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Of marks and meaning : a palaeographic, semiotic-cognitive, and comparative analysis of the identity marks from Deir el-Medina.

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OF MARKS AND MEANING

A PALAEOGRAPHIC, SEMIOTIC-COGNITIVE, AND COMPARATIVE ANALYSIS OF THE IDENTITY MARKS FROM DEIR EL-MEDINA

Proefschrift

ter verkrijging van de graad van Doctor aan de Universiteit Leiden, op gezag van Rector Magnificus prof.mr. C.J.J.M. Stolker, volgens besluit van het College voor Promoties te verdedigen op woensdag 7 september 2016 klokke 13.45 Uur.

door

Kyra Valeska Jorinda van der Moezel

geboren te Vleuten

in 1987

'In the process of reasoning, signs fulfill the function of useful and necessary tools since they serve as an 'abbreviation' of the more complex semantic concepts which they represent'

Gottfried Wilhelm Leibniz
Paraphrased in Nöth, Handbook of Semiotics, 22

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FOREWORD

THE DISSERTATION that lies before you concerns the workmen's identity marks from Deir el-Medina. Deir el-Medina is the modern name for the site of the New Kingdom village on the West Bank of ancient Thebes, which housed the workmen who constructed the royal tombs in the Valley of the Kings and the Valley of the Queens. Deir el-Medina is known among Egyptologists for the major corpus of written documentation on all sorts of topics including private business, legal matters, religious and literary texts as well as administration of the work in the Theban Necropolis. The number of documents that derive from the village is truly unsurpassed. The reason for this, as well as for their good state of preservation, is first of all the fact that the village lay isolated in the desert protected from the more humid conditions in the Nile Valley. A second important fact is that the village was only inhabited for a certain period of time and was left untouched after abandonment. Therefore, the site itself remained well-preserved, which provided us with a wealth of archaeological material as well. On the basis of these rich documentary and archaeological sources, not only the work carried out by the Necropolis workmen can be studied in more detail than anywhere else in Egypt, also the personal life of the villagers reveals itself in all its facets. They appeared to have been active artisans, writers, and businessmen, who lived their daily lives working, settling business or arguments with other villagers, practicing religion and celebrating feasts. Their lives are known to a great degree of detail.

Construction of the village began under Thutmosis I, the period to which we can date the earliest evidence concerning the history of Deir el-Medina.[1] With a hiatus during the Amarna period the village was inhabited until the reign of Ramesses XI. The lifespan of habitation in Deir el-Medina is therewith estimated from approximately 1550 to 1070 BCE. During this timespan the workmen made intensive use of marks to convey their identity on ostraca, pottery, tools and all kinds of domestic and funerary objects, as well as in graffiti throughout the Theban Mountains. The marks were also used in administrative records with the aim to identify the workmen in relation to their work in the Theban Necropolis. The earliest marks on ostraca that could be dated with certainty come from the reign of Amenhotep III, but it is possible that some go back as far as the reign of Thutmosis III. The last dated marks come from the reign of Ramesses XI. The marks have been known to Egyptologists since the first archaeological excavations of the village proper along with its cemeteries by Bruyère under the auspices of the *Institut Français d'Archéologie Orientale* in Cairo. Bruyère published his results in the series *Rapports sur les fouilles de Deir el Médineh* (1922-1951), in which he included several potsherds and ostraca with marks.[2] He did not, however, study them in detail, and he designated the marks generally as 'marques' or 'marques de potérie'.[3] Also after Bruyère the marks were noted, but as nobody could read or interpret them they remained to be variously called 'signes', 'marques', 'enigmatic' or 'cryptic' signs', 'signes cabalistiques' or 'funny signs'.[4] It was only after a study by

[1] Especially revealing was the discovery of bricks which were used in the village's surrounding walls, and which were stamped with the cartouche of Thutmosis I. Bruyère, *Rapport sur les Fouilles de Deir el Médineh* III, 26 (Fig. 2), 29.
[2] E.g. Bruyère, *Rapport sur les fouilles de Deir el Médineh 1948-1951*, pl XVIII nr. 01 with the beautiful key piece for dynasty 18 'Bruyère 1', now in the *Institut Français D'Archéologie Orientale* in Cairo, numbered IFAO OL 6788.
[3] See, for instance, the publication of his archives online:
http://www.ifao.egnet.net/bases/archives/bruyere/?id=MS_2004_0148_011 and
http://www.ifao.egnet.net/bases/archives/bruyere/?id=MS_2004_0166_009.
[4] Haring, 'Towards decoding the necropolis workmen's funny signs', *GM* 178 (2000), 47 and references.

McDowell of the ostraca in the Huntarian Museum in Glasgow in 1993[5] that the nature and purpose of the marks gradually became clear. She suggested that the marks ostraca could refer to the roster of day-duties (*wrš*), which give day-by-day recordings of workmen who were 'on watch' to receive provisions for the villagers that were brought from the Nile Valley up to Deir el-Medina. As these duty rosters contain dates, they have been an invaluable aid in the precise dating of hieratic ostraca from the reigns of Ramesses III and IV, but they now also appeared to be an aid in dating the ostraca inscribed with marks that convey similar information. The comparison of the marks ostraca to the duty-rosters led to the identification of individual mark owners: workmen who made use of personal identity marks. McDowell had already noted that some marks seemed to refer to proper names, such as for *Kɜsɜ* and for *Ms*. Haring made this very plausible when he elaborated on the idea of personal workmen's marks.[6] A key piece for him was marks ostracon Berlin P 12625, which shows entries of marks preceded by dates. The day-entries he compared to duty rosters from the end of the reign of Ramesses III and the first years of Ramesses IV. This led to a list of identifications between workmen and marks, the key marks being for *Kɜsɜ* and his son *Pn-ʿnḫ.t*, for *Ms*, for *Mry-Rʿ* and his son *Nfr-ḥtp*, for *Ḥr* and for *Wsr-ḥɜ.t*.

It soon became clear that the use of marks in Deir el-Medina was something more than casual. Indeed, the marking system is remarkable in several respects. First, the marks convey *individual* identity. Whereas systems of identity marks were known in Egypt since the Early Dynastic period onwards, they usually convey collective identity, referring to workmen's teams, workshops, (temple) institutions or domains. Second, the intensity with which the identity marks were used in Deir el-Medina is exceptional for ancient Egypt, if not for marking systems as a universal phenomenon. The marks were truly omnipresent, having been used on a variety of sources and in different contexts, private as well as administrative, and secular as well as religious. The many hundreds of ostraca, objects and graffiti with marks plus the wealth of archaeological and textual data for which Deir el-Medina is renowned give us a unique chance not only to study the workings of the marking system in its historical and functional context, but also to provide a case study of a marking system for intercultural comparative purposes.

