *Alpha Centauri*: $F^1 \rightarrow G^1$
  - 2nd movement *Beta Cygni*: $G\#^1 \rightarrow B\flat^1$, $F^1 \rightarrow G^1$
  - 3rd movement *Gamma Draconis*: $E^1 \rightarrow G\flat^1$, $G\#^1\text{-}B^1\text{-}C$, $A^2 \rightarrow B^2$, $D^1\text{-}E^1\text{-}F\#^1$,
  - 4th movement *Delta Orionis*: (page turner part) $F^1\text{-}F\#^1\text{-}G^1$, $E^1\text{-}F^1\text{-}F\#^1$, $D\#^1\text{-}E^1\text{-}F^1$, $D^1\text{-}D\#^1\text{-}E^1$, $C\#\text{-}D\text{-}E\flat^1$, $C^1\text{-}C\#^1\text{-}D^1$, $B^2\text{-}C^1\text{-}C\#^1$, $A\#^2\text{-}B^2\text{-}C^1$, $A^2\text{-}B\flat^2\text{-}B^2$
- 2nd partials on:
  - 2nd movement *Beta Cygni*
    - I: $f^1\text{-}g^1$, $b\flat^1\text{-}c$, $a\text{-}c^1$, $g^1\text{-}b\flat^1$, $b^1\text{-}d\flat^1$, $c^1\text{-}d^1$, $a\#^1\text{-}b^1$, $c\#^1\text{-}d^1$, $f^1\text{-}g^1$, $a\text{-}a\#$, $f^1\text{-}f\#^1$, $a^1\text{-}b\flat^1\text{-}b^1$, $f^1\text{-}a\flat^1$
    - II: $c^1\text{-}d^1$, $f^1\text{-}g^1$, $d^1\text{-}f^1$, $g^1\text{-}b\flat^1$, $f\#\text{-}g\#\text{-}a$, $G^1\text{-}G\#^1\text{-}B^1$, $D\#^1\text{-}E^1\text{-}G^1$, $b\text{-}d^1$
  - 4th movement *Delta Orionis:* $b\flat\text{-}d\flat^1\text{-}e\flat^1$, $e^1\text{-}g^1\text{-}a^1$, $c\#^1\text{-}e^1$, $D^1\text{-}F^1\text{-}G\flat^1$, $c^1\text{-}e\flat^1\text{-}e^1$
- 4th partials on:
  - 2nd movement *Beta Cygni* (end): $e\#\text{-}g\#$
- Pizzicato:
  - 2nd movement *Beta Cygni* : II: $g^1\text{-}a^1$, $b^1\text{-}c^2$
- Mute chords with fingers:
  - 2nd movement *Beta Cygni:* I: $a^2 \rightarrow c^3$, $c^3 \rightarrow e\flat^3$ / *II:* $f^1 \rightarrow a\flat^1$, $d^1 \rightarrow f^1$, $a \rightarrow b$
  - 3rd movement *Gamma Draconis*: II: $f \rightarrow g$, $G\#1 \rightarrow B\flat^1$ / *I:* $a^1 \rightarrow b^1$, $d \rightarrow e$
  - 4th movement *Delta Orionis*: I: $c^1\text{-}e\flat^1\text{-}b^1$, $a^1\text{-}b^1$, $g\#^1\text{-}b^1\text{-}c\#^2$ / II: $c^1\text{-}e\flat\text{-}f^1\text{-}g\flat^1$
- Mute chords with the palm:
  - 3rd movement *Gamma Draconis*: II: $G^1 \rightarrow B^1$, $D^1 \rightarrow F\#^1$
- Mute chords with two palms:
  - 3rd movement *Gamma Draconis:* $a \rightarrow a\flat^1$, $a \rightarrow f^2$
- 12-inch ruler (30.48cm): $A^2 \rightarrow G\#$, $d^2 \rightarrow a^3$
- 15-inch ruler (38,1cm): $c \rightarrow d^2$
- Glissando over strings:
  - 4th movement *Delta Orionis:* PI: $f\# \rightarrow f^1$, $e \rightarrow a^1$, $e \rightarrow b^1$ (but both hands can be used)

Evaluation:

- Due to *two* crossbeams in between *a* and f^2, over which interval two palms are to mute the strings in the 3rd movement *Gamma Draconis*, the following pianos are impossible:
  - Bösendorfer 290, 225,
- Due to crossbeams, the 12-inch ruler on the bass strings $A^2 \rightarrow G\#$ is impossible on:
  - Baldwin SF10, SD10, L1
  - Bösendorfer 290, 225, 214CS
  - All Fazioli
  - Seiler 242
  - Steinway D, B, A
  - Yamaha CFIIIS, C7, C6, S6
- Due to crossbeams, the treble ruler from $d^2 \rightarrow a^3$ is *impossible on all pianos*
- Due to crossbeams, the 15-inch ruler from *c to* d^2 is impossible on*:*
  - All Badlwin
  - Bechstein 88
  - All Bösendorfer
  - All Fazioli
  - Kawai GE30, GE20
  - All Seiler

- Steinway D, B, A
- Yamaha CFIIIS, C7, C6, S6

All in all, if two or more rulers are made for the treble range, the best piano for *Makrokosmos IV* is:

- Kawai RX5, RX3, RX3C
- Steinway O, M
- Yamaha C5, S4, C3

A Little Suite for Christmas A.D. 1979:

- 5th partials on: *C1, D1, D#1, E1, F#1, A♭1, B♭*
- 2nd partials on: *a♭, b♭, d♭ →e1, g1, a♭1*
- Glissando over opened strings: *b→b♭1*
- Bass pizzicato: *G-g*
- Tenor pizzicato & partials: *c#1→a♭1, g→e♭1*
- Muted cluster: *d♭1→b♭1*

Evaluation:

- Due to crossbeams, the glissando over *b→b♭1* is impossible on:
  - All Bösendorfer
  - Fazioli 228, 212
  - Kawai GE30, GE20
- Due to the top note laying right before a crossbeam, the glissando is impossible on:
  - Seiler 242
  - Yamaha C7, C6, S6
- Due to crossbeams, the muted cluster from *d♭1→b♭1* is impossible on:
  - All Bösendorfer
  - Fazioli 228, 212
  - Kawai GE30, GE20

All in all, the best piano for *A Little Suite for Christmas A.D. 1979* is:

- All Baldwin
- Bechstein 88
- Fazioli 308, 278
- Kawai RX5, RX3, RX3C
- Seiler 206
- All Steinway
- Yamaha C5, S4, C3

Gnomic Variations:

- Glissando over opened strings:
  - Variation 6: *e♭-a1*
  - Variation 9: *a→g#1*
- Muted strings:

  - Variation 6: *d¹-e♭¹-e¹, c¹-c#¹-d¹, g#¹-a¹-b♭¹, f#¹-g¹-a♭¹, a#¹-b¹-c², c#¹-d¹-eb¹, a-b♭-b, g#-a-a#, a#-b-c¹, e-f-g♭, f#-g-a♭*
  - Variation 8: *B♭² -E¹-A¹*
  - Variation 14: *G¹-G#¹-A¹*
  - Variation 17: *D-E♭*
- <u>Muted strings with palm:</u>
  - Variation 6: *c¹→e¹, f#¹→a#¹, c#¹→c², a→a♭¹, e→e¹, a#→d¹, e→a♭*
  - Variation 10: *b→a¹*
  - Variation 17: with palm (fast appoggiaturas): *b-f¹, a-e♭¹, g→d♭, f→b♭*
- <u>Palm cluster on string</u>:
  - Variation 17: *A→e, A²→E¹*

Evaluation:

- Due to crossbeams in the range *e♭-a¹*, glissandos are impossible on
  - Baldwin SD10
  - All Bösendorfer
  - Fazioli 228, 212
  - Kawai GE30, GE20
  - Steinway D
- Due to crossbeams in the range *a→g#¹*, glissandos are impossible on
  - Bösendorfer 225
  - Fazioli 228
  - Kawai GE30, GE20
- Due to crossbeams in the range *f#¹→a#¹, c#¹→c², a→a♭¹, e→e¹, a#→d¹, e→a♭*, muting strings with palms are impossible on:
  - All Bösendorfer
  - Fazioli 228, 212
  - Kawai GE30, GE20
- Due to crossbeams in the range *c#¹→c²,* muting strings with palms are impossible on:
  - All Bösendorfer
  - Fazioli 308, 228, 212
  - Kawai GE30, GE20
  - Seiler 242
  - Steinway B, A
  - Yamaha C7, C6, S6
- Due to crossbeams in the range *a→a♭¹*, muting strings with palms are impossible on:
  - Bösendorfer 225
  - Fazioli 228
  - Kawai GE30, GE20
- Due to crossbeams in the range *e→e¹,* muting strings with palms are impossible on:
  - Baldwin SD10
  - Bösendorfer 225
  - Yamaha CFIIIS
- Due to crossbeams in the range *a#→d¹*, muting strings with palms are impossible on:
  - Bösendorfer 225
- Due to crossbeams in the range *e→a♭*, muting strings with palms are impossible on:
  - Yamaha CFIIIS

- Due to crossbeams in the range *b→a*[1], muting strings with palms are impossible on:
    - All Bösendorfer
    - Fazioli 228, 212
    - Kawai GE30, GE20
- Due to crossbeams in the range *b-f*[1], muting strings with palms are impossible on:
    - Bösendorfer 225
- Due to crossbeams in the range *a-e♯*[1], muting strings with palms are impossible on:
    - Bösendorfer 225
- Due to crossbeams in the range *g→d♯*, muting strings with palms are impossible on:
    - Baldwin SD10
    - Bösendorfer 225
    - Yamaha CFIIIS
- Due to crossbeams in the range *f→b♭*, muting strings with palms are impossible on:
    - Baldwin SD10
    - Yamaha CFIIIS
- Due to crossbeams in the range *A→e*, muting strings with palms are impossible on:
    - Baldwin R1
    - Bechstein 88
    - Bösendorfer 200CS, 214CS
    - Kawai RX5, RX3, RX3C, RX2, GE30, GE20
    - Seiler 206
    - Steinway O, M
    - Yamaha C5, S4, C3

All in all, *Gnomic Variations* is best performed on:

- Baldwin L1
- Fazioli 278

4.1.3 The right piano for John Cage's preparation practices

We have seen in the historical overview of Cage's prepared piano that only gradually became aware of how important it was to list details of the preparation practice in the score. It was not until the 1960's that he realised he did not remember even the materials, left alone the measurements, for *Bacchanale.* But the effect of an object on the strings in between which it sits is dependant on where alongside those strings it is inserted. It was also not until later that Cage understood how the length of strings varied with the model of the piano (and with the brand) and that measurements for all strings could not be recalculated "by simple subtraction or addition" based on the given length of one string of one (unknown) model.[1707] If a concert grand is 1.5 times the length of a baby grand, its strings are not 1.5 times longer than those of the small model, and the

[1707] He advised this method in his *General directions for preparing a piano for 'Sonatas and Interludes'*, a typed sheet that was found in the box with original preparation materials that author found at the home of Richard Lippold, now part of the John Cage Trust.

distance to a certain nodal point on a string of a concert grand cannot just be multiplied by a fixed number to end up with the same nodal point on the baby grand. This means that Cage's often very precise insertion measurements (up to a 16th of an inch for some pieces) are useless unless the piano model on which the measurements were taken is known.

Cage never indicated the piano model with the preparation practices in scores. In the *General directions for preparing a piano for 'Sonatas and Interludes'* - written after 1948[1708] – he advised the performer to play on "a Steinway Grand, preferably an M (next preference an A or B, other possible styles: L or O)." In a letter of 1968, however, he stated that he had used a Steinway B for the preparation practice of the *Sonatas and Interludes* and that he found ("when I used to perform") that an A or O "also worked well."[1709] It is striking that the model O is mentioned last in this earliest mentioning of prepared piano models – as if it were Cage's least preferred model – while it is currently the habit of considering that model as the standard for the historically informed performance practice of his prepared piano music. It is also striking that Cage consistently referred to Steinway when discussing the piano models for his music. It is hardly conceivable that he always had a Steinway available on stage when performing in the 1940's and 1950's, when neither he nor Cunningham were established artists in the United States.

The O model (5'10") was introduced by Steinway in 1902, reintroduced (as a 5'10½") in 1914 but discontinued in New York in 1923 (while continued in Hamburg). It was not until 2006 before it was reintroduced (5'10¾" – 180cm) in New York. Comparing measurements of a present-day O with one from 1912 shows that there are no differences in framework between the two, suggesting that Steinway varied little in the design over the decades.[1710] The Steinway A is different from the O (its triple choruses start at F instead of B) but the same as the B. (Table 4.1.)

There is no documentation of what piano model Cage, Cunningham or their friends might have had at home when Cage wrote his prepared piano music. We know that he bought a grand piano (and a van) for the Cunningham Dance Company with the money he won at the Italian television contest in 1958, but it is not known which model or brand. In 1979 he wrote that he had not had a piano of his own since 1954.[1711]

Despite the lack of information on Cage's access to pianos, there are some indirect clues to find out what type of piano he might have used when composing for his prepared piano pieces. The prescription of inserting an object in between the strings of a specified double or triple chorus can show where the chorus sections were situated on the piano that Cage used to determine the preparation practice.

There are no such specifics in the manuscripts of the early pieces but the scores that were later published often show what Cage had intended for the preparation practice that is part of that publication. (Cf. 3.4.3.2.3.2 for the differences between manuscripts and published scores of the earliest pieces, and for the dates of the publications.)

[1708] The exact date of the Lippold box, of which the *Directions* are part, is not known. The *Sonatas and Interludes* were finished in 1948, the boxes could have been assembled as late as 1960, when C.F. Peters published the score, and for which occasion Cage assembled a small number of such boxes to be sold (or rented out?) with the score.

[1709] Letter to Gregory Clough, Jan. 18, 1968. I am indebted to Deborah Campana for having faxed me a copy of this letter, which is part of the John Cage Archive at Northwestern University.

[1710] This tendency can be perceived among many models from different brands.

[1711] Typed message to Richard Bunger on December 6, 1979. I am indebted to Deborah Campana for having faxed me a copy of this letter, which is part of the John Cage Archive at Northwestern University.

For the preparations of the published versions of *Totem Ancestor,* Cage indicated "2-3" for all prepared pitches from *e♭* onwards. For *B♭* and A he wrote "if 3 strings: under 1, 3 / over 2 - if 2 strings: under 1 / over 2", demonstrating how he was aware that not all pianos had triple choruses for *B♭* and *A*. If we limit our search for a piano model to Steinway models, then Cage had in mind either any of models D, B and A (all three having triple choruses for *A* and *B♭*) or O/M (double chorus for *A* and *B♭*).

For *And the Earth Shall Bear Again* Cage indicated "2-3" from *d* upwards (which is the case on all Steinway grand pianos) but prescribed preparations that cover multiple notes in the bass, so that there is no issue with double or triple choruses. In between *And the Earth Shall Bear Again* (1942) and *Our Spring Shall Come* (1943) there are no bass preparations; for the later piece he used the same tactics as in the former to avoid problems with double or triple chorus preparations. For *Tossed as it is Untroubled* (1943), Cage foresaw triple choruses from *e* upwards and a double chorus for *E♭*, which allows for the piece to be conceived for any piano (as far as triple choruses are needed). As these three pieces cannot be connected to a particular instrument, the measurements in their preparation tables are of little use to determine what type of sound Cage had in mind.

For *The Perilous Night* (1944) triple choruses are needed from *g* upwards, double from *A♭*^{1} to *F*. The latter would indicate Steinway model O or M, as would be the case for the single object to be inserted between the single strings of *E*^{1} and *F*^{1}.

The original preparation table for *Spontaneous Earth* (1944) has single preparations for the bass strings upwards until (and including) *B♭*. For *B* Cage prescribes two screws at one inch in front of the damper, suggesting that there are three strings. (It is theoretically possible that Cage had in mind two screws next to one another in between the two strings of the same double chorus, but that would be the exception to his habit if compared to the double preparations in other pieces.) From then on (*d* and upwards), Cage indicates the preparation materials to be placed "always between 2 & 3rd strings unless marked." If the double choruses indeed run up to and include *B,* this is only possible on the small Steinway M, which has double choruses up to and including *c.* If *B* is to be triple strung, then all the Steinway models are possible. But Cage intended double chorus preparations between *B*^{1} and *B* (or *B♭*), which is not possible on a Steinway A, B or D since these models have triple strings from as low as F. That leaves O and M if *B* is considered triple strung (most likely), or M if *B* is to be double strung (as indicated in the manuscript).

Root of an Unfocus prescribes triple choruses from *d* onwards (connecting to every Steinway model), but a long bolt between the 2nd and 3rd string of *B♭*, unless there are "only 2 strings". The later means that he had a triple chorus in mind, and therefore model O.

For *A Book of Music*, Cage prescribes double choruses for *G*^{1} and *F*, and triple from *e♭* onwards. This is only possible on a Steinway O or M. In *Three Dances*, triple choruses are need from *e♭* onwards, and double from *A*^{1} to *A♭* downwards. That again is only possible only an M or O model. For *Two Pastorales* only O and M are possible (double choruses on *D* and *F#*; triple from *c*^{1} onwards). The *Concerto for Prepared Piano and Orchestra* indicates single strings to *G♭*^{1}, double from *G*^{1} to *A* and triple from *c#* onwards. That is also possible only on an O or M.

For the other pieces (*Mysterious Adventure*, *Daughters of the Lonesome Isle*, *Music for Marcel Duchamp*, *Sonatas and Interludes* and *Works Of Calder*), Cage asked for triple

choruses from *d* upwards at the lowest, double for *D* at the lowest and single strings for D^1 or lower. These specifications allow for these pieces to be played on any piano in our list (except the EG models by Kawai, but Kawai pianos were not imported into the US before 1963[1712]).

Summing up, only one piece is definitely conceived on a Steinway O (*Root of an Unfocus*); *The Perilous Night, A Book of Music, Three Dances, Two Pastorales and the Concerto for Prepared Piano and Orchestra* have a preparation practice that connects them to an O or an M; the preparations of the published version of Totem Ancestor could have been for a B, A, O or M (depending on the perspective); and *Spontaneous Earth* could be either for O or M (likely) or only for M (possibly).

All other pieces have either no bass note preparations, or the differentiation between double and triple chorus usage is such that all Steinway models are possible. Their measurement indications can only be considered efficient if they are connected to certain models by way of their chronological proximity with other pieces that have a more narrow connection with a particular model. It could be construed that a Steinway model O was the piano on which Cage composed or at least checked most of his preparations before sending off a composition to his publisher. If he had no piano from 1954 onwards (i.e. after he wrote his last pieces with fixed preparations), he may have had an O or M, or a friend with an O or M. Possibly, the grand piano he had bought for the Cunningham Dance Company was a Steinway O or M and stood in the dance studio, accessible to Cage who was the official accompanist to the company. At any rate, the difference between the adjacent models O and M is very small (compared to the difference between an O and a B or D). It remains important, however, that Cage may have composed pieces on pianos of another brand, not realising how great the differences can be and communicating about Steinway models with the idea to be on safe, standard grounds.

4.1.4 Tack piano[1713]

To make a tack piano, Lou Harrison had the duplicate strings removed from a baby grand or a grand piano. With only one string per note, the sound was clean, pure and void of any slight tuning differences between unison strings. Tacks were metal-headed (present-day plastic covered coloured tacks would dampen the percussive attack). To limit the instances of frustrating string breakage, but also because it is commonly accepted as a 'standard' 18th century pitch, Harrison kept his piano a half step below the modern pitch of a=440Hz.
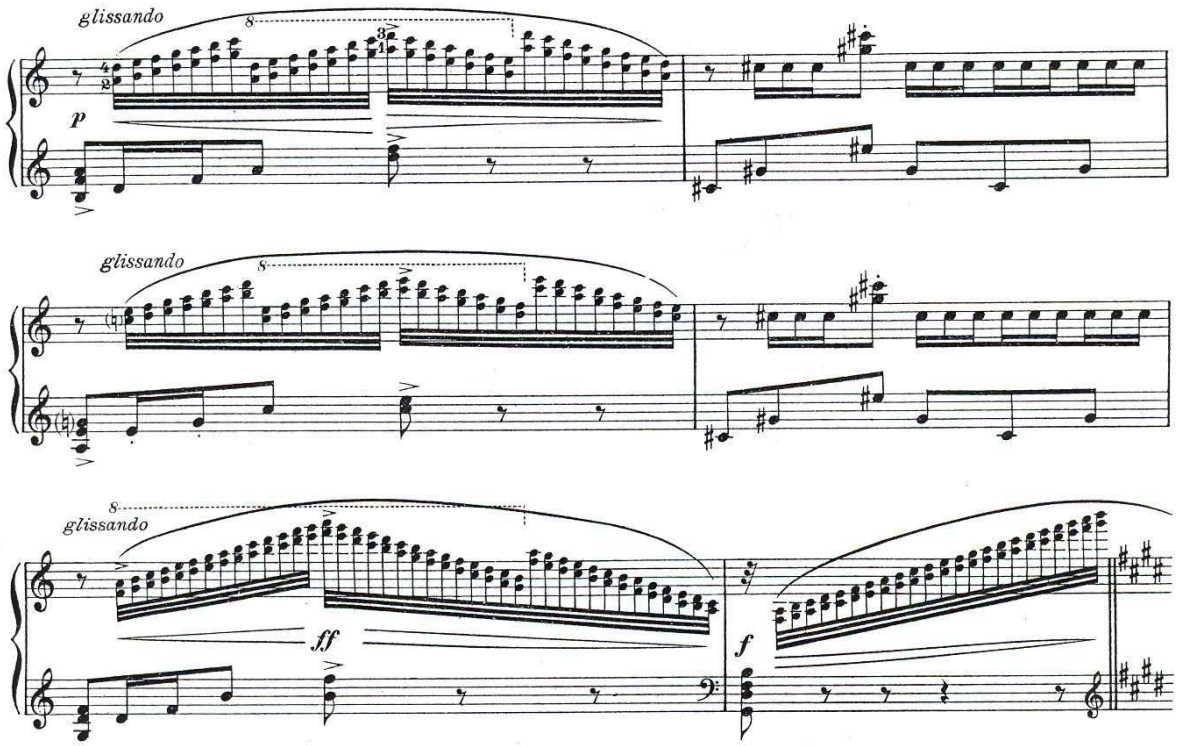
In concert practice, to prevent a valuable grand piano from being “tacked,” practice uprights were used. To further avoid problems, duplicate strings could be damped with heavy felt so they do not sound, instead of taking them off altogether. Tacks are harder on the strings than regular hammers and may cause strings to break. Tacks also damage the hammers, leaving a “tack-hole”. Some players therefore have a separate set, and refurnish the grand piano with their dedicated hammers.

[1712] http://www.kawaius.com/main_links/about_us/aboutmain_09.html. Last accessed September 2009.
[1713] I am grateful to Linda Burman-Hall for mailing me this information (August, 2009).

4.2 Historical sources for performance practice of individual extensions

4.2.1 Glissandos

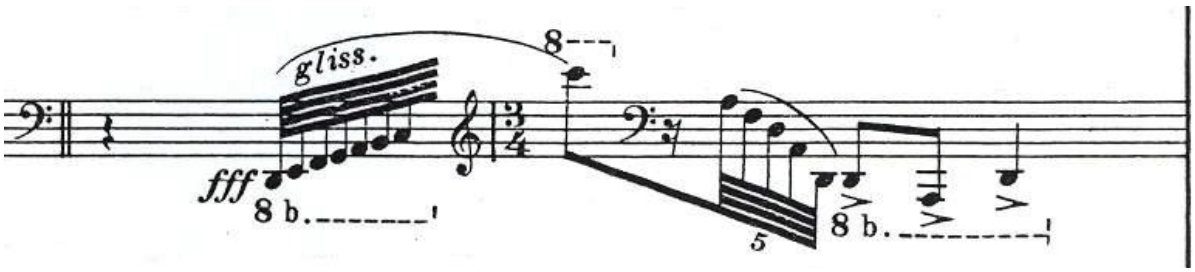
The hundreds of examples of glissandos, as discussed in the previous chapter, have led to many insights regarding historical fingering and the art of beginning and ending a glissando. But while the sheer number of glissandos in Liszt's oeuvre made it possible to conclude that he had a clear predilection for unmarked and unprolonged beginnings vs. a preference for marked endings, his contemporaries' glissando technique cannot just be deduced from what Liszt used to do. And even if virtually all glissandos in history end on a note that is stressed in some way, suggesting proper fingering, we do not know how Ravel played or intended pianists to play his back-and-forth double note glissandos in *Alborado del gracioso.* (Ex. 4.4.) The stressed top notes can be articulated individually (leaving out some of the glissando notes before to turn the hand to the position ready for the downwards movement) or they can be sounded as part of an open ending (*after* which the hand changes position to return downwards). Both versions are very different in their musical effect but the notation gives no clue for either.



Example 4.4. M. Ravel: *Miroirs* (1905), nr. 4 *Alborado del gracioso*, bars 176-181. Editions A. Durand et Fils. Reproduced by permission.

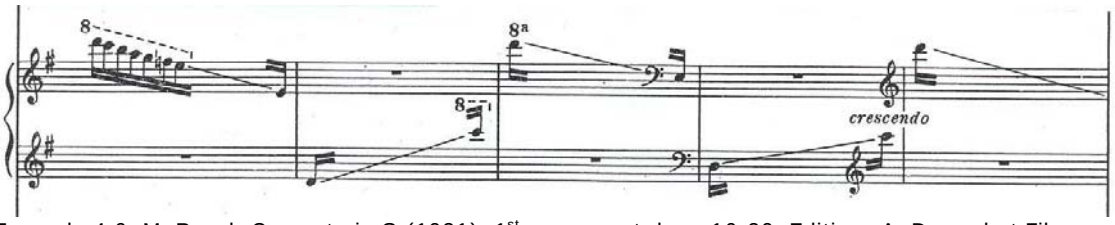
Similarly unsolved questions are found in for instance Bartók's second piano concerto, where the written out notes may either mean to indicate carefully positioned rhythmic and metric pulses, or just simple clues as to where to start gliding. (See above, ex. 3.430.) The difference is not only audible; it also is determinant of the musical interpretation of the passage. The same decision has to be made for the opening glissandos in Ravel's Concerto in G (See above, Some problems are less than crucial as they hardly make a musical difference (e.g. in Stravinsky's *Les Noces* (see above, ex. 3.427), where we do not know until which white key the gliding part goes before the hand leaves the keyboard to properly hit a black key); in other instances common sense easily overrides notational doubt, for instance in Ravel's concerto for the left hand, where

a very loud glissando with an open beginning has to compete with a whole orchestra at full volume – few pianists would deny the glissando the benefit of an accent on its first note. (Ex. 4.5.)



Example 4.5. M. Ravel: Concerto for the left hand (1930), cue 46. Editions A. Durand et Fils. Reproduced by permission.

In other instances it can be deduced that no accents are necessary, e.g. in ex. 4.6, where the beginning- and endnotes are indicated merely to show exactly at which notes the hands alternate.
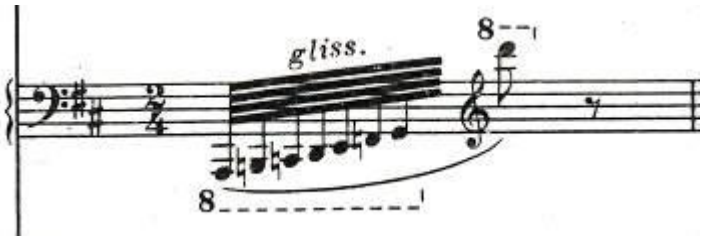


Example 4.6. M. Ravel: Concerto in G (1931), 1st movement, bars 16-20. Editions A. Durand et Fils. Reproduced by permission.

Apart from the scores and the 18th and 19th century tutors (see previous chapter), which do not in fact reveal much besides fingerings, there are disappointingly few sources with information about the historical glissando praxis. Besides one remark by Liszt – advising a student to use as much nail as possible in order to not hurt the finger – only one book, really, offers some historically informed insights. After the success of *Au piano avec Fauré* and *Au piano avec Claude Debussy*, French pianist Marguerite Long started writing *Au piano avec Maurice Ravel*, based on her personal experiences with Ravel and his music. She died in 1966, leaving the project unfinished, but Pierre Laumonier completed it, "thanks to the notes left by the great artist."[1714]

For the glissando at the end of the piano's opening cadenza in the concerto for left hand, Long remarks that "The glissando must be vigorous and… complete; it is heard to often deprived of its last notes, evidently to assure the projection of the final D."[1715] Long herewith suggests that there should be no space in between the last note of the glissando and the endnote. Consequently, the hand cannot be lifted much to articulate and project the D, which in turn suggests that Long – and therefore Ravel – would have preferred the continuity of the glissando over the separate projection of the end note. (Ex. 4.7.)

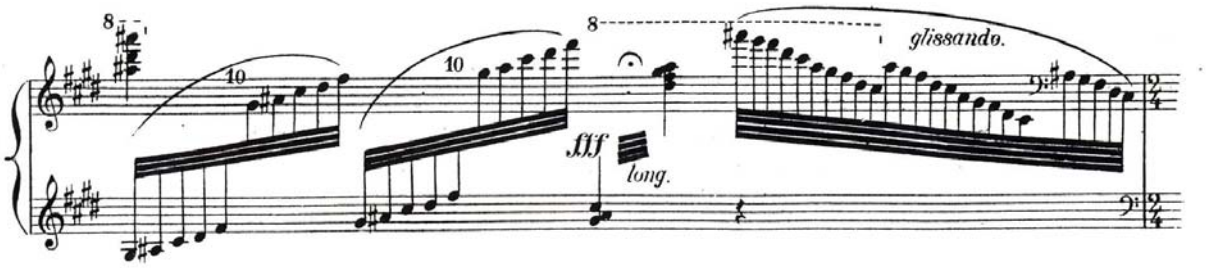
[1714] As recounted on the back flap of Laumonier 1971 : « […] réussit, grace aux notes laissées par la grande artiste […] »

[1715] Laumonier 1971, p. 90 : « Le glissando doit être vigoureux et… complet; on l'entend trop souvent privé de ses dernières notes dans le but évident de projeter plus sûrement le ré final. »

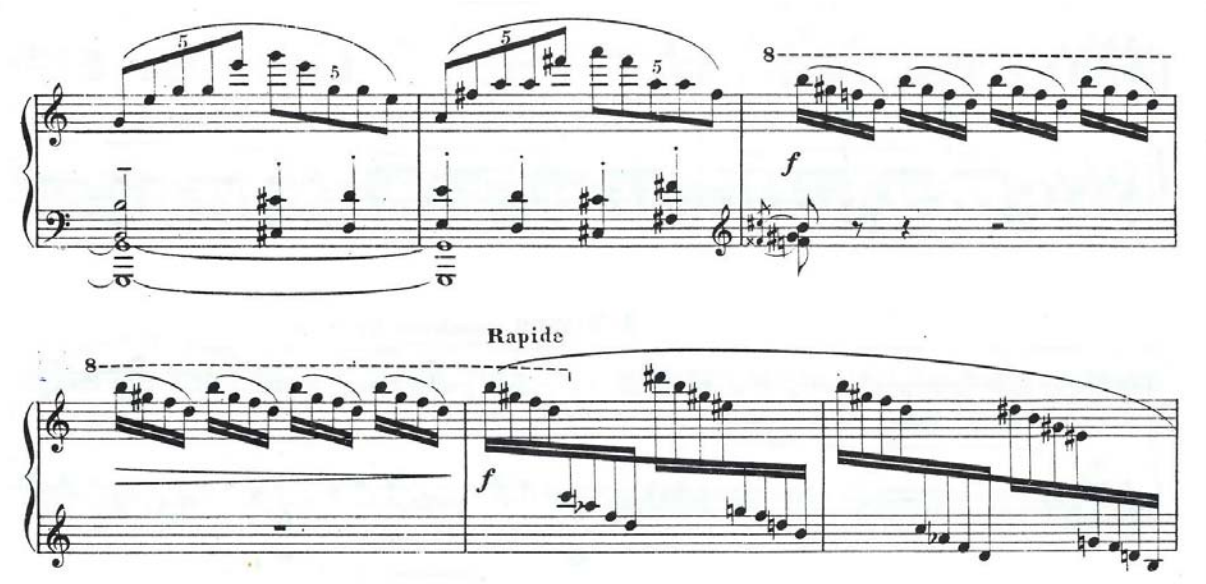


Example 4.7. M. Ravel: Concerto for the left hand (1930), cue 5. Editions A. Durand et Fils. Reproduced by permission.

