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On the origin of patterning in movable Latin type : Renaissance standardisation, systematisation, and unitisation of textura and roman type

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Citation

Blokland, F. E. (2016, October 11). *On the origin of patterning in movable Latin type : Renaissance standardisation, systematisation, and unitisation of textura and roman type*. Retrieved from <https://hdl.handle.net/1887/43556>

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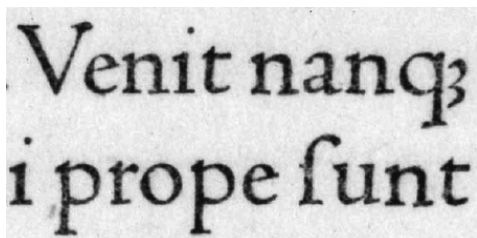
Issue Date: 2016-10-11



I. GLOSSARY OF TERMS

The reader may not be familiar with all historic and technical terms mentioned in this dissertation. In the following glossary, a number of these terms are explained.

Archetypal model (for roman type)



The type Nicolas Jenson applied in 1470 for the tractate *De Præparatione Evangelica* is generally considered the first roman type of high quality. It was not the first roman type: it was predated by the type Sweynheym and Pannartz used for Cicero's *De Oratore* in 1465 (although even this one may have been anticipated by a roman type applied in Strassburg a few months earlier).¹ Nevertheless, Jenson's roman type formed the basis for Francesco Griffo's roman types from 1495 and 1499, which in turn formed the basis for the French Renaissance roman types by Claude Garamont, Robert Granjon, and Hendrik van den Keere (these punchcutters are briefly introduced in the next glossary). The types of Garamont in particular have been of great influence on the works of his successors since the sixteenth century and continue to form the basis for the conditioning of typographers today.

Although Stanley Morison considered it to be a matter of taste whether Griffo's roman types were an improvement upon those of his illustrious predecessor,² I will argue in this dissertation that Griffo made direct use of Jenson's standardisation of character widths. Because Griffo's French-Renaissance successors also used the same proportions, Jenson's roman type is called archetypal.

¹ Stanley Morison and Kenneth Day, *The Typographic Book 1450–1935* (London: Ernest Benn Ltd., 1963), p.26.

² Stanley Morison, *Four Centuries of Fine Printing* (London: Ernest Benn Ltd., 1949), p.25.

Ascender

Parts of the lowercase letters that stick out above the top of the x-height, such as the ascenders of the b, d, h, k, and l, and the terminal of the f.

Baseline

The line on which the upper- and lowercase letters and all other characters stand.

Body (size)

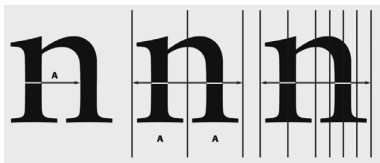
The body size or body of a typeface is the distance from the top ascenders to the bottom of the descenders. Whether the f, or any other letter with an ascender, or the g, or any other letter with a descender, is taken for measurement differs per punchcutter or type designer. Moxon writes in *Mechanick Exercises* that ‘By Body is meant, in Letter-Cutters, Founders and Printers Language, the Side of the Space contained between the Top and Bottom Line of a Long Letter.’ An example of such a long letter is the capital J.³

The body size does not by definition equal the body of movable type, which is the vertical dimension of the rectangle on which the letters are cast. The height of the cast type can be identical to the body size, but foundry type was usually cast on a slightly larger rectangle.

³ Joseph Moxon, *Mechanick Exercises on the Whole Art of Printing* (1683–4), ed. Herbert Davis and Harry Carter (New York: Dover Publications, 1978), p.102.

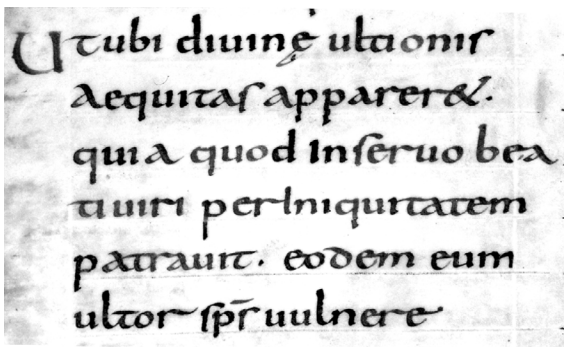
Moxon's definition is annotated by Davis and Carter as being 'Not a good definition because letters are often cast on a body larger than it need be. It is the dimension of type determined by the body of the mould in which it was cast (from the punchcutter's point of view: "is intended to be cast").'⁴ The reason for casting letters on a larger body was to incorporate some extra distance between lines. In later times letters were cast on lower bodies and strips of metal were used for this separation, which is called 'leading'.

Cadence units



These units are part of a unit arrangement system that was developed as a result of this research on standardisation of the Renaissance type production. These cadence units are the result of a division of the stem interval of the lowercase letter n, indicated with 'A' in the image above. The distance from a side bearing to the centre of the counter equals the stem interval. The resulting character width (twice as large as the stem interval) can be divided into smaller units by either bisecting the aforementioned distance or by dividing it into an arbitrary number of units. The cadence unit arrangement system makes it possible to artificially fit type.

Carolingian minuscule (Caroline minuscule)



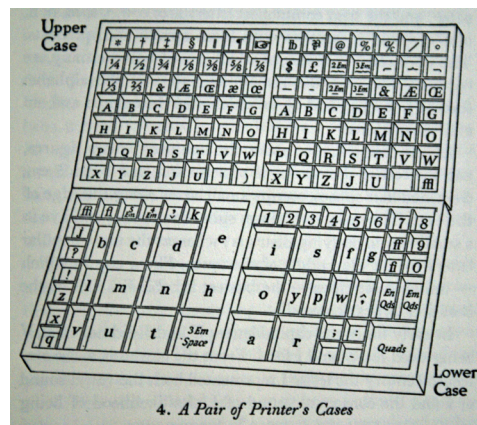
The Carolingian minuscule is the formal book hand from around 800: '[...] under the rule of Alcuin of York, who was abbot of St. Martin's from 796 to 804, was specially developed the exact hand which has received the name of the Carolingian

⁴ Moxon, *Mechanick Exercises*, p.102.