That was exactly the aim of the research project *Symbolizing Identity. Identity Marks and their Relation to Writing in New Kingdom Egypt* for which Haring received funding by the Netherlands Organisation for Scientific Research (NWO) in 2011.[7] The project included two sub-projects to be carried out by two PhD candidates, who would analyze the marking system from different perspectives. The first sub-project was to include a palaeographic study of the system and its origins and a theoretical semiotic-cognitive study of its workings as compared to linguistic writing, as well as a comparative study of marking systems as a universal phenomenon. The second sub-project concerned a study of the historical functioning of the system in the village of Deir el-Medina, including a study of the mark-users, their degree of literacy and the exact role of the marks ostraca in the administrative functioning of the Theban Necropolis.[8]

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[5] McDowell, *Hieratic Ostraca in the Huntarian Museum Glasgow*.
[6] Haring, 'Towards decoding the necropolis workmen's funny signs', *GM* 178 (2000), 49-56.
[7] The research proposal can be found here: http://media.leidenuniv.nl/legacy/haring-symbolizing-id.pdf.
[8] The second project was carried out by Daniel Soliman. See Soliman, *Of Marks and Men. The Functional and Historical Context of the Workmen's Marks of the Royal Theban Necropolis*.

The present thesis concerns the first sub-project. Three main questions are central to it:

1. What is the form and graphic nature of the marking system?
2. What is the meaning of the marks and how do they convey that meaning?
3. How can the relation between marks and writing be defined?

The questions will be answered in an Introduction and three Parts that embed the marks from Deir el-Medina in a palaeographic, a semiotic-cognitive, and a comparative context and that discuss their relation to writing as a system of visual communication. In the Introduction we review the traditional and current status of marking systems as nonlinguistic systems of visual communication in relation to linguistic writing systems: how are both defined, and how could or should they be defined? Therewith, we create a theoretical frame that throughout the dissertation serves as a background against which to discuss the nature of the marking system from Deir el-Medina and its relation to writing.

Part I provides a palaeographic analysis of the system. It introduces the reader to the system by providing a classification, a description of forms and style, a description of formal and stylistic developments and an embedding of the marks in the context of other, earlier ancient Egyptian marking systems. It consists of three chapters. Chapter 1 focuses on classification and the problems inherent in any classification. It addresses the questions 'What are the actual marks?' and 'To what extent can we say that a mark carried phonetic or pictorial value?'; that is, 'To what extent can we say that a mark was inspired by hieroglyphic or hieratic script, or rather by a concrete object or being?'. The system includes marks with forms that seem to have been derived from hieroglyphic or hieratic script, but also marks with forms that do not seem to occur in script and rather represent concrete objects or beings. Yet, if hieroglyphic script itself consists of representations of concrete objects or beings, where can we draw the line? This problem as well as a development toward ever more influence from script will be reviewed. Chapter 2 primarily focuses on the questions 'What was the origin of the marks' and 'How were they created or selected?'. It discusses earlier Egyptian marking systems and compares them as sources of formal and functional inspiration to the marks from Deir el-Medina. Chapter 3 concerns the palaeographical tables with facsimiles of all specimens (Table I3-2) and metadata (Table I3-1), as well as information on how the facsimiles as well as the font that is used throughout this dissertation were created. The Tables are given as appendices in digital form as they are too elaborate to be included in the text. It is advised to consult the tables when reading the text especially of chapter 1; references are given when consultation of the tables is necessary for correct comprehension of the text.

As it appears from Part I that a classification and analysis of the marking system on the basis of palaeographical study alone is insufficient for a correct assessment of the nature and functioning of the system, Part II contains a detailed semiotic-cognitive analysis that addresses the question 'How do the marks convey meaning?'. It attempts to accommodate the marks in a model that explains their nature and functioning, as well as the structure of the system in general. It consists of three chapters. Chapter 1 is a short introduction to the field of semiotics, giving the main questions it is concerned with as well as the reason for using it in the frame of the present dissertation. Chapter 2 is an intensive chapter that leads the reader through a number of semiotic theories and models that concern the analysis of linguistic and nonlinguistic systems of visual communication. The chapter has been set up so as to lead toward an integrated model that makes use of aspects of all theories and models discussed. The outcome is a synthetic multi-layered model that accommodates the manners in which the marks generate

meaning and which is based on a theory that explains the nature and function of the marks on the basis of graphic, graphic rhetoric, phonetic and phonetic rhetoric signification. Chapter 3, then, forms a bridge toward the cognitive sciences and enters into the question how the human brain is involved in the processing of linguistic and nonlinguistic information. It specifically focuses on the question of how we can accommodate the semiotic theories and models of chapter 2 in our human cognition.

Part III, finally, provides a comparative analysis of the system from Deir el-Medina and similar systems with the aim to study the practice of using marks as a universal phenomenon and the position of the Deir el-Medina marks within this phenomenon. A number of marking systems from other times and places was selected on the basis of availability of published research. Chapter 1 of Part III primarily focuses on the question 'Which characteristics of marking systems are in fact universal?'. It discusses the marking systems with respect to formal composition, function and development. Chapter 2 primarily focuses on the question 'How can the status of marking systems in relation to linguistic writing be defined?', and involves again the traditional and current ideas on nonlinguistic marking systems in relation to linguistic writing as were discussed in the Introduction.

The dissertation ends with a Conclusion that offers an answer to the three main questions that were outlined above.

Two further notes should help the reader go through the work that follows. First, during the four-year project a database was kept which contains photographs and metadata of all our research material, including ostraca, pottery, tools, building blocks, domestic and religious objects, as well as graffiti with workmen's marks. This database is available with a guest account. When its consultation is convenient to the reader with regard to a correct understanding of the text this is mentioned in a footnote that refers to the Database *Symbolizing Identity*, giving key terms to ease the search. Second, an explanation of the different fonts that are used throughout the text and the appendices may be useful. For the representation of hieroglyphs as known from hieroglyphic script I made use of the program JSesh. Transliterations are in *ṯrlỉt_ŚG ṯỉmes*. For the marking system, including those marks that are related to hieroglyphic or hieratic script, I made use of the font specifically created for the marking system.[9] For the representation of specific specimens of marks I have used the facsimiles as they are presented in Table I3-2. By using these facsimiles it was possible to show graphic variations between specimens of the same mark and font-type. Facsimiles were also used in the text to represent those marks that had not yet received a font-type at the time of writing. The reason why several marks were not yet included in the font is explained in Part I, chapter 3.