Unfortunately, Long does not comment on the beginning of the glissando, so that we do not know how she interpreted the start of the other large solo glissando in the concerto (Ex. 4.5.) As for glissando beginnings, it is interesting to read how Long sees the black-key glissando in Ravel's *Jeux d'Eau* (ex. 4.8): "the glissando must start with an accent on the A# […] Debussy, as has been often remarked, was inspired by this lightning passage in *Jardins sous la pluie*: one will find the more discreet echo of this sequence and this accent on page 8, 4th system."[1716] *Jardins sous la pluie* (ex. 4.9) was written in 1903, two years after *Jeux d'Eau.*



Example 4.8. M. Ravel: *Jeux d'Eau* (1901), bar 48. Editions A. Durand et Fils. Editions A. Durand et Fils. Reproduced by permission.



Example 4.9. Cl. Debussy: *Estampes* (1903), 3rd movement *Jardins sous la pluie*, bars 114-119. Editions A. Durand et Fils. Reproduced by permission.

[1716] Laumonier 1971, p. 123 : « […]le glissando doit débuter par un accent sur la dièse;[…] Debussy, on l'a maintes fois remarqué, s'est inspire de ce trait fulgurant dans ses *Jardins sous la pluie*: on retrouvera l'echo plus discret de cette sequence et de cet accent page 8, 4e alinéa."

Although Debussy's piece contains no glissando, the passage in *Jardins sous la Pluie* is indeed similar in musical gesture to *Jeux d'Eau*. Above all, it sheds some light on how to interpret Long's remarks. We cannot be absolutely certain that her advice on glissando playing comes straight from Ravel: the composer had died almost thirty years before, and it remains unclear how much of the historical glissando playing aesthetics were a question of personal taste rather than of convention based on consensus. Yet, Robert Schmitz played the glissando in the same way Long prescribed when he recorded it on a reproduction piano for a 1919 roll.[1717] It remains nevertheless remarkable that neither Ravel nor Debussy put a clear accent on the culmination points that the glissando and arpeggio are in both pieces. In fairness, Debussy does start the arpeggio with a renewed *forte*, but that is a general level and not an accent on one note. The comparison between both examples may mostly show how, in such general situations of a build-up followed by a downwards movement – whether a glissando or not – the change in direction was customarily introduced with an accent. More revealing about Long's remark is the reference to lightning. If this represents an idea that Ravel had about how to interpret this passage, the lightning concept means that the first note of the glissando should not be prolonged, a reflex that would otherwise easily coincide with the accent.

4.2.2 Clusters

Except for the scores there are as few historical sources on cluster playing as there are on glissando performance practice. One small report by Cage concerns a recital he witnessed Cowell perform in 1928-29, where Cowell showed "that he had taken all the buttons off of his sleeves […] so that they wouldn't hurt the ivories."[1718] This practice was undoubtedly meant to facilitate arm-cluster playing, and perhaps more to avoid the noise of sleeve buttons hitting the keyboard than to prevent them from damaging the keys.
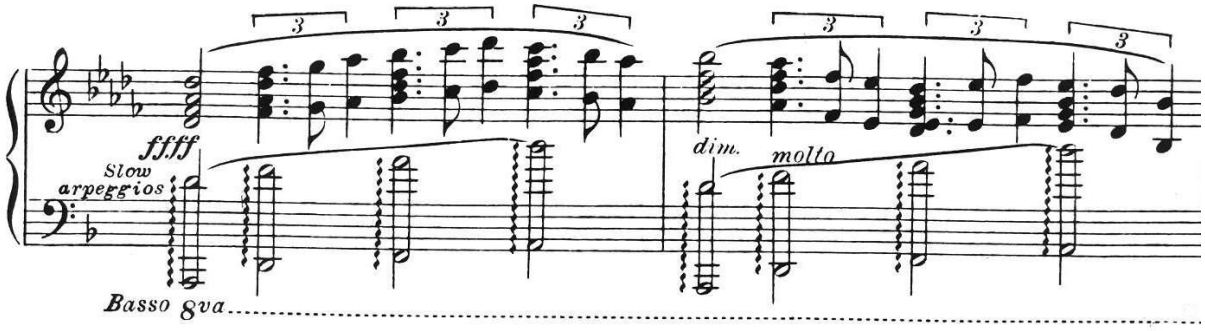
Cowell's own recording of some of his piano music teaches us more about his techniques for playing clusters.

Following Cowell's recordings with the score, it is immediately clear that he had been used to improvise with these techniques, perhaps more than actually always playing what he had written, or having improvised them often before writing them down. For some pieces, e.g. *Advertisement* and *Antinomy* there is little of the music recorded that corresponds with what is in the score. Especially in introductory passages, whole cluster sequences have disappeared from the music or have been replaced by something resembling in character but not in any detail. *What's This* is repeated in its entirety, even if the score only indicates the second section to be repeated. Of course, Cowell was already in his sixties when he made the recordings, but judging the speed of e.g. the alternated arm clusters, aged technique was not the issue and the cluster passages where he shows some difficulty in mastering precision would prove difficult to anyone.

Despite the differences with the score, one can hear how – at the end of his life – he still loved to play this music, as he infuses them with interpretation that goes beyond the mere accommodation of ergonomical concerns (e.g. the time it takes to position huge arm clusters after big leaps in *Exultation),* for instance the una corda effects in *Aeolian Harp*, when the music modulates unexpectedly for the last reoccurrence of the theme.
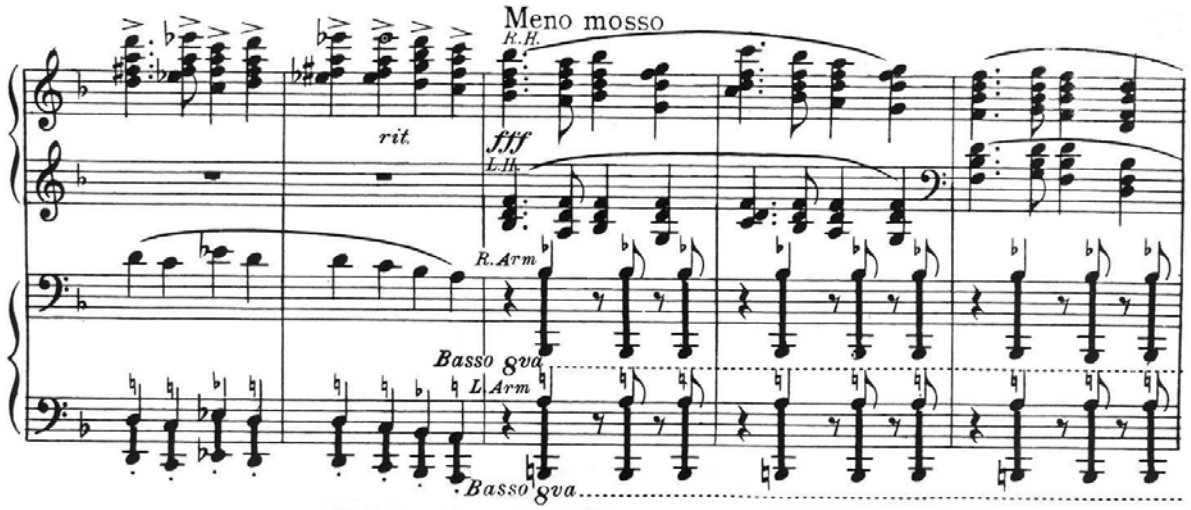
[1717] As reissued on a Dal Segno disc (DSPRCD 004). Schmitz (1889-1949) was also heavily involved with the Parisian composers of the early 20th century and gave the premiere of, amongst others, Debussy's first rhapsody. His book *The Piano Works of Claude Debussy* (1966) was published after his death.
[1718] Cage 1975, p. 13.

In *Tides of Manaunaun*, it is revealing to hear how Cowell starts each arpeggiated arm cluster *on* the beat instead of before. The top notes are heavily accentuated, however. (Ex. 4.10.) In contrast, the arpeggiated backbeat octave clusters in for instance *The Harp of Life* are played as anacrusis.



Example 4.10. H. Cowell: *The Tides of Manaunaun* (1917), bars 22-23. Reproduced by permission of Associated Music Publishers.

For the huge backbeat arm clusters in *The Voice of Lir* (ex. 4.11), Cowell takes his time to execute the leaps back to the treble, shortening the eight notes to sixteenths.



Example 4.11. H. Cowell: *The Voice of Lir* (1920), bars 19-23. Reproduced by permission of Associated Music Publishers.

For the cluster glissandos in Stockhausen's *Klavierstück X* the composer recommended using woollen gloves with the fingers cut off in order to accommodate for the friction that the palms have to undergo when gliding over keys. Two pianists that have been involved in the earliest performances deviated from or elaborated on that advice. Aloys Kontarsky put on gloves of a flexible synthetic fibre that fit the hand better and wear less while playing.[1719] Frederic Rzewski is reported to have used a pair of women's white gloves and also to have dusted his hands and the keyboard with talcum powder. Because of the powder, "a fog rose from the keys which, owing to the harsh lighting of the piano, became especially visible in front of the dark background – perhaps one would not have noticed it at all otherwise. In any case the smoke, gushing out of the music as it were, adequately characterized the explosive music."[1720]

[1719] Henck 1980, p. 67.
[1720] Quoted from Schnebel by Henck 1980, p. 86, fn. 87.

4.2.3 Cage's prepared piano

4.2.3.1 General – the materials

The most basic of Cage's piano preparations are the bolts and screws. As they are essential to the preparation practice, we will briefly go into their characteristics. A bolt is a fastener with a particular thread specification to be held on by a nut with that same thread. A screw is mostly tapered and has a thread that is intended to be self-tapping. Small bolts can be referred to as "machine screws." A headless fastener threaded for its entire length is called a "set screw."



Example 4.12 Bolt Screw

In general, bolts have a finer thread than screws and are fixed in between strings by virtue of their width. Screws have a wider thread whereby it can be screwed in between two steel strings. Bolts are used mostly for bass notes; screws for the treble.

Some of the more specific bolts and screws that Cage prescribed are (ex. 4.13-4.15):



Example 4.13. Carriage bolt[1721] Eye bolts Hex bolts (Machine bolts) Headless bolt



Example 4.14. Stove bolt U-bolt Machine screw[1722] Oval head machine screw (Small machine bolt)

[1721] A carriage bolt has a wide, domed head and most have a shank which is square for about ¼ inch from the head. As the name suggests, this style of bolt was originally used to build carriages: the bolt is intended to be driven by a hammer into a hole in wood whereby the square shank prevents the bolt from turning, as a nut (with washer) tightens the assembly from the other end.
[1722] The term "machine screw" is really a misnomer: it is a bolt.



Example 4.15. Wood screws Oval head screw Hook screw Eye lags Cup point set screw

Cage was not always consistent in his naming the hardware. A “Screw attached to a hook” (*Imaginary Landscape (1st version)* is the same as a “Hook screw” (*Our Spring Will Come*, *Works of Calder*) and a “Screw Eye” (in the same *Works of Calder*). The differences that the naming may suggest are often non-existent or at least negligible when it comes to the consequences in timbre. The octagonal bolt (*Works of Calder*) is basically the same as the hex bolt; only its head has eight corners instead of six but that does not influence the size and weight of the bolt, really.

Cage used furniture bolts in several works (*Three Dances*, *Sonatas and Interludes*, *Works of Calder*, concerto) and has stated that these were circa 1/8” in diameter and thinner than stove bolts, which he said were circa 1/4" in diameter.[1723] They were, but there is no indication that he used anything different from an eye bolt (see below).

In the preparation tables, Cage differentiated between large, big, long and medium bolts. According to Cage, “LG meant long, circa 4” (though as I recall it meant large circa 1/4" or more in diam.[).]”[1724] A Medium Bolt “meant not the smallest or thinnest but one somewhat thicker.”[1725]

It is not known what he meant by “Typewriter bolt” (*Three Dances*, *Daughters of the Lonesome Isle*) but it can only have been a small bolt.
The “Black bolt” (*A Book of Music*, concerto) is equally unspecified. Again, it may have been a mere way of detailing for the sake of detailing.

Weather stripping was a fibrous material to seal openings around doors and windows to prevent rain and water from entering or to keep interior air in. At the present, that particular material is not manufactured anymore.

The rubber Cage used came from canned fruit jars.

4.2.3.2 Historical preparations for *Sonatas and Interludes*

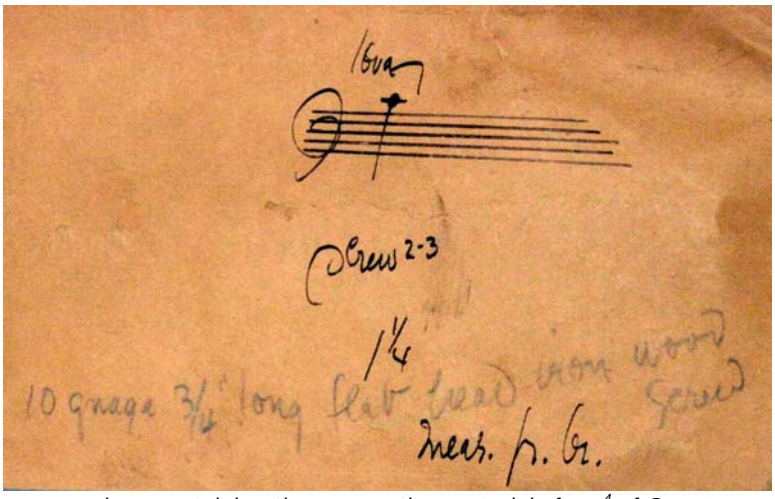
Two boxes with preparation materials for Cage’s *Sonatas and Interludes* have survived. One was cardboard and part of Cage’s estate, the other one was in metal and found by

[1723] Typed message to Paul R. Klecka on July 27, 1973. I am indebted to Deborah Campana for having faxed me a copy of this letter, which is part of the John Cage Archive at Northwestern University.
[1724] Idem.
[1725] Idem.

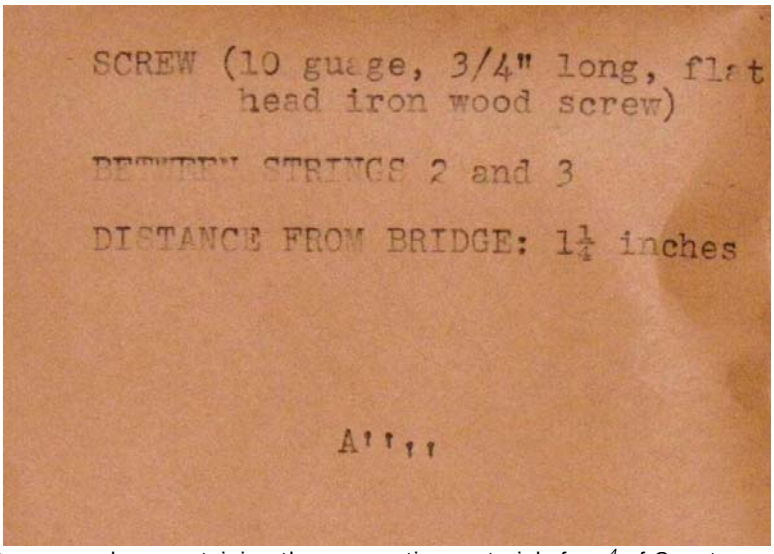
the author with Richard Lippold, the sculptor whose wife Louise had danced to Cage's *Suite for Toy Piano* (1948) and choreographed and danced to *A Flower* in 1950. Both boxes contain little paper envelopes with the preparations materials and a caption listing the content, on envelop per pitch and per material. The metal box must have been an earlier set, as the listings – in ink, in Cage's handwriting – are less elaborate. (Ex. 4.16). More details are added in pencil, most likely from a later date. These details – characteristics such as head type, gauge size and length of screws and bolts – are included on the envelopes in the cardboard box, which are typewritten. (Ex. 4.17-4.18.) The metal box had been a gift from Cage to Lippold and had come with an autograph score and a screwdriver. The cardboard box was probably made when a number of preparation sets were assembled by Cage and friends (see below) to be sold by C.F. Peters together with the score.



Example 4.16. J. Cage: boxes with preparation materials for *Sonatas and Interludes*.



Example 4.17. J. Cage: envelope containing the preparation materials for a^4 of *Sonatas and Interludes*. Earlier set.



Example 4.18. J. Cage: envelope containing the preparation materials for a^4 of *Sonatas and Interludes*. Later set.

Appendix 2 of this study lists photographs and measurements of the preparation materials found in the earlier box, including the added details in pencil. A few nuances aside, the materials in both boxes are identical. The eye bolts in the earlier set appear to have been stripped of a plastic coating; the later set has newer such bolts that never had a coating. (E.g. for c^4.) In the earlier set, one such eye bolt has evidently been replaced at some time by a much newer bolt (f^3), perhaps to replace a missing item. In general, the rubber comes from the circular pieces of rubber that served to close off jars. Only for two notes (e^2 and $g\#^1$) the newer set has a straight piece of rubber. As all the other pieces are part of a circle, this exception must also have been a question of replacing an original that had become too brittle to be used.

The screws are mostly flat head iron wood screws, ranging from 10 gauge,3/4" long to 14 gauge, 2" length.

An example of a Small Bolt measures gauge 3/16"x3/4" long (d^4, a^3); a Medium Bolt (round head iron machine screw) is 10/24x1" (b^2). For the non-specified, generic "bolt" Cage used either a $1/4x1^{1/2}$" round head iron stove bolt (e.g. c^1), a 20 gauge $1/4x1^{1/2}$ stove bolt or a 1/4x1/2" stove bolt or machine screw. A Long Bolt is a 1/4x3" round head stove bolt (g) and a Large Bolt is a $5/16x1^{1/2}$" machine bolt (a and g). Interestingly, in Cage's set a Furniture Bolt" is a 13 gauge, $1^{1/4}$" long, "washer head furniture screw" on g^4, but otherwise (mostly) a 8-32x1" screw eye.

All nuts are ¼/20 square iron nuts. The jar rubber varies between $1^{3/8}$ x1/2", 2x7/32" and $1^{1/2}$x1/4" (all 1/16" thick). Both pieces of plastic (d^1 and g^1) are $1^{7/8}$x7/8x1/16.

The last two sonatas (XIV and XV) are called "'Gemini' – after the work by Richard Lippold." We found the sculpture – which is named after the northern constellation whose principal stars are the mythological twins Castor and Pollux, characterized by the Greeks and Romans as inseparable companions – at the Munson-Williams-Proctor Institute Museum of Art in Utica, New York. The work is small ($7^{1/2}$x6") and dated February 1947[1726], i.e. it was made during the process of composing the *Sonatas and Interludes*). (Ex. 4.19.)

[1726] Lippold's *Gemini* was acquired by the museum in 1949 as a "gift of the artist."



Example 4.19. Richard Lippold: *Gemini*, sculpture that inspired Cage to the title of the 14th and 15th sonatas of *Sonatas and Interludes* (1946-1948).

4.2.3.3 Cage's plastic bridge

For his *Concerto for prepared piano and orchestra*, Cage listed a "plastic bridge" among the preparation materials. Cage has explained this object to be a piece of plastic mounted on a piece of wood that rests on the soundboard. The plastic is meant to press against the strings and act as a second bridge, shortening the speaking length of the strings under which the object is situated. Initially, the plastic was manipulated "with the help of a screwdriver" to form a bridge[1727]; later wooden wedges were used.[1728] In a letter to Boulez, Cage wrote how the bridge was meant to produce "many microtonal pitch relations."[1729]

4.2.3.4 Cage's directions for preparing the piano

The cardboard box with original preparations contained a typed sheet with "general directions for preparing a piano for 'Sonatas and Interludes'":

[1727] Fürst-Heidtmann 1979, p. 52: "…wobei es in früheren Zeiten, wenn dies mittels eines Schraubenziehers geschah, vom Holz absprang und eine Brücke formte…" Unfortunately, Fürst-Heidtmann does not indicate how exactly she obtained this information from Cage and how it was originally put into words by Cage.
[1728] Fürst-Heidtmann 1979, p. 52: "Später wurden Holzkeile benutzt und das Stück so befestigt, daß es wie eine Haut aufsaß."
[1729] As cited in Dianova 2008, p. 148.

1. Have free from two to eight hours, and put yourself in a frame of mind conducive to the overcoming of obstacles with patience.

2. Have following: 45 envelopes containing objects and labeled with specific directions, two rulers, 6 and 18", a piano tuner or screw driver, a Steinway Grand in tune, preferably an M (next preference an A or B, other possible styles: L or O).

3. Measure from damper to bridge on 3rd string (when there are three strings for a single tone, the strings are numbered 1, 2, 3 from left to right, viewed from keyboard side) of B''. The distance should be 4 and 7/16". If it is not, adjust, by means of simple subtraction or addition, all measurements from the dampers, accordingly. Do not so adjust measurements for Great or Large D [=*D*], nor for those above E flat''' [= $e\flat^3$].

4. Insert objects at designated points measuring always to the object at its nearest point. Begin this operation I the low register and work up the piano.

5. Test soft pedal to see that it works properly. The action of the soft pedal is to cause the hammers to strike only the 2nd and 3rd rather than all three strings. This results in a decided change of timbre in the case, particularly, of the following: small D and G, B', C, D, F, and F sharp'', C, C sharp, E flat, E, and all above D sharp'''.
   List those of the above tones that do not shift timbre with the use of the soft pedal.
   Give this list to a piano tuner and ask him to adjust the hammers so that the soft pedal acts properly
   Lacking a piano tuner, remove action, adjust hammers, and replace action.
   Repeat as many times as necessary.

6. Make nice adjustments of intonation according to context in the compositions to be played. Especially useful for this purpose are Sonatas VII and VIII and the first Interlude. This adjustment can only be made according to memory based on having heard the pieces when the piano was properly prepared. Proper preparations are made (Maron 1949) by the composer, Maro Ajemian, Lou Harrison and Jack Heidelberg, all resident in News York City.
   Remove 'buzzes'. This is done by carefully changing the position of the screw up or down without changing its distance.
   Make sure nuts are not touching adjacent strings.

4.2.4 String piano playing

In the recording Cowell made of *Aeolian Harp*[1730], he follows the published sequence of harmonies, but with consistently upwards glissandos instead of alternating them with downwards motion. The pizzicatos passages have a few notes added each time. The piece was not transposed for the recording. In *The Banshee*, it is impossible to hear exactly along which strings he glides, since the effect of this technique is hardly ever an exact pitch. But here too, Cowell leaves out sections (e.g. the repeated glissandos – cf. ex. 3.720). The two initial instances of the pizzicatos are transposed down a half step; the third and last one is transposed down a major third. This demonstrates how he started out transposing because of inside layout problems, only to accidentally start on a wrong string for the last occurrence and continue counting adjacent strings to know

[1730] Folkways 3349.

which ones where at the intervals he had composed. The last note is one half step to low.

5 CONCLUSIONS

5.1 In theory

Composers and musicians are clearly deprived of a vocabulary to adequately discuss timbres. These are either compared to other sounds or their terminology is based on the techniques that are used to produce them. Those other sounds are, of course, equally ill defined, and two different techniques can produce sounds that are not always easy to distinguish by ear (e.g. a pizzicato at a tuning peg vs. striking that peg with a triangle stick). Because of the confusion between extended techniques and effects, and since the term extended piano has as yet not been defined – though it has been widely accepted – this study has considered the subject from a double perspective: the extended techniques that enable the performers to produce the effects, and the extended piano as the composer's attitude towards the instrument. To define the extended piano and its performance techniques, it has proven necessary to redefine *the* piano, i.e. the characteristics of the original concept. From a performer's point of view, Curt Sachs' still widely accepted departure from the zither to classify the piano is unbalanced to say the least: the keyboard is as important as the strings since it defines the way sounds (and their combinations) can be made at the piano.

This study proposes a definition of the piano that includes the properties of the sounds and its performance technique. As such, the piano is characterized by a struck string sound, of which attack (volume) and ending (duration) can be controlled per key. It performance technique basically consists of the vertical articulation of one finger per one key. This is equally valid for the use of the pedals. These are the properties of the piano as the instrument was designed and constructed at the beginning.

Consequently, and based on a review of the existing literature of extended techniques and their effects, the extended instrument is nothing more or less than the *improper* use of its characteristics. In the case of the extended piano: the extensions are those techniques that do not use the vertical articulation of one finger per key, and those sounds that are not produced by the keyboard-hammer and pedal mechanisms. The improper techniques include gliding over the keyboard, striking it with the palm, forearm, or other bodily parts, bypassing the keyboard-hammer action by manipulating the strings directly, not fully depressing the pedals, etc. The improper sounds are produced with any original controlling mechanism of the piano to *not* produce the originally intended sound, or with any part of the piano that was not intended for direct sound production at all. Extremes are, on the one hand, the production of *no* sound (but still part of a performance), and on the other hand improper techniques producing sounds that are difficult or impossible to distinguish from the proper piano sound (e.g. depressing one key with proper articulation of two fingers). Some extensions require proper techniques but need the performer to alter the piano's sound production mechanism (prepared piano), others involve the pianist to perform vocal utterances or operate machines. The fact of a performer interacting with a piano in a concert situation is central to the investigation.

One technique has demanded special theoretical attention. Defining the cluster is highly problematic as long as no distinction is made between the perspectives from which the phenomenon is considered (aural, ergonomical, representational). This study considers the cluster to be the ergonomical point of view, i.e. the *performance technique* of depressing keys without applying individual finger articulation.

5.2 Historical development of the extended techniques

Much of the evolution of the extended piano's repertoire is representative of the general musical history: we can see the influences of concepts like chance procedures, indeterminacy, performance art and the rebellion against tradition as well as against avant-garde, of instrumental evolutions like the emancipation of percussion, the standardization of instrumental design and the historical battle for prominence between piano, clavichord, organ and harpsichord, and of the 20th century process of democratization and popularization.

But each technique has its own, more private development that stretches across those centuries making up the story of the extended piano. Simultaneously, the concept of the extended piano, the attitude of the composer versus one of the most omni-present musical instruments, can be described on a level of its own.

5.2.1 Keyboard glissando and cluster

It is not surprising to find that the glissando and the cluster – the two most basic ways to produce sound from an object: striking and rubbing it – developed simultaneously. It is striking, however, that they did so independently from each other. In the first two centuries of the history of the piano, they were never seen together. In fact, when the glissando knew its biggest growth in development – in between the 1820's and 1880's, the cluster was out of sight and hearing. Even in the 20th century it took a while for them to show up together with other extended techniques. Both developed at the same time during the first two decades, but on different continents (clusters in the US / glissando in Europe).

There are more such counter-intuitive conclusions to be drawn for the early evolution of the glissando and cluster. Both techniques have demonstrated to be problematic in terms of exact identification and performance practice. Especially the glissando can only be determined if and when the composer included a specific indication, such as the one by which this study could identify the first definitive glissando instance: "for the left hand's 2nd finger at the nail" (<1853, Moyreau). Besides such verbal indications, repeated fingerings have been a typical clue, although not many can be found in the 18th century. Sometimes indirect evidence can be established, such as the speed being too high (or at least improbable) to use individual articulation. But mostly, the glissando is a form of fingering for a run that can in many of the cases be played with regular fingering just as well. The ensuing confusion makes a case for supporting the opposite notion, i.e. that any individually articulated run in C major may just as well have been considered a potential glissando. The possible practice of performing a glissando as an alternative fingering left to the discretion or the 'mood' (i.e. the showmanship needs) of the player enjoys as little visibility in scores as does proper fingering. This is the reason for which evidence of double note glissandos is easier to detect than that of the single-note glissando. The white-key, one-hand double-note glissando, at least when the other hand is occupied, cannot be anything other than a glissando if it is to be played at relatively high speed.

For the early cluster, it is mostly the question of density that causes problems in identification: the first known cluster technique was merely indicated as such above a C major chord (1724, Dandrieu). Whether subsequently developed signs use a symbol or figured bass indication, the precise manner of playing is not disclosed: a vertical waving line between two notes an octave apart (ca1750, Foucquet) does not demonstrate whether it is to be filled chromatically or diatonically; figured bass does not say how closely to accumulate the notes (1738, Rebel); a horizontal waving line to prescribe the

use of the elbow (<1787, Corette) does not provide any of the necessary performance practical details for doing so. For much of its history, the ambit of the cluster is indicated tonally, i.e. as one or two octaves, regardless of the size of the (male or female) performer's hand. Such issues were not dealt with before the arrival of the 20th century emancipation of the 12 tones (when each of the three density types were given their own symbols), and of graphic notation, which started the focus on the shape of the body part rather than the interval that determines the ambit.