Minuscule.⁵ Carolingian refers to Charlemagne: ‘The term Carolingian, or Caroline, rests on the belief that the script sprang full-grown from the brain of Charlemagne, with Alcuin standing by as midwife.’⁶

The Carolingian minuscule formed the direct basis for the Humanist minuscule in the fifteenth century. The most generally accepted theory is that the Carolingian minuscule was mistakenly attributed to the ancient Romans by the Renaissance humanists. The reason for this was that when the humanists handled the manuscript books that were copied in Carolingian minuscule hands from the eleventh and twelve centuries, they thought they were looking at hands from Roman scribes.⁷

Case (upper/lower)



4. A Pair of Printer's Cases

A case is a wooden tray that is divided into compartments for the storage of foundry type.⁸ From this case the typesetter picks the characters that he needs. The case is vertically divided into two segments: the upper case and the lower case. Both segments are divided into small compartments. The compartments in the upper case contain the capitals plus some additional characters. In the lower case the ‘small’ letters, also plus some additional characters, are stored. Upper- and lowercase are typical typographic terms. After all, written letters are not stored in cases. The calligraphic counterpart of lowercase letters is formed by minuscules.

⁵ Edward Maunde Thompson, *An Introduction to Greek and Latin Palaeography* (Oxford: The Clarendon Press, 1912), p.367.

⁶ Berthold Louis Ullman, *Ancient Writing and its Influence* (New York: Cooper Square Publishers, 1963), p.105.

⁷ Elizabeth Lewisohn Eisenstein, *The Printing Revolution in Early Modern Europe* (Cambridge: Cambridge University Press, 2005), pp.134,135.

⁸ Daniel Berkeley Updike, *Printing Types: Their History, Forms and Use* (Cambridge, MA: Harvard University Press, 1937), Volume 1, pp.20,21.

Casting (foundry type)

For the production of foundry type the matrix, which contains a hollowed (readable) image of a letter and which is mounted onto a mould, is filled with typesetters' lead. The latter hardens as soon as it has been poured into the shaft of the mould, and the caster has to make an abrupt vertical move, a strong shake, to get the lead into all details of the letter.⁹ The caster has to be careful, because shaking the mould too hard may spill the lead over what Moxon describes as the mouth of the upper half of the mould. According to Lawson, between 2,000 and 4,000 casts were made by a caster every day that he worked.¹⁰

Character

This term is often used as a synonym for letter, or even to indicate any grapheme in a font, including signs and symbols. However, a letter is a unit from the alphabet and there are only 26 letters in the English alphabet and the Greek alphabet contains even fewer: 24 letters (Cyrillic: 32, Hebrew: 22, Arabic: 28, et cetera).¹¹ There are more graphemes required to represent the Latin, Greek, Cyrillic, Hebrew, and Arabic scripts. Frederic Goudy described the alphabet as 'a system and series of symbols representing collectively the elements of written

⁹ Moxon, *Mechanick Exercises*, p.169.

¹⁰ Alexander Lawson, *Anatomy of a Typeface* (London: Hamish Hamilton, 1990), p.389.

¹¹ Peter T. Daniels and William Bright (eds.), *The World's Writing Systems* (New York/Oxford: Oxford University Press, 1996), p.883.

language’.¹² I would like to narrow Goudy’s description of the alphabet somewhat to ‘the basic set of graphemes of a written language’. Alphabet-derived graphemes are generally composed of multiple elements and can therefore be referred to as ‘characters’. As a result of this somewhat proprietary nomenclature, in the image above the lowercase e is a letter and the ê (a letter with a diacritic), a character.

Character width



To make movable type, handwritten letters were adapted and moulded into rectangles. This system remains unchanged today, and digital characters are also placed on a (virtual) rectangle. Each character on such a rectangle has –as much as possible– an equal amount of space on either side. The total width of the rectangle (letter plus space) is called character width.

Descender



Parts of the lowercase letters that stick out below the baseline.

Fitting



¹² Frederic William Goudy, *Typologia; Studies in Type Design and Type Making* (Berkeley: University of California Press, 1977), p.124.

This is the process of spacing movable-type characters in such a way that, irrespective of the sequence in which the letters are placed, there is always equilibrium of white space. Traditionally, spacing is done by eye, but in this dissertation a systematised alternative based on standardisations distilled from archetypal model is discussed.

Font

This is a set of related glyphs. This can be letters, characters, ornaments, symbols, or a collection of these. Normally they match in dimensions, weight (for example, light, regular, medium, and bold) and style (roman and italic). The number of glyphs in a set depends on the system. A digital single-byte font can contain up to 256 glyphs (2^8) and a double-byte font up to 65536 glyphs (2^{16}). In the times of foundry type, a font contained a collection of glyphs that were cast on the same body. Moxon uses the word ‘fount’ in his description. According to Davis and Carter the form ‘font’ is older and comes from the French ‘fonte’, which was in use by 1523.¹³ The pronunciation of font and fount is identical.¹⁴

Foundry type



This is movable type cast for manual typesetting. Until the end of the nineteenth century the casting of foundry type was done manually with a typefounder’s hand mould. In later times foundry type was also occasionally cast with the ‘hot metal’ Monotype casters. These machines were actually meant to cast lines of movable-type text. After printing with the lines, the letters were melted again and new letters were cast; the applied alloy was therefore softer than the ones used for ‘real’ foundry type.

¹³ Moxon, *Mechanick Exercises*, p.19.

¹⁴ Robert Bringhurst, *The Elements of Typographic Style* (Vancouver: Hartley & Marks Publishers, 1996), p.233.

Glyph



This is a formalised and fixed (as synonym for incised, engraved, photographed, or digitally stored) language(s)-specific graphical unit (grapheme) that represents a letter or character. The fixed image of a glyph is meant for repetitive use. However, glyphs used to represent a certain character can very much differ. For example, the lowercase letter a can be represented by many different glyphs (see image above).

Gothic type (blackletter)

This is a container term for type that is related to the gothic art in the High Middle Ages (ca.1000–1300) and the Late Middle Ages (ca.1300–1500). It comprises the *textura* and the *rotunda* models, which are discussed in this dissertation, but also models that are related to our present-day cursives: *schwabacher* and *fraktur*. An alternative name for gothic type is ‘blackletter’.