I take this opportunity to express my deep gratitude to many without whom this dissertation would not have been achieved. First of all, I am particularly grateful to Ben Haring and Daniel Soliman for their cooperation, valuable discussions, useful critiques and reflections as well as the encouragement and support they offered during the last four years of funny signs. I would also like to thank Professor Olaf Kaper for the time invested, and Rob Demarée for always bringing us new material and insights. The work carried out by Hans van den Berg in creating the database *Symbolizing Identity* and the font used for the identity marks was indispensible, as was the assistance provided by Suzanne Knauff and Rikst

[9] Many thanks go to Hans van den Berg and Rikst Ponjee for their assistance in the creation of this font. Details on how the font-types were created are given in Part I chapter 3.

Ponjee. Their help in maintaining the database, even after our second return from Cairo with hundreds of new documents, is much appreciated. Rikst furthermore deserves special thanks for her assistance in creating the font and in organizing conferences, as well as for the good old Fridays that were dominated by tea. I wish also to express my gratitude to Kathrin Gabler, and to Alex de Voogt and Dirk de Vries for valuable discussions and for offering their advice and insights on various topics. My appreciation also goes to the organizers and participants of the conferences *The Idea of Writing* (Alex de Voogt) and *Non-Textual Marking Systems* (Frank Kammerzell, Julia Budka, and Petra Andrássy) over the years 2011-2014. It was during these conferences that I found inspiration in the insights and material generously shared by fellow scholars. The Department of Egyptology at Leiden University, The Netherlands Institute for the Near East (NINO), and the Leiden Institute for Area Studies (LIAS) have all been indispensable for the resources offered. Carola Bronkhorst deserves special appreciation for her help in making it through the last mile, as well as for the necessary moments of distraction. Finally, I would like to thank my mother, Annemiek Steenbergen, for her help and support, as well as my father, Bob van der Moezel, and my brother and sister, Rowan and Maroussia, for their encouragement throughout my study. My special thanks go to Alper van Sijl for supporting and encouraging me, for giving me advice and keeping me on track, for offering perspective and reflection, but above all for his confidence in me. No matter how far apart, the knowledge that you are there keeps me going on.

Kyra van der Moezel

INTRODUCTION

DEFINING VISUAL COMMUNICATION

WE TEND TO think of communication in terms of speech and writing: speech as the oral expression of language and writing as its graphic expression.[1] This thought can be traced back to ancient Greece, particularly to a statement written by Aristotle around 350 BC:

> *'Spoken words are the symbols of mental experience and written words are the symbols of spoken words'*[2]

This statement was understood in the sense that spoken signs are the key to language systems, while written signs are merely their representations, serving only to their needs. Even though Aristotle had not meant to say this,[3] writing thus came to be considered written speech: spoken language recorded by marks the basic function of which is phonoptic.[4] Western scholars throughout the Middle Ages and the Early Modern Period held the view of writing as a visible *surrogate* or *substitute* for speech. This view, called 'the surrogational model' by Harris,[5] was prevailing especially in the 18th and 19th centuries. The French missionary De Brébeuf, for instance, in translating the poem Pharsalia by Lucan, spoke of 'cet art ingénieux – de peindre la parole et de parler aux yeux'.[6] In similar fashion Voltaire's famous quote reads 'l'écriture est la peinture de la voix : plus elle est ressemblante, meilleure elle est.'[7] The Irish poet Trench in 1855 spoke of 'representing sounds by written signs, of reproducing for the eye that which existed at first only for the ear'; and 'The intention of the written word' is 'to represent to the eye with as much accuracy as possible the spoken word.'[8] The surrogational view was still popular in much of the 20th century. The historian and assyriologist Gelb defined 'full writing' as the 'written substitute for its spoken counterpart', as a 'vehicle through which exact forms of speech could be recorded in permanent form', and as a 'device for expressing linguistic elements by means of visible marks'.[9] In his words, 'The original object of writing is the creation of symbols which stand for words of the language.'[10] The linguist Bloomfield stated that 'Writing is not language, but merely a way of recording language by means of visible marks'.[11] Last but not least, sinologist DeFrancis wrote that 'all full systems of communication are based on speech. … no full system is possible unless so grounded'. He even declared that writing was *the only system that could*

[1] Cf. Gelb, *A Study of Writing*, 9; Defoort, *Het woekerende schrift*, 13.
[2] Aristotle, *On Interpretation*, part I section 1.
[3] Harris, *Rethinking Writing*, 23-24 explains that Aristotle's concept of 'symbol' is to be distinguished from the concept of 'representation'. Aristotle did not describe written signs as representations of spoken signs; rather, written and spoken signs are two different and unique, yet complementary systems of signs.
[4] i.e. serving to represent sound, to make sound visible. Harris, *Rethinking Writing*, xii.
[5] *Ibid*., xi-xii, 26-27, 34-37.
[6] Mentioned by Gelb, *A Study of Writing*, 13 without reference, but see Larousse, *Grand Dictionnaire Universel du XIX^e Siècle*, Tome 2, article 'Brébeuf (Guillaime de)', and Tome 12, article 'Pharsale'.
[7] Mentioned in Harris, *Rethinking Writing*, xii without reference, but see Voltaire, *Oeuvres complètes* II, article 'Orthographe'. Voltaire wrote this article originally in 1764, but renamed the edition of 1769 *La Raison par Alphabet*. See Mervaud, *Le Dictionnaire philosophique de Voltaire*, 41-42.
[8] Trench quoted by Harris, *Rethinking Writing*, xii.
[9] Gelb, *A Study of Writing*, 10-13, 24.
[10] *Ibid*., 97.
[11] Bloomfield, *Language*, 21 (2.1), 282 (17.1).

be used to convey thought in visible form because it records speech, and speech had evolved as the fullest and most efficient means of conveying thought.[12]

The view on writing as graphically recorded speech implied the idea of writing as an evolutionary goal. The 20th century saw a rise of several models of visual communication, which all progressed from rudimentary and primitive pictures toward ever more advanced systems that recorded speech more accurately, culminating in the modern Western alphabet as the most efficient and complete replication of speech.[13] For instance, the philologist and historian Taylor presented a sequential development of five stages:[14]