As long as the glissando is difficult to distinguish from its individually articulated counterpart (the C major run), it mostly serves the same abstract function of filling up the distance covered by a more or less large interval. The few of instances where the glissando had a representational function (a sword in Moyreau, fireworks in Kauer, the guillotine in Dussek, a canon ball trajectory in Carr) cannot be compared to the purpose of the early cluster, which is entirely programmatic. For two peculiar instrumental genres – the battle piece compositions and the *Judex Crederis* improvisations – the cluster has been the ultimate symbol. Curiously categorized, the battle piece relied on the cluster to imitate the firing of a cannon ball, while the biblical depiction of God's apocalyptical wrath used it to instill the sonorous images of lightning and thunder upon the listener. Perhaps less astounding but still noteworthy, the two genres did not mix: canon balls were sounded on the stringed keyboard instruments, the thunderclaps resonated through the pipes of the organ.[1589] Because precise details on the emergence of the cluster in organ improvisations are lacking, it is as yet impossible to ascertain whether it came first and found its way into the repertoire of the other keyboard instruments, or the other way around.

Due to the glissando's almost invisibility (by way of its chameleonic nature as a C major keyboard run), it has been easily integrated in 18th century tonal music. There are even instances (e.g. Scarlatti) where it is specifically indicated to be played in an F major context, leading to the conclusion that either a B natural was not all too problematic in such a context (which has been known to be the case for non-glissando runs), or that some keyboard actions were light enough to accommodate the gliding over white and black keys in one movement (which is practically possible on period instruments).

Similarly, though more surprisingly, the early cluster has also undergone attempts at integration into tonal contexts. Essentially, the accumulation of adjacent tones easily clashes with tonal triads. It is easy to understand, therefore, that the canon shot is often isolated in between two separated sections. On the other hand, however, attempts to attribute the cluster some tonal functions are dated ca 1750 (Foucquet) and 1777 (Balbastre). Nevertheless, even on its simplistic level of tone painting realism, the cluster does not blend easily with the other kinds of battle sounds, which are still constructed on tonal harmonies.

The cluster remains a programmatical device until the early 20th century, when it is liberated to function musically independent. It is only then that the cluster is developed beyond the two-or three-octave, static (and most likely purely chromatic) sound mass. In the mean time, at the time of the Vienna Conference, the piano cluster all but dies out with the battle piece. Meanwhile, the organ cluster continues its powerful *Judex crederis* tradition with advanced developments in moving and accessory-operated clusters, and is joined by a new but related genre: the idyll interrupted by a storm. Perhaps a layman variant of the biblical scene, the interrupted shepherd's afternoon did convince at least one composer to write clusters for the piano again, but other than this pastoral piece by

[1589] One battle piece was published as intended for the piano as well as organ (*Bataille Geschikt voor Clavier en Orgel* (1792) by an anonymous author), but it contains no clusters. Schulin 1986 (p. 71) mentions a second such piece (*Bataille d'Austerlitz* (1805) by Beauvarlet-Charpentier) but while this score does contain two-hand clusters, we found no evidence of it being intended for the organ as well.

Kunkel (1888) and one anachronistic battle piece in the US (by Blind Tom in 1866), we see no piano clusters in between ca1816 and the early 20th century.
The glissando fares a different fate. From about the last decade of the 18th century onwards, the glissando is part of a general boom of extended techniques that brings it into all genres and countries, explores its many types, experiments with unrealistic virtuosity (Vogler and Nägeli), and even lets it play a role in compositional matters (trio in C by Haydn, opus 53 by Beethoven). In the 1820's the technique is given a name instead of merely a fingering, it receives recognition in the major piano methods and consolidates the position that it was granted as a concerto device since Beethoven. All types of glissandos are explored, far beyond the typically 18th century single-note and octave incarnations: black-key, pseudo-chromatic, for two-hands, in parallel and contrary motion, in thirds, sixths, fourths, chordal- and quasi-glissandos. The technique is accorded new melodic functions, its fingerings, dynamic range, speed and morphology are studied, and even its compatibility with ever-more chromatic environments is the subject of experiments. The glissando became a distinct part of pianists' professional profiling (Herz, Liszt), even if as many others showed no interest (Chopin, Schumann). Liszt alone accomplished much of the progress: he wrote more glissando pieces, more glissandos per piece, and more notes in glissandos than anyone before and after him. Through such overabundance, accompanied by the creativity that he brought to all levels of the technique's application, he put it on the higher plains of transcendental piano technique.

As much as Liszt epitomizes everything that brought the glissando to a climax in the 19th century, his interest in the essentially closely related technique of cluster playing has left him cold. He had been exposed to it through the organ cluster repertoire and even wrote his own version of an interrupted shepherd's idyll, but other than writing a dissonantly dense bass chord that could easily have been a cluster under the hands of a 19th century German or French organist, Liszt looked down upon the notion of a full vertical accumulation of adjacent tones.

Despite the 19th century developments in program music – the main biotope for the cluster, and one for which Liszt certainly acted as a proponent – it is as if the cluster's use depended on Liszt's opinion: no piano composer touched it. Yet, it could have easily served the need for flashy techniques in brilliant showpieces. The glissando certainly profited from the appetite for bravura. After Beethoven's opus 53 all of the glissandos that could be found in the 19th century were written in concertos, solo transcriptions, variations, dances and one etude. All this music specifically served to impress audiences by their entertainment value, and the glissando should certainly be considered an integral aspect of such performance practices.[1590]

As far as the glissando is concerned, the 19th century is its golden age, rising to the outer limits of its potential as never before and never afterwards. For, in the second half of that century, the popularity declined. This can be seen in the statistics of the glissando's presence in scores and smaller tokens such as the emergence of the *quasi glissando,* but also in the opinions of commentators like Adolphe Kullak, the different editions of who's *Aesthetic of piano playing* increasingly characterized the glissando to be cheap and on its way out of the repertoire. This was certainly the case for the last decades of the 19th century, but a new century brought in new interest, although more French than German. In the 6th edition (1916), Kullak writes how

> Nowadays, it [the glissando] has ever more passed into disuse in the serious piano compositions. That it does not possess any aesthetic-musical worth anymore, is presently observed by Ruthardts manual, which, in the 6th edition still

[1590] This is why the 1845 sonata opus 177 by Kalkbrenner is worth mentioning as an exception, even though its full title – *Grande Sonate Brillante* – shows that even the most serious of 19th century musical forms can be given entertainment value.

> containing a widespread system of specialized study repertoire, already then not provided any space for the glissando.[1591]

At that very time, however, the glissando was effectively granted its second life, though mainly outside of the German repertoire. Many of the types, formats and concepts that had been neglected were picked up again (e.g. the chordal and solo black-key glissando) and the glissando was introduced to the orchestral piano and celesta parts as well as to the repertoire for children. Especially noteworthy are the interests in calibration, notation, the transition between glissando and individual articulation, and the use of the glissando as a sound more on its own than as an essentially melodic run that is embedded in tonality. Little dead-ends such as the enharmonic glissando show how far the renewed interest in the glissando could bring composers. In fact, the first two decades of the 20th century show a wealth of details in the glissando's performance practical development that is comparable to what had happened in the middle of the previous century, even if it is now spread over the output of many more composers from many parts of the world.

While it was mostly in 20th century Western Europe that the glissando boom took place, there was no real interest in the cluster, except for the works of Rebikov (1911) and the micro-clusters (1908). The doubt that arises in some instances, as to whether or not stacks of adjacent keyboard notes are to be played with cluster technique, may show the old continent to still not be ready for the re-entry of the cluster in the piano repertoire. This is the moment the US starts playing a major role in the history of the extended techniques. Until now, the new continent had eagerly imported European virtuosos while sending their aspiring composers to Europe for their training. With the cluster, this habit was broken. Ives maybe universally hailed as the first real American composer, but because of the impossibility of accurately dating his relevant compositions, the honour of having written the earliest 20h century cluster was Canadian (1911, Anger). Cowell quickly followed on an independent track, as did Ornstein (both in 1913) and Ives. Antheil came quite a bit later with clusters (1922) but he developed his own take on the technique. What Liszt had done with the glissando, Cowell did with the cluster. Single-handedly, so to speak, Cowell conceived of almost any type, form or use of the keyboard cluster. He even worked out the first cluster theory, although he put very little of it to practical use in his many dozens of cluster scores. Both Ornstein and Antheil wrote substantially less clusters than their reputation of bad boys has led to believe. More interesting is the work of Ives, if only because of the challenges in identifying the performance practice.

With Cowell, Ornstein and Ives, the cluster finally achieved the status of an abstract musical sound. Continuing on the American drive that pushed the cluster evolution forward, the cluster found its way in the compositions by Russel (elaborating on Ives' cluster-board technique) and Varese for percussion ensemble, and from thereon into the works by John Cage for piano as well as prepared piano, and eventually into pieces by Feldman and Brown. At this point, in the 1950's, the cluster is about to travel on two separate but converging tracks to Europe, where it had virtually laid dormant for more than a century (discounting Boulez' isolated trail in the first *Notation* and, again, Rebikov). Firstly, as the New York School pianist, David Tudor had seen his pianistic idiom infused with the cluster through the works of his Big Apple friends and brought it to Germany on his concert tours, where in Cologne (1954), he awakened Stockhausen's interest in the clusters. In 1956 Stockhausen starts writing his first clusters in *Klavierstück XI.* Secondly, Kagel – who had wanted to study with Schoenberg but chose Europe after the dodecaphonist's death – imported Cowell's clusters into Germany by

[1591] Kullak 1916, p. 238: "Es ist unsern Tagen in der ernsten Klavierkomposition immer mehr abgekommen. Dass es keinen ästhetisch-musikalischen Wert mehr besitzt, konstatiert für die Gegenwart Ruthardts Wegweiser, der, noch in der 6. Auflage über ein weitverzweigtes System spezieller Etüdenliteratur verfügend, schon damals fürs Glissando keinen Raum mehr hatte."

way of his own compositions (*Anagrama*) and Cowell's book New *Musical Resources* (1957), publishing an influential article on the matter in a magazine of which Stockhausen was co-editor. From then on, Stockhausen's interest in the cluster was stirred to the point that he wrote the masterly *Klavierstück X* (1961), which completely serializes the cluster and brings the cluster glissando (first used in the 19th century on the organ, "reinvented" by Cowell in 1925) to its high point. Meanwhile, Young had welcomed the cluster to the repetitive minimalist aesthetic (1960), the lost connection with the organ cluster tradition was re-established (Ligeti and Kagel), and, from the late 1950's or1960's, it found its way into rock-and-roll. From the 1960's onwards, the cluster has become a fixture in most compositional aesthetics. In 1984, William Y. Elias wrote a book called *Grapes,* devoted to the notation of the cluster.

Like the cluster, the glissando had also entered the repertoire to stay, although already much earlier. Since the 1920's, the concerto glissando maintained its position, the changing width of double-note glissandos were further developed (1985, Lachenmann's *Ausklang*), as was the technique of gliding over the keys with objects (1965, Von Biel's *Deklination* and 1969, Lachenmann's *Guero*). Von Biel also writes the slowest known glissando (1989-92) and in the 1990's, Herbert Henck experimented with and introduced real-chromatic glissandos as well as blocked-key, blocked-damper and whole-tone glissandos.

From the history of both the glissando and cluster, it is clear that these techniques have evolved from performance practical considerations rather than theoretical constructs. For the glissando this is evident from the way its notation has always been lacking several necessary performance practicle details, which had to be determined by the performer's technique and mood. But also the cluster has never much been a chord in a secundal harmonic system. Even Cowell's cluster theory in *New Musical Resources* was obviously written to legitimize a pianistic phenomenon that would otherwise have had difficulties being taken seriously in compositional use. Even the most theoretcally embedded clusters – those in Stockhausen's *Klavierstück X* – were adapted to the performer's technique after the score was composed.[1592]

5.2.2 Playing besides the keyboard

It is not illogical that low-grade extensions like the keyboard cluster and glissando appeared as early as the beginning of the 18th century (even if the literature still does not seem to realize the age of the cluster technique). It is a different matter for those techniques that require direct action on the strings. Yet, in the 1790's, Rust and Wernicke wrote music that requires just that. For some pieces it is a little unclear which was the instrument the performer is supposed to play on, but they were all definitely stringed keyboard instruments. The techniques themselves are more than simply gliding over strings, they are also more numerous. Rust and Wernicke prescribed silently depressed keys to open up strings that are then glided over. Rust also thought of a technique that is at its best on a clavichord but possible on other keyboard instruments (hitting an already depressed key), added flageolet technique, pizzicato, tapping and tremolo on the strings. The most baffling aspect is the degree at which the techniques are integrated in the 18th century tonal structures of the music. The effects do not stand on their own but, rather, both composers incorporate them among the properly played notes. Rust asks for whole themes to be played in (double-note) flageolets and he specifically develops extended techniques together with the musical material. Wernicke applies Cowell's Aeolian Harp technique to the harmonies and rhythms that punctuate his phrases almost a century and a half before Cowell thought of doing so. In fact, the level of musical integration Rust

[1592] E-mail to author by Herbert Henck, May 5, 2009.

and Wernicke managed to accomplish will be unchallenged until well into the 20th century.

As unexplained as these two composers' mature handling of such techniques emerges in history, as sudden does any interest in the inside of the piano cease after them. Except for some rumors, there is no evidence of any such compositional activities in the whole of the 19th century.

It is the 20th century that sees inside piano playing blossom. In between 1916 and 1918, another Scandinavian composer that is almost completely forgotten today – Rued Langgaard – prescribes strings glissandos, pizzicato and tapping on the keyboard lid. At the same time, the better known Percy Grainger, plays on the piano's insides with percussion sticks.

Already before 1921, Cowell comes along to explore the inside of the piano with much the same enthusiasm as he had the cluster. Beginning with sweeping and plucking in *Two Strings* (1916-21), he continuous in *The Sword of Oblivion* (ca1920-22) with scratching, rubbing, hitting, dampening strings, as well as sliding between partials on them. Immediately afterwards, his *Piece for Piano and Strings* (1923) contains glissandos across the strings, clusters on them, and pizzicatos, all choreographed within a musical logic. A second movement for this piece was planned to incorporate tremolos on the strings, and differentiation between fingertip and –nail for pizzicatos. With *Aeolian Harp* (ca1923 – string glissandos over open strings; pizzicatos) and *The Banshee* (1925 – glissandos across and alongside strings; pizzicatos), Cowell wrote his most successful and influential pieces that rely on inside piano techniques. In the same year 1925, he expanded the repertoire of techniques by including pitch bending and hitting strings using an object. A few years later, he added the use of "various implements" to play on crossbeams, soundboard, lid and frame (1928 – *The Leprachaun*). In 1930, finally, he restored the link with history and composed overtones that are produced by pressing nodal points of strings (*Sinister Resonance*). A decade later he announced "a new way of piano strings" that consists of tremoloing across the three strings of a chorus (*Mice Lament*). Cowell continued to use such techniques until the 1950's without further developing them. In the mean time, the percussion ensemble music of Russel and Cage took over the use of some of the existing techniques. For Cage, muted strings with fingers and with metal objects quickly led to the prepared piano, with which he spent most of the 1940's, but afterwards he turned to the inside techniques and emancipated them to the point that he could compose all those improper sounds simultaneously with the proper ones (*Music of Changes*).

Meanwhile, in the early 1950's Hovhannes had found inspiration in sounds from non-western instruments like the North-Indian Jhaltarang and the Arabic Oud to play on the strings using percussion sticks and plectra. Wolff exploited the unpredictability of the techniques' sound production to initiate relations between performers' actions in chamber music settings. Dlugoszewski is another unknown composer who then started to seriously contribute to the development of inside-piano playing, using without reserve virtually any household item to perform uninhibitedly any imaginable action on the strings. In great contrast with Dlugoszewski's music for the modernist experimental dance of her husband Eric Hawkins, it was also in the early 1950's that the classically trained but commercially set-up piano duo Ferrante-Teicher exploit Cowell's Aeolian Harp technique, pizzicatos, muted strings and rubber preparations for their easy listening record Hi-FiReworks, introducing the inside piano sounds into popular culture.

On the old continent it had been quiet around such techniques since Tcherepnin's ending a piano composition with a few taps on the lid in 1926. Only in the early 1950's did Pierre Henry use them for his work with Pierre Schaeffer. And Kagel's immigration to Cologne was marked with the finishing of *Transición II*, in which a percussionist plays the inside of the piano. From the 1960's onwards, the tale of the inside piano techniques is one of two

continents. In Europe, Luc Ferrari first uses a bow to play a piano strings, a technique that was only developed really by the Americans Curtis Curtis-Smith and Stephen Scott. Some of the Fluxus performances asked for dismantling the piano – certainly the most extreme inside piano playing. At the end of the 1960's the techniques found new life in Lachenmann's *Musique Concrète Instrumentale*, after which they became as much as a repertoire open to any composer and musician, including those who were active in the for instance the popular music band Pink Floyd.

5.2.3 Silently depressed keys

The late-18th century composers Rust and Wernicke were the first to prescribe silently depressed keys so that the opened-up strings could be set off to vibrate by gliding over them. Timbre filtering by using keys to silently open and close strings or to catch sympathetic resonance is seen again throughout the 19th century but in only a few isolated examples. In the early 20th century Schoenberg was the first to show a continued interest in unleashing sympathetic resonance with silently depressed keys. Different composers used the technique for different reasons (e.g. Ives, Berg, Stravinsky in the 1910's and 1920's), notably for the Rust and Wernicke version (Cowell from 1914 onwards). Most of the effort in exploring the potential came from the 1950's composers like Boulez and Stockhausen, who went to great lengths to control and integrate sympathetic resonance into their serialist works. The outcome was often hardly realistic from a performance practical point of view, but the result of such a relentless focus was that the silently depressed cluster was recognized as the most effective method of obtaining satisfactory sympathy from the strings. After the serial period, Crumb must be mentioned for reinstating the melodic potential that is furnished by the combination of silently depressed keys and strings glissandos. Ligeti discovered added value in the silently depressed keys by considering them as blocked (1976). Creating short rests in sequences of finger patterns that indiscriminately run over blocked and unblocked keys, rhythms can be created that are much harder to realize when merely playing properly on the keyboard. In the 1980's and 1990's, Henck experimented with using wedges to block keys and gliding over the keyboard to obtain all kinds of non-diatonic glissandos and arpeggios.

5.2.4 Prepared piano

The earliest documented preparing of a piano was witnessed in Paris and consistently involved paper. In the 1910's, a performance by Satie of his *Piège de Méduse*, and Delage's song *Ragamalika* had individual notes prepared. A rumor has it that there was a Parisian tradition of putting a sheet of paper on the strings of a piano to imitate the sound of a harpsichord for performances of operas that needed the latter, but this could not be confirmed. Nevertheless, Ravel offered just that as an alternative to the luthéal that he had really wanted for *Tzigane* and *L'enfant et les sortileges* from the 1920's.

Nothing is heard of the prepared piano again, until Cage came up with it (apparently unaware of the precedents) at the end of the 1930's. He spent more then a decade perfecting the instrument by experimenting with different materials of different sizes and weights, with combinations, positions and manners of insertion, and by employing the instrument in instrumental different settings. During and after that time, few composers felt it worthwhile to tread on what was considered Cage's ground (e.g. Wolff). The interest was intense enough, though, and some composers came close with e.g. the tack piano (Harisson), putting stones on the strings (Kagel) or sending the proper piano sounds through a ring modulator (Stockhausen). In the 1980's, Scott was the most consistent user of preparations for his Bowed Piano Ensemble.

5.2.5 Pedals

Improper use of the pedals started with partially depressed sustaining and una corda pedals in works by Boulez and Stockhausen in the 1950's. As with their clusters and sympathetic resonance, these extended pedal techniques verged in the border of the nonsensical, an aspect that Kagel picked up and used ad absurdum in 1961 (*Metapiece*). The latter is also responsible for having the pianist literally play the pedals as if they were drums (*Unguis Incarnatus Est,* 1972). Since the 1950's, half and slowly released sustaining pedals are most common in contemporary scores.

5.2.6 Others

It is not known whether the texts in between the staves of battle pieces, recounting the action on the field, were meant to be recited while playing. These and the ones Satie included in many of his scores were probably printed to be read silently by the pianist in order to catch the right performance mood at any given moment of the story. But one battle piece from 1866 demands that the pianist whistles and mimics train sounds while performing the music. Such vocal utterances are encountered again in popular music of the ragtime era in the first decade of the 20th century. The next stage is met in 1957, with Kagel's *Anagrama*, where the pianist has to pronounce syllables and sentences. If we discount the singer-pianists in popular music, Kagel is the one continuing the little tradition with his pieces for singing harpsichordist (1972) and laughing pianist (1977). It is from that time onwards that Crumb included all types of vocal expression in his music for or including the piano, remaining the foremost exponent of this extension in the 1970's.

Documented foot stomping is rare and dates back to ragtime at the earliest. Later examples include music by Cage (1940's) and a score by Frederic Rzewski (*Steptangle* 1984). Handclapping also occurs mostly in Cage (1940's), as did the first instances of blowing on whistles or operating electrical devices (1950's).

Theatrical techniques have been used more intensely. The Fluxus word pieces are rarely anything but theatrical actions. Luc Ferrari prescribes the manners in which the performer must behave on stage and how the scenic actions must be cheerful and silly, and aim at inciting laughter and mystification (1965). Kagel choreographed the entire entrance, performance and exit of *Recitativarie* (1972) into the minutest detail, including the position of the right arm, the speed and manner of treading, the direction of the performer's eyes, etc. Since the 1980's such elaborate indications disappeared but the request at the performer to freeze after the last sound returned for several compositions until the 1990's.

5.3 Historical development of the extended piano

Besides and above the view on individual extended techniques and their developments, the history of the extended piano is that of composers' attitudes towards the instrument and its sound producing potential.

Clearly, different techniques developed at different speeds and at different moments in time. As could be expected, the low-grade extensions of keyboard cluster and keyboard glissando appeared first, though it is odd to notice how they took two centuries to appear in one piece together, or with other extensions. That the inside playing of Rust and Wernicke was not combined with low-grade improper keyboard actions like glissandos

and clusters shows how these two concepts – string playing and improper keyboard actions – were not regarded as related. In fact, as much as the levels of extending the keyboard towards glissandos, clusters and the inside was surprisingly high, there was no cohesion in 18th century use of the improper qualities of the stringed keyboard instruments.

The lack of a coherent attitude (improper or otherwise) towards the early piano has to do with its development being in the embryonic stages. The instrument can be seen as the converging of a number of attempts at compensating for the perceived shortcomings of existing concepts of keyboard instruments. To accommodate the complaints by composers and performers (mostly still one and the same) about the limits of the different keyboard instruments, the piano was expected to incorporate the best of each of them: sustainability as on the organ, volume as on the harpsichord, dynamic flexibility as on the clavichord, and mobility as the latter two. The new invention did not meet all of these ideals immediately: the sound of the early piano was feeble compared to many harpsichords. But it could project its tone enough to fill a public space, and with the possibility to accentuate individual notes and to simulate legato, the dream of cantabile playing became more tangible than it had ever been on the organ, harpsichord or clavichord.

The attempt at neutralizing the disadvantages of one keyboard instrument by borrowing characteristics from other existing instruments was nothing new, as is shown by the tradition to extend the harpsichord's sound world with registers, much like on the organ. The entrepreneurial appetite of the builders seems to have been whetted by a demand for ever more improper instrumental color, as stops appeared on each keyboard instrument. Apart from a register to mimic every instrument in the orchestra, there seems to have been no end to what the organ could be accessorized with.[1593] On a smaller scale, harpsichords have been fitted with Lute, Oboe, Harp, Bassoon and/or Venetian Swell 'Veränderungen,'[1594] and clavichords were attributed Piano, Lute and/or Pantaleon stops. The remote controlled devices that were to feign timbral registration on the early piano – percussion, bassoon, harp, lute, Jeu Celeste, harpsichord, 'pizzicato', Venetian and other swell stops[1595] – were really only left-over traces from its ancestral organ and harpsichord concept than that they were in any way an intrinsic part of the piano, let alone that they were a musically worthwhile addition to it. It should not surprise us that above all the damper pedal – the one stop most uniquely contributing to the ideals of the new instrument – became a focal point for future composers developing the pianistic idiom in their works. Next to accessories, all kinds of hybrid instruments were constructed to ultimately merge the best of sometimes very different worlds: pianofortes fused with organ, spinet, harmonium or harpsichords; the organ was combined with a Tangentenflügel, harpsichord, spinet or clavichord; the harp and Glass-harmonica were made to be played with keys; the Geigenclavicymbel was invented, etc.[1596]

Considered from our vantage point, the early pianoforte is first of all an extension of the existing harpsichord concept into the realms of its organological family. Through the wish to emulate characteristics of the voice as well, the piano's potential is extended towards its outer limits by enforcing the concept of legato on what is and remains basically a percussion instrument. That it seems at times to be drawn irresistibly towards this essential root is witnessed by the Janissary stops, the tambourine-and-piano pieces and

[1593] Stauff 2003 counts 376 different organ stops, "removing synonyms, prefixes and suffixes such as Bass, Celeste, Contra, Double, Echo, Gross, Grand, Holz, Klein, Octave, Major, Minor, Solo, and Sub, variants based solely on pitch, and stops of dubious origin or distinction".
[1594] Hirt 1968, p.121-123.
[1595] See Mobbs 1984, p. 471-476 and Hirt 1968, p. 121-123.
[1596] See Hirt 1968, p. 129-157 and the preface of Daniel Gottlob Türk's *Klavierschule oder Anweisung zum Klavierspielen* (1789) as cited partly in Kloppenburg 1951, p. 94.

the cluster's noise factor. The early expression of the piano-percussion relationship is short-lived, however, but returns in the 20th century.

Most of the 19th century is devoted to the glissando and hardly any interest is discerned in any other technique. The whole focus of the virtuoso composer-pianists was on developing keyboard technique, as shown by the enormous amounts of studies for acquiring proficient keyboard skills, including not only finger dexterity but also chord techniques, leaps and effects like tremolos and trills as well as glissandos. Leaving the confusion between the sounds of ancestral keyboard instruments behind, the piano evolving towards a standardized timbral concept, and the basic keyboard technique emerged as the aspect to transcend. A second factor was the continuing obsession with legato playing – essentially against the nature of the hammer-action – to emulate the voice. The innumerable paraphrases of and variations on popular opera arias can certainly attest to the need for "voicing," whether it is in the treble or in the tenor-range "third voice" that the two thumbs had to be exercised for. A third relevant influence on the development of 19th century piano sound was the orchestra. 19th century piano repertoire sees not only a gradual growth of the keyboard range (pushing the designers to actual extensions of the number of keys) but also of chords that need to sound orchestral. Ergonomical fingerings to grasp more notes than the hand has fingers, even stretching as widely as possible, are the result.[1597] Such chords, often with two adjacent notes on the bottom and on top (with thumb, resp. fifth finger), could have evolved towards the cluster in theory – and nearly did in Liszt's *Orage* – if it weren't for the fact that this was nowhere near the objective. Larger chords were designed to produce more sound, the spreading of their notes over wide stretches assured timbral transparency like in the orchestra, and individual finger technique guaranteed timbral control. The step towards the uncontrollable noise characteristics of a cluster was insurmountable, as close as the connection really seems. There is a 19th century extended piano, and it does attempt at moving away from the proper piano sound, but it extends towards the ideals of vocal and orchestral sound production and does so with minimally extending its technique. The micro-clusters of playing two notes with one finger are the lowest-grade extensions possible. The timbre filtering is non-existent in compositions outside of Schumann's oeuvre. The glissando has little to do with the 19th century timbral ideals: it was a typical virtuoso showpiece technique in that it provided a short cut towards extremely fast runs, and did so with minimum effort and maximum effect.

The 20th century picture of how, in the end, the step towards real improper use of the piano's characteristics was taken, is very much one of two continents. Not bothered by the weight of the European traditions in composition, Cowell (and Ives) could explore any side of piano playing that may have been considered taboo elsewhere. There was no way for Schoenberg to be interested in silently depressed clusters or a glissando on the strings: such sounds did not fit the democratic model he envisioned for the tones in his compositions. The less than efficient applications by Berg and Stravinsky of open strings show how they could not muster the effort to really explore the potential of the technique. The primary concern for control over individual notes can be discerned in Boulez' compositions as well, where clusters are indicated to be played with individual finger articulation as much as possible, even if that is more difficult and less efficient than with for instance the palms of the hands. Rebikov remains a very isolated example of a cluster composer in the first forty years of the 20th century, as are Langgaard's string glissandos (he was nevertheless the first to consider the piano as merely consisting of a body with strings) and Grainger's percussion stick technique (he might be

[1597] Ergonomical writing is an important sign of piano writing and piano sound slowly developing. Late 18th century left hand accompaniments, such as Alberti basses, were still based on four part polyphony and could be played on any keyboard instrument, even on the harp. With the development of idiomatic piano writing (including the damper pedal), specific textures emerged, such as the typical accompaniment figures in Chopin nocturnes, with low bass notes and the rest of the chord notes higher up towards the tenor register. See also Rowland 1992.

considered more European than American in the 1910's, however). That the prepared piano was experimented with in Paris is exceptional but also minimal. Satie was hardly a mainstream composer, Delage only dared insert paper under the strings of one note, and Ravel preferred the luthéal – an instrument on which to play with proper piano technique – over the effort to develop the alternative of paper preparation so that it would not be such a poor alternative.

Cowell did not have to consider any reserves in the US, were maverick behavior could earn the attention of an impresario who could then arrange a career as a bad boy of music. Yet it is striking that he developed the cluster and the string playing techniques on two separate tracks. It took him nearly a decade before he first combined them in one composition. But when he finally did, in *Piece for Piano with Strings* (1923), he was the first to approach the extended piano as a complete instrument, able to perform a "whole world" of music. Cowell never applied all possible techniques in any single piece – several types he never used – but he achieved more than one combination of extended techniques that is musically convincing.

Once Cowell first experimented with what he called the "percussion piano," the extended piano idiom was never far removed from the core of the piano's identity as a percussion instrument: his ideas inspired Cage to form a percussion ensemble in which the extended piano quickly took a central position; his percussion and string piano led Cage to the prepared piano; indirectly, his ideas on percussion and dance are connected through Cage to Dlugoszewski, who spent most of her professional musical life composing for and playing on her "timbre piano" to accompany her partner's choreographies, much as a counterpart to the Cage-Cunningham relation between prepared piano and dance. In turn, Cage's prepared piano led Harrison to concentrate on the tack piano, which enhances the percussive nature of the pianos hammers by overruling the effect of the felt. The influence of Cowell is even noticeable in Kagel's *Transición II,* for which the piano is effectively played by a professional percussionist, an interest that Cage later expressed in his *Etudes Boreales.*

In the end, it was Cage who democratized the extended techniques and who first tried to eradicate their discriminatory position as extensions. It was Cage as well who added whistles, props, electrical devices and theatrical actions to the repertoire of the extended piano. It is no wonder that he first reached the extreme consequence of writing for the extended piano, prescribing any sound producing action.