Gothic type was not obsolete immediately after the introduction of roman type; the nature of the publications (classical, ecclesiastical, historical, etcetera) determined the sort of type that was applied. Although Jenson became famous because of his roman type, he cut and applied more gothic type.¹⁵ In 1474 Jenson produced his first two editions in gothic type and from that time on Jenson applied his roman type only occasionally.¹⁶ Clearly roman type did not immediately replace gothic type in the South of Europe and this delay was even more pronounced in North-West Europe. A century later, when Christoffel Plantin published his *Index Characterum*, gothic type was still in use, although ‘Plantin had come a long way toward naturalising roman as the plain printing type of his gothic region.’¹⁷

Grapheme

Graphemes are the units that make up a writing system. In general, they are the graphical equivalents of phonemes, which are the basic units of spoken language.

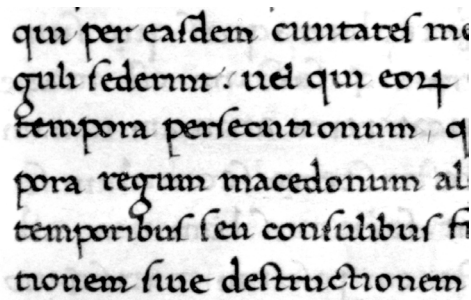
¹⁵ Martin Davies, *Aldus Manutius, Printer and Publisher of Renaissance Venice* (London: The British Library, 1995), p.8, and Stanley Morison, *Type Designs of the Past and Present* (London: The Fleuron, 1926), p.15.

¹⁶ Martin Lowry, *Venetian Printing: Nicolas Jenson and the Rise of the Roman Letterform* (Herning: Paul Kristensen, 1989), p.23.

¹⁷ Christopher Plantin, *Calligraphy & Printing in the Sixteenth Century*, ed. Ray Nash (Antwerp: Plantin-Moretus Museum, 1964), p.56.

Graphemes comprise letters, syllables, characters, numerals, punctuation marks (of which there are no equivalents in speech), ornaments, et cetera. One can consider this collection as a huge container with all variants of all informal and formal grapheme variants used or in use in a writing system, such as for instance capital, uncial, textura, rotunda, Humanistic minuscule, roman type, italic type, fraktur, et cetera. More information on graphemes and the system they are a part of can be found in Appendix 9: *Systems and models in type*.

Humanistic minuscule



This is a formalised variant of the Carolingian minuscule dating from the fifteenth century. The Humanistic minuscule formed the basis for roman type. It is attributed to Gian Francesco Poggio Bracciolini (1380–1459): ‘It is not only one of the earliest approximately datable examples of humanistic script, [...], but actually the very first.’¹⁸ The uninterrupted construction of the Carolingian minuscule was emphasised in the Humanistic cursive: ‘It was the generation of chancery clerks after Poggio, i.e. of the period after the middle of the fifteenth century, who discarded the intricate gothic cursive in favour of a rational humanistic cursive.’¹⁹ The Humanistic cursive is generally attributed to Niccolò Niccoli (1364–1437).²⁰ The Humanistic cursive formed the basis for italic type: ‘It is in fact the kind of hand that led to the italic type fonts, just as the script of his friend Poggio was the prototype of the roman type fonts.’²¹

Incunable (incunabula)

Printed material, such as books and pamphlets, dating from the early years of printing with movable type until 1501.

¹⁸ Berthold Louis Ullman, *The Origin and Development of Humanistic Script* (Roma: Edizioni di Storia e letteratura, 1960), pp.21,22.

¹⁹ Stanley Morison, *Letter Forms: Typographic and Scriptorial* (New York: The Typophiles, 1968), p.142.

²⁰ Ullman, *The Origin and Development of Humanistic Script*, p.59.

²¹ Ibid., p.60.

Italic (type)

This is generally used as a collective term for slanted letters, irrespective of their construction. It is also used as synonym for ‘cursive’. The three variants of the lowercase a above show from, left to right, two cursive forms with an interrupted and uninterrupted construction respectively, and a sloped roman.

The first a finds its origin in the sixteenth-century chancery writing hands of the papal court in Rome. This was a formally written cursive, which means that its construction was interrupted to make the pattern more rigid. The a in the centre shows that the thin stroke goes all the way up to the top. A calligrapher could write this letter in one movement, hence its construction is uninterrupted. Gerrit Noordzij considers the left a to be a hybridised variant, an italic, of the cursive centre one.²²

Justification (matrix, line)

Once a punch is struck in a copper matrix (‘raw strike’), the matrix has to be adjusted and refined before it can be used for casting. This process is called justification. The term is also used for the alignment of text at the right margin to prevent fraying. This is achieved by evenly distributing the remaining space at the end of a line after the application of standard word spaces. The size of word spaces can also be evenly reduced to let a (part of a) word fit on a line.

Kerning

This is the overlapping by letter parts of the character width of the adjacent letter, like the terminal of the long s in the image above. Kerning is typical for

²² Gerrit Noordzij, *The Stroke of the Pen: Fundamental Aspects of Western Writing* (The Hague: Koninklijke Academie van Beeldende Kunsten, 1982), p.33.

typography; the calligrapher never has to define the beginning and end of the width of the character, and letter forms freely enter each other's space. If necessary, their forms will be adapted spontaneously.

In the case of foundry type, kerning may result in collisions with parts of other letters. One way to circumvent this is with the use of ligatures. Another solution is to provide variants for certain combinations, like an f or a long s with a short terminal. In present-day digital technology, the term kerning is used to indicate corrections to the spacing of letter pairs. These corrections can either be positive or negative, i.e., the space between two characters can be enlarged or reduced. In most cases the correction will be negative and hence will result in an overlap of the character width of the adjacent letter. In digital fonts the corrections are defined in tables containing kerning pairs.

Lead (typefounding)

This is an alloy that is primarily made of lead, which is mixed with tin, antimony, and copper. At Plantin's printing office in about 1580 an alloy was used that contained 82% lead, 9% tin, 6% antimony, and for the rest copper. In the twentieth century a different alloy was used for foundry type: 60% lead, 15% tin, 25% antimony, and a trace of copper.²³ Sometimes iron was added.²⁴ Plantin's alloy was not of the highest quality and Leon Voet explains that Plantin started to make his own metal after all his possessions were sold in April 1562, because it was quicker, or cheaper, or both.²⁵

Ligatures



These are combinations of letters that together form one character. In foundry type a number of ligatures were required to prevent technical problems, such as the f-i and the f-l combinations. As a result of kerning, the terminal of the f would

²³ Lawson, *Anatomy of a Typeface*, p.389.