1. Pictures;
2. Pictorial symbols;
3. Verbal signs;
4. Syllabic signs;
5. Alphabetic signs.

DeFrancis presented a sequence quite similar to this which ranged from pictures via rebus symbols and syllabic systems to alphabetic writing systems. Only the latter were acknowledged as 'full writing', while the other stages were designated as 'partial', 'limited', 'pseudo-' or 'non-writing'.[15] Gelb's sequence included the phases of 'No writing', 'Forerunners of writing' and 'Full writing'. The first stage he called the 'semasiographic stage … in which meanings – not words or sounds – are suggested by signs'.[16] This 'primitive semasiography' is 'outside of our normal system of writing';[17] that is, it is No(t) writing. The subsequent stage of 'Forerunners', Gelb argued, consisted of several forms of human intercommunication that served 'as the basis for the ultimate evolution of writing'.[18] This ultimate evolution, or 'the most developed form of writing', was the last stage of full alphabetic writing.[19] Gelb presented these phases in a rigidly linear progression: apparently, there was no way back 'once man discovered a way of expressing exact forms of speech in written signs'.[20] In a similar way, Bloomfield spoke of writing as 'an outgrowth of drawing'.[21] The first stage in his sequential model was represented by pictures, which 'fall short of writing in accuracy, since they bear no fixed relation to linguistic forms'.[22] The second stage was represented by conventional and uniform characters, which developed from pictures and which people produce and to which they respond in a certain conventional way. The final stage in Bloomfield's evolution of writing was represented by symbols, which developed from the characters and were associated with linguistic forms. Only when linguistic value began to predominate, the stage of 'real writing' was reached.[23]

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[12] DeFrancis, *Visible Speech*, 5, 7, 42; also referred to in Boone & Mignolo, *Writing Without Words*, 5-6. Writing certainly is an efficient way to convey thought, but not the fullest and by no means the only system to do so.
[13] Boone & Mignolo, *Writing Without Words*, 6.
[14] Taylor, quoted in *ibid*., 6-7.
[15] DeFrancis, *Visible Speech*, 58, 268; King, 'Visible Speech, Review', *Language* 67 no. 2 (1991), pp. 377-379.
[16] Gelb, *A Study of Writing*, 15.
[17] *Ibid*., 13, 15.
[18] *Ibid*., 36.
[19] *Ibid*., 15, 24, 36.
[20] *Ibid*., 11. It is argued below that many examples in modern Western societies prove this statement to be incorrect.
[21] Bloomfield, *Language*, 282 (17.2).
[22] *Ibid*., 283 (17.2).
[23] *Ibid*., 283-285 (17.2).

The scripts of the ancient world, such as Egyptian hieroglyphic script, the Mesoamerican systems among which Maya hieroglyphic script and the Aztec and Mixtec pictorial systems, the Easter Island Inscriptions, Sumerian and ancient Chinese, were variously interpreted, but were generally placed at the beginning or outside of the evolutionary sequence. Egyptian and Chinese, although not passing the second stage of characters in Bloomfield's thesis, were usually allocated the highest positions. Gelb considered them (together with Sumerian and Hittite) 'fully developed writing systems'; yet, he argued that they were only in their initial word-syllabic stage and, although phonetic, had not yet reached the ultimate level of the alphabet.[24] Less developed in his eyes were the Aztec and Maya systems, which he considered 'Forerunners of writing'. While he acknowledged that they contained some level of systematization and convention,[25] they were primitive in that they did not represent phonetic systems. He argued that these systems simply could not be phonetic because 'if … the Aztecs and the Mayas did not succeed in evolving a phonetic system by the sixteenth century in spite of Spanish influence, it is difficult to argue that they had had such a system in pre-Columbian days.'[26] This reasoning is representative for Gelb's idea of a strict linear evolution forward, but it turned out to be wrong: some thirty years after Gelb's statement the decipherment of Maya writing had progressed greatly and the system appears to have been a mix of logograms and syllabic signs.[27] Certainly, Gelb could not have known that in his time, but it shows that he disposed of the systems he could not understand well in 1963 as primitive and undeveloped, allocating them lower status in his evolutionary model.[28] By the time DeFrancis wrote his book *Visible Speech* (1989) more about Maya script was known, and he indeed accepted it as a syllabic system based on language. Yet, other Mesoamerican systems such as Aztec and Mixtec, which were not yet well understood, were still disposed of as non-writing. DeFrancis did not accept their pictures as structured systems of communication, and condemned pictography in general as a 'very restricted type of communication' which was to be 'clearly and categorically dismissed as limited, dead-end means of communication'.[29]

Clearly, what many scholars felt uncomfortable with were the pictorial elements of ancient systems of visual communication. This feeling most probably came forth from an inability to interpret these elements, as instead of being language-based they followed other modes of expression that were not understood. The pictures were considered drawings comparable to those made by young children, or designs for magical purposes, or expressions related to mythological ideas. Gelb stated that the Easter Island inscriptions, 'on which so much effort has been wasted by so many imaginative minds', were not even writing in the most primitive sense of the word as they probably represented nothing else but 'pictorial concoctions for magical purposes'.[30] According to Bloomfield, the Ojibwa, one of

[24] Gelb, *A Study of Writing*, 60-88.
[25] *Ibid*., 12, 59.
[26] *Ibid*., 51-57.
[27] Coe, *Breaking the Maya Code*, 246-248.
[28] This reasoning is also present in his judgment of various African forerunners of writing as against various American Indian forerunners of writing, the latter of which he described as more developed, systematized and standardized, simply because he was less familiar with the African systems (Gelb, *A Study of Writing*, 49). An example which shows that a rigid progression forward to alphabetic script, without there being a way back, is non-existent, is the Ethiopic Ge'ez language, which was written in a script that had evolved as a semi-syllabary out of alphabetic South Arabic script. See Lehmann, '27-30-22-26 – How many letters needs an alphabet?' in De Voogt & Quack (eds.), *The Idea of Writing. Writing Across Borders*, 15.
[29] DeFrancis, *Visible Speech*, 45, also referred to in Boone & Mignolo, *Writing Without Words*, 8-9.
[30] Gelb, *A Study of Writing*, v, 60-61. For other systems of visual communication given a magical interpretation by Gelb, see pp. 25-26, 36. It is now known that the Easter Island inscriptions were written in the, not yet deciphered, script of the Rapa Nui people. See, for instance, Pozdniakov & Pozdniakov, 'Rapanui Writing and the Rapanui Language', *Forum for Anthropology and Culture* 3 (2006), 89-122.

the largest groups of Northern American Indians, represented the notion of 'ill omen' by an owl, in accordance, '*no doubt*, with some tribal belief'.[31] He continued to state that in situations that do not lend themselves to drawing, we may suppose that the 'picture-user … actually spoke to himself and tried out various wordings of the troublesome message'.[32] This message was, of course, first and foremost 'troublesome' to Bloomfield and not to the 'picture-user', who may have known exactly what he was doing in a system of graphic communication that was simply unlike the phonoptic system Western scholars were so intensely focused on.