With Cage's action pieces (1959-1963) the piano had effectively become a stage prop like any of the other objects on or with which the performer was to make a or any sound. With Fluxus this regard for the piano was intensified to the point that Nam June Paik stated that "The piano is a taboo. It must be destroyed."[1598]

After Cage there has still been a life for the extended piano. If anything had been declared possible, not all or any combination had effectively been tried. Composers like Kagel, Curtis-Smith, Stockhausen, Crumb and Lachenmann all succeeded in establishing a distinct, personal idiom for their use of the extended piano, each one based on carefully developed combinations of favored extensions. Electronic manipulation of the proper piano sound and the bowed piano are the last major contributions to the extending of the piano, considering it either from yet another new perspective and bringing it closer again to the long forgotten ancestral *Geigenklavier* (bowed piano; electro magnetic activation of strings) or to the prepared piano (ring modulation).

From the 1980's onwards the tendency to profile oneself with extended techniques – whether it be with a specialty in one technique or with an overall concept – seems to have subsided. However, individual contributions on the level of a single technique were

[1598] Fricke 2006, 110.

still valuable (Ligeti's blocked keys, Henck's glissando experiments), and the creative minds of composers will surely continue to find yet new ways or combinations.

It is worthwhile to consider the position of the standardized piano in the story of the 20th century evolution of the extended techniques. One the one hand, for sure, the Steinway "norm" of the 20th century piano enabled composers to be confident that what they wrote with their own piano in mind would be possible to play on most pianos on stage. This had hardly been the case before. As much as it had been impossible to count on a particular hammer action and ensuing proper piano sound for just any performance in any city in Europe around 1800 (cf. Viennese and English pianos), it would just as much have been impossible in the 20th century to count on a particular lay-out of the framework to think of e.g. producing a glissando directly on the strings. Actually, this was to remain a problem for many decades to come, but even the tiny first steps in the direction of extending the piano necessitated a form of standardization, for instance Schoenberg's need for a third pedal for his opus 11. On the other hand, the piano's tone color and its greatest obtainable volume of tone are closely allied. The need for a greater tone has resulted in the standardized piano having much less overtones than before. At least in hindsight, this historical loss in tone color seems to be compensated for, by recuperating the piano's innate potential for a sound rich in overtones and color.

To come back to the phenomenological perspective as discussed at the beginning of this study, the extended piano has evolved from a closed tool to one that has been opened widely, for some Fluxus pieces even to the extent that it cannot function anymore. The evolution happened very gradually, however: step by step, sometimes closing parts again before exploring further. It has taken two and a half centuries fro composers to lose all inhibition and open the piano for discovering all the functions that the instrument possesed from its origins.

The composer's artistic, social and financial position on the one hand, and the extended piano's evolution on the other hand, are connected. The two great pioneers of extending the piano – Cowell and Cage – were financially poor and not artistically ready for any accepted career when they developed their interests in extended techniques. Cage is reported to have played Grieg and Moszkowski, but there is no proof that he was on a high enough level to make a living out of it.[1599] It is equally doubtful that Cowell could have had any career with classically (contemporary) repertoire if he had wanted to. For long times, both Cage and Cowell did not have access to the best and newest of instruments. Literally as well as phenomenologically, opening up a run-down instrument comes much more easily than when approaching a shining concert grand on a respected stage, possibly with a suspicious technician or owner in the neighborhood. When you do not have the resources to buy or rent timpani (as Cage and Cowell complained they didn't), you may get something cheaper that is still a "proper" instrument, but when that isn't even possible, you get a piece of wood and make do. That is the attitude Cage applied to the challenge he met when wanting to compose *Bacchanale.* That is the attitude Cowell must have had when his physical condition and lack of professional training forced him to invent ways of his own to make a mark.

A final perspective on the evolution of the extended piano is that of geography. It is remarkable how both the glissando and the cluster first appeared clearly in France. While the cluster knew unexpected 18th century success in mainly French battle piece repertoire, however, the German battle pieces seem to distinguish themselves by preferring percussion stops for the depiction of cannon shots. The French organ cluster on the other hand would be related to German interests in the same technique on that same instrument.

[1599] E-mail of David Vaughan, archivist to the Merce Cunningham Dance Company, to author. (May 19, 2008.)

The curiously isolated instance of string playing in Wernicke's large set of variations arouses suspicion that more interesting developments might be found in the history of the musical activities north of Germany.

During the 19th century, musical exchange between Europe and America happened in a westward direction only, with Parisian virtuosos feverishly crisscrossing the new land to display their refined technique. In the next century, the one-way flow was reversed (though not before Cowell had been influenced by Schoenberg's opus 11 in 1914) and American composers and performers started to present themselves on the European scene. Ornstein, Cowell and Antheil conquered the old continent as new types of virtuosos, not perceived as very refined but guaranteeing at least to impress the establishment with scandalously wild playing. When Cage came to Europe in the 1940's and 1950's, the impression he made went beyond the superficial and touched upon the imagination of Boulez, Henry, Stockhausen and Kagel, to name but the best known. More than thirty years after his first European tour, Cowell's cluster ideas directly influenced Kagel, Stockhausen, Boulez and Ligeti. Besides or even above Lachenmann, it was Crumb who enjoyed the most popularity in Europe for his extended piano idiom.

5.4 Notation

Until graphic notation was introduced, the cluster and glissando technique's performance practical characteristics were subordinate to the priorities that western classical music notation gave to pitch and duration. The early clusters where conspicuously notated as one, two or three octaves, regardless of shape and size of hand. The glissandos mostly ended with some type of accent, suggesting individual articulation, even if that means that the last notes of the gliding cannot be played. The actual technique is found in between the notes that it connects, but none of it is revealed through its notation. With the emergence of graphic notation, the situation for the glissando did not change much, as mostly the notes between beginning and ending were replaced by a straight line, still not telling how the ending is to be articulated. For the clusters, notation did change for the better in the 1950's and 1960's as composers used it to compose with the actual properties of cluster playing. Stockhausen notated an arm cluster with an open bottom ending to avoid prescribing the length of the performer's arm. Kagel's ideograms made it possible to concentrate on the movements rather than specific pitches to determine the exact ambit.

Throughout the three centuries of this subject's history, editors of publications have had problems coping with the historical notation of extended techniques. Whether a 19th century pianist wanted to include his own, historically non-informed insights into a publication of a piece from before his birth, or a late 20th century editor prepares an Urtext edition on Balbastre, Liszt or Ives, extended techniques seem in general to be misunderstood easily, both at the level of knowledge about historical notation and of sheer performance technical insight in the matter.

19th century editions more or less followed the ease with which the glissando could be executed at the contemporary pianos, which is the same as following the popularity of the technique. At the height of its development, editors of compositions from the previous century did not shy away from adding the word "glissando" to a run that was otherwise not immediately identifiable as such, or an ossia with a glissando to make sure that the technique was at least considered by the performer. When the glissando lost some of its popularity, the same scores came onto the market without the indication again, or with ossias showing alternatives that favored individual articulation. 20th century editors have mistaken Balbastre's clusters for glissandos, have not bothered to include in their preparatory work the nuances of Liszt's glissando writing that can be

found in early editions, and simpler chords, even a glissando, have replaced Ives' micro-clusters.[1600] The editions of extended piano works by Cowell and Cage, published in their lifetime, can be remarkably different from the manuscripts and from recordings that have survived.

5.5 Historical performance practice

The numerous scores that have survived show us how much 18th and 19th century composers and performers experimented with extended techniques leave much to be desired. Because of the deficient representational qualities of the glissando's and cluster's traditional notation, we do not know most of the details that are crucial to the knowledge of how exactly these techniques were applied. Even the relatively many piano methods that mention glissando practice and show examples of their use are disappointing to the performer who needs more than what he can already find in the scores himself. It is tantalising to find significance in one 18th century tutor's characterisation of the glissando as depending on the mood of the performer, but it is merely fascinating for it cannot be established yet in how far such an attitude allows to be generalised across geographical and chronological borders. No historical commentaries are known to enlighten us about such performance practical details, as crucial as these are to determine period performance. Statistics may show us that, in scores, most 19th century glissandos end with a marked note that suggests individual articulation, but we have no direct knowledge of how much freedom performers exercised in controlling the momentum in between the glissando's beginning and ending, and the transition between the gliding and the individual articulation. Surprisingly, much the same can be said about the 20th century and the performance practice of all the techniques that have blossomed in that age. The fact that this period is directly connected to our present-day can be a misleading comfort. The problems that face the performer when investigating long bygone ages are similar, if not the same, as those that the "new music" aficionado has to overcome if he wants to find out how the music of, say half a century ago, was played. 20th century piano methods furnish as little real performance practical information as their counterparts in the previous two hundred years. If there are perhaps more reviews and books written about the last century, they do not mention how pianists modulate the speed when gliding over the keys. Stockhausen's score of *Kontakte* does not show how its clusters should be played. At best it hints at a common practice; in the worst case, it demonstrates that few performers care, since no one of those who played and recorded the piece could help this study establish just when Stockhausen wanted a chromatic, diatonic or pentatonic cluster. A new edition, supervised by the Stockhausen Foundation, left out one confusing hint, but did not solve the problem. Cowell's scores and recordings are so much of a contradiction that little reliable performance practice can be deduced from it. Despite the popularity of Cage's prepared piano pieces, we know next to nothing about the dances that were essential to the music (even when they were composed separately).

Nevertheless, indirect clues have helped to enlighten us. Beethoven's use of rests to indicate that a hand does not play (rather than that no sound is made in that register), and Haydn's reworking of a sequence to allow for glissando playing have helped to at least identify glissandos where none are expected by present-day performers. Inversely, as in the case of Haydn, the glissando's characteristics (e.g. its momentum) can help form the basis for determining tempo and character of the piece. In the case of the cluster, the evening that Liszt spent listening to a demonstration at the Fribourg organ,

[1600] Originally, in the fourth of Ives' *Four Ragtime Dances*, there is a run with two micro-clusters for the thumb. Noted Ives scholar James B. Sinclair edited the score for a "critical edition" and replaced the run with a glissando.

has shed fresh light on a piece by his that has been in danger of succumbing to oblivion. Hunting down already long forgotten scores have further enabled us to compare notation and conclude for instance that the curious notation in Balbastre's *Marche des Marseillais et l'air Ça-ira* concerned indeed clusters and not glissandos. And the simple comparison of Cage's scores and manuscripts have led to reconstructing early preparation practices, which in turn has helped to develop ways to work out concert programs so that this music can live on the stage once more.

The manner in which the glissando's development has proven to be historically tied to the evolution of the piano's design – most notably to key-dip, key-weight and chamfering – makes us conscious of how important it can be to choose the right instrument for the right technique. This needs not be limited to the 19th century: the question of whether Haydn's trio in C should be played on an English or Viennese instrument is quickly settled with the glissando in mind. The Beethoven trio even furnishes us with a unique insight: even if a present-day piano's action is mostly too heavy for an octave glissando in a late-18th century scherzo, in terms of historically informed timbre development, it is more accurate to play a two-hand glissando than to use individual articulation. If present-day instruments are at all considered for this repertoire – concert practice is still hardly ready for recitals with five or six historically different pianos – a Dutch invention to manipulate key-weight turns out to offer great potential for reviving some of the glissando repertoire that has been considered too difficult to play on modern instruments. For the 20th century the insights are similar, and their value equal. Determining on which pianos Crumb's works can be adequately performed – by comparing simple measurements of available pianos with the composer's wishes in the scores – helps the performer to be prepared as professionally as when he brings Beethoven to the stage. The question of professional attitude is no difference when it comes to the preparation materials for Cage's music. The historical preparation materials show not only how meticulously the composer had prepared himself (as do the general preparation practice directions that he left with them), they also demonstrate how Cage was then, in the 1940's, not yet the Cage that performers all too easily confuse him with today, i.e. a Cage that was content to leave timbral (and other) choices to the performer. Most importantly, the materials provide valuable information on the sounds that he liked and sought after when composing for the prepared piano.

5.6 Some directions for future research and applications

Despite the comprehensive frame of this study, a few subjects are in need of further attention, for which more research would be welcomed. Some examples are here listed.

Throughout the examples of the 18th century glissando, the slur has seemed to be present more often than not. It could not be deduced, however, in what way this could be considered determining for identifying a glissando. More detailed knowledge about the diverse functions of the slur 18th and early 19th century slur would be welcome.

The curious final variation of Israel Gottlieb Wernicke is ample reason to go and explore the Scandinavian archives for more on this composer and many other composers worthwhile discovering.

The question of how much the glissando indications in Scarlatti's F major sonatas are to be taken seriously (or how much effort should be made to glide from A to B♭ to C) depends on how performers have felt in general about playing a C major run over an F major chord.

Cowell has left us over 900 scores with his music, now housed in the Library of Congress Surely, more than the few dozen that are now published would be worthwhile bringing to the stage again.

Virtually all of Cage's music is now published. This makes it all the more incomprehensible that some of it is edited so poorly. Even the few pieces that have had the honor of being edited did not profit much from what a historically informed attitude might bring to them. It would be beneficial to the performance as well as the reception of music from recent times to bestow its publication with the same professionalism and respect that music from much older eras has enjoyed.

It has not been a surprise, really, to learn how many musicians feel opposed to the seriousness with which this study has tackled its subject. The glissando still suffers the prejudice of being considered cheap, a judgment that is based solely on a late-19th century opinion that is in itself demonstrably prejudicial, such as:

> *A glissando in Haydn's grandest of trio's is inconceivable.*
>
> *The fast octave runs in his concerto can only mean that it was written for a double-manual harpsichord.*
>
> *Bach could not possibly have intended a glissando in any of his works.*

With the same matter-of-factness of a musicologist claiming – without proof – that any fast run in C major in Italian an German repertoire is to be considered a glissando, some performers dismiss any thought of a glissando, sometimes even arguing that it is impossible to play it before they actually try it. No doubt, for a while yet, the glissando will continue to be easily misunderstood as a cheap effect instead of as containing a worthwhile musical potential. On the other hand, it has been baffling to see how some of the same performers that have such issues with the glissando, find it easy to play a cluster where there is none written. Inquiries about whether a performer (specialized in 17th and 18th century repertoire) would or would not play the dense opening harmony of Rebel's *Chaos* with cluster technique, have been met with the same self-assured answer, equally without real arguments, though this time in the opposite direction: "of course that is a cluster." Harnoncourt's edition of Farina's *Cappricio Stravagante* indicates cluster technique for some of the imitations of natural noises in the harpsichord part, but also without any argument or source, except for the admittance that the original score did not contain any reference to this technique. If this study can prove anything concerning the 18th century glissando and cluster, it is above all that still too much is unknown about these effects to make generalizations. But dismissing a glissando (or a cluster, e.g. in a battle piece that has empty octaves in the bass with "canon" written above it) is as much an – as yet – unfounded generalization as is any statement that claims the individually articulated run is without question the norm. For musicologists as much as for performers, taking historically informed performance practice serious also means taking such techniques seriously. Throwing together a few ill-informed or plainly wrong facts to publish a lemma on the cluster in the News Groves Dictionary is not worthy of any encyclopedic reference work, whatever the subject.

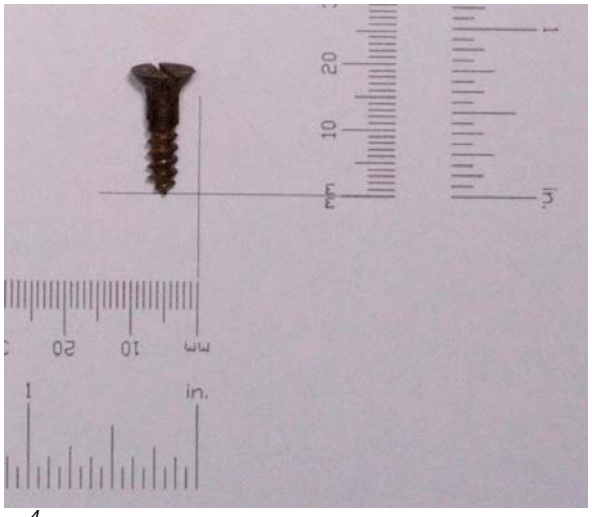
The same courtesy towards this subject from the part of the instrument building industry would be as beneficial. Research into piano design has been proven painstaking. Any request to a piano manufacturer for information about the history of their models' design is either left unanswered or is replied to with the accusation of industrial espionage.

If this study is hopeful of a future for its subject, it would be a future where any creative thought of any composer in any age could be met with innocent interest, looking for knowledge about it without regard for its status. An interest that brings together historians and performers alike in search for refreshed ways of making music.

Besides the above-mentioned subjects that warrant further investigation, the present study is in itself only the basis for further research into the performance practice of the extended piano techniques. Detailing the historical developments in scores, and the information on the original performance practice that has come down to us, is only a first step towards granting these techniques their rightful place in present-day performance practice. Further study is needed to develop ways in which pianists can apply them on instruments of our own time.

6 APPENDICES

6.1 Appendix 1: original preparations for *Sonatas and Interludes* (ca1948)



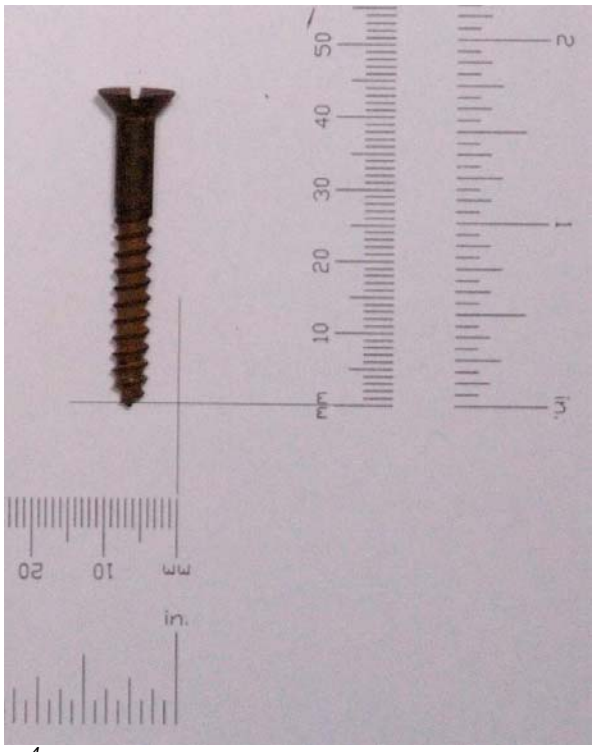
a [4]
Screw (10 gauge, ¾" long, flat head iron wood screw)
Between strings 2 and 3
Distance from bridge: 1¼ inches



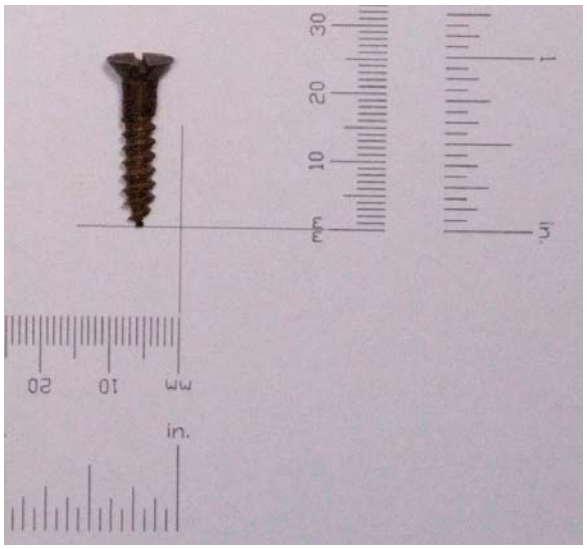
g [4]
Medium bolt (13 gauge, 1¼" long, washer head furniture screw)
Between strings 2 and 3
Distance from bridge: 1 and 3/8"



f [4]
Screw (14 gauge, 1” long, flat head iron wood screw)
Between strings 2 and 3
Distance from bridge: 1 and 5/8”

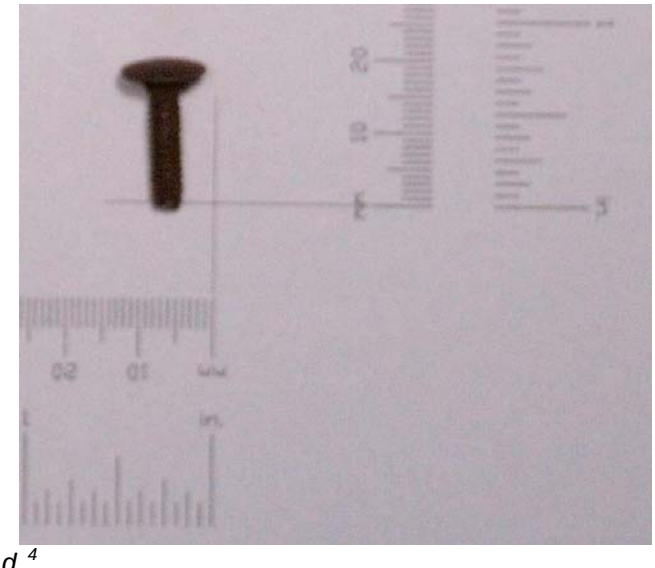


e [4]
Screw (12 gauge, 1 and ¾” long, flat head iron wood screw)
Between strings 2 and 3
Distance from bridge: 1 and 13/16”



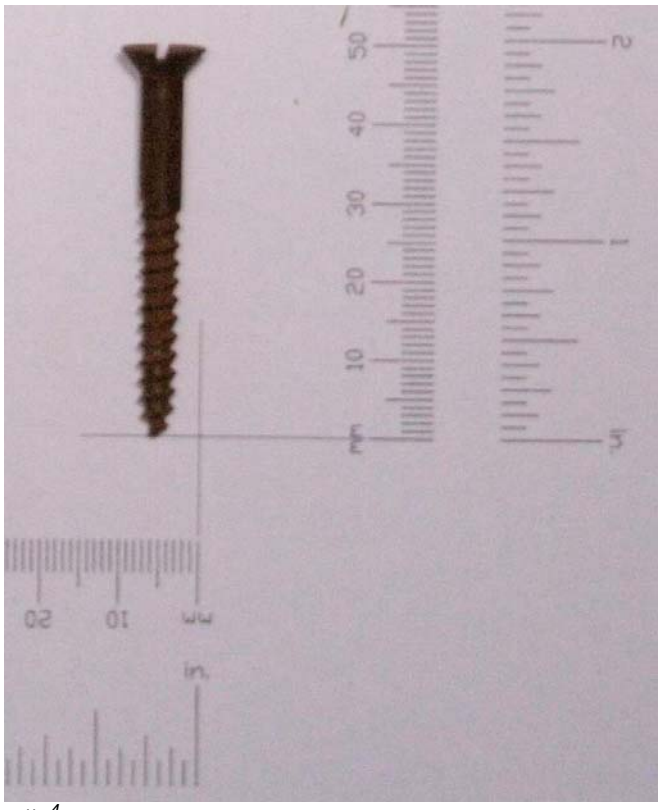
e♭ 4

Screw (11 gauge, 1” long, flat head iron wood screw)
Between strings 2 and 3
Distance from bridge: 1 and 3/4"

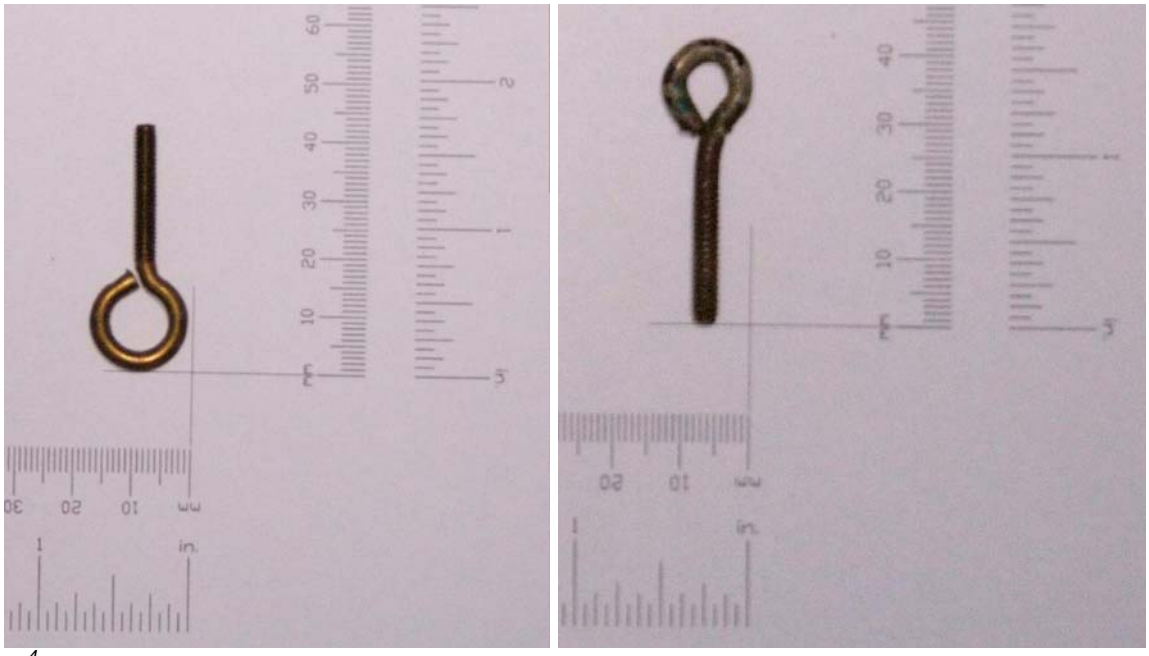


d 4

Small bolt (3/16 carriage bolt, 3/4" long)
Between strings 2 and 3
Distance from bridge: 2 inches



c# [4]
Screw (12 gauge, 2” long, flat head iron wood screw)
Between strings 2 and 3
Distance from bridge: 1 and 11/16”



c [4]
Furniture bolt (8-32 x 1” eye bolt or machine eye screw)
Between strings 2 and 3
Distance from bridge: 2 and 3/16”



b [3]
Screw (14 gauge, 2” long, flat head iron wood screw)
Between strings 2 and 3
Distance from bridge: 2½ inches



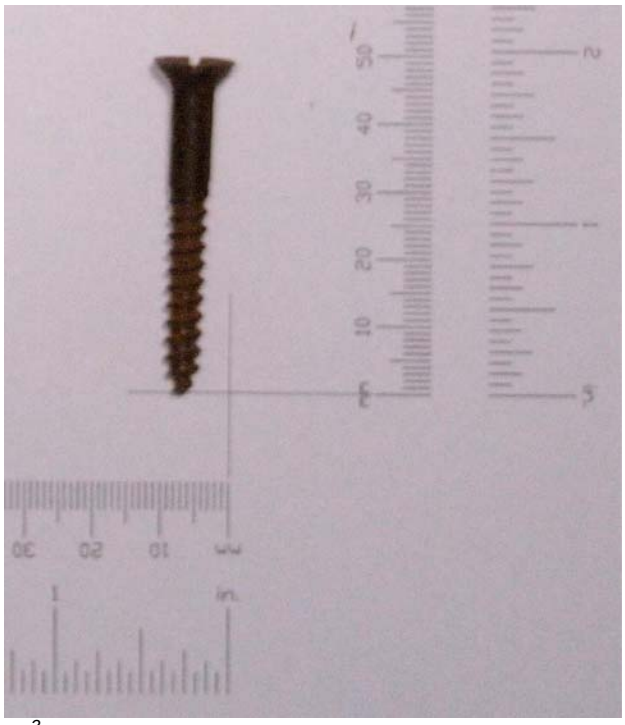
b♭ [3]
Screw (12 gauge, 2” long, flat head iron wood screw)
Between strings 2 and 3
Distance from bridge: 1 and 7/8”



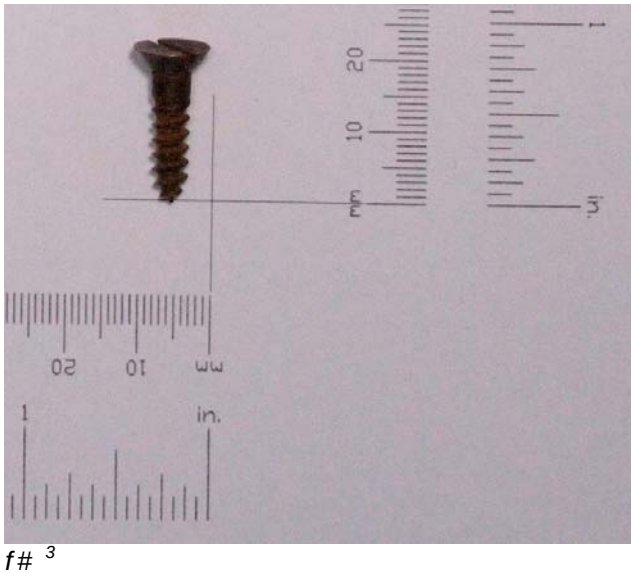
a [3]
Medium bolt (13 gauge, 1¼” washer head furniture screw)
Between strings 2 and 3
Distance from bridge: 2 and 7/8”



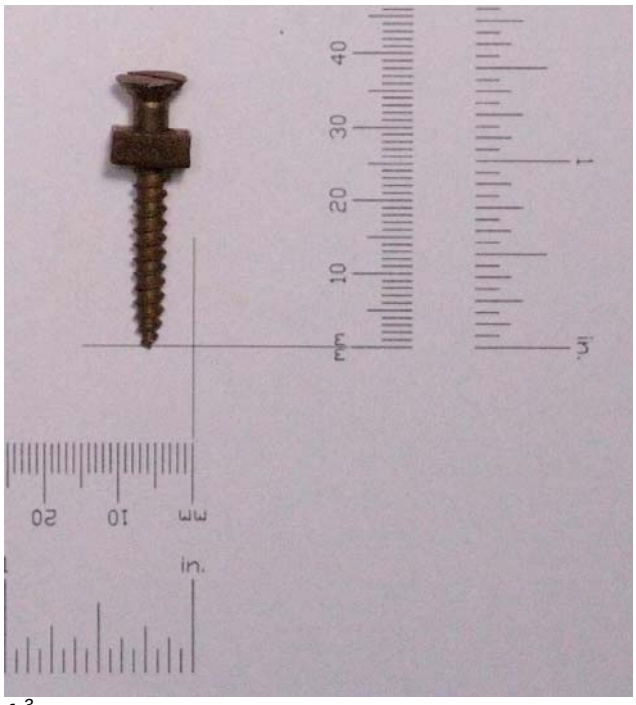
a♭ [3]
Screw (12 gauge, 1½” long, flat head iron screw)
Between strings 2 and 3
Distance from bridge: 2¼ inches