²⁴ Cornelis and Jacob Ploos van Amstel, *Beschrijving der letter-gieterij*. (Amsterdam: De Wed. van K. van Tongerlo en Zoon, 1768), first part, p.4.

²⁵ Leon Voet, *The Golden Compasses* (Amsterdam: VanGendt & Co, 1969–1972), Volume 2, p.106.

inevitably collide with either the dot on the i or the top of the l, and subsequently it would break off.

Other ligatures, such as the c-t one in the image above, were meant to control the spacing. The lowercase c contains quite a lot of trailing space because of its open counter, and sometimes it is preferable to force the c into the space of the next letter. Some of these combinations can also be found in the calligraphic precursors of roman type.

In the case of textura (type), ligatures can easily be formed for many letter combinations because most letters are made out of vertical strokes. Calligraphers used these to control the lengths of lines, and Gutenberg used a large number of such ligatures for controlling the justification of lines.

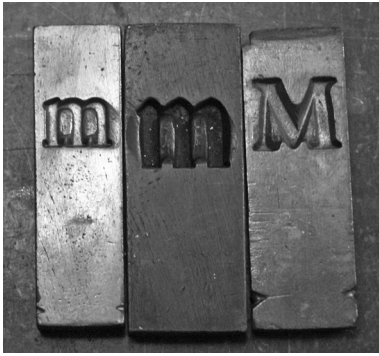
Today ligatures such as fi and fl are above all used for æsthetical reasons. If in a digitally typeset text the terminal of the f collides with the dot on the i nothing will break off, but it will probably not look nice. Throughout the years, ligatures have become a sign of well-made typography.

Letter model



This is a geometric model, developed by the present dissertation's author, that captures the construction of textura and Humanistic minuscule, with the exception of those that contain diagonals and find their origin in the shapes of capital letters: k, s, v, w, x, y, z. The model maps the strokes which are repeatedly used by the calligrapher and also supports the idea that handwritten letters have a built-in standardisation, which was especially emphasised when calligraphic letter forms were transformed into movable type.

Matrix



This is a piece of copper (or very occasionally lead) into which a punch was struck.²⁶ Usually this was done with a hammer, but Carter mentions the later use of ‘a striking’, ‘in which the punch is held firmly and upright whilst a screw, acting upon the top, presses it gradually into the copper. A vernier scale shows the depth to which the punch has been driven. This puts less strain on the punch than a hammer.’²⁷ After being justified the matrix was put in a mould for the casting of foundry type. Matrices were justified in such a way that after placing them in the mould the cast type had ‘all the accuracy and finish required for printing.’²⁸

Mould (typefoundry)



This is a hand-held device for the casting of foundry type. The Dutch term ‘gietsfles’, which literally translated means ‘pouring bottle’ exactly describes what it is. A typefounder’s mould consists of two parts that are kept together by the caster’s hand. The halves can be slid in one direction to control the width of the shank, of which the aperture can be seen in the centre of the mould in the image above. At the end of the shank the matrix is fixed with a large and easy to remove

²⁶ Voet, *The Golden Compasses*, Vol.2, p.63.

²⁷ Harry Carter, *Fournier on Typefoundry* (New York: Burt Franklin, 1973), p.84.

²⁸ *Ibid.*, p.89.

metal spring. Molten lead (actually an alloy) is poured into the shank and fills the image of the letter in the matrix.

In most cases each body size requires a different mould, although there are Renaissance moulds that allow the adjustment of the body. More information on moulds can be found in Chapter 6. The hand mould was used for production until well into the twentieth century, but from the middle of the nineteenth century the casting process became increasingly mechanised.²⁹

Movable type



This term comprises the forms of type that find their origin in the system Gutenberg developed for typesetting and printing with separated letters. Gutenberg placed letters onto rectangles and, irrespective of their sequence, the spacing of these letters was uniform.

The Renaissance typesetters applied foundry type, and manual typesetting continued to be professionally practised into the twentieth century. Around the end of the nineteenth century the hot metal Monotype casting machine became an alternative for manual typesetting. Letters were cast and placed in line automatically, but were still movable. The typesetter could make corrections to the lines of cast text if necessary. This in contrast to line-casting machines, such as Linotype and Intertype, which produced solid lines of text.

Point size

The size of the body translates into typographic points, which are units for calculating dimensions of type and line spacing. Before the first point systems were developed in eighteenth-century France by Pierre Simon Fournier and

²⁹ Allen Hutt, *Fournier, the Compleat Typographer* (London: Frederick Muller, 1972), p.xi.

François Ambroise Didot,³⁰ body sizes were not indicated with points. In Dutch, body sizes had names such as ‘Ascendonica’, ‘Parangon’, ‘Augustijn’, ‘Brevier’, and ‘Nonpareil’. In French the Parangon was called ‘Petit Parangon’ and Ascendonica was called ‘Ascendonica Romain’. Some names were (almost) identical: the Dutch ‘Nonpareil’ was called ‘Nonpareille’ in French. In English the Dutch Parangon was called ‘Paragon’ and Ascendonica was called ‘Double Pica’.³¹

The naming of the sizes was based on their use, the appreciation of the type (beauty), the region of origin, or something else. In Plantin’s dialogue on calligraphy and printing one can read about the relationship between the application and naming: ‘[...] as in the composition of missals they called some missal types canon and petit canon de messel, glose de messel; letter de Cicéro, letter de S. Augustin, because they had been used to printing such authors with these types.’³² And on beauty: ‘Because of their great beauty some are called mignonne, nonpareille and paragon.’³³ And then he writes: ‘Others have taken their names elsewhere, such as gros and petit canon, texte, two line tourné letters, gros trait, grand and petit bourgeois, letter batarde, letter de somme or modern, and letter de parchemin.’³⁴

The naming of type could vary per region and, as Leon Voet noted In *The Golden Compasses*, which describes the history of the house of Plantin-Moretus, it is even possible that the names varied from one printing office to another.³⁵ The practice of naming the various sizes of type may have been a usage that was new in Plantin’s early years: ‘Different names were sometimes given to the same fount and two different founts might be referred to by the same term.’³⁶

³⁰ Updike, *Printing Types*, Vol.1, pp.26,31.