The evolutionary model of writing had further implications on a social level. Harris notes that the various evolutionary stages were taken as diagnostic indicators of levels of civilizations or mental progress among the peoples of the world.[33] As a prototypical example he quotes Rousseau in *Essai sur l'origine des langues* (1781), who linked pictography to savage peoples, word- and syllabic writing to barbaric peoples, and alphabetic writing to civilized peoples [*peuples policés*].[34] At the end of the 19th century this idea was echoed by nota bene the first professor of anthropology in Oxford, Burnett Tylor, who wrote that 'the invention of writing was the great movement by which mankind rose from barbarism to civilization'.[35] In similar manner, in 1949, the linguist Diringer argued that 'In the growth of the spiritual human advance, that is of civilization, the origin and the development of writing hold a place of supreme importance'.[36] In 1989, still, DeFrancis condemned those peoples who made use of pictorial communication as living in 'culturally limited societies'.[37]

Alphabetic writing was, and often still is, equated with civilization and associated with literacy. The societies not having reached it are variously designated as 'illiterate', 'non-literate' or 'preliterate'. Boone, specialized in Pre-Columbian Mesoamerican art and writing, is right in rejecting all three terms. 'Illiterate' has the connotation of 'uneducated'; 'non-literate' implies that a society lacks something, as a result of which its people are culturally deficient; and 'pre-literate' carries evolutionary expectations, conveying the sense that alphabetic writing as ultimate achievement and indispensible basis of progress is a universal goal, and that all societies are somewhere along the road to it.[38] The societies of the Aztec and Maya are completely thrashed by Gelb, who described them as primitive without any cultural *tour de force* in analogy to their undeveloped inscriptions. A fully developed culture could only be reached through a fully developed alphabetic writing system.[39] This idea is still central in a recent movement within communication theory called the Alphabet Effect, which promotes the hypothesis that alphabetic scripts have encouraged and developed several cognitive skills such as abstraction, analysis, classification, coding and decoding.[40] The term

[31] Bloomfield, *Language*, 284 (17.2); my emphasis.
[32] *Ibid*., 284-285 (17.2).
[33] Harris, *Rethinking Writing*, 1.
[34] *Ibid*., 2, quoted from Rousseau, *Essay on the Origin of Languages*, 17.
[35] Harris, *Rethinking Writing*, 4, quoted from Burnett Tylor, *Anthropology*, chapter 8.
[36] Diringer, quoted in Harris, *Rethinking Writing*, 5.
[37] DeFrancis, *Visible Speech*, 47, 57. In anticipation of what follows, we may remark here that DeFrancis probably did not realize that every person in the modern Western world makes use of pictorial communication every day, be it in the form of traffic signs, pictograms in public buildings, pictures on food packages, laundry labels in garments, and so forth.
[38] Boone & Mignolo, *Writing Without Words*, 4; Harris, *Rethinking Writing*, 7, 15.
[39] Gelb, *A Study of Writing*, 57-58.
[40] Yet, to my knowledge this hypothesis was not compared to cognitive skills acquainted on the basis of non-alphabetic scripts. Since all visual communication is cognitively processed, it would be wrong to argue that cognitive skills are only encouraged by the alphabet. For more information on the cognitive and neurological processing of visual communication, see Part II, chapter 3.

'Alphabet Effect' was coined by the media ecologist Logan, who on the basis of this hypothesis claimed among others that China has a lack of theoretical science due to the non-alphabetic nature of Chinese writing.[41]

How did we come to focus so strongly on the alphabet? Why is it that we only consider someone literate if he or she has learnt to read and write on the basis of a modern Western alphabetic system? Why do many European languages still denote illiterate persons as *analphabète* (French), *analfabeet* (Dutch), *Analphabet* (German), *analfabeter* (Danish), or *analfabéta* (Hungarian), equating lack of knowledge of the alphabet with illiteracy in general?

At least two socio-economic processes stood at the basis of the development that made the alphabet our primary standard. First, the late 19th century saw the rise of many evolutionary models, which were being pursued throughout the natural and social sciences in the light of scientific positivism.[42] A famous example is, of course, the theory of evolution by Darwin (1859). Many such models had a strong bias toward European norms and values. The evolutionary models of writing fitted right in. Second, the change from agrarian to industrial societies in many Western nations and the progression of democratization, leading to economic and political modernizations at the turn of the 19th and 20th centuries, made knowledge of reading and writing a necessary means to participate in society. In Britain it was Disraeli who implemented the Education Act in 1876, which stated that 'It shall be the duty of the parent of every child to cause such child to receive efficient elementary instruction in reading, writing, and arithmetic.'[43] In the Low Countries the first compulsory education law dates to 1900, although before that time 85 to 90% of the children was already attending school. By the middle of the 20th century it had become impossible to participate successfully in society without the ability to read and write.[44] As such, the progression of society as well as the progression of any member in society were related to knowledge of reading and writing in the system used in the West, the alphabet.

The association of writing with spoken language and the perceived superiority of the alphabet in relation to other forms of communication, has moved us away from recognizing alternative forms of recording and interpreting complex human knowledge. Fortunately, in recent years more people have become aware of the fact that the alphabet is by no means 'the only system that can be used to convey thought in visible form.'[45] There are many more visual systems of recording and communicating information, and evidence against a linear evolutionary development of writing is not difficult to find. One need only think of brand marks, traffic signs, pictograms to communicate warnings or to identify locations, emoticons, maps and diagrams, scientific and musical notation, religious symbolism, and emblems of tribes, clans or families such as coats of arms to understand that, in the words of Mignolo, 'the history of writing is not an evolutionary process driving toward the alphabet, but rather a series of

[41] Logan, mentioned in Harris, *Rethinking Writing*, 14.
[42] Boone & Mignolo, *Writing Without Words*, 6.
[43] Elementary Education Act 1876, chapter 79 article 4. To be found online: http://www.educationengland.org.uk/documents/acts/1876-elem-educ-act.html.
[44] Personal communication with Bob Schoemaker, PhD candidate at Leiden University pursuing research on the history of Dutch education. I would like to thank him for sharing his thoughts with me so elaborately and for providing me with literature on the topic.
[45] Cf. above, pp. ix-x with note 12.

co-evolutionary processes'[46] in which different communication systems follow their own transformations. These other systems may not be writing in the traditional sense: they may not be alphabetic, not even language-based. Yet, they replace and complement language-based writing all around us. They co-exist with the alphabet – that is, are not a previous underdeveloped stage of it – and may convey information in a different, more efficient, organized or universal way – that is, not in a more primitive way. The fact that 'different' or 'other' does not mean 'less' is a lesson which humanity in general seems to find hard to learn.

A mentality change that includes a rising appreciation for non-alphabetic forms of visual communication as well as a rejection of the evolutionary models has set in. Thus far, it has resulted in roughly two new approaches to writing. Proponents of the first approach plead a broadening of the traditional definition of 'writing'. Their theory is sometimes called 'writing integrationally defined'. Proponents of the second approach rather plead a broadening of the context in which writing and other visual systems of communication must be allocated specific places and functions. What does this entail for the new age of communication theory?