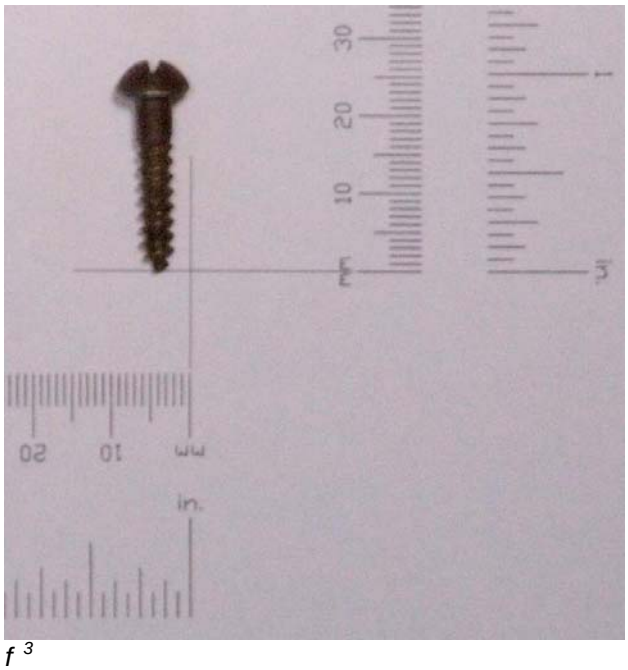
g [3]
Screw (14 gauge, 2” long, flat head iron wood screw)
Between strings 2 and 3
Distance from bridge: 3 and 3/4"



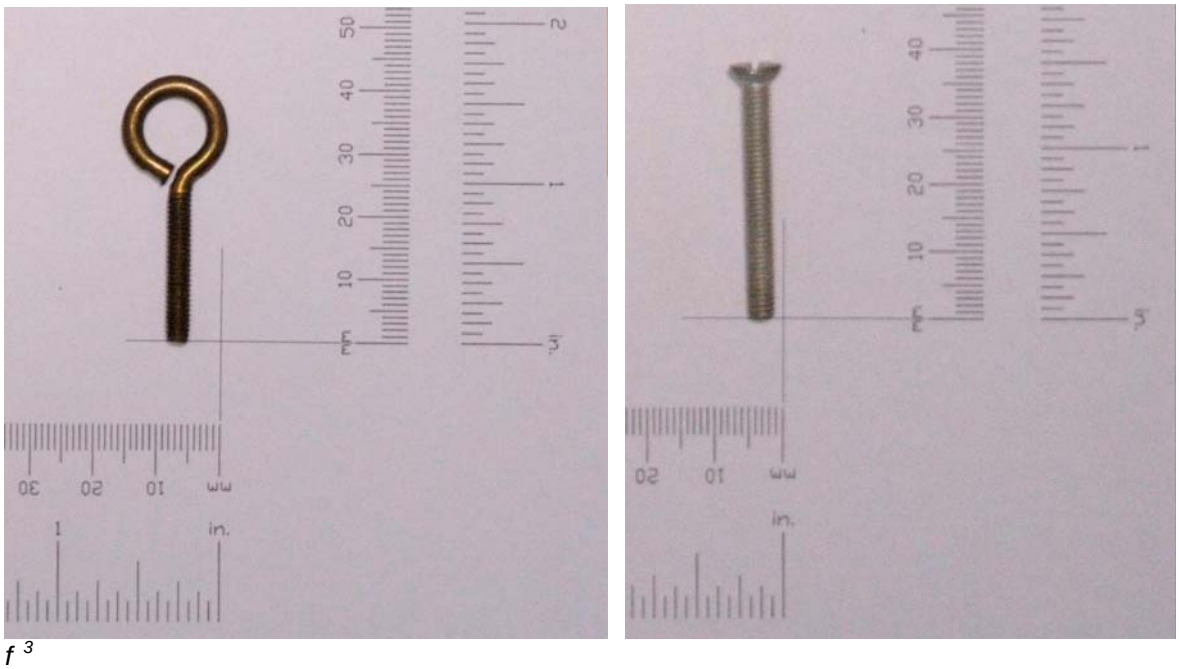
f# [3]
Screw (12 gauge, 7/8” long, flat head iron wood screw)
Between strings 2 and 3
Distance from bridge: 2 and 15/16”



f [3]
Screw (10 gauge, 1½” long, flat head iron wood screw)
Between strings 1 and 2
Distance from bridge: 3/4"

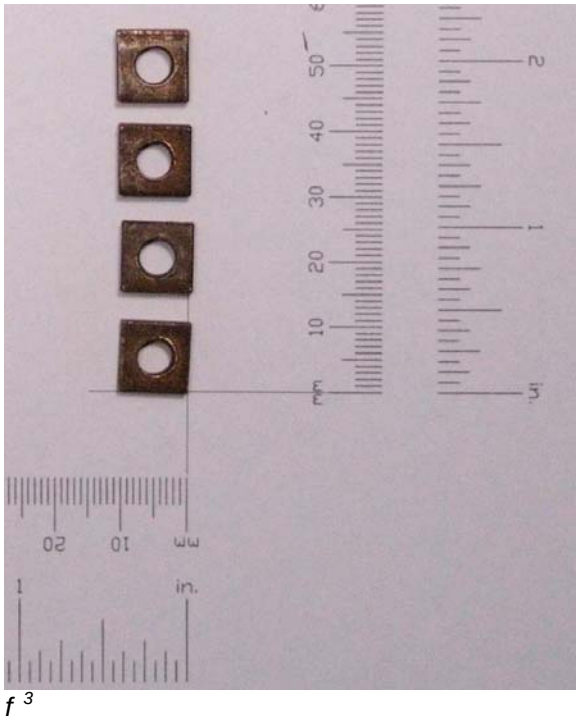


f [3]
Round screw (10 gauge, 1” round head iron wood screw)
Between strings 2 and 3
Distance from bridge: 3 and 3/4"
Note: Place bolt or screw through nuts in each case before placing between strings; arrange nuts so that they do not affect F#[3].



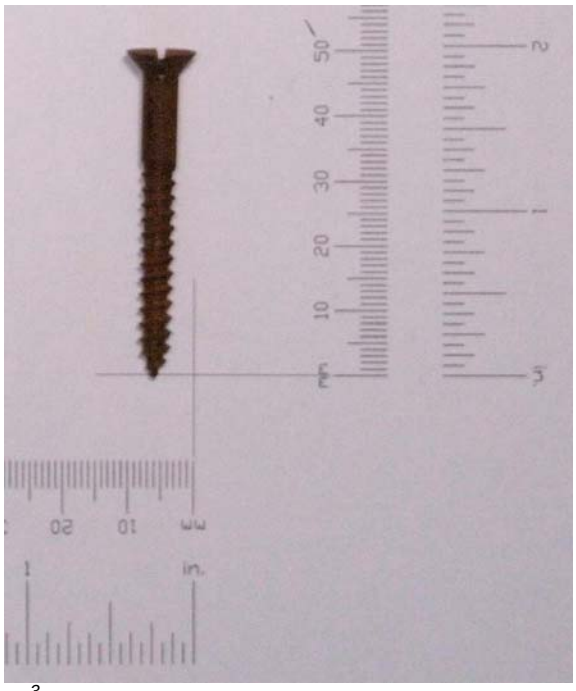
f [3]

Furniture bolt (8-32 x 1” eye bolt or machine screw eye)
Between strings 2 and 3
Distance from bridge: 2 and 1/8”
Note: Place bolt or screw through nuts in each case before placing between strings; arrange nuts so that they do not affect F#[3].



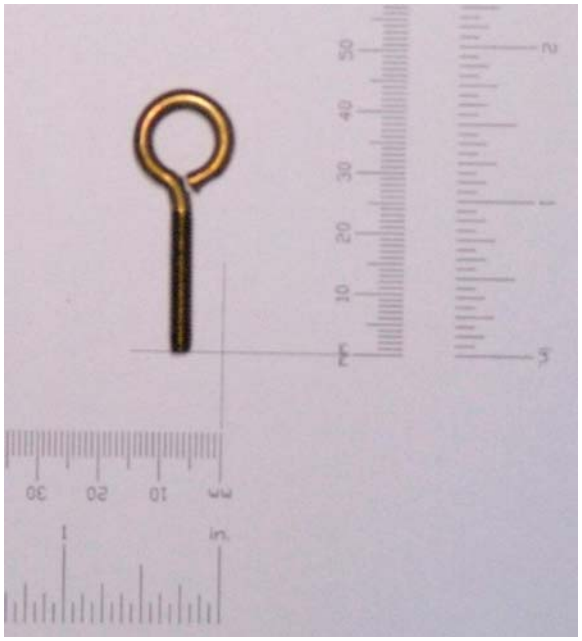
f [3]

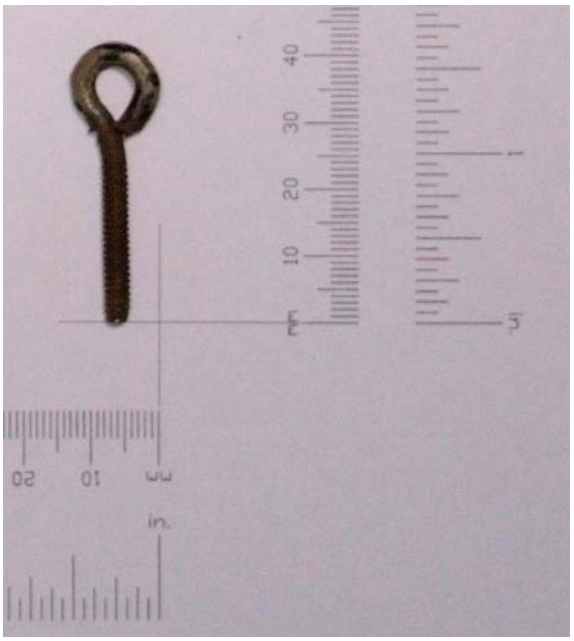
Nuts (¼/20 square iron nuts)
Between strings 2 and 3
Distance from bridge:
Note: Place bolt or screw through nuts in each case before placing between strings; arrange nuts so that they do not affect F#[3].



e [3]

Screw (12 gauge, 2” long, flat head iron wood screw)
Between strings 2 and 3
Distance from bridge: 1 and 13/16”



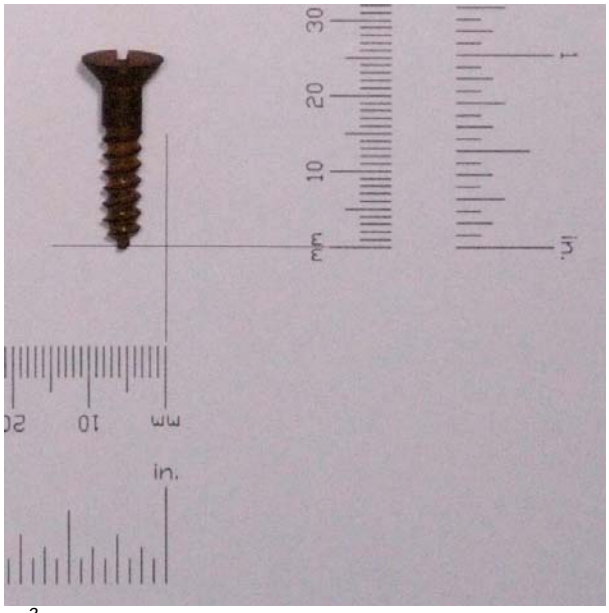


e♭ [3]

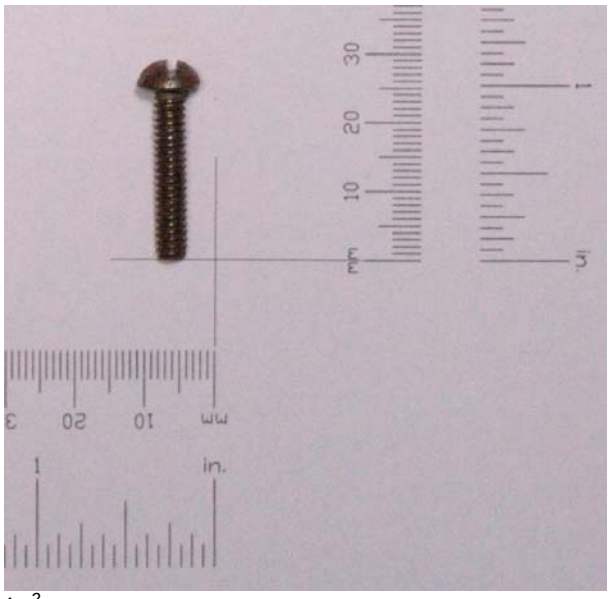
Furniture bolt (8-32 x 1” eye bolt or machine screw eye)
Between strings 2 and 3
Distance from dampr: 1 and 7/8”



c# [3]
Screw (12 gauge, 1” long, flat head iron wood screw)
Between strings 2 and 3
Distance from damper: 1 and 15/16”



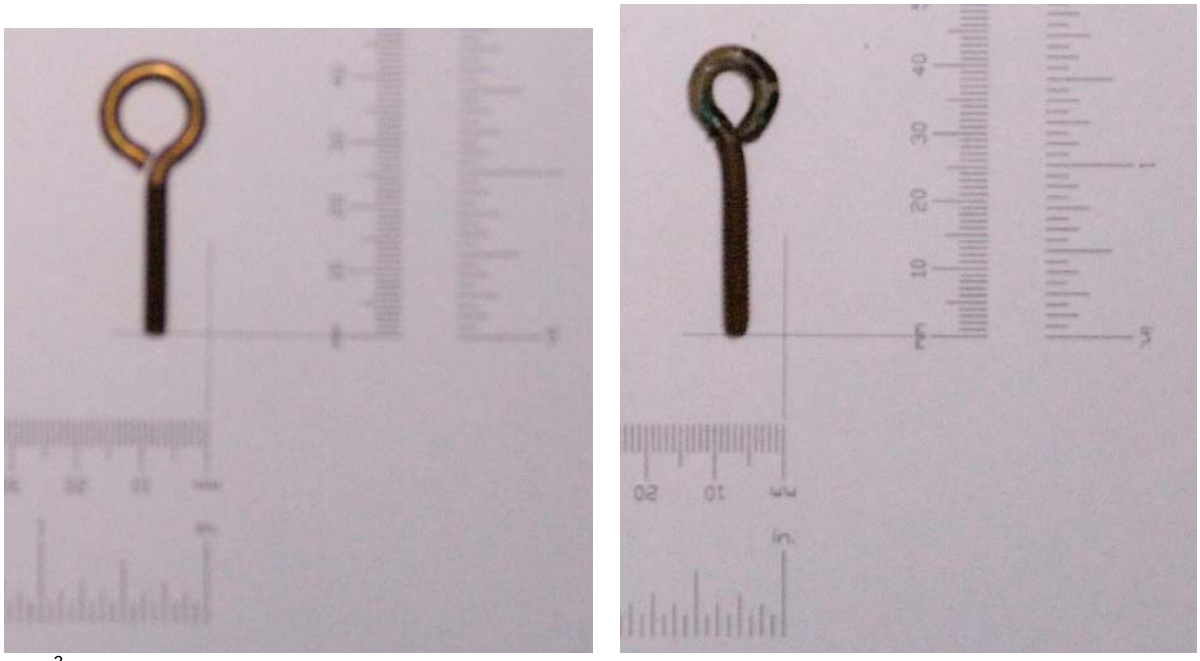
c [3]
Screw (12 gauge, 1” long, flat head iron wood screw)
Between strings 2 and 3
Distance from damper: 1 and 1/16”



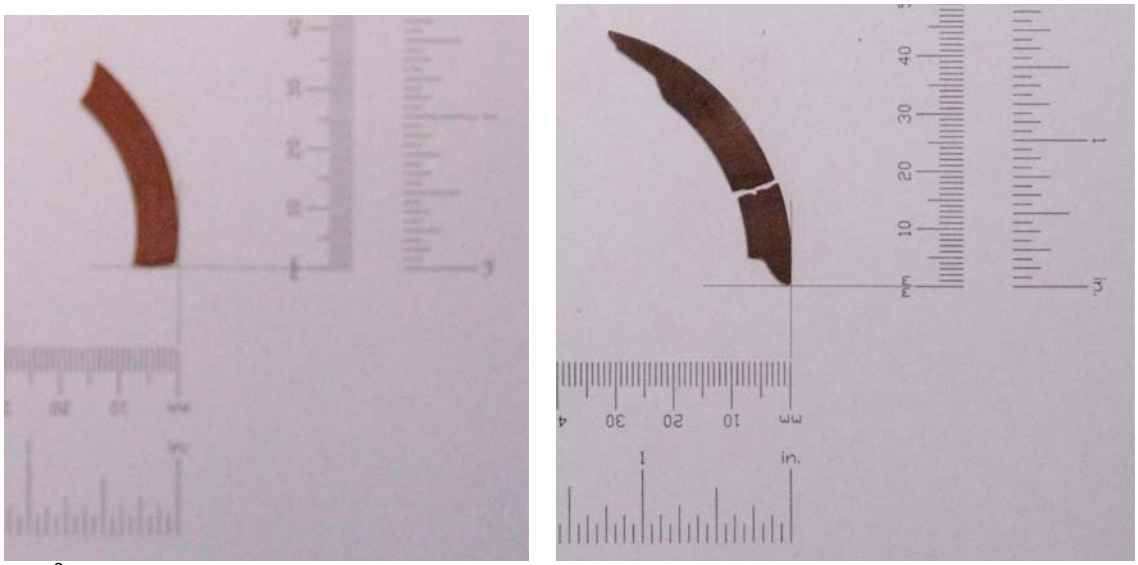
b [2]
Medium bolt (10/24 by [1] inch round head iron machine screw)
Between strings 2 and 3
Distance from damper: 3 and 3/4"
Note: the distance from damper to bridge should be 4 and 7/16”; if it is not, change all measurements from damper correspondingly, except those below small D)



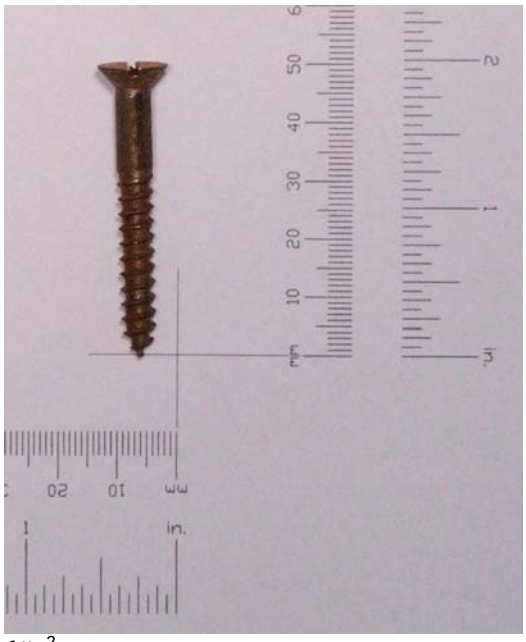
a [2]
Screw (14 gauge, 2” long, flat head iron wood screw)
Between strings 2 and 3
Distance from damper: 4 and 7/16”



g# [2]
Furniture bolt (8-32 x 1” eye bolt or machine screw eye)
Between strings 2 and 3
Distance from damper: 1 and 1/4"



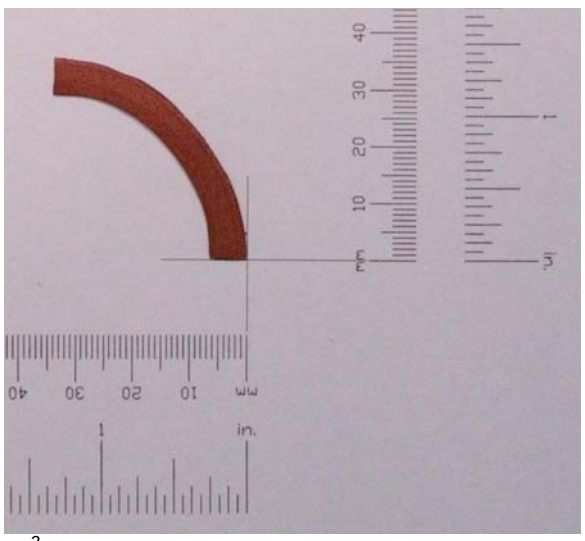
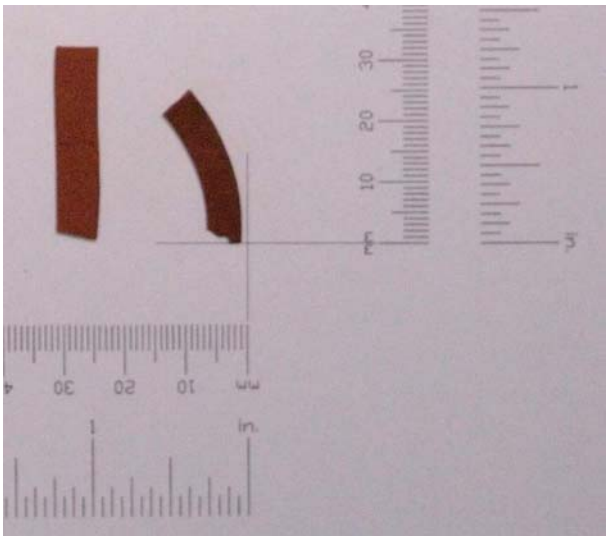
g# [2]
Rubber (1 and 3/8 x ½ x 1/16: jar rubber)
Interlaced under strings 1 and 3 / over string 2
Distance from damper: 4 and 1/2"



f# [2]
Screw (14 gauge, 2” long, flat head iron wood screw)
Between strings 2 and 3
Distance from damper: 1 and 3/4"

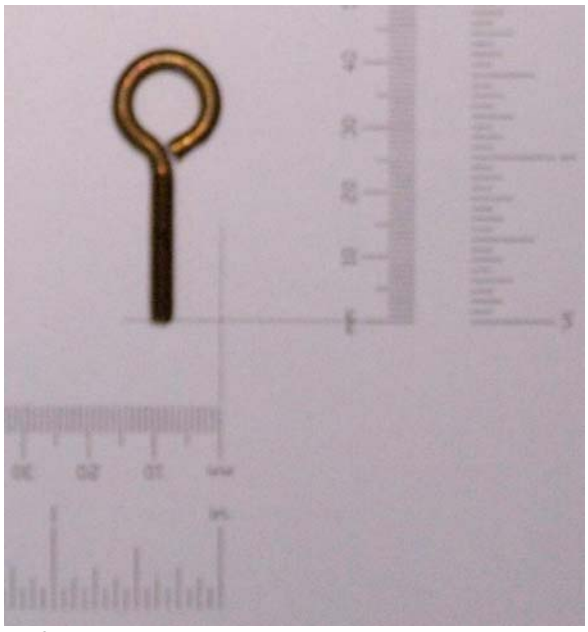
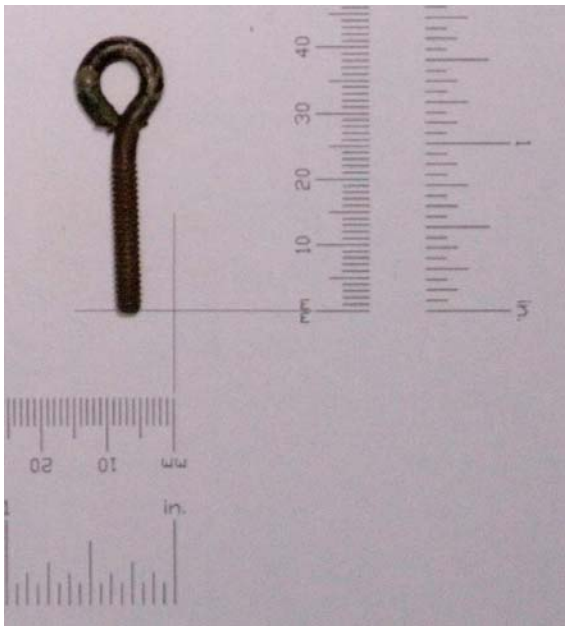


f [2]
Screw (12 gauge, 2” long, flat head iron wood screw)
Between strings 2 and 3
Distance from damper: 2 and 5/16”

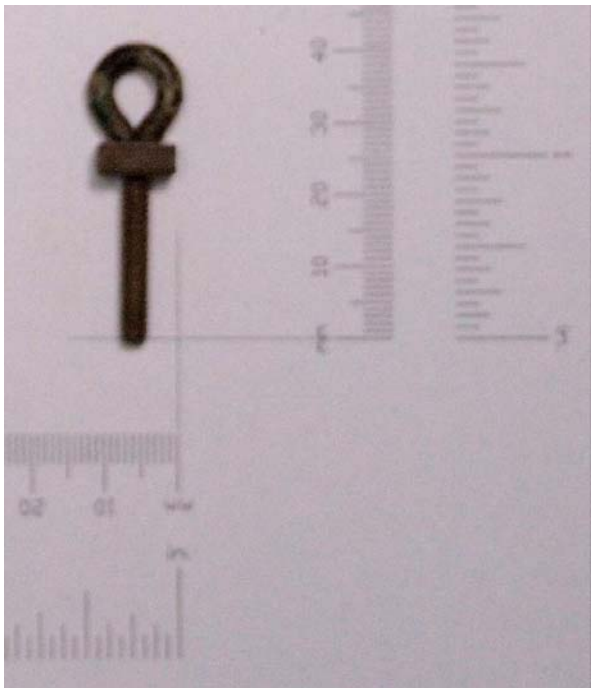
e [2]

Rubber (jar rubber: 2 x 7/32 x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from damper: 5 and 3/4"

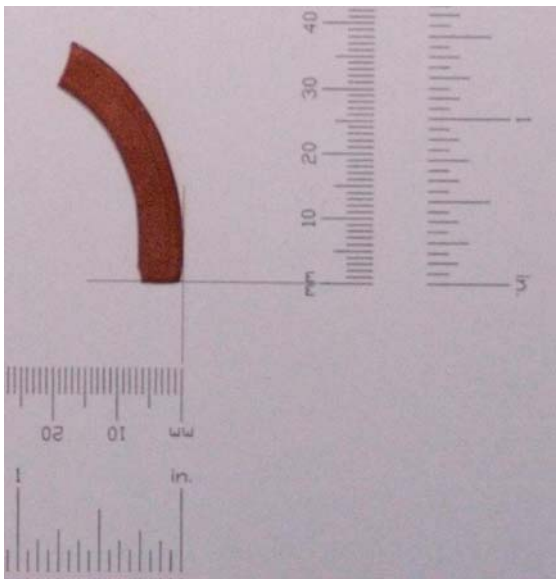
e♭ [2]

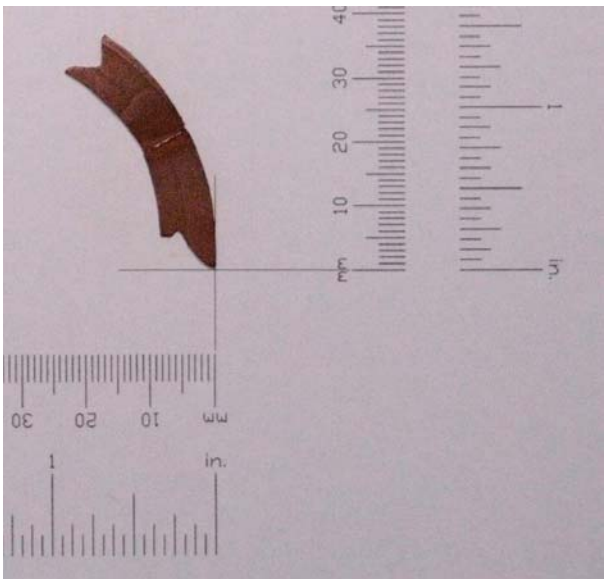
Furniture bolt (8-32 x 1” eye bolt or machine screw eye)
Between strings 2 and 3
Distance from damper: 6 and 7/8”
Note: place bolt through nut before placing between strings



e♭²

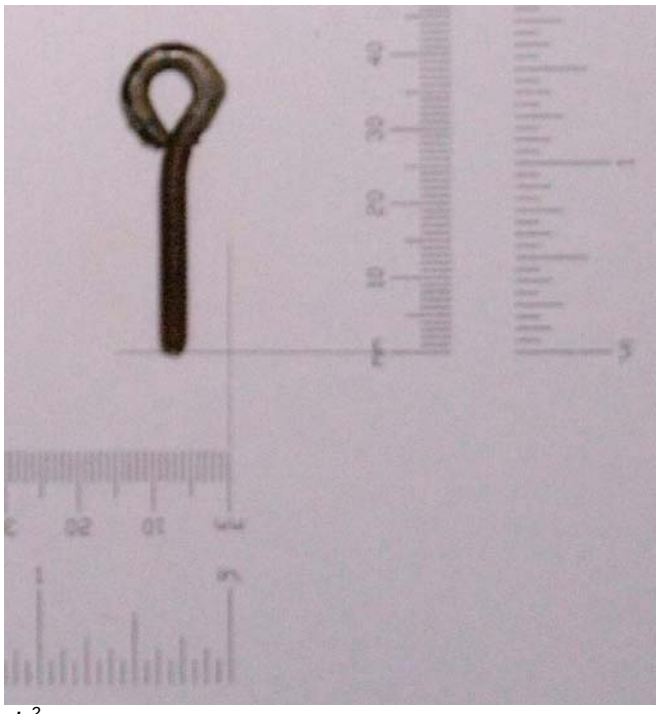
Furniture bolt and nut (¼/20 square iron nut)
Note: place bolt through nut before placing between strings





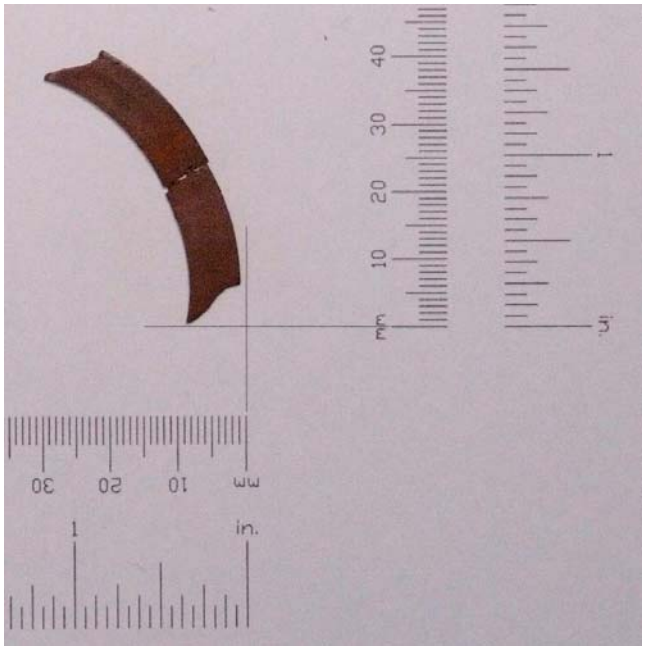
e♭²

Rubber (jar rubber: 1½ x ¼ x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from damper: 6½”