³¹ Hendrik Désiré Louis Vervliet, *Sixteenth-Century Printing Types of the Low Countries* (Amsterdam: Menno Herzberger & Co, 1968), p.16.

³² Plantin, *Calligraphy & Printing in the Sixteenth Century*, p.49.

³³ Ibid., p.53.

³⁴ Ibid., p.53.

³⁵ Voet, *The Golden Compasses*, Vol.2, p.55.

³⁶ Ibid. p.55.

Punch



The oldest known publication on printing (type) was written by the Frenchman Loys Le Roi and dates from 1576. In 1594 it was translated by Robert Ashley and published in London. Le Roi's description is very brief and so is the part on the production of punches:

To make Characters for imprinting, it is requisite to haue ponchions of steel, softned by the fire, on which they graue with counter-ponchions hardned, or grauing yrons steeled, the white which is within the letters: perfecting and smoothing the bodies of them with fyles, where they are eminent, or vneuen; not at the right ends, but at the contrarie: after they wet these ponchions in water to harden them, and then polish them, and do strike them into little peeces of fine copper [...].³⁷

Christoffel Plantin's description of the punch in his dialogue on calligraphy and printing is concise too: 'This is a long piece of steel, on the end of which is engraved the desired character. [...] When it is done it is struck into copper and a matrix is made, which is nothing but the impression of the character struck, exactly as when a seal is impressed in wax.'³⁸ The way the shanks of the punches were cut could differ. Van den Keere made slight changes in his manner of shaping twice in his career.³⁹

For cutting, the steel had to be relatively soft, but for striking into the copper matrix it had to be hard. In an annotation to Moxon's *Mechanick Exercises* it is mentioned that 'The best steel for punchcutting is one whose hard and soft tempers differ as much as possible and is least liable to cracking or distortion in passing from one to another.'⁴⁰ For cutting, the steel was softened by annealing the bars in a very hot fire and leaving them to cool slowly inside.⁴¹ For hardening it, the end of the punch containing the letter was brought to a red heat and then cooled in

³⁷ Loys le Roi, *On Printing* (Loughborough: The Plough Press, 1974), p.6.

³⁸ Plantin, op.cit., p.41.

³⁹ Vervliet, *Sixteenth-Century Printing Types of the Low Countries*, p.31.

⁴⁰ Moxon, *Mechanick Exercises*, p.106.

⁴¹ Carter, *Fournier on Typefounding*, pp.30,31.

cold water. Fournier's description of the hardening process makes it clear that this was far from easy:

It is this struggle between hot and cold that closes up and compresses the pores of the steel and hardens it, and it is the right degree of heat in the punch and cold in the water that gives the right degree of hardness to the steel.⁴²

The counterpunch was used for striking counters of letters into punches. Instead of engraving parts, such as the insides (counters) of the lowercase b, n, and o, these were cut on separate punches. The counter of the b could then also be used for the d, p, and q.⁴³ The strike with the counterpunch, if properly impressed, provided a quicker and neater result than could be achieved by cutting.⁴⁴ There were even counter counterpunches used occasionally. For striking steel into steel the receiving part had to be even softer than for engraving. Fournier provides a recipe for that too.⁴⁵ If counterpunches were used, the side of the punch on which the letter was cut (the 'Face') was larger than if all parts of the letter were cut. This prevented cracking when the counterpunch was struck, which required force.⁴⁶

Punchcutting



As the name of the profession reveals, the punchcutter cut punches. In the period from 1450 until 1500, the complete typefounding process, which included the cutting of punches, the striking and justification of matrices, and the casting of type, was the work of a single person. In later times these activities were also split

⁴² Ibid., p.78.

⁴³ Ibid., p.29.

⁴⁴ Theodore Low De Vinne, *The Practice of Typography* (New York: The Century Co., 1900), p.16.

⁴⁵ Carter, *Fournier on Typefounding*, p.31.

⁴⁶ Moxon, *Mechanick Exercises*, p.101.

depending on the needs of the market.⁴⁷ Letters, for example, were cast from third-party matrices.

Cutting punches manually was practised in a manner that remained unchanged between the Renaissance until late into the twentieth century, although after the release of Linn Boyd Benton's matrix-engraving pantograph in 1884, punchcutting was no longer a prerequisite for producing matrices.⁴⁸ A famous twentieth-century punchcutter was Paul Helmuth Rädisch, who worked closely with Jan van Krimpen. Rädisch combined the old punchcutting technique with a more modern photographic one, as described in Appendix 5.2.

Fournier describes 'the art of the punchcutter' as follows: 'to know the best possible shape that can be given to letters, and their proper relation to one another, and to be able to reproduce them upon steel so that they may be struck into copper to make the matrices by means of which the letters can ever after be cast in any numbers.'⁴⁹

Raw strikes (matrix)



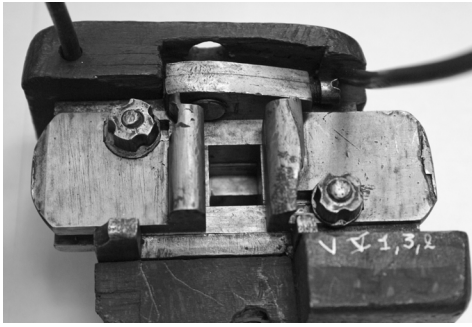
These are matrices that have been struck with a punch and are unjustified, which means that they have not been further prepared for the production of type. Due to the force required to obtain a proper impression of the image of the letter on top of the punch into the piece of copper, the latter is distorted. Matrices were traded both raw and justified.

⁴⁷ Vervliet, *Sixteenth-Century Printing Types of the Low Countries*, p.12.

⁴⁸ Lawson, *Anatomy of a Typeface*, p.390.

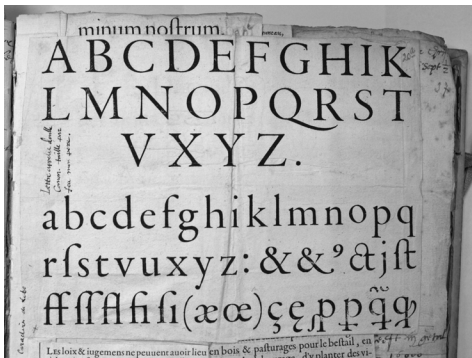
⁴⁹ Carter, *Fournier on Typefounding*, p.21.