'Writing integrationally defined'

The idea to broaden the traditional definition of writing is in fact not new. A very early suggestion to include under writing not only linguistic but also other forms of visual communication is found already in the work of the ethnologist Haberlandt. In 1898 he stated that the strongest support for science is the art of writing, which, in its widest meaning, is to be found amongst every tribe on earth.[47] No human collective can be labeled nonliterate because 'Jedes Bildzeichen ist in gewissem Sinne … ein Schriftelement.'[48] Haberlandt argued that the sequencing and regulation of marks provides the basis for writing regardless of the linguistic or nonlinguistic character of the representations.

In a sense, it may even be argued that a broad interpretation of writing is also already present in the work of Gelb: in chapter one of *A Study of Writing* he acknowledged that the restricted definition of writing as the visible equivalent of speech is deficient. He argued that 'writing in the widest sense' only loosely expressed language in its early stages.[49] Gelb disagreed with linguists who dismissed the stages in which writing did not serve the purpose of recording speech as 'feeble attempts in the direction of writing, but not real writing'.[50] Yet, Gelb's terminology is ambiguous and a return to the traditional narrow definition of writing is implicit in his description of the evolutionary stages: the designations of the first two stages, 'No Writing' and 'Forerunners of Writing', suggest that only the third stage, 'Full Writing' with alphabet as the ideal, was writing in the true sense. Gelb's work is permeated with the idea that true writing conveys linguistic forms, and every mark that does not convey linguistic information belongs to a primitive stage. He emphasized a yawning gap between 'what the primitives understood as writing' and 'writing as *we* normally understand it'.[51] That gap, he

[46] Mignolo in Boone & Mignolo, *Writing Without Words*, 13.
[47] Haberlandt, *Völkerkunde*, 102.
[48] *Ibid*.
[49] Gelb, *A Study of Writing*, 10-11 (quote from p. 10).
[50] *Ibid*., 12.
[51] *Ibid*., 6, 12; my emphasis.

argued, was caused by a 'great human achievement', 'an important and decisive step which entirely revolutionized' the further progress of writing; that is, phonetization.[52]

Five years later Derrida condemned this idea that he called 'phonologism' or 'logocentrism': the view of science that establishes an opposition between speech and writing and which prefers *logos* (the 'word' or 'act of speech') over writing.[53] In fact, he stated that the concept of writing comprehends spoken language, and exceeds it; 'If writing is no longer understood in the narrow sense of linear and phonetic notation, it should be possible to say that all societies … practice writing in general.'[54] Derrida argued that no reality or concept could correspond to the expression 'society without writing'; that expression is merely 'dependent on ethnocentric oneirism, upon the vulgar, that is to say ethnocentric misconception of writing'.[55] When we speak about 'peoples without writing', this means nothing more than that they do not make use of what *we* are used to call writing. Derrida did not consider speech superior and argued that outside the domain of language, in everything that we observe in this world, there is writing in the broadest sense one can think of. Writing, for Derrida, was omnipresent.[56]

Most recently the need for a broader definition of 'writing' has been expressed both in Europe and America with respect to such diverse systems as modern brand marks and Pre-Columbian Mesoamerican systems of visual communication. In the field of Mesoamerica a scholarly dichotomy seems to exist. Those specialists working with Mayan texts tend to follow a traditional idea of writing as recorded speech in that they include the Maya hieroglyphic system in the definition of writing, but exclude the pictorial Aztec and Mixtec manuscripts.[57] Aztec and Mixtec specialists, on the other hand, clearly do consider these pictorial systems to be written communication. Boone is one of them. She argues that, while phonetic elements play a minor role, the manuscripts are largely *pictographic expressions of language* that convey meaning according to conventions and structures not necessarily related to speech.[58] Phonoptic expression is not the only form of language expression, speech is not necessarily the point of departure, and linguistic syntactical structure is not the only meaningful pattern to convey information. The traditional definition of writing, which only explains part of the Mesoamerican systems of communication, should be broadened to include those other graphic forms of expression. Boone pleads for a complete graphic catalogue so that we can 'think more broadly about visual and tactile systems of recording information' to reach a more encompassing definition of writing, which at least is needed for the analysis of the Mesoamerican systems.[59]

In the field of modern brand marketing it is especially Perrin who propagates the idea that what linguistics has labeled 'writing proper' is ethnocentric, even anthropocentric.[60] He states not only that marks such as brand marks should be considered nonlinguistic forms of writing, but also that such nonlinguistic writing systems should be interpreted in a broader biological framework: leaving marks is not merely a human phenomenon, but one that is common to all species. It is a universal practice, a

[52] Gelb, *A Study of Writing*, 11-12.
[53] Derrida, *Of Grammatology*, 3, 97-103.
[54] *Ibid*., 6-9.
[55] *Ibid*., 19-110.
[56] Defoort, *Het woekerende schrift*, 43.
[57] E.g. Coe in *Breaking the Maya Code*. Boone & Mignolo, *Writing Without Words*, 5, 13.
[58] *Ibid*., 5-6, referring to Smith and her study of Mixtec documents in *Picture Writing from Ancient Southern Mexico*.
[59] Boone & Mignolo, *Writing Without Words*, 3-4, 13-14.
[60] Perrin, 'Marks', *Elsevier Language Sciences* 33 (2011), 632; Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 92-93; Perrin, Evans Pim & Yatsenko, 'Mark Studies' in ibid. (eds.), *Traditional Marking Systems*, 14-15.

form of interspecific communication[61] that finds its origin in leaving environmental, territorial and resource marks related to survival: marking danger, fecundity, territory or food sources, and so forth. Writing defined in such a broad frame should, then, also include animal tracks and traces, for instance in the form of footprints or scents; all to be interpreted in a biological and environmental context.[62]

Thus, the theory of 'writing integrationally defined' concerns the application of the term 'writing' to various kinds of linguistic and nonlinguistic forms of visual communication, even understood in terms of human and non-human communication. Proponents warn against the dominance of linguistic writing; 'writing' is rather made an umbrella term for every form of sign-making. But how to conceive of this theory in a terminological and categorical sense? Despite being called 'writing integrationally defined', does the theory define writing at all? To argue that the term 'writing' should cover more than merely alphabetic writing is easy, but it leaves the problem of this 'more'. When the meaning of the term is extended, it becomes applicable to an enormous amount of signs and systems that differ considerably in nature and structure. The result is a vast nebula that encompasses all sorts of visual communication systems, which float around freely without being defined *per se* or in relation to one another. If both animal tracks and Egyptian hieroglyphics are argued to be 'writing', how, then, are the differences defined, and how are they both defined in relation to alphabetic writing? The question remains what writing entails precisely.