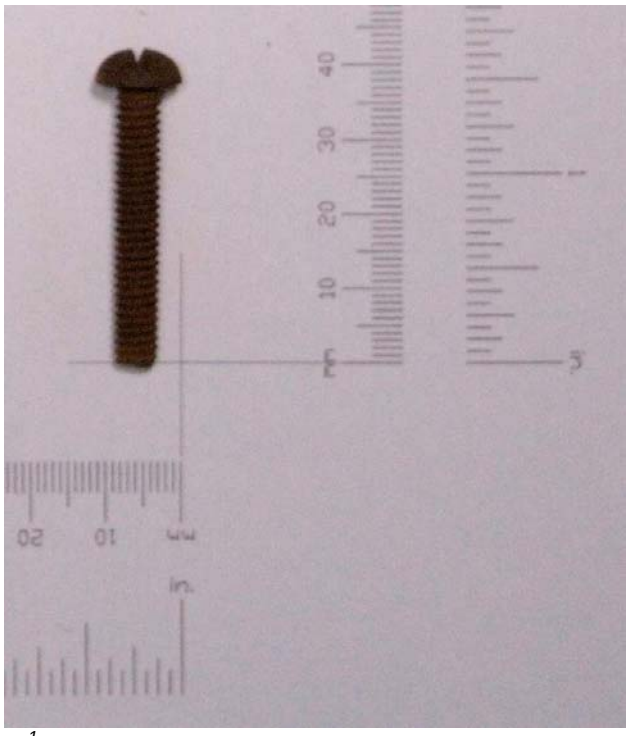
d [2]

Furniture bolt (8-32 x 1” eye bolt or machine screw eye)
Between strings 2 and 3
Distance from damper 2 and 9/16”

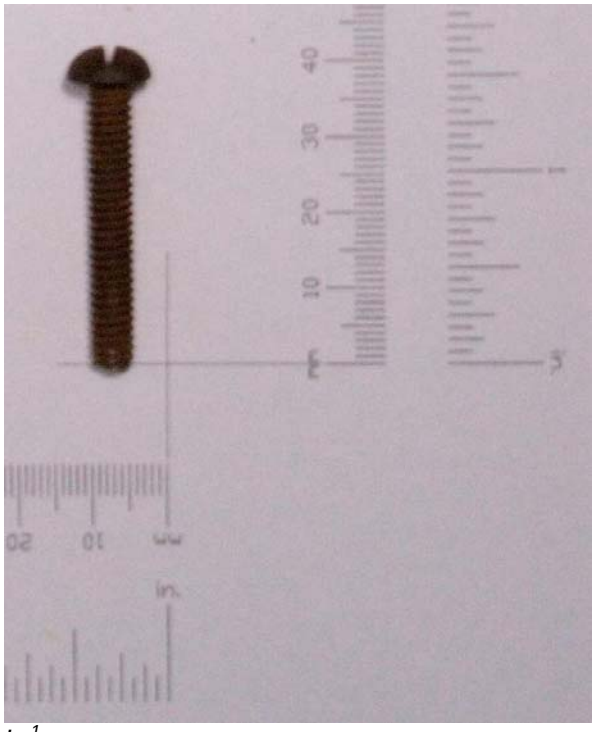


d♭ [2]

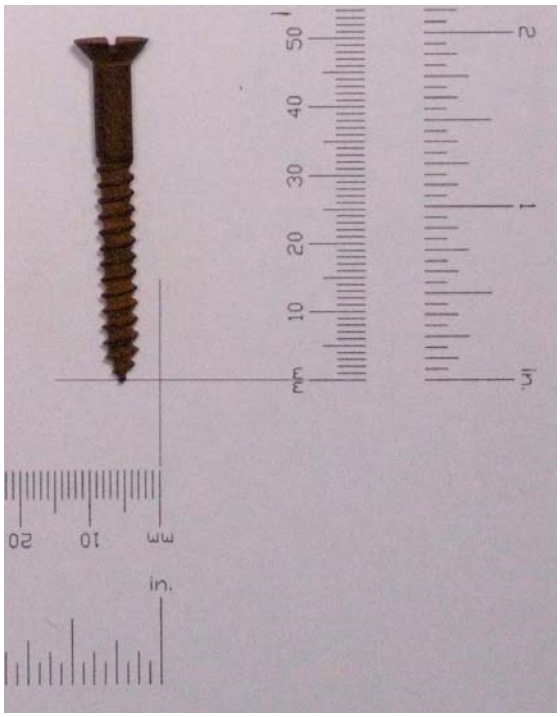
rubber (jar rubber: 1½ x ¼ x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from damper: 3 and 5/8



c [1]
Bolt (¼ x 1½” round head iron stove bolt)
Between strings 2 and 3
Distance from dampers: 7 and 1/8”

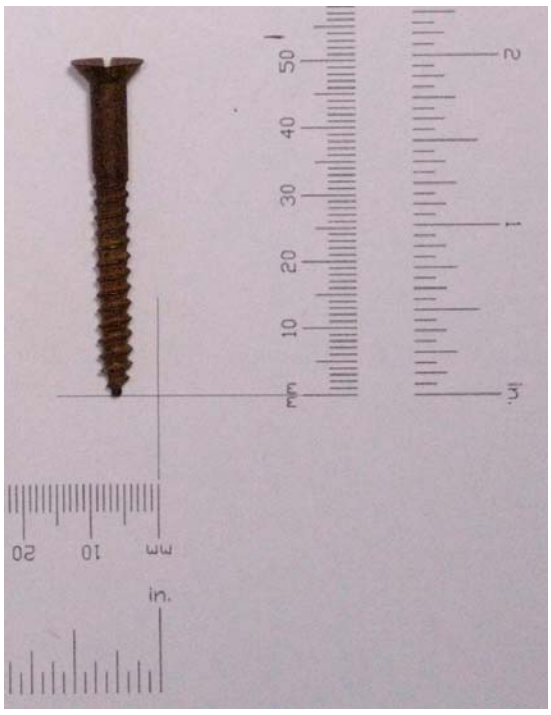


b [1]
Bolt (¼ x 1½” round head iron stove bolt)
Between strings 2 and 3
Distance from dampers: 2”



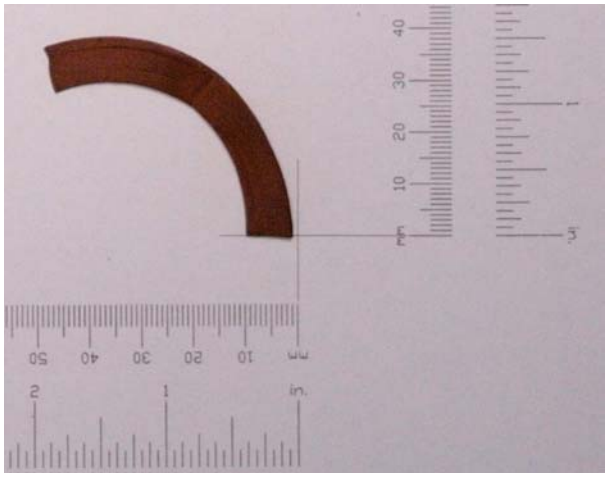
b♭[1]

Screw (12 gauge, 2” long flat head iron wood screw)
Between strings 1 and 2
Distance from dampers: 10"
[Earlier set in ink, crossed out in pencil:] experiment to find which screw



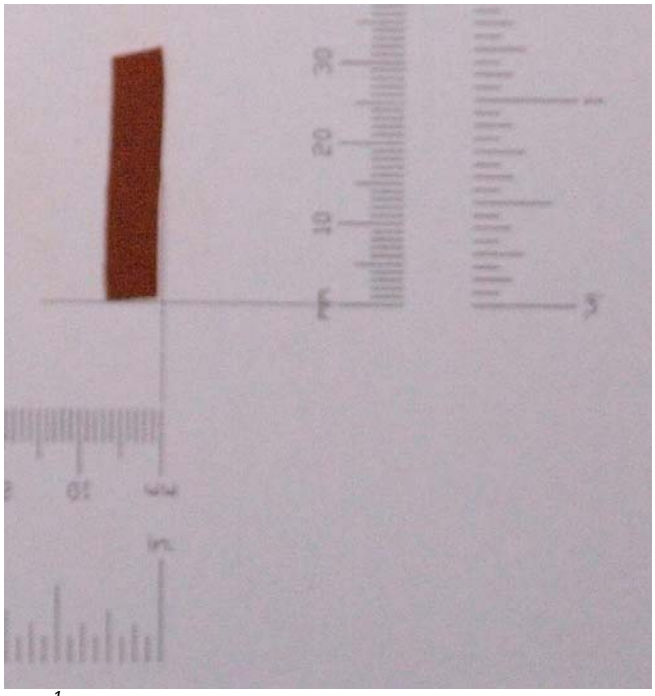
b♭[1]

Screw (12 gauge, 2” long, flat head iron wood screw)
Between strings 2 and 3
Distance from dampers: 1”
[Earlier set, in ink, crossed out in pencil:] experiment to find which screw



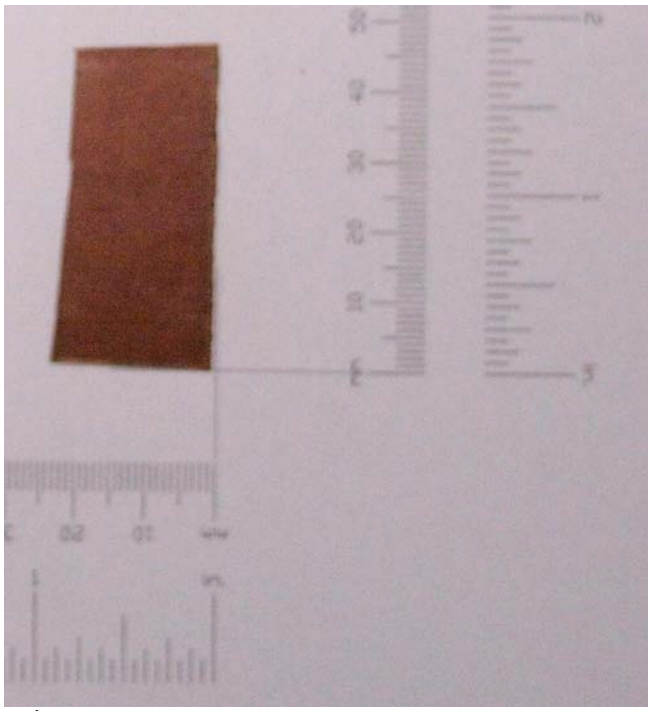
b♭[1]

Rubber (jar rubber: 2½ x ¼ x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from dampers: 8 and 1/4"

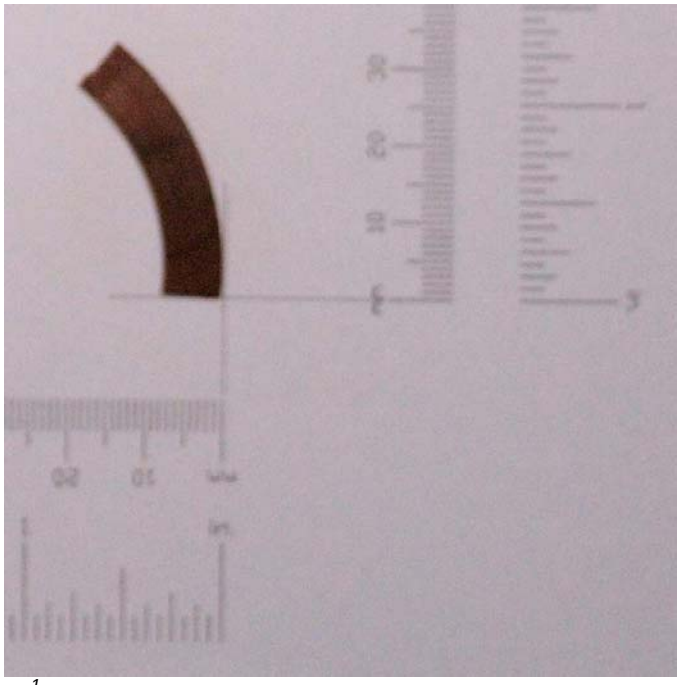


g# [1]

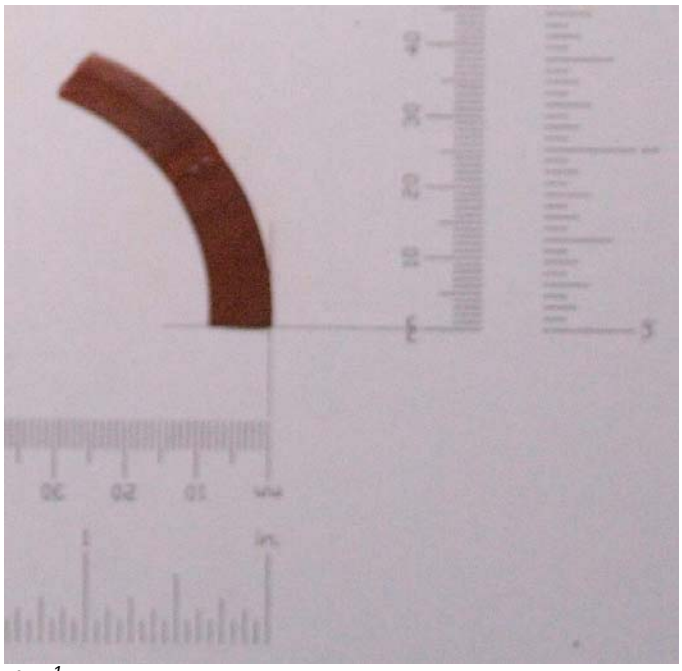
Rubber (jar rubber: 2½ x ¼ x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from dampers: 4 and 1/2"
Plastic distance: 2 and 15/16”



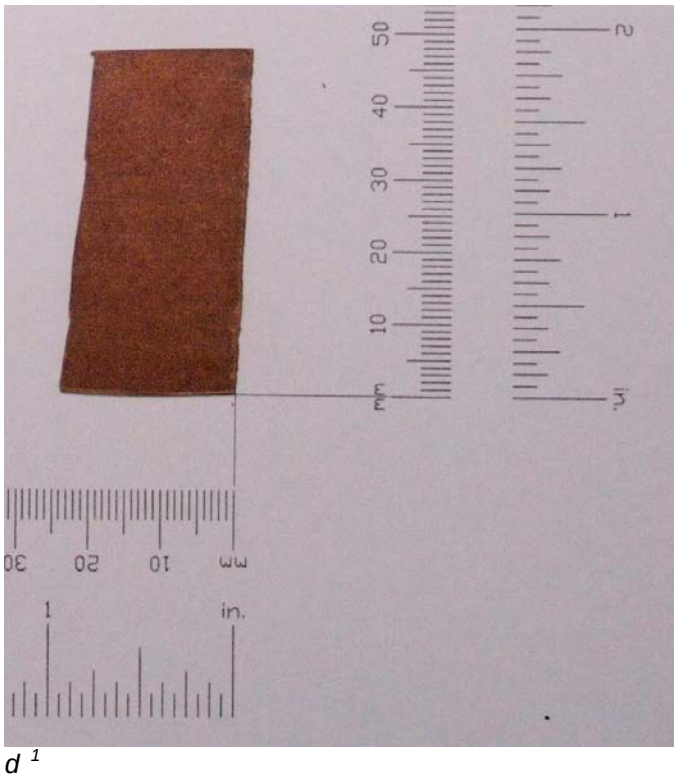
g [1]
Plastic (1 and 7/8 x 7/8 x 1/16)
Interlaced over string 1 / under strings 2 and 3 (extends over g, a, b♭)
Distance from dampers: 2 and 7/8"



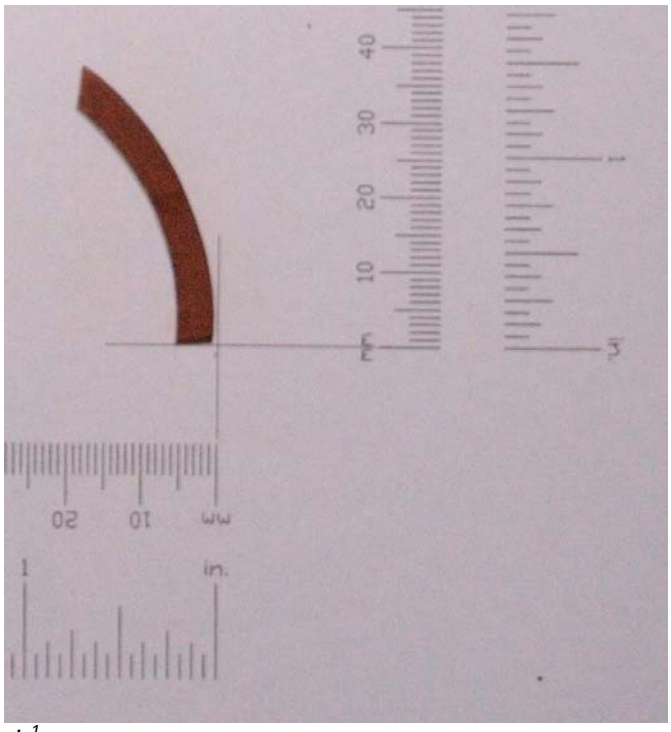
g [1]
Rubber (jar rubber: 1 and 7/8 x ¼ x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from dampers: 10 and 1/8"



d# [1]
Rubber (jar rubber: 2 x ¼ x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from dampers: 5 and 7/16"
Plastic distance: 4¼”

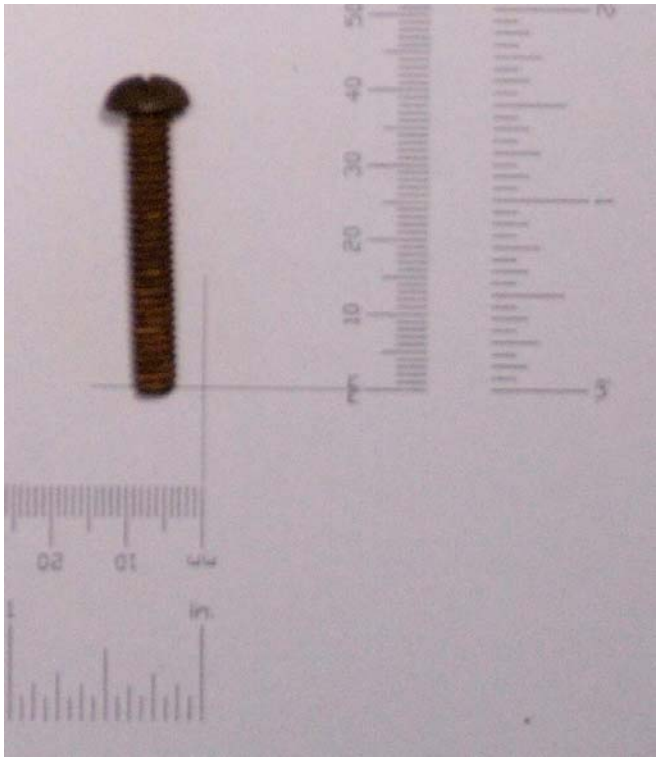


d [1]
Plastic (1 and 7/8 x 7/8 x 1/16)
Interlaced over string 1 / under strings 2 and 3 (extends over d#, e)
Distance from dampers: 4 and 1/8"



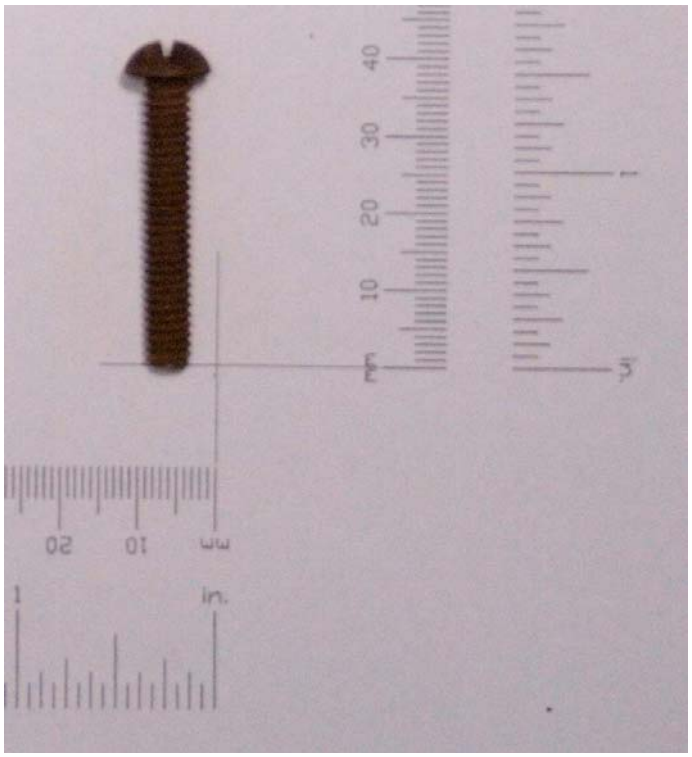
d [1]

Rubber (jar rubber: 1½ x ¼ x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from dampers: 9 and 3/4"



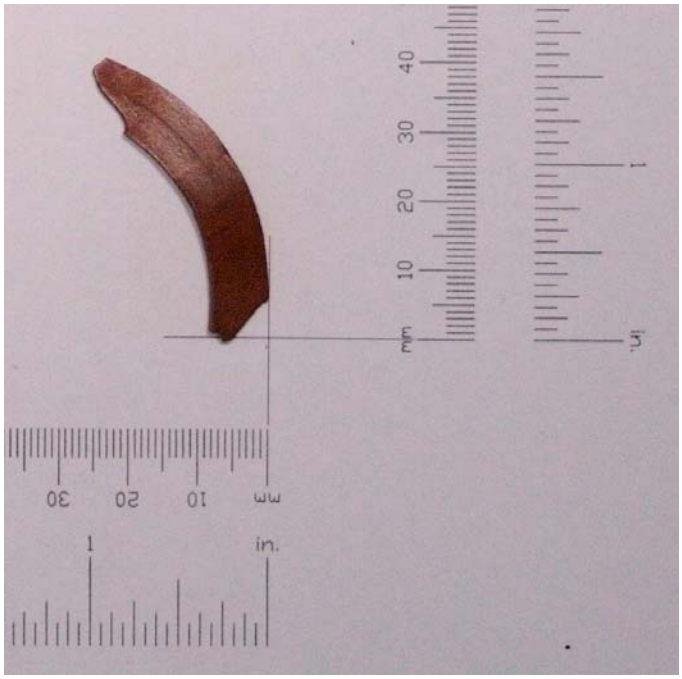
d♭ [1]

Bolt (¼ x 1½ round head iron stove bolt)
Between strings 1 and 2
Distance from dampers: 15 and 1/2"



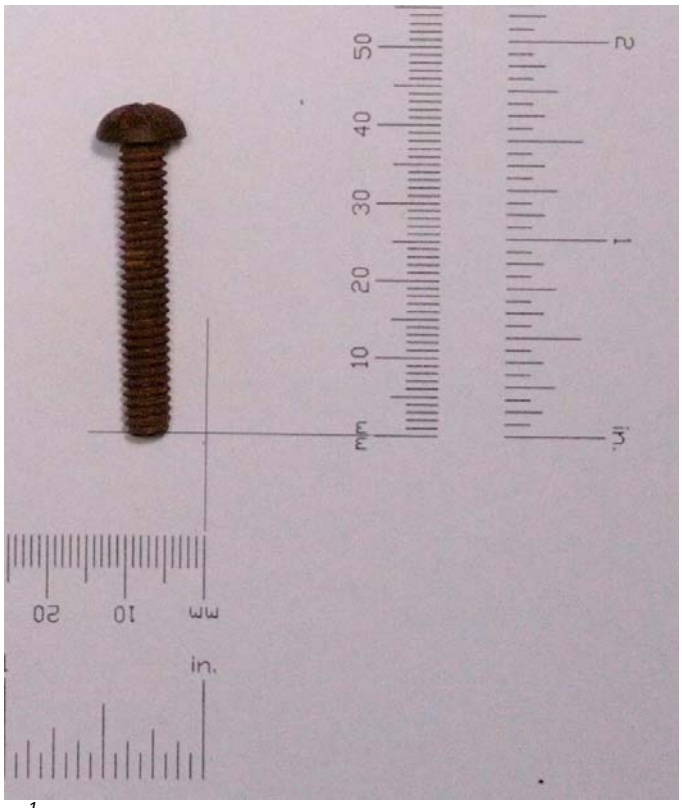
d♭[1]

Bolt (¼ x 1½ round head iron stove bolt)
Between strings 2 and 3
Distance from dampers: 11/16"

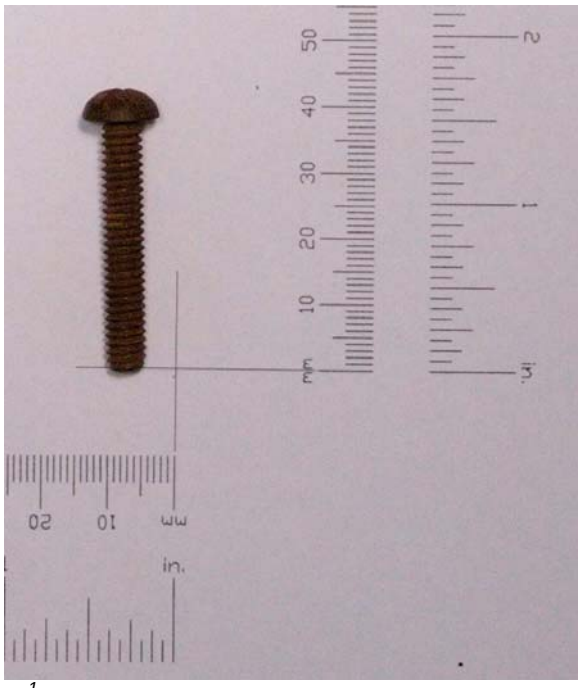


d♭[1]

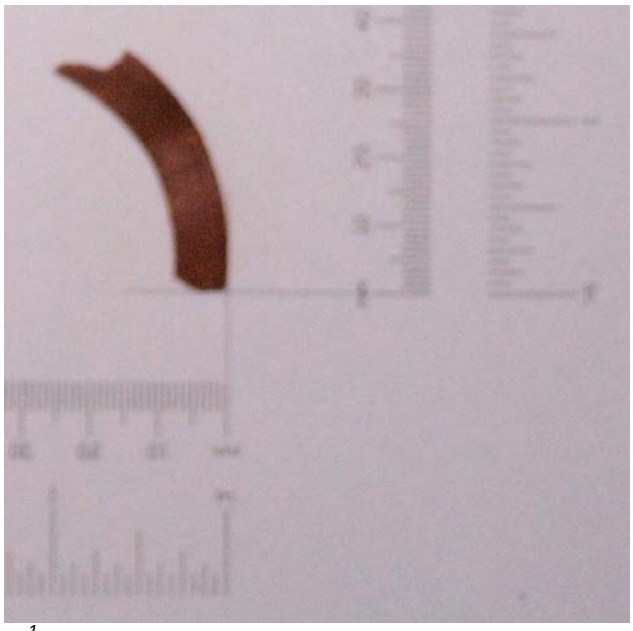
Rubber (jar rubber: 1 and ¾ x ¼ x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from dampers: 14 and 1/8"



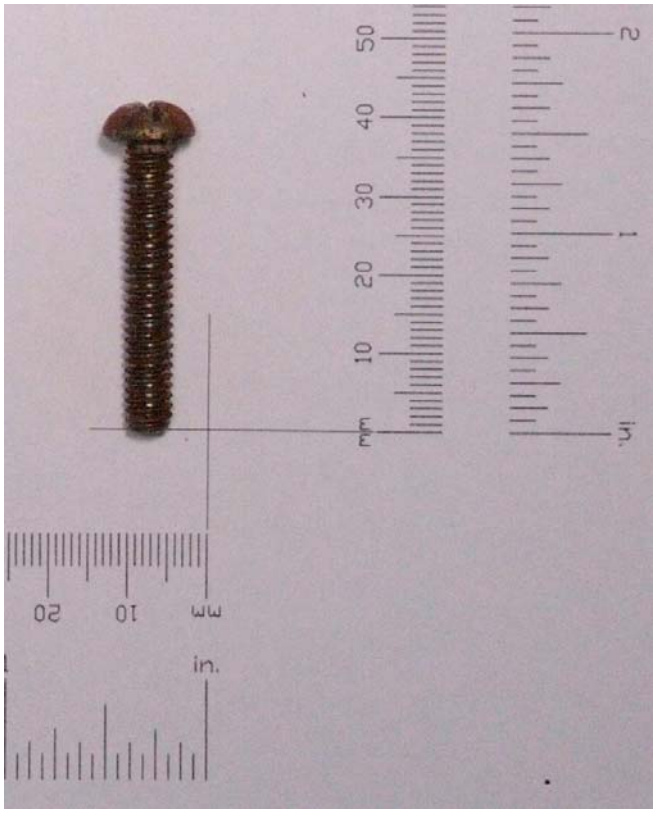
c [1]
Bolt (¼ x 1½ round head iron stove bolt)
Between strings 1 and 2
Distance from dampers: 14 and 1/2"



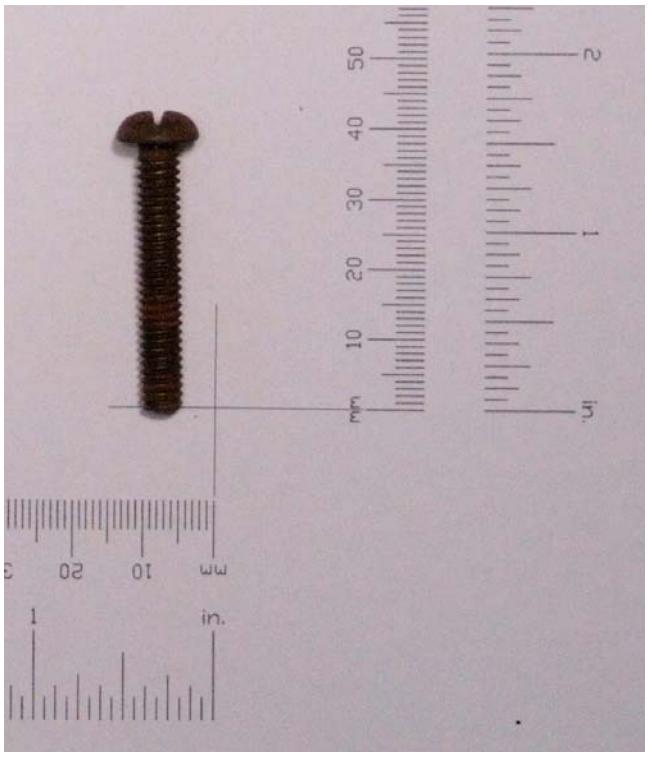
c [1]
Bolt (¼ x 1½ round head iron stove bolt)
Between strings 2 and 3
Distance from dampers: 7/8"