Registers (moulds)



These were sliders at the bottom of the typefounder's mould for positioning the matrix in relation to the mould's shank. The offset of the matrix was determined with the mould's registers and hence so too was the position of the letter within its character width. Offset was required because otherwise the molten lead would leak out of the mould. The position of the mould's registers was fixed with nuts. In case the matrices were justified for fixed registers, the positions of the latter could remain the same for all letters from the same set. More information about these registers can be found in Chapter 6.

Roman type

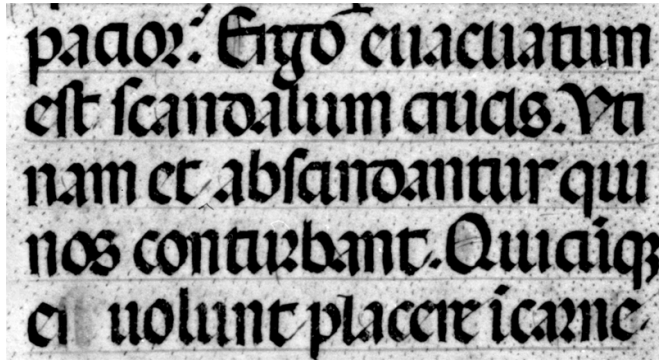


A collective term for type that finds its origin in the formalisation and standardisation of the Humanistic minuscule. Although there were a number of hybrid types combining gothic and Humanistic details, developed in Italy in the 1460s, the first roman is attributed to Johann and Wendelin da Spira (they migrated from Speier in the Rhineland to Venice, hence their surname) and was applied by them in 1469.⁵⁰ The archetypal model by Nicolas Jenson from 1470 was much more refined and thus became the basis and point of reference for later roman type. The Italian calligrapher Giovanni Battista Palatino (ca.1515–ca.1575)

⁵⁰ Morison, *Type Designs of the Past and Present*, p.15.

was the first to use the term ‘LettereRomane’, instead of ‘antique’ or ‘antiqua’, or ‘antiche’ as employed by Pacioli and other writers.⁵¹

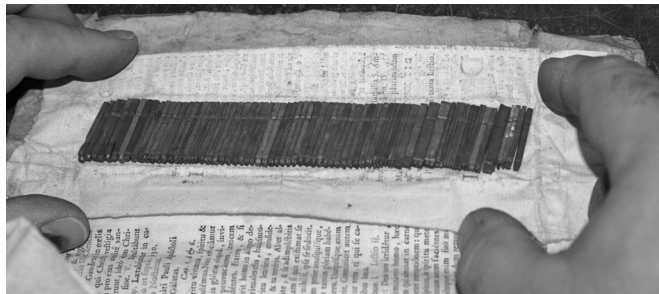
Rotunda



A late gothic hand from Italy dating from around the beginning of the fourteenth century.⁵² Although morphologically directly related to the textura, it combines the vertical stressing of strokes of the latter with a number of round letters.

Another name for Rotunda is round gothic. As a type it was also applied North of the Alps –for instance by Christophe Plantin.⁵³

Set patterns



These were collections of pre-cast type that were delivered together with matrices in case the matrices were not justified for casting with fixed registers. The caster could use these by putting a pre-cast letter into the related matrix and then enclosing it with the mould’s registers. Consequently the caster did not have to check the spacing/fitting.

⁵¹ Stanley Morison, *Pacioli’s Classic Roman Alphabet* (New York: Dover Publications, 1994), p.81.

⁵² Albert Kapr, *The Art of Lettering: The History, Anatomy, and Aesthetics of the Roman Letter Forms* (München: K.G. Saur, 1983), p.61.

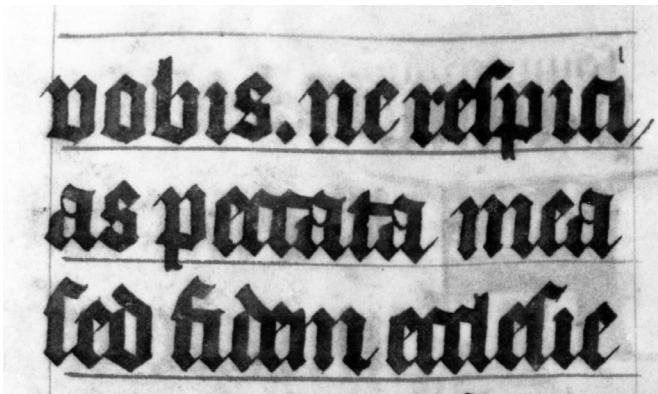
⁵³ Vervliet, *Sixteenth-Century Printing Types of the Low Countries*, p.178.

Side bearing



These are the vertical boundaries that mark the character widths. In contrast with digital type, side bearings in movable type are physically present as the edges of the metal rectangles on which the letters are placed.

Textura



This is a collective term for variants of the Carolingian minuscule, in which the curvature is suppressed. The most formalised one, which was translated into type in the fifteenth century, is the 'textura quadrata'. A less formal variant that is less angular is known as 'textura rotunda'.⁵⁴

Typefounding

This is a general term for the manufacturing of metal type. Typefounding was originally practised by the producers of foundry type, which was used for typesetting by hand. From the end of the eighteenth century the term also became applicable for type produced by casting machines, like the Monotype and Linotype hot metal typesetters.

⁵⁴ Vervliet, *Sixteenth-Century Printing Types of the Low Countries*, p.37.

Typesetting

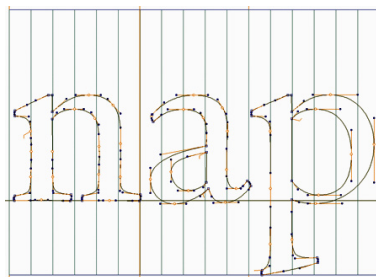
This is the process of composing lines with type. This can be done manually with foundry type, but can also be done using a keyboard for hot metal composing, photo typesetting, and digital typesetting. Until the rise of desktop publishing, typesetting was a separate profession that required special skills. Nowadays the graphic designer directly shapes digitally submitted texts.