This problem did not remain unnoticed and scholars such as Boone and Perrin do in fact plead for the recognition of differences among the systems that are 'integrationally defined'. There have been attempts to internally organize the vast superordinate category that 'writing' inevitably becomes. Harris, for instance, proposed a broad and inclusive framework of writing that includes all kinds of human activity, but he propagated for a distinction between alphabetic, or 'glottic' writing in his terms on the one hand, and 'non glottic' writing on the other, as well as for further sub-categorizations in both distinctions. In addition to alphabetic writing, he acknowledged all sorts of notations (musical, mathematical), tokens and emblems as different systems of writing in their own right. Musical and mathematical notation are not linguistic, but they do require an understanding of the structural principles upon which the notations are based – principles of writing that differ from those of glottic writing.[63] Most recently, Boone has equally suggested an internal organization, distinguishing two principal kinds of writing (fig. 0-1):[64]

1. Glottographic systems of writing (Harris' glottic writing). These are basically systems that have traditionally been considered writing. They are based on speech and linguistic syntax;

2. Semasiographic systems of writing. These systems consist of signs that communicate meaning directly and independently of spoken language through pictorial value. Semasiographic systems have the same status as glottographic systems, but they differ in nature and structure: whereas the latter are lexical, semasiographic systems convey meaning according to other internal structures and conventions.

[61] i.e. a form of communication that is not characteristic to only one species, but that is shared among different species.
[62] While indeed the practice of leaving marks and messages is an interspecific phenomenon we will in this dissertation not touch upon the biological origin or zoosemiotic nature of mark making in detail. We are mainly interested in the processes that create and convey meaning specifically *by the human mind*, as well as in the relation between nonlinguistic marks and linguistic writing as systems *used and interpreted by the human mind*. For animal tracks and traces as sources of inspiration for human linguistic writing, see Part II, chapter 2, section 2.
[63] Harris, *Rethinking Writing*, viii-ix; ibid., *Signs of Writing*.
[64] Boone & Mignolo, *Writing Without Words*, 13-17.

The semasiographic systems are further divided into conventional and iconic systems.[65] To conventional semasiographic systems are allocated those systems that make use of conventional symbols, which are comparable to the conventional symbols of glottographic writing except that they are not based on speech. Examples are scientific, musical and choreographic notations. To iconic semasiographic systems are allocated all systems with signs that display a natural relation between their form and that to which they refer; that is, iconic semasiographic signs display a relation of natural resemblance with that to which they refer. Boone mentions the examples of traffic signs, signs for travelers in the airport, and cleaning instructions in garments,[66] which show in picture what they mean.

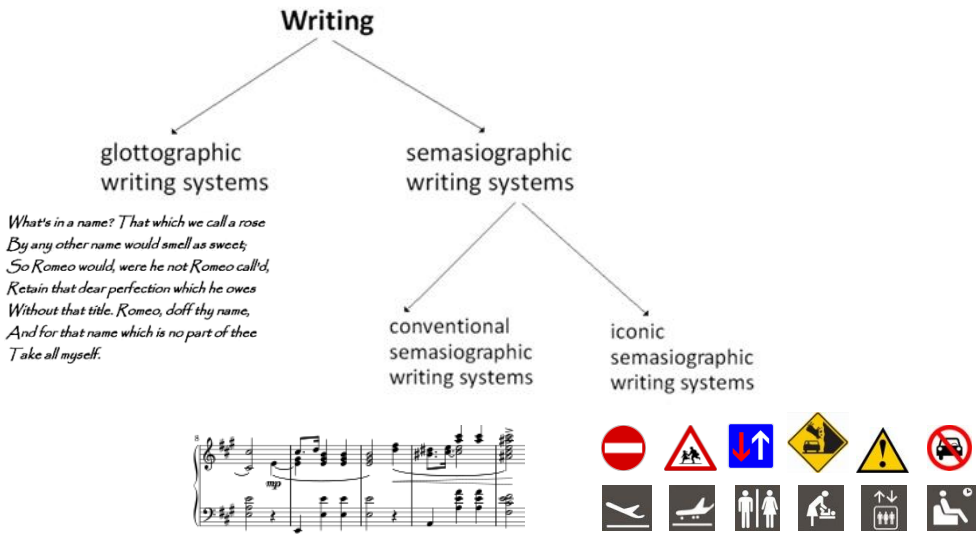


Fig. 0-1 An attempt to internally organize the superordinate category that writing inevitably becomes in the approach of 'writing integrationally defined'. Based on Boone & Mignolo, *Writing Without Words*, 13-17.

Boone notes that the distinction between conventional and iconic semasiographic systems is blurred: iconic signs usually involve conventional elements and iconic elements occur in conventional notations. Traffic signs, for instance, combine iconic semasiographic pictures of vehicles or human beings with conventional semasiographic shapes and colors: the red circle and diagonal line indicate a prohibition in , and the yellow lozenge signals caution, for instance in a sign that specifically warns against falling cows . But not only the distinction between conventional and iconic pictures is blurred; the distinction between glottographic and semasiographic systems is already blurred. What about the word 'stop' in the red hexagon of , or the inclusion of the letter P above the picture of person in wheelchair in ? From the point of view of glottographic systems, no linguistic text can be argued to be pure glottic writing;[67] even if this Introduction, for instance, would not contain figures and images inserted in the text, it would still make use of a specific format, lay-out and punctuation marks, which are conventional semasiographic systems in that they do not represent sounds of speech.

[65] Boone & Mignolo, *Writing Without Words*, 16.
[66] *Ibid*..
[67] An idea already put forward by Derrida, *Of Grammatology*, 45-65.

Thus, the schema of fig. 0-1 in fact turns out to be better represented as in fig. 0-2 below. It does not solve the problem of defining the nature of writing in a broad sense. We are still left with a nebula in which now terms such as 'glottographic', 'semasiographic', 'conventional' and 'iconic' seem to float around freely. The distinctions between these terms are merely terminological; they do not reflect the reality in which the relation between different systems of visual communication appears to be more fluent. In fact, writing in a broad sense subdivided into glottographic and semasiographic systems leads straight back to Gelb and what has come to be called the word–image dichotomy. Considered as such, the approach of 'writing integrationally defined' leaves intact the traditional distinction between language-based systems on the one hand, and nonverbal and nonlinguistic systems on the other, merely applying the term 'writing' to all.

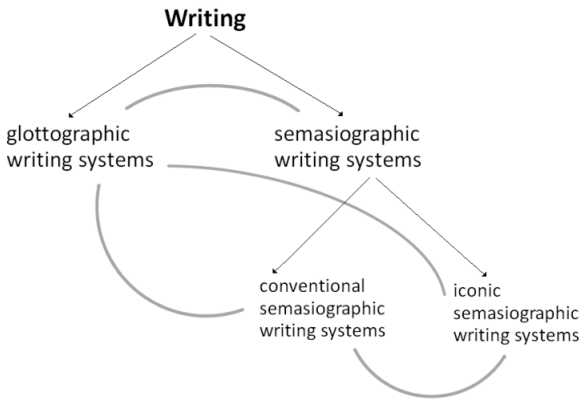


Fig. 0-2 The distinctions between glottographic and semasiographic, and conventional and iconic is not as straightforward as fig. 0-1 visualized it.