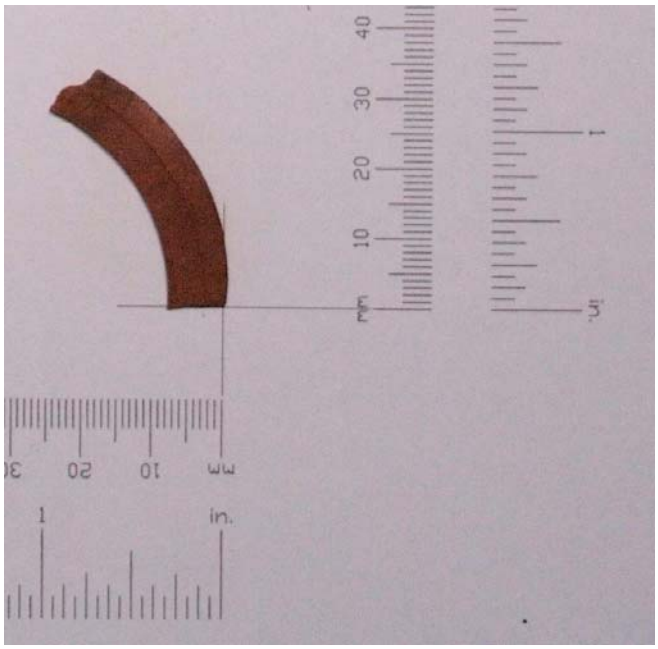
c [1]
Rubber (jar rubber: 1½ x ¼ x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from dampers: 6 and 1/2"



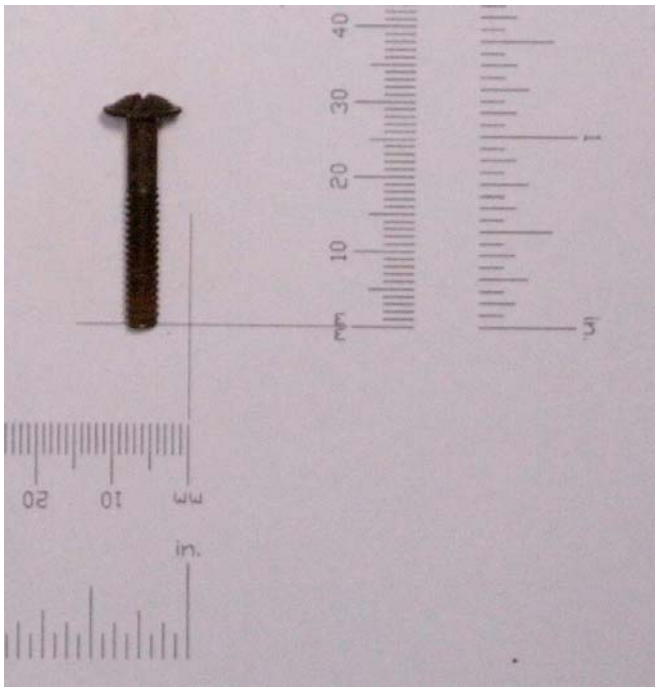
b
Bolt (1/4 x 1½ round head iron stove bolt)
Between strings 1 and 2
Distance from dampers: 14 and 3/4"



b
bolt (1/4 x 1½ round head iron stove bolt)
Between strings 2 and 3
Distance from dampers: 9/16"

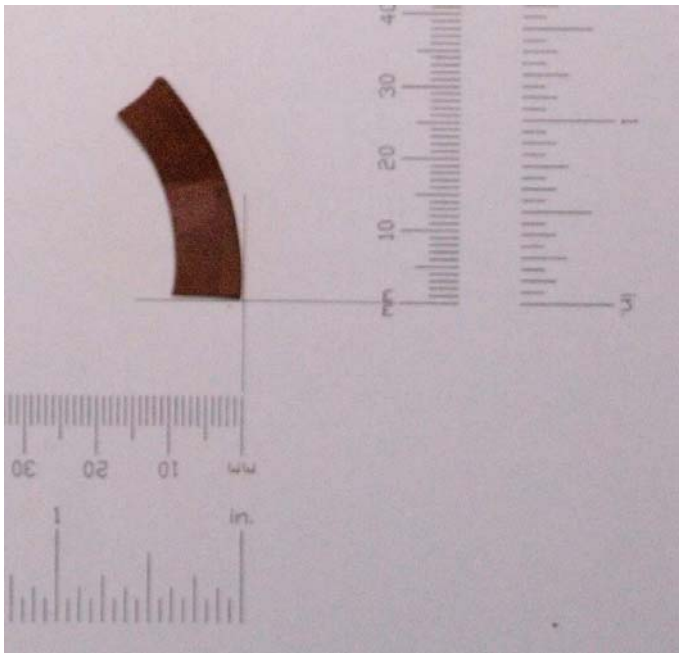


b
Rubber (jar rubber: 2½ x ¼ x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from dampers: 14"



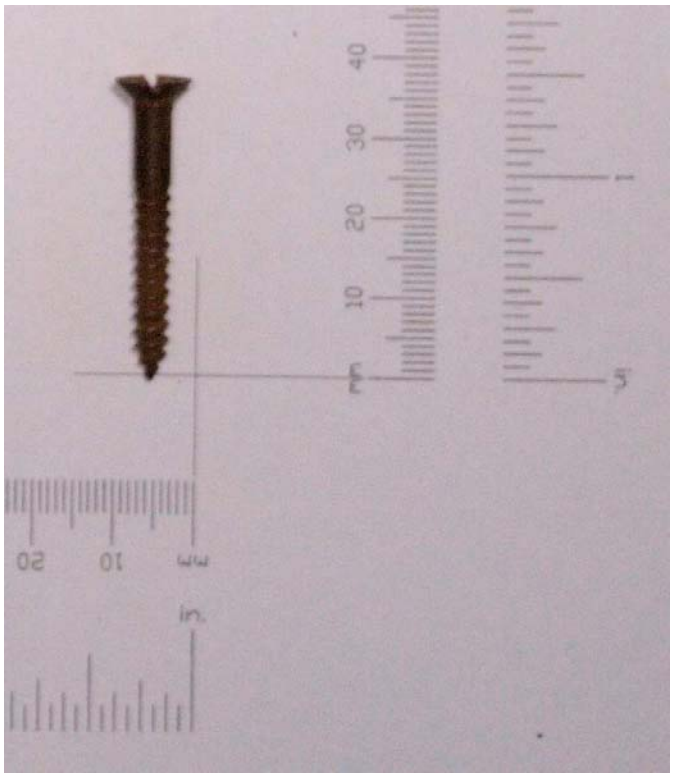
b♭

Medium bolt (10/24 x 1” round head machine screw)
Between strings 2 and 3
Distance from dampers: 10 and 1/8”

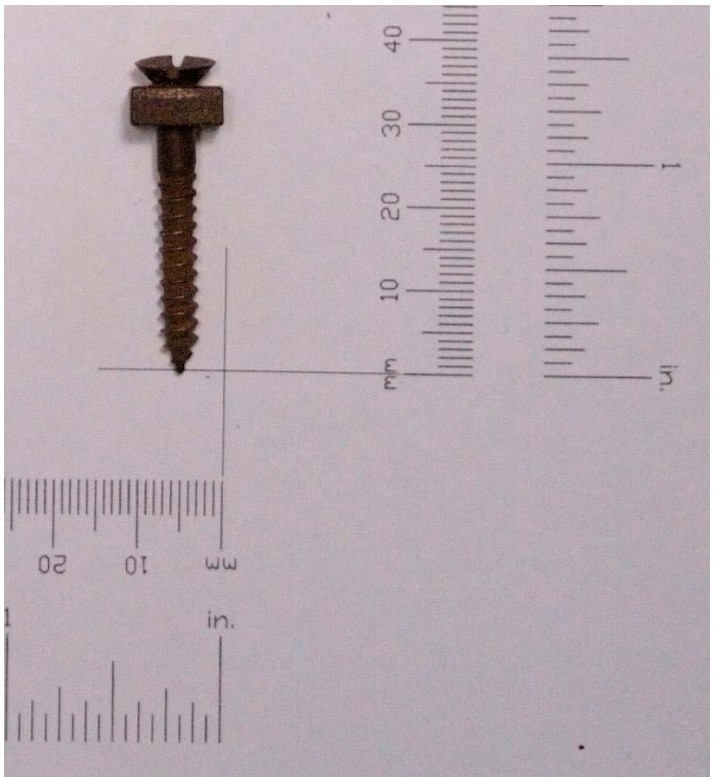


b♭

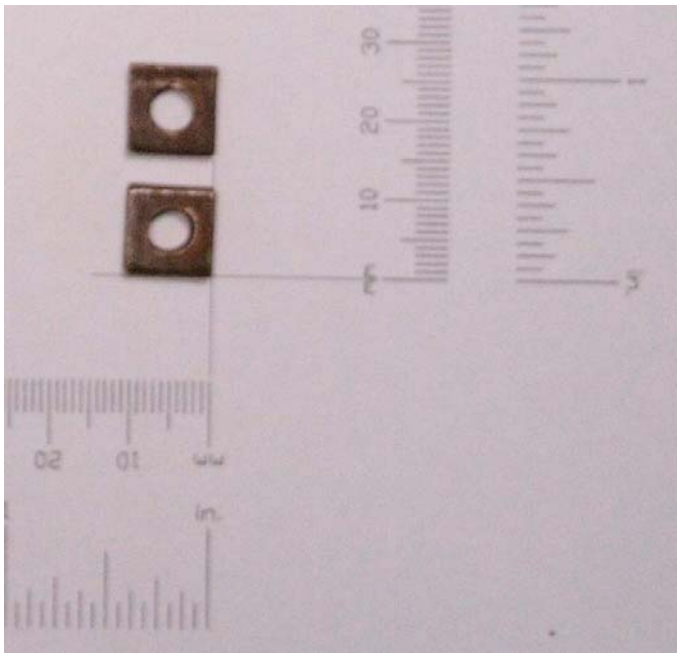
Rubber (jar rubber: 1¼ x ¼ x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from dampers: 9 and 1/2"



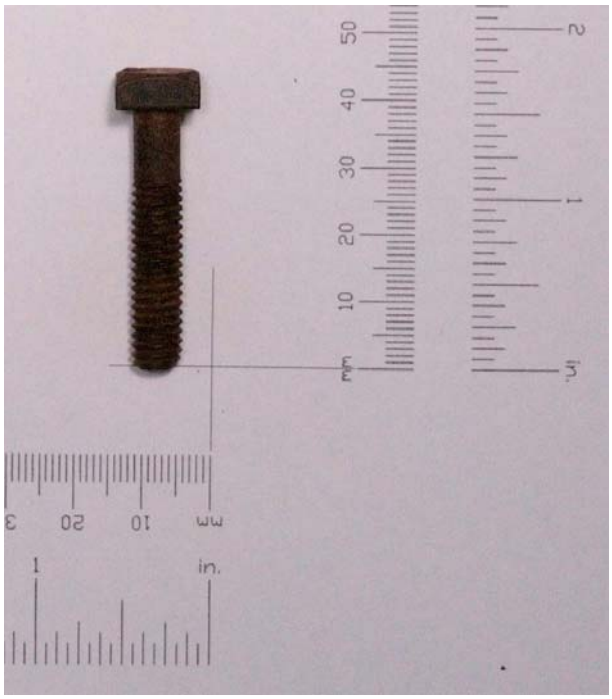
a
Screw (No. 9 wire gauge 1 and ¾” flat head wood screw)
Between strings 1 and 2, opposite large bolt



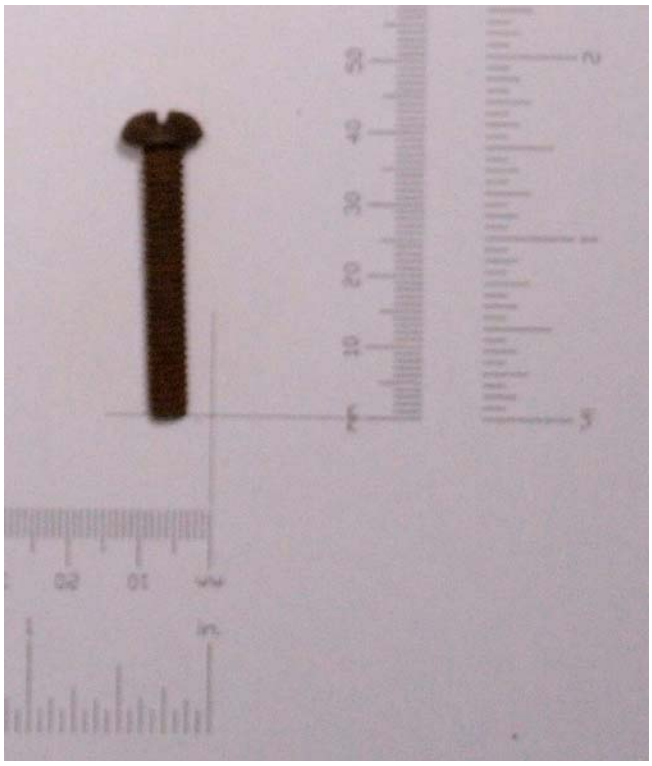
a
Screw and nuts (10 gauge, 1½”, flat head iron wood screw; ¼/20 square iron nuts)
Between strings 1 and 2
Distance from dampers: 1”
Note: place screw through nuts before placing between strings



a
nuts (square iron nuts ¼/20)

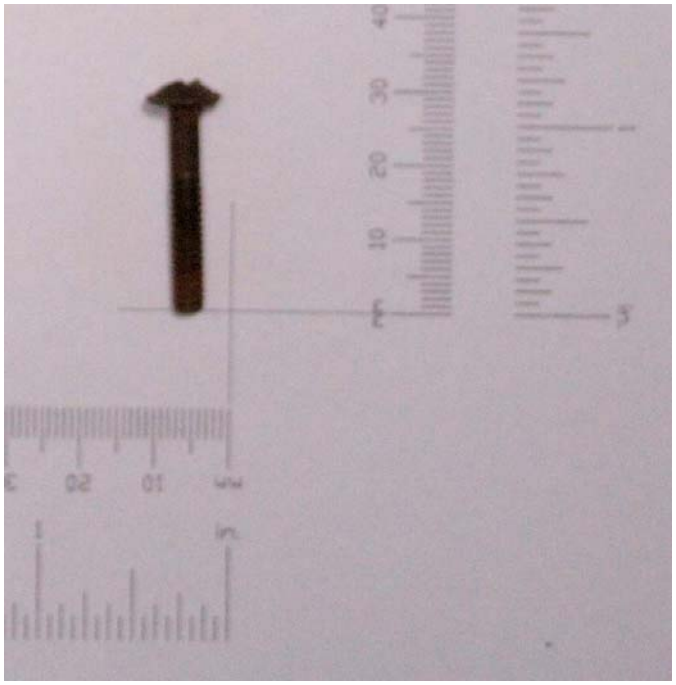


a
Large bolt (5/16 x 1½ machine bolt)
Between strings 2 and 3
Distance from dampers: 5 and 7/8”



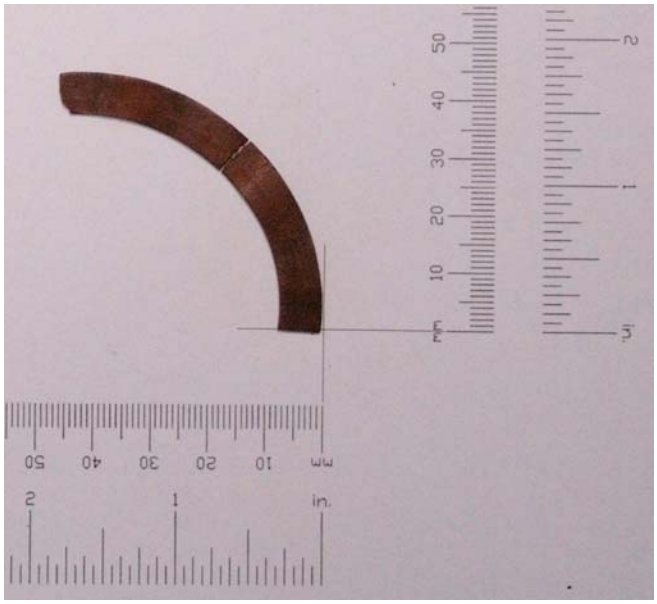
a♭

Bolt (¼ x 1½ round head iron stove bolt)
Between strings 1 and 2
Distance from dampers: 7 and 1/8”



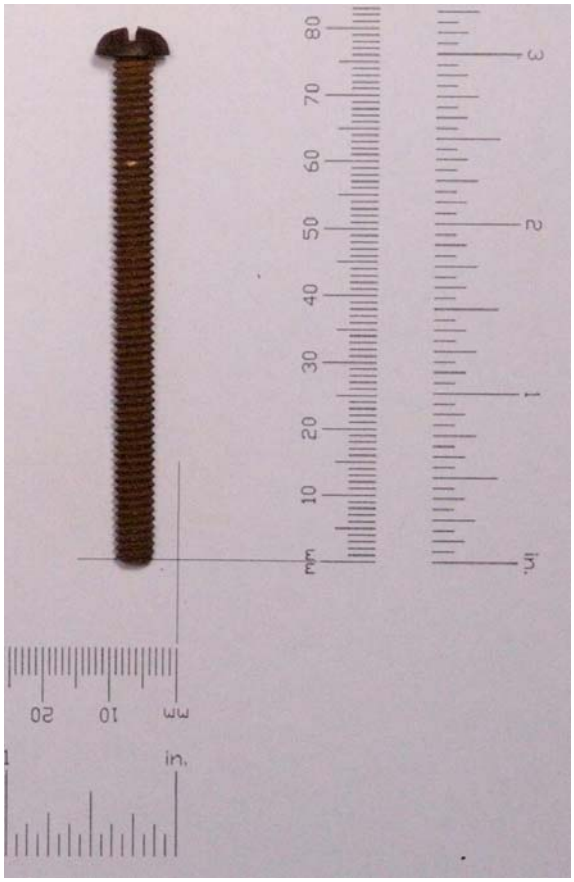
a♭

Medium bolt (10/24 x 1” round head machine screw)
Between strings 2 and 3
Distance from dampers: 2 and 1/4"



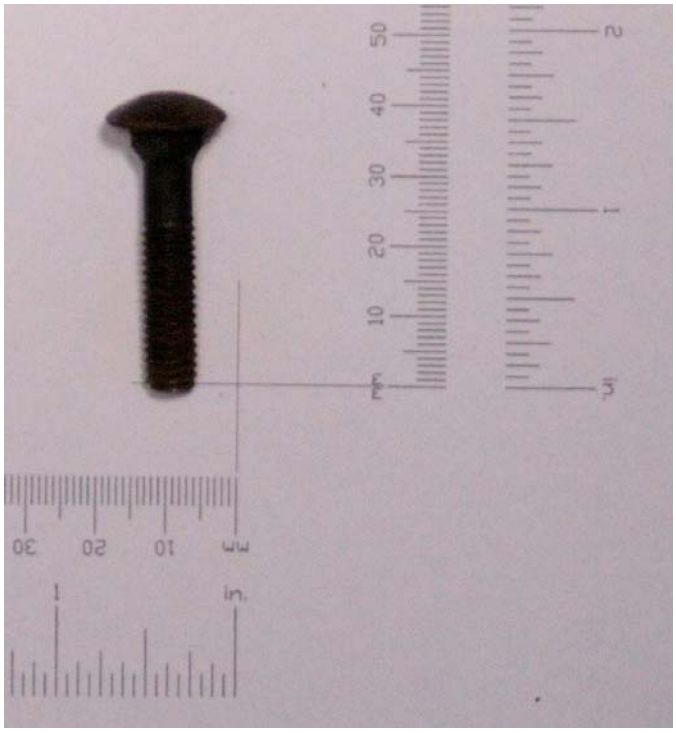
a♭

rubber (jar rubber: 2½ x ¼ x 1/16)
Interlaced under strings 1 and 3 / over string 2
Distance from dampers: 4 and 1/8"

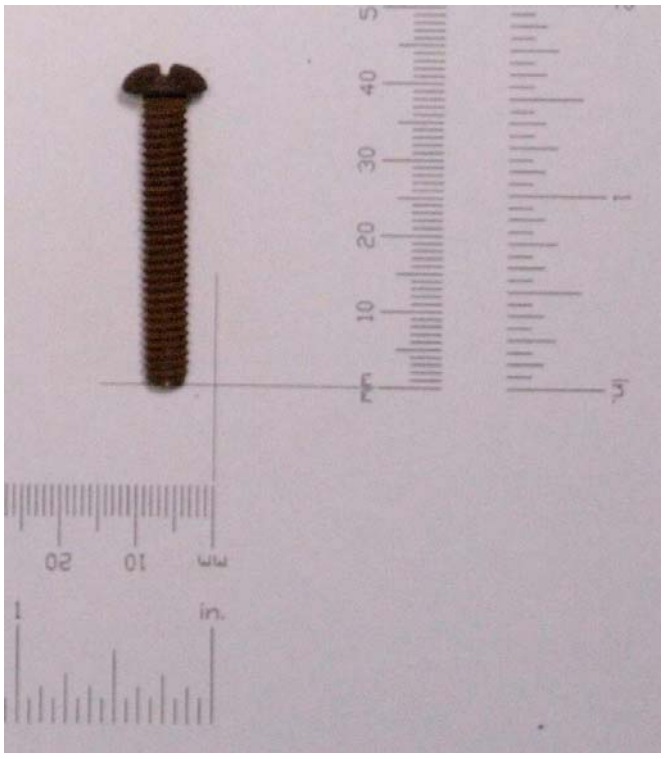


g

long bolt (1/4 x 3 round head stove bolt)
Between strings 1 and 2
Distance from dampers: 8 and 3/4"



g
large bolt (5/16 x 1½ carriage bolt)
Between strings 2 and 3
Distance from dampers: 3 and 1/4"

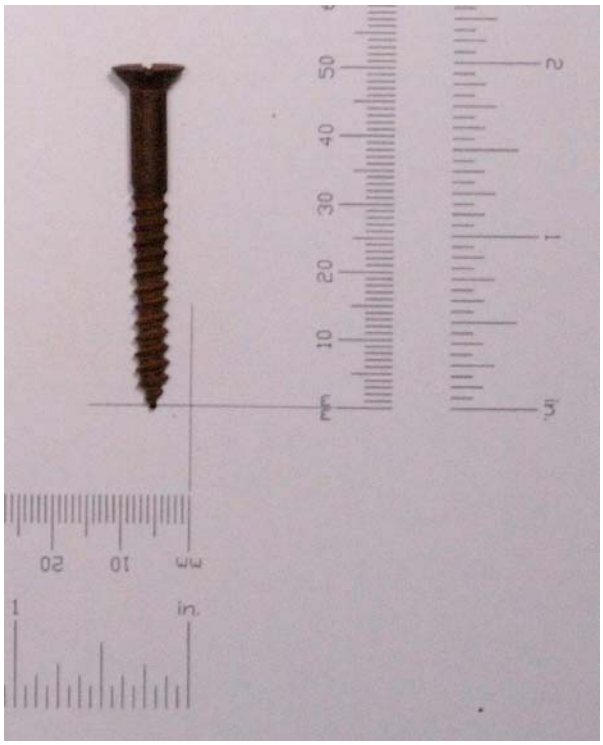


D
Bolt (1/4 x 1½ round head iron stove bolt)
Between strings 2 and 3
Distance from dampers: 11/16"



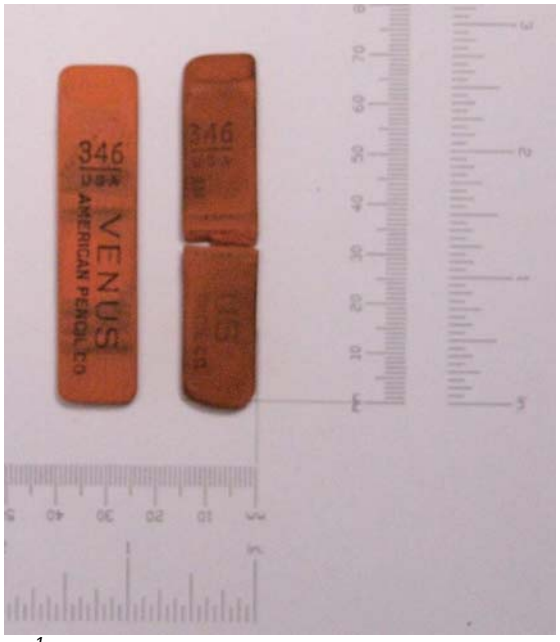
D

Screw with rubber (12 gauge, 2” flat head iron wood screw, wrapped with one thickness of jar rubber 1/16”thick)
Between the two strings
Distance from dampers: 4 and 7/16"
Note: place the screw with rubber between the strings in such a way that the rubber contacts the strings.



D

Screw with rubber (12 gauge, 2” flat head iron wood screw, wrapped with one thickness of jar rubber 1/16”thick)
Between the two strings
Distance from dampers: 4 and 7/16"
Note: place the screw with rubber between the strings in such a way that the rubber contacts the strings.



D [1]
Eraser (American Pencil Co. #346)
Interlace under *C#*[1] & *E♭*[1] over *D*[1]
Distance from dampers: 6 and 3/4



D [1]
Eraser (American Pencil Co. #346)
Interlace under *C#*[1] & *E♭*[1] over *D*[1]
Distance from dampers: 6 and 3/4

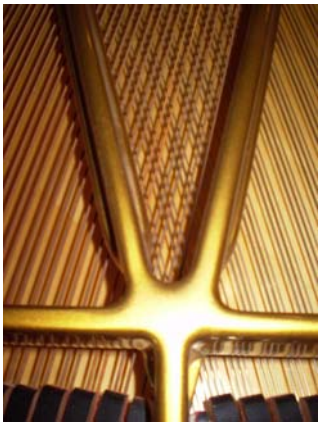
Appendix 2: measurements of present-day piano models

The classical pianist can go to any recital hall and expect the same 88 keys as he has at home. Only the tone and touch of the instrument is something he will have to anticipate adjusting to. As much as the extra keys in the bass of a Bösendorfer Imperial may be a disorienting factor to him the pianist who brings the extended piano repertoire has much to worry about: the layout of the plate sections, with the crossbeams dividing the differently strung choruses, is very likely to deviate from one piano design to another; not al pianos have a third pedal; the key-dip can be too great to allow comfortable glissando playing; there may be dampers in the treble where the composer expected none and prescribed a screw as a preparation; there may be a gap in between two string choruses over which a glissando will not sound smoothly; the way the steel string choruses overlap those of the wound strings may cause great difficulties in accessing nodal points to produce partials.

A list of measurements, accompanied by photographs, is aimed at preparing the pianist for the confrontation with the insides of a piano that may be highly different from the on he is practicing on. This information should allow him to known how to transcribe for instance Cowell's *The Banshee,* or where he may expect to encounter difficulties with specified glissando stretches that run over crossbeams, how long the cluster board needs to be to fit on the keyboard, whether or not it is a heavy keyboard for glissando playing, etc.

The pianos models that have been measured were found at the three Royal conservatories of Gent, Antwerp and Brussels and on Flemish concert stages that regularly program contemporary music.