Typography

In general, this is considered a formalised reproduction of handwriting, although some consider it to be more closely related to lettering. In the case of the latter, every letter is drawn or painted separately, for instance on a shop window. In *An Essay on Typography* Eric Gill describes typography as the reproduction of lettering via movable type.⁵⁵ The fact that Gill relates typography to lettering can be explained by the fact that he was a sculptor and letter carver. In his definition, the more handwriting-oriented Gerrit Noordzij put the emphasis on calligraphy by describing typography as writing with prefabricated letters.⁵⁶ Typographer and poet Robert Bringhurst describes typography as ‘idealised writing’.⁵⁷

With the invention of movable type came typography. The typographer restores the patterns from the type designer (punchcutter) and optimises the conditions in which the type has to function. Just like the calligrapher, the type designer creates patterns. However the type designer splits up the patterns into a collection of movable rectangles for distribution.

Unitisation (of type)



This is the translation of the proportions and widths of characters and word spaces into common denominators. This results in a unit-arrangement system.

⁵⁵ Eric Gill, *An Essay on Typography* (London: Lund Humphries, 1988), p.66.

⁵⁶ Gerrit Noordzij, *The Stroke: Theory of Writing* (London: Hyphen Press, 2005), p.49.

⁵⁷ Bringhurst, *The Elements of Typographic Style*, p.19.

Such a system can either be applied exclusively horizontally –for example to control the justification of lines– or it can also be used in a vertical direction to standardise the body size. In 1883 Linn Boyd Benton took out a patent for types made to units both in body and width. This was called ‘self-spacing’ type.⁵⁸

x-height



This is the height of the lowercase letter x. In general the term is used to indicate the height of all (parts of) letters that equal or come close to the height of the x. Round letters, such as o, usually have, for optical reasons, some overshoot above and below the x-height; otherwise they would look smaller. Although less often used, the term X-height indicates the height of the uppercase letter X.

⁵⁸ Updike, *Printing Types*, Vol.1, pp.34.

II. GLOSSARY OF PUNCHCUTTERS

In this dissertation a small handful of punchcutters are placed into the spotlight, but there were many more. If one looks at punchcutters from the Renaissance Low Countries and France alone, one finds names such as Cornelis Henriczoon Lettersnijder, Jan Dinghelsche, Jan Thibault, Maarten de Keyser, Joos Lambrecht, François Guyot, Ameet Tavernier, Antoine Augereau, Pierre Haultin, Jacob Sabon, Jean Vatel, François Gryphius, Michel Du Boys, Charles Chiffin, Julien Du Clos, and many others. Today they are perhaps not as famous as the punchcutters mentioned in this glossary because their role in the history of printing type was limited, but nevertheless quite a lot of them produced great type.

Fournier, Pierre Simon (1712–1768)



French punchcutter, typefounder, and author of *Manuel Typographique, Utile aux Gens de Lettres, & à Ceux Qui Exercent les Differentes Parties de l'Art de l'Imprimerie* from 1764–66. This book contains directions for producing foundry type.

Fournier criticised the Romain du Roi and is well known for his adage that the eye should rule.⁵⁹ Harry Carter writes about Fournier:

His grasp of typography was so complete and so firm that he could venture into every corner of it, its literature, its history, its relation to greater things, writing, architecture, music. He was as much an artist as a mechanic, and to a less extent a man of letters.

⁵⁹ Carter, *Fournier on Typefounding*, p.9.

Garamont, Claude (ca.1510–1561)

Not much is known about Garamont's activities as punchcutter until 1540. Probably he entered the trade in 1535.⁶⁰ Still, according to Beatrice Warde (pseudonym: Paul Beaujon) one might say that too much is known about the cutter for a critical study of his work.⁶¹ He was an apprentice to the punchcutter Antoine Augereau and was married to Guillemette Gaultier, a printer's daughter. His enterprise was not very commercially successful. However, for the development of roman type he was of great importance, because he fixed the model that found its origin in Jenson's archetypal one. In 1531 a series of roman types based on Griffo's type for *De Aetna* from 1495 was introduced by the French printers Simon de Colines and Robert Estienne and these types are attributed to Garamont.⁶² The Garamont model is still preferred 'today as the most natural and invisible of typefaces,' as Hendrik Vervliet wrote in his article 'The Garamond Types of Christopher Plantin' from 1965.⁶³

Garamont's name is often written as 'Garamond'. Vervliet writes in a footnote to his article that he makes a distinction between Garamont the punchcutter and the 'Garamond' types. Garamont's types are already indicated as such in specimens dating from the end of the sixteenth century.⁶⁴ Although I could not find any sources for this assumption, I once heard in the Museum Plantin-

⁶⁰ Hendrik Désiré Louis Vervliet, *French Renaissance Printing Types* (New Castle: Oak Knoll Press, 2010), p.39.

⁶¹ Paul Beaujon, 'The 'Garamond' Types: xvi & xvii Century Sources Considered', *Fleurion Anthology* (London: Ernest Benn Limited, 1973), pp.181–213 (p.181).

⁶² Martin Lowry, *Nicolas Jenson and the Rise of Venetian Publishing in Renaissance Europe* (Oxford: Basil Blackwell, 1991), p.221.

⁶³ Hendrik Désiré Louis Vervliet, 'The Garamond Types of Christopher Plantin', *Journal of the Printing Historical Society*, Number 1, (London, 1965), pp. 14–20 (p.14).

⁶⁴ Leon Voet (et al.), *Inventory of the Plantin-Moretus Museum –Punches and Matrices* (Antwerp: Museum Plantin-Moretus, 1960), p.13.

Moretus that ‘Garamond’ was the result of stripping ‘ius’ from the latinised version of Garamont’s name: Garamondius.

Granjon, Robert (1513–ca.1590)

French master punchcutter and printer who rivals Garamont when it comes to refinement and quality. He cut new type for Plantin, and he also adapted type by Garamont, making ascenders and descenders shorter for the Antwerp printer for the purpose of economising.⁶⁵ Granjon was a prolific punchcutter, producing on average two typefaces per year.⁶⁶ Vervliet calls Granjon ‘a multinational avant la lettre’ because he sold matrices to the whole of Europe.⁶⁷

The italics of the digital revivals (a revival is an adaptation to the current technology of a historic typeface) Adobe Garamond and Garamond Premier are based on models by Granjon, although there are actually eight italics attributed to Garamont himself.

Griffo, Francesco (1450–1518)

Francesco Raibolini of Bologna, better known as Griffo, cut the punches for the roman type applied by Aldus Manutius in *De Aetna* (1495) and *Hypnerotomachia Poliphili* (1499). The punches of the two roman types were most probably cut directly on Jenson’s model. Manutius’s father-in-law Andrea de Torresani of Asola owned type from Jenson, so he had direct access to the model.⁶⁸ Griffo’s roman type model dominated the trade from the end of the fifteenth to the middle of the seventeenth century.⁶⁹ Nowadays the roman from 1495 in particular is commonly in use, and still under the name ‘(Monotype) Bembo’.

⁶⁵ Hendrik Désiré Louis Vervliet, *The Palaeotypography of the French Renaissance* (Leiden: Brill, 2008), p.216.

⁶⁶ Vervliet, *French Renaissance Printing Types*, p.44.

⁶⁷ Ibid., p.44.

⁶⁸ Horatio Forbes Brown, *The Venetian Printing Press* (New York: G.P. Putnam’s Sons, 1891), p.46.

⁶⁹ Stanley Morison, *A Tally of Types: Cut for Machine Composition and Introduced at the University Press, Cambridge 1922–1932* (Cambridge: Cambridge University Press, 1953), p.32.

Gutenberg, Johann(es) Gensfleisch zum (ca.1398–1468)

German goldsmith to whom is attributed the invention of producing, and printing from movable Latin type. Gutenberg belonged to the family of Gensfleisch, a patrician clan from Mainz. This city was well reputed for the number and skills of its workers in precious metal. Johann's father was associated with the archiepiscopal print.⁷⁰

Gutenberg's enterprise was complex and required huge investments.⁷¹ The role of his invention for the distribution of information can hardly be overestimated. It is considered one of the most crucial developments in the history of civilisation,⁷² and Gutenberg was therefore elected 'Man of the Millennium' in a poll by *The Sunday Times* at the end of 1999.

Jenson, Nicola(u)s (ca.1404–1480)

French engraver and master of the Royal mint at Tours, who became type founder and printer. Jenson is considered to have been the most competent technician in the typographic métier during his time. After studying printing and type founding

⁷⁰ Victor Scholderer, *Johann Gutenberg: The Inventor of Printing* (London: The Trustees of the British Museum, 1970), p.9.

⁷¹ John Man, *Gutenberg, How One Man Remade the World with Words* (New York: John Wiley and Sons, 2002), p.149.

⁷² Adriaan van der Weel, *Changing our Textual Minds* (Manchester: Manchester University Press, 2011), p.10.

in Mainz, he established a highly esteemed printing firm in Venice around the end of the 1460s. The possibility cannot be dismissed that he learned type founding directly from Gutenberg.⁷³ It is not certain that Jenson cut the gothic and roman types he applied himself; it is possible that he hired a punchcutter for the execution. In 1475 Pope Sixtus IV made Jenson a Count Palatine, which proves his status as type founder and printer in his time.⁷⁴ Jenson influenced the development of human communication not only during his life but also after his death, because of his reputation among his successors.⁷⁵

Keere, Hendrik van den (ca.1540–1580)

Hendrik van den Keere the Younger of Ghent is considered the greatest Flemish punchcutter of the sixteenth century.⁷⁶ Voet writes in *The Golden Compasses*:

Although his roman alphabets never quite equalled the elegance of his French models, they were nevertheless strongly designed, easily legible, and at the same time economical, because of their smaller ascenders and descenders. His speciality, however, was the ‘flamande’: his black letter alphabets were among the most beautiful ever designed. On 7th January 1568 he supplied Plantin with 21 matrices for fleurons and on 16th June 1569 he contracted to deliver strikes of a nonpareil gothic within five to six weeks. Orders did not become really frequent until after Granjon’s departure, but from 1570 until his death in the summer of 1580, Van den Keere supplied Plantin with punches and matrices with unrelenting regularity, and supplemented or modified existing sets, greatly extending the Plantinian typographical collection. Altogether the Ghent craftsman delivered 44 sets of punches and matrices (14 roman, 14 Gothic, 1 cursive italic, 1 civilité, 2 Greek, and 12 music types), and also a number of fleurons and various signs.⁷⁷

Van den Keere’s Paragon Romain, which is considered by Vervliet to be ‘one of the truly outstanding designs originating in the Low Countries,’⁷⁸ was adapted and enhanced for digital use by the author of this dissertation. The digital font family was released under the name DTL VandenKeere. Because Van den Keere never cut any italic type, work by his contemporary François Guyot (d.1570) formed the basis for the accompanying italics.

⁷³ Based on my investigations of Gutenberg’s textura type and Jenson’s roman type and the similarities of proportions between both types I consider this plausible.

⁷⁴ Morison and Day, *The Typographic Book 1450–1935*, pp.27,28.

⁷⁵ Lowry, *Nicolas Jenson and the Rise of Venetian Publishing in Renaissance Europe*, p.174.

⁷⁶ Vervliet, *Sixteenth-Century Printing Types of the Low Countries*, p.30.

⁷⁷ Voet, *The Golden Compasses*, Vol.2, pp.73,74.

⁷⁸ Vervliet, op. cit., p.252.

Moxon, Joseph (1627–1691)

Besides being a hydrographer, Joseph Moxon was also an instrument maker, a lexicographer, and a printer, a punchcutter, and a typefounder. His account of the typefounders' practice and printing, titled *Mechanick Exercises on the Whole Art of Printing*, from 1683–84 has become especially famous and is often cited, including in this dissertation. *Mechanick Exercises* is the oldest detailed source of information about the typefounders' practice. The only other source is Fournier's *Manuel Typographique, utile Aux Gens de Lettres* from 1764–1765. Because no information is known from the times of Gutenberg and Jenson, Moxon's and Fournier's descriptions are often projected on the Renaissance typefounders' practice. In this dissertation this projection is questioned.

The first evidence of Moxon's activities as punchcutter and typefounder dates from 1667. He printed a type specimen sheet in 1669.⁷⁹ Moxon was not trained as punchcutter or caster: 'He himself said that he had never been properly taught the art of type-founding, but had taken it up solely through his interest in the subject – as was the case with many celebrated type-cutters before and since.'⁸⁰ Moxon's types are not highly regarded, but *Mechanick Exercises* is an impressive account of the seventeenth-century typefounder's practice.

⁷⁹ Moxon, *Mechanick Exercises*, pp.xxxv,xxxvi.

⁸⁰ Updike, *Printing Types*, Vol.I, p.9.