Bechstein B-88 (208cm)


1 2 3 4

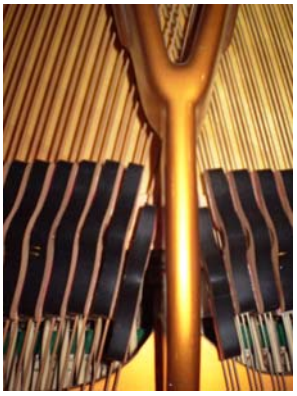
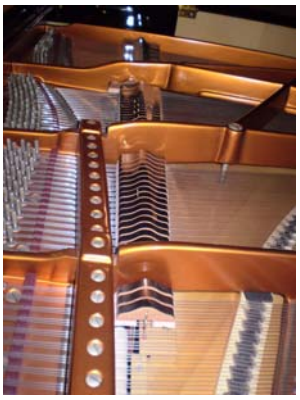
_____V_____

A²--------F¹/F#¹----------*A* **V** A#----------*c²* *c#²------f#³* *g³--------c⁵*

1w 2w 3s

Key-dip	*A²*	10.43mm
	c¹	10.89mm
	c⁵	10.02mm
Keyboard length		122.9cm
Distance *c¹*-opening		89cm
No dampers from		*g³*
3rd pedal		YES

Bösendorfer 200 (200cm)

1 2 3 4

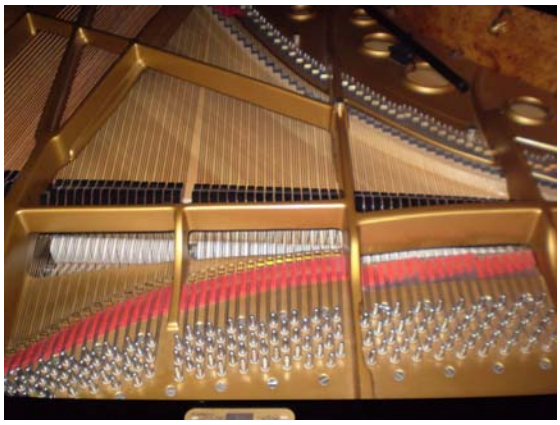
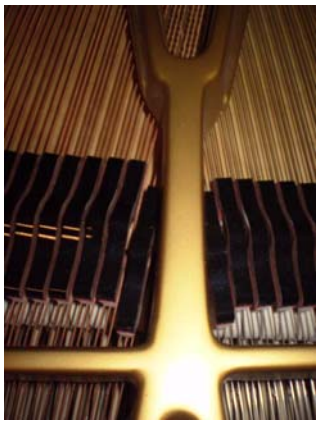
_____V_____▌_____ _▌_____

A²--------*F¹*/ *F#¹*----------*A#* **V** *B*----------*g#¹* ▌ *a¹*----- *d#³* ▌ *e³* --------*c⁵*

1w 2w 3s

Key-dip	*A²*	10.25mm
	c¹	10.41mm
	c⁵	10.59mm
Keyboard length		123cm
Distance *c¹*-opening		86.5cm
No dampers from		*g³*
3rd pedal		YES

Fazioli 308


1 2 3 4

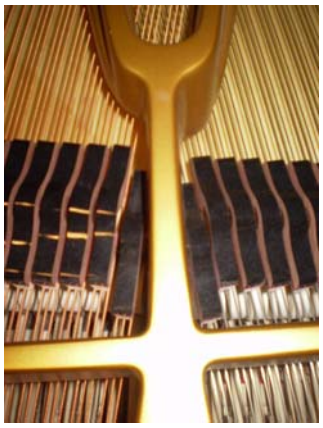
_____ **V** _____▌_____ _▌_____

A²-------E¹/ F¹-------A / A#¹------- D# **V** *E---------b¹* ▌ *c²------f³* ▌ *f#³- --------c⁵*

1w 2w 3w 3s

Gap between strings of	*g* and *g#*
Key-dip	*A²* 9.70mm
	c¹ 10.70mm
	c⁵ 9.47mm
Keyboard length	123cm
Distance *c¹*-opening	98cm
No dampers from	*f#³*
3rd pedal	YES (also 4th pedal, reducing distance hammer-strings)

Fazioli 278


1 2 3 4

_____ **V** _____▌_____▌_____

A²-------E¹ / F¹--------A / A#-------- E **V** *F---------c#¹* ▌ *d²------g³* ▌ *g#³- --------c⁵*

1w 2w 3w 3s

Gap between strings of *g* and *g#*

Key-dip *A²* 9.94mm
c¹ 10.40mm
c⁵ 10.63mm

Keyboard length 122.9cm

Distance *c¹*-opening 101.5cm

No dampers from *g#³*

3rd pedal YES

Fazioli 228





1 2 3 4

_____ **V** _____▌_____▌_____

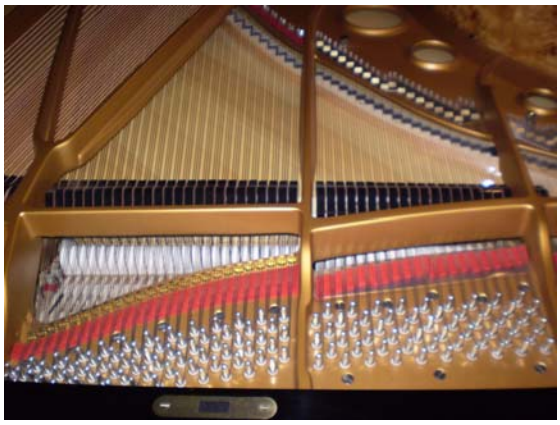
A²-------E¹ / F¹---------- F# **V** *G---------f#¹* ▌ *g¹--------d#³* ▌ *e³----------c⁵*

1w 2w 3s

Key-dip	*A²*	10.02mm
	c¹	10.45mm
	c⁵	9.55m
Keyboard length		122.9cm
Distance *c¹*-opening		93cm
No dampers from		*g³*

3rd pedal: YES

Fazioli 212





1 2 3 4

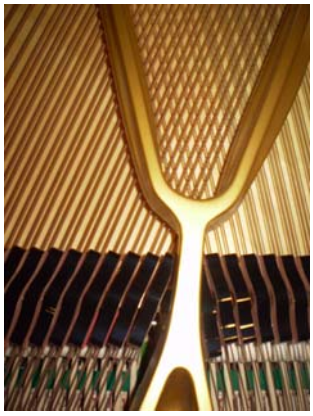
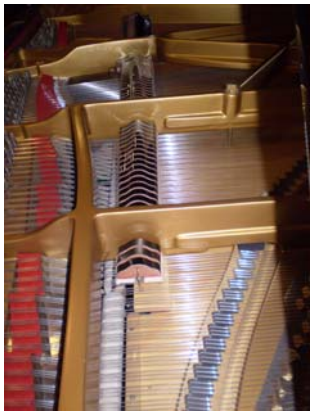
_____ **V** _____▌_____▌_____

A²----------*E¹*/ *F¹*---------- *G* **V** G#--------*g#¹* ▌ *a¹*------*d#³* ▌ *e³*- --------*c⁵*

1w 2w 3s

Key-dip	*A²*	10.21mm
	c¹	10.92mm
	c⁵	10.60mm
Keyboard length		122.7cm
Distance *c¹*-opening		91cm
No dampers from		*f#³*
3rd pedal		YES

Fazioli 183

1 2 3 4

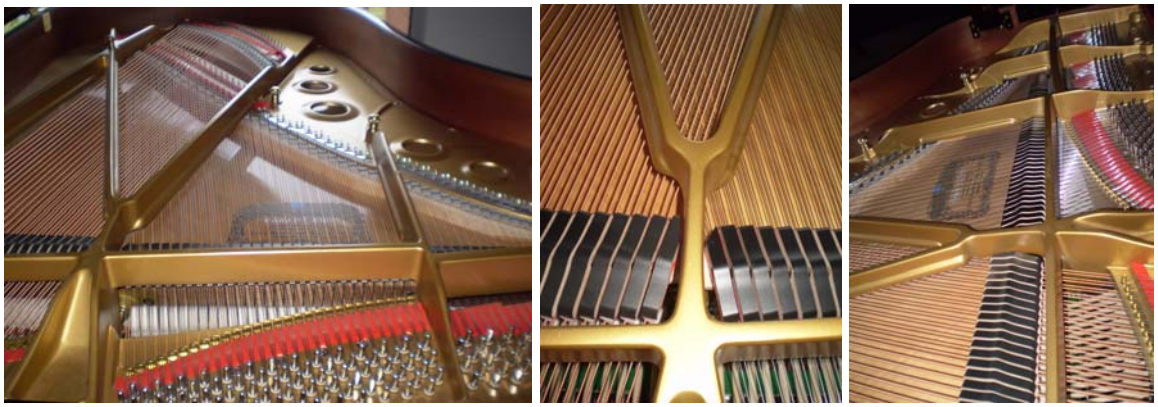
_____ **V** _____▌_____▌_____

A²----------G1 / G#¹--------- c# **V** *d----------g#¹* ▌ *a¹--------d#³* ▌ *e³- --------c⁵*

1w 2w 3s

Key-dip	*A²*	9.44mm
	c¹	10.12mm
	c⁵	10.29mm
Keyboard length	122.7cm	
Distance c^1-opening	90cm	
No dampers from	g^3	
3rd pedal	YES	

Kawai RX-5



1 2 3 4

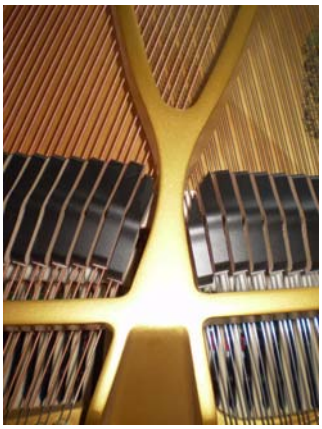
_____V_____ _____▌_____▌_____

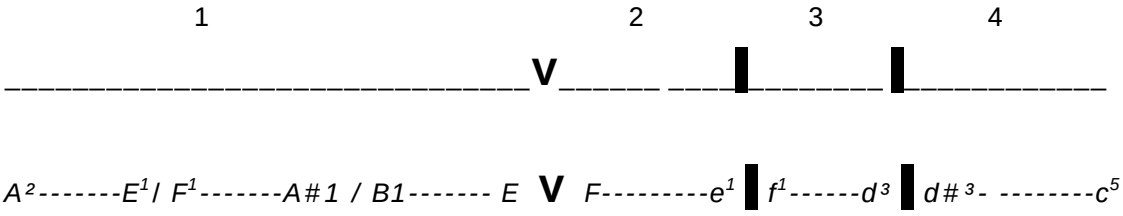
A²-------E¹/ F¹-------A#1 / B1------- E **V** *F---------e¹* ▌ *f¹------d³* ▌ *d#³- --------c⁵*

1w 2w 3w 3s

Key-dip	A²	10.2mm
	c^1	10.2mm
	c^5	9.8mm
Keyboard length		123.8cm
Distance c^1-opening		76cm
No dampers from		$f\#^3$
3rd pedal		YES

Kawai RX-3

A²-------E¹/ F¹-------A#1 / B1------- E **V** *F---------e¹ f¹------d³ d#³- --------c⁵*

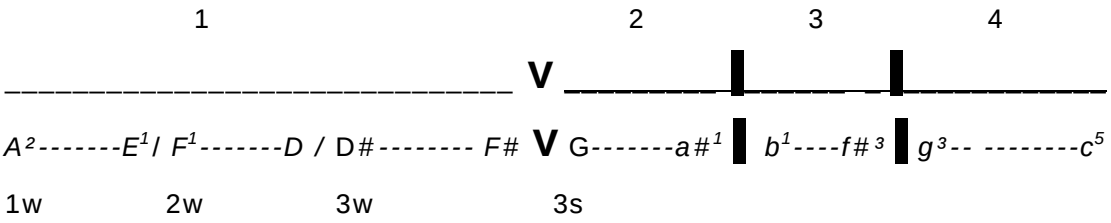
1w 2w 3w 3s

Key-dip	A^2	10.2mm
	c^1	10.2mm
	c^5	9.8mm

Keyboard length	123.8cm
Distance c^1-opening	76cm
No dampers from	$f\#^3$
3rd pedal	YES

Seiler 242



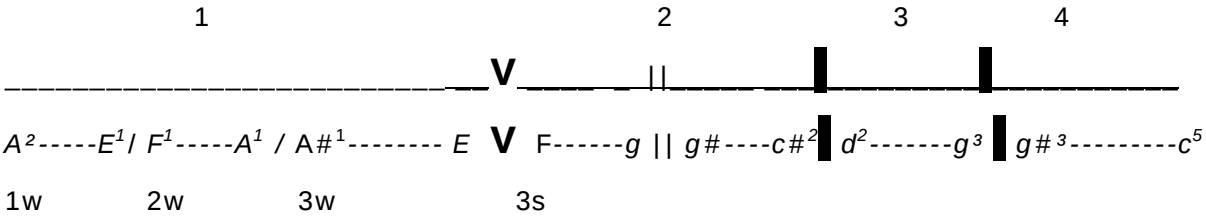


Key-dip	A^2	10.2mm
	c^1	10.2mm
	c^5	9.8mm

Keyboard length	123.8cm
Distance c^1-opening	76cm
No dampers from	$f\#^3$
3rd pedal	YES

Steinway D

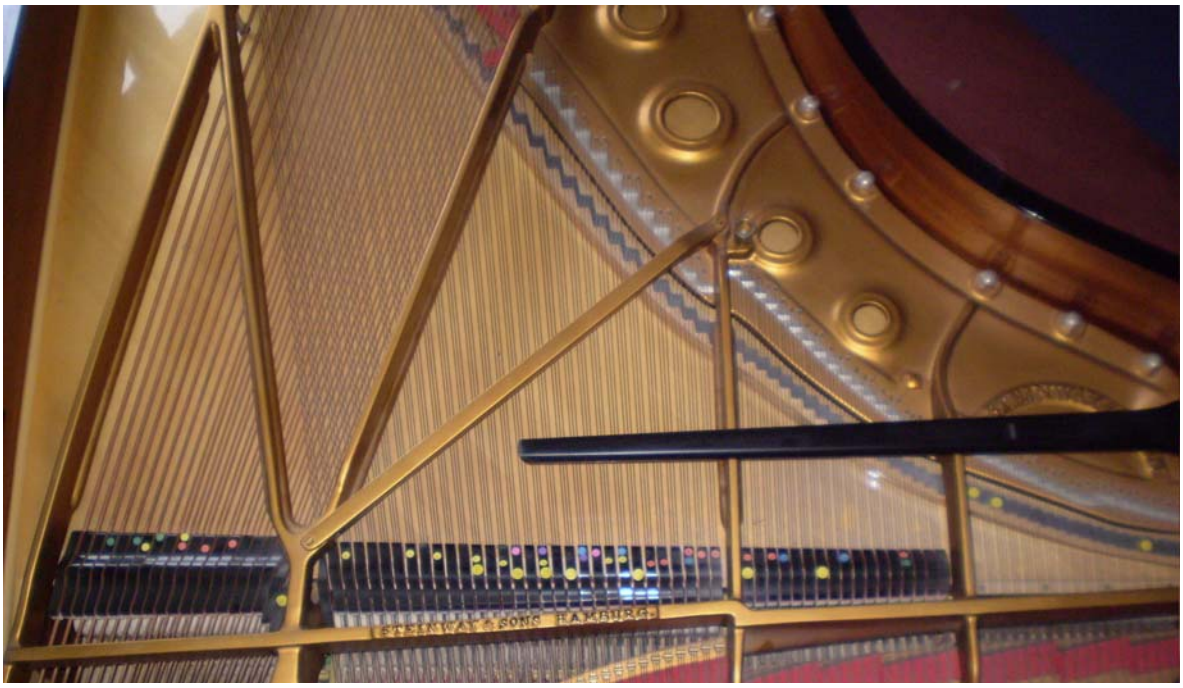


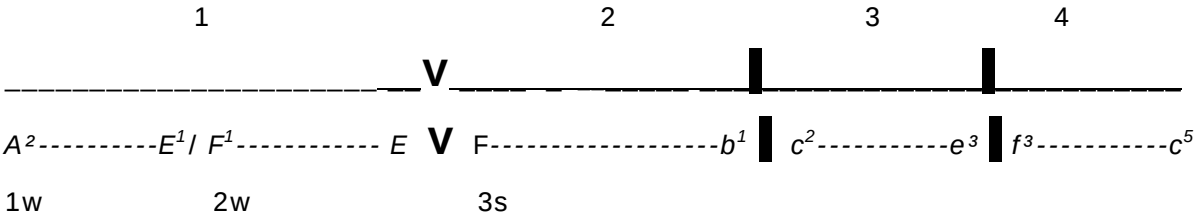


Key-dip	A^2	10.2mm
	c^1	10.2mm
	c^5	9.8mm

Keyboard length	123.8cm
Distance c^1-opening	76cm
No dampers from	$f\#^3$
3rd pedal	YES

Steinway B





Key-dip	A^2	10.2mm
	c^1	10.2mm
	c^5	9.8mm

Keyboard length	123.8cm
Distance c^1-opening	76cm
No dampers from	$f\#^3$
3rd pedal	YES

Yamaha CFIIIS



1 2 3 4

V

A^2-------E^1/ F^1------A^1 / A#^{1}------ E **V** F--------g | $g\#$----$c\#^2$ | d^2---g^3 | $g\#^3$-------c^5

1w 2w 3w 3s

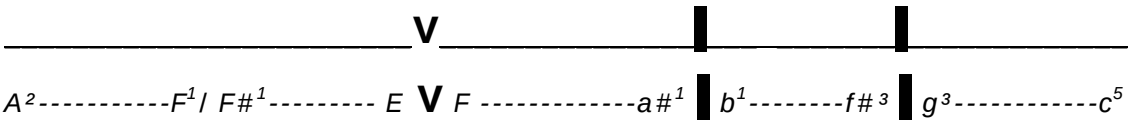
Key-dip	A^2	9.94mm
	c^1	10.81mm
	c^5	10.40mm

Keyboard length	122.9cm
Distance c^1-opening	100cm
No dampers from	$g\#^3$
3rd pedal	YES

Yamaha C7



1 2 3 4



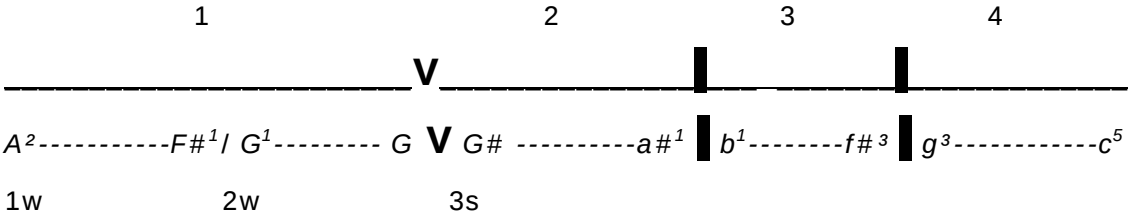
1w 2w 3s

Key-dip	A^2	10.2mm
	c^1	10.2mm
	c^5	10.2mm

Keyboard length	122.8cm
Distance c^1-opening	95cm
No dampers from	$f\#^3$
3rd pedal	YES

Yamaha C6



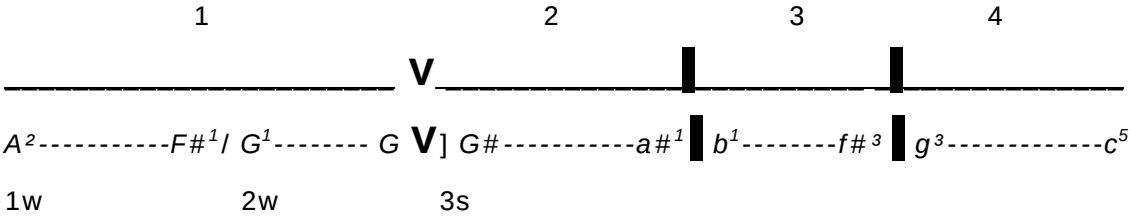


Key-dip	A^2	10.2mm
	c^1	9.8mm
	c^5	9.8mm

Keyboard length	122.8cm
Distance c^1-opening	98cm
No dampers from	$f\#^3$
3rd pedal	YES

Yamaha S6





Key-dip	A^2	10.2mm
	c^1	10.2mm
	c^5	9.8mm

Keyboard length	123.8cm
Distance c^1-opening	76cm
No dampers from	$f\#^3$
3rd pedal	YES

Yamaha C2



1 2 3 4

_____**V**_____▌_____▌_____

A²----------F#¹/ G¹ -------A# **V** B------*c/c#-----d²* ▌ *d#²--------g³* ▌ *g#³----------c⁵*

1w 2w 3s

Key-dip	A²	10.2mm
	c^1	10.2mm
	c^5	9.8mm

Keyboard length	123.8cm
Distance c^1-opening	76cm
No dampers from	$f\#^3$
3rd pedal	YES

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The main date indicated at each entry is the one of the original edition of the source. If a later issue was used for this dissertation, its date is mentioned in the details of the entry. Numbers of pages refer to the edition here used.

Websites are only listed here by name of author, year of last access (even if different from possible indications on the site of its last update), title and general URL. As the web pages are mostly unnumbered, we refer to them in the footnotes by the general bibliographical reference *and* by the particular page-URL.

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8 SUMMARY – DUTCH

Een aantal persoonlijke ervaringen met het uitvoeren van een specifiek soort piano repertoire dat gebruik maakt van zogenaamde “extended techniques” heeft de spreekwoordelijke vinger gelegd op de wonde van het gebrek aan historisch geïnformeerde informatie. De weinige bestaande uitvoeringspraktische literatuur over dit onderwerp lijdt dan weer onder een gebrek aan grondigheid, kwaliteit en betrouwbaarheid, terwijl de geschiedkundige bronnen – die als bijna vanzelfsprekend uitvoeringspraktische perspectief negeren – meestal slechts beperkte beschikbaar zijn en aan het historische overzicht verzaken. Als roepnaam voor het onderwerp geniet *Extended Piano Techniques* dan wel wijd verbreid begrip onder musici in Angelsaksische landen, er is nochtans geen officiële of formele definitie van te vinden. Zo is het bij aanvang van de studie onmogelijk te stellen of bij voorbeeld het glissando of het gebruik van live elektronica deel uitmaakt van het onderwerp of niet. Even erg is het gesteld met individuele terminologie: vele van de *extended techniques* zijn geen technieken maar klank effecten, en er zijn effecten die een naam zijn toegediend die eigenlijk beter op een andere bestaande techniek slaat (Schoenberg’s *Klavierflageolett*).

Om een geïntegreerd overzicht te bekomen van het onderwerp, met aandacht voor theoretische, geschiedkundige en uitvoeringspraktische aspecten, werd het repertoire voor piano (solo of als deel van kamer- en concertante muziek) van 1700 tot 2000 onderzocht – meer dan 17000 werken gingen onder de loep. Ondanks het drievoudige perspectief werd getracht om te komen tot een geheel van informatie dat in de eerste plaats de uitvoerder van dienst kan zijn. De eerste stap behelst het definiëren van het onderwerp en haar voornaamste terminologie en concepten. Een historische dieptestudie kan daarmee de evolutie blootleggen van de basis piano-en-forte tot het multifunctionele “extended” instrument, samen met de chronologische lijn van de compositorische interesse in de speeltechnieken die deze evolutie leidt.

Het theoretische hoofdstuk begint met een vogelvlucht studie van het gebruik van de terminologie om te leiden tot het inzicht dat een dubbel uitgangspunt het onderwerp beheerst: dat van de componist die het instrumentale klank potentieel wil uitbreiden, en dat van de muzikant die denkt in termen van klankproducerende acties. Om te komen tot een verantwoorde definiëring van het onderwerp en het eraan verbonden begrippenapparaat, wordt vanuit dit dubbele perspectief een premisse gehanteerd die de *extended piano* vooropstelt als het oneigenlijke gebruik van dit instrument. Na het overlopen van de originele ontwerpintentie van de piano, haar fenomenologische functie als een “instrument” en haar genealogische positie onder de instrumenten families, maakt een nieuw opgestelde definitie van de eigenlijke piano het mogelijk om de oneigenlijke tegenbeeld te bepalen, i.e. de *extended piano*. Een categorisatie van de oneigenlijke houding ten opzichte van het instrument maakt een gradueel overzicht mogelijk van de wijzen – extreem of minder extreem – waarop een extensie zich verhoudt tot *de* piano. Een beschouwing van de extended piano als geheel van hulpmiddelen om te compenseren voor de beperkende karakteristiek van het originele piano design, samen met een overzicht van bestaande terminologie om subsoorten van het oneigenlijke instrument te duiden, sluiten het algemeen oriënterende deel van de theorie van de extended piano af.

Om tot een gedetailleerder beeld en begrip te komen van de soms welbekende oneigenlijke speeltechnieken wordt van enkele – het glissando, het sympathiek laten vibreren van open snaren, de geprepareerde piano en oneigenlijke pedaaltechnieken – hun theoretische karakteristieken ontleed zoals etymologie, notatie en morfologie. In bijzonder behoeft de theorie van de cluster een grondig onderzoek. Mede aan de hand van bestaande theoretische geschriften, zoals enkele 20ste-eeuwse componisten die hebben uitgegeven, worden de cluster en haar theoretisch-akoestische zowel als

uitvoeringspraktische karakteristieken voor op zijn minst het doel van deze studie geherdefinieerd.

Het historische overzicht van het oneigenlijke gebruik van de piano wordt geschetst aan de hand van de extended techniques zelf. Elk van de drie onderdelen – grosso modo de 18de, 19de en 20ste eeuw – is ingeleid door een schets van de algemeen maatschappelijke, cultuurhistorische en muzikale context. De mogelijkerwijs verwarrende veelheid aan besproken composities is opgevangen door ze te structureren in een eerste vorm van conclusie: de algemeen te ontwaren evolutionaire periodes. Een eenvoudige lijn van de eerste tekenen van de cluster en het glissando tot een eerste golf van oneigenlijk gebruik kenmerkt de 18de eeuw. Aandacht wordt gevestigd op problemen van detectie van oneigenlijke technieken in het vroegste stadium en de focus wordt uitgebreid van de piano naar het orgel, klavecimbel en klavechord. In de eerste plaats omdat het vroege piano repertoire evengoed dat van de andere toetseninstrument is geweest, ten tweede omdat het duidelijk wordt hoe toetstechnieken zich weliswaar anders kunnen voordoen op bij voorbeeld het orgel dan op de pianoforte, maar op die manier dan toch weer een nuancerend licht werpen op de evolutie van de extended piano. Zo blijkt dat, naast de archetypische en als het ware universele of instrumentaal-genderlose toetsentechnieken als de cluster en glissando, ook de vroegste speelwijzen om de snaren van klavierinstrumenten te beroeren niet eenduidig voor dit of gene klavierinstrument was bedoeld.
Zo krijgen de genres van de orgel-donderstukken en de piano-strijdspelen de nodige aandacht, en komt het werk van Friedrich Wilhelm Rust naar voor als één van de hoogtepunten van de 18de-eeuwse extended piano. De ontwikkeling van de cluster in de battle-pieces en het eraan verwante gebruik van slagwerkpedalen op de 18de-eeuwse piano is meteen de reden om deze eerste periode af te sluiten rond het Congres van Wenen in 1816, wanneer de muzikale evolutie van de meeste vroege extensies stopt.

Voor wat betreft deze studie is de 19de eeuw in alle opzichten, behalve één, de eeuw van de expansie. Alle aspecten van het muziekleven kennen een bloeiperiode in de zin van groter en meer, zij het dat, van alle extended techniques, alleen het glissando daar deel aan neemt. Het opmerkelijke gebrek aan compositorische interesse voor de cluster en het bespelen van de binnenkant van de piano uit zich noch slechts in enkele ontwikkelingen van de orgel-cluster, ergonomische vingerzettingen en wat geflirt met oneigenlijke piano klanken voortgebracht met de minst extreme extended techniques denkbaar. In deze eeuw van grootsprakerigheid is het glissando de blikvanger. De aandacht van deze studie voor de 19de-eeuwse piano extensies gaat daarom uit naar de wijze waarop het glissando in de eerste instantie een gestage maar snelle opgang maakt tot het een hoogtepunt bereikt in het oeuvre van Franz Liszt, en naar de redenen voor de erop volgende teloorgang. Besprekingen van het distributiekanaal van de pianomethode, de historische evolutie naar een consensus om het fenomeen een naam te geven, de ontleding van statistische gegevens over de aanwezigheid van het glissando in het repertoire, de opvolging van de evolutie der morfologische kenmerken, vingerzettingen, snelheden en speciale types zoals het quasi- en pseudochromatische glissando, worden aangevuld met het behandelen van de plaats van het glissando in 19de-eeuwse uitgaven van 18de-eeuwse composities en in de veranderende tonale context.

De 20ste eeuw wordt geëvalueerd doorheen een indeling in groepen van ongeveer 20 jaar, met een eerste nieuw hoogtepunt aan het begin dat een hernieuwd belang van het glissando en de cluster koppelt aan experimenten met sympathieke resonantie, embryonale preparatie- en theatrale praktijken, het verder ontginnen van de binnenkant van de piano en de opkomst van persoonlijkheden, zoals Henry Cowell, die belangrijke delen van hun werk besteden aan de extended piano. De geografische ontdubbeling van de interesse – de Verenigde Staten van Amerika stappen massaal mee in het verhaal – gaat niet onopgemerkt voorbij, en de interactie wordt gedetailleerd toegelicht. Met name de opgang van de Amerikaanse verworvenheden inzake het uitbreiden van de eigenlijke

mogelijkheden van de piano, en de invloed van Henry Cowell, John Cage en hun entourage wekt bijna continu belang. De plaats van de piano tussen slagwerk instrumenten is een eveneens terugkerend element in deze geschiedenis. Nieuwe ontwikkelingen zoals de geprepareerde piano en de opmars van de experimenten naar de grenzen van zowel het mogelijke als het fatsoenlijke krijgen uitgebreid commentaar. Na het onderzoeken van de confrontatie tussen de uitbreiding van de pianoklank en de dromen van de serieel –denkende componisten, met als schakelpersoon Mauricio Kagel, wordt het studieperspectief verwijd. Op enkele categorische evoluties na – de bowed piano, het instrumentaal theater en de elektronica – maakt de polarisatie tussen continenten en de chronologische stap-voor-stap evolutie in hoge mate plaats voor een bespreking van componistenprofielen, individuele pamfletstukken en evoluties van het onderwerp binnen de meer algemene muziekcultuur.

Het hoofdstuk over de historische uitvoeringspraktijk van de extended techniques is logischerwijs sterk afhankelijk van de inzichten die het geschiedkundig verloop hebben opgeleverd: de identiteit van de extensies (en dus haar speltechnische eigenheden) zijn dermate bepalend geweest en besproken geworden om het vorige hoofdstuk te stofferen, dat ze niet opnieuw hoeven te worden aangehaald. Hoe weinig pedagogische informatie van uitvoeringstechnische aard er daarenboven uit sommige periodes ook slechts is overgeleverd, er kunnen nog tal van conclusies getrokken worden op basis van indirecte afleidingen over bij voorbeeld het bespelen van het juiste instrument en over alternatieven voor technieken wanneer een dergelijk instrument niet beschikbaar is. Er wordt ook uitvoerige historische informatie verzameld over de uitvoeringspraktijk en de materialen van John Cage's geprepareerde piano, over de bowed piano en over de wijze waarop instrumentaal theater werd gebracht in de jaren '50 tot'70. Een appendix levert uiteindelijk een overzicht van de belangrijkste hedendaagse piano modellen aanwezig in de West-Europese en Amerikaanse conservatoria en concertzalen. Details over de makelij (afmetingen, verdeling der snaren, beperkende ligging van constructiedelen) van elk model moeten het mogelijk maken voor de lezer om zich professioneel voorbereid met extended piano repertoire op de podia te begeven.

De besluiten die tijdens de hele studie werden verzameld worden aan het einde van dit proefschrift gebundeld om rode draden zowel als meer algemene of achterliggende inzichten samen te vatten. Een bibliografie sluit dit onderzoek af.

9 CURRICULUM VITAE LUK VAES

Having completed his basic musical studies with Claude Coppens and Godfried-Willem Raes at the Royal Conservatory of Ghent in Belgium, Luk Vaes took lessons with Yvonne Loriod and Olivier Messiaen in France and went to Cologne for post-graduate study under Aloys Kontarsky. In 1990 he won a special Fulbright scholarship to study American piano literature with Yvar Mikhashoff at Buffalo's State University of New York.

He became first prizewinner of the international competitions "Tenuto", "Orpheus" and "New Music for New Pianist", was awarded the Artistic Promotion Prize for the best interpretation of Belgian music. In 1991 he won the Cameron Baird Competition and a year later he received the Darmstädter Stipendium Preis.

Luk Vaes worked on a personal level with composers such as Earle Brown, Mauricio Kagel, Lou Harrison, Frederic Rzewski, Ned Rorem, George Crumb, Kevin Volans, Helmut Lachenmann, John Cage, Edison Denisow, etc. and creates new works each year, most of them written especially for him. He made numerous recordings for television and radio both in Europe and in the USA and played solo concerts at such renowned venues and festivals as the Concertgebouw Amsterdam, Philharmonie Keulen, Tage für Neue Musik Zürich, Berlin Biënale, Warsaw Autumn, Klavier Festival Rurh, Mozarteum Salzburg, Almeida Festival London, Ijsbreker Amsterdam. As well as appearing in concert series in New York, Los Angeles, San Francisco, Paris, Rome, etc., Luk Vaes gave master classes in Vienna, Salzburg, Sienna, Chicago, New York, Gent, Berlin, The Hague, etc.

As a freelance organizer he has conceived and co-ordinated concerts and festivals in Ghent, Brussels, Toronto, New York and Chicago. He was appointed musical director of the "Week of Contemporary Music" (1992) and became production director of the 1993 incarnation of the North American New Music Festival. He was director of the Belgian new music ensemble Champ d'Action and founded the Flemish leg of the international November Music festival organization (Belgium, Holland and Germany), of which he is currently director. Besides being invited as a member of the jury of international competitions, Luk Vaes has written and produced programs for the Belgian Radio (*Ravel according to Ravel*, *Piano works by Cowell*) and recorded CD's for the New York based label *Mode Records*, the German *Winter&Winter* catalogue and for the Belgian recording centre Steurbaut. His Kagel-CD (together with Teodoro Anzelotti) won nine international prizes, e.g. "CD of the year" by the English magazine 'Wire,' "Choc" by 'Le Monde de la Musique', and a "Diapason d'or."