In sum, the theory of writing integrationally defined was a reaction against the traditional perspective on writing, arguing that not all writing is based on spoken language and that 'writing' as a broad concept in fact entails a variety of systems of visual communication. Yet, instead of distinguishing between glottic and nonglottic writing, alphabetic writing and other sorts of writing designated by means of terms such as 'pictorial', 'iconic', or 'semasiographic', is there another way in which we can analyze the differences between systems without ignoring the fluency between categories?

Allocating writing a place within broader context

There is a theory that bypasses the traditional word–image dichotomy in its attempt to define not only writing, but visual communication in general. The theory is proposed by the art historian Elkins in his book *The Domain of Images* (2001). It departs from the assumption that the 'dialectic opposition and evolutionistic continuum between picture and script is a flawed premise'.[68] In fact, any system of visual communication is a mixed system. Instead of struggling with linguistic text, or writing in the traditional sense, on one end of the line and pictorial elements on the other, Elkins acknowledges that neither text nor any image is 'pure': they both make use of linguistic and nonlinguistic elements, and simultaneously mix letters, pictorial elements, punctuation marks, colors, shapes, formats, and so forth. There is no such thing as a purely pictorial image, or a page of writing uncontaminated by

[68] Elkins, discussed in Jackson, *Moche Art and Visual Culture in Ancient Peru*, 85.

elements of non-writing.[69] Although Elkins decides to follow the traditional idea of writing being a representation of speech,[70] he reduces it to merely one of three *compositional domains* from which any system of visual communication can draw. The other two domains are Picture and Notation. Together, the three domains are presented in a Venn-diagram as shown in fig. 0-3 below. Each of the domains is a source of inspiration. Every system of visual communication is a unique composition, in which one or two domains may be dominant, for instance Writing in alphabetic scripts and Picture in traffic signs. No system, however, is pure Writing, pure Picture or pure Notation.[71]

Venn-diagram of Visual Communication

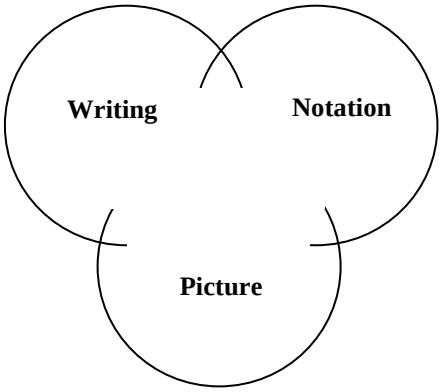


Fig. 0-3 Venn-diagram of visual communication, which visually summarizes the theory that every system of communication is composed of elements that derive from three domains: Writing, Picture, Notation. Elkins, *The Domain of Images*, 85-86.

The Venn-diagram is basically an intersection of three circles that creates four overlapping areas (three in between the domains and one in the middle). We have, however, decided to delete the inner lines of the circles in order to show that the domains are not rigidly separated: they are open and flow into each other. The domains can be described as follows:

Writing — The domain of Writing contains elements that are traditionally considered writing. Such elements include phonoptic symbols, an internal ordering according to linear sequence (in lines or columns), and syntax governed by linguistic patterning.[72] Any system, ancient or modern, in which one or more of these elements are discerned, makes use of the domain of Writing.

Picture — To the domain of Picture Elkins assigns on the one hand allographic forms of Writing, and on the other all sorts of pictures that have a natural or iconic resemblance to what they denote. The term allography is used to refer to formal changes that can be made to signs of writing without affecting their linguistic value. It concerns among others palaeographic and cursive shapes, calligraphic forms and fonts of printed letters.

[69] '[…] there is 'reading' in every image and 'looking' in every text.' Elkins, *The Domain of Images*, 84 (quote), 91. For this idea, see also already Coe, *Breaking the Maya Code*, 18, 25-27.
[70] He decides to do this also because the traditional concept of writing is 'too ingrained to be abandoned or easily critiqued'. Elkins, *The Domain of Images*, 84.
[71] *Ibid*., 89-91 and Part II.
[72] Marcus, referred to in Jackson, *Moche Art and Visual Culture in Ancient Peru*, 84.

While both pictures and allographic forms are assigned to the domain of Picture, the latter thus have a closer relation to the domain of Writing.[73]

Notation — In the domain of Notation we find essentially abstract and geometric configurations that are neither called 'writing' nor 'picture'. They include formats, maps, diagrams, charts and schemas. They neither convey meaning on the basis of speech, according to linguistic syntax, or on the basis of a resemblance to what they denote; nor do they show linear sequential sequence. Rather, their meaning is based on rules that revolve around other formalized spatial arrangements and visual ordering devices such as grids or axes.[74]

In Part II of *The Domain of Images* Elkins discusses several systems of visual communication in terms of the three domains, from closest to pure Writing, to closest to pure Picture, to closest to pure Notation.[75] Thus:

- Closest to pure Writing we find alphabetic scripts, although a closer look reveals that these scripts contain many elements that belong to the other two domains. To the Pictorial domain belong **the font that is used for printing (which may evoke times long past)**, or calligraphic forms such as presented in fig. 0-4, but also already the nature of the shapes of alphabetic letters themselves; fig. 0-5 shows that they still display some resemblance to their pictorial origin.[76] To the domain of Notation belong formats or diagrams included in the text such as the Venn-diagram of fig. 0-3 above.

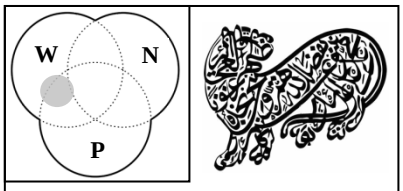


Fig. 0-4 Calligraphic forms of writing can mix with pictures. http://www.in-your-faith.com/311/.

- The domain of Writing loses some of its dominance to the domain of Picture in the case of Egyptian hieroglyphic script. This script draws from Writing in that it makes use of signs with phonoptic function, linear sequence and linguistic syntax, but it simultaneously draws from Picture in that its signs may also convey pictorial information. In being signs of a sound and picture script, Egyptian hieroglyphs move fluently from the domain of Writing to the domain of Picture and back. The same can be said of other sound and picture scripts, such as Hittite and Maya hieroglyphic script, as well as ancient Chinese, Assyrian and Phoenician.[77] The domain of Notation is found in Egyptian hieroglyphic script as well, particularly in temple inscriptions, the contents of which can be related to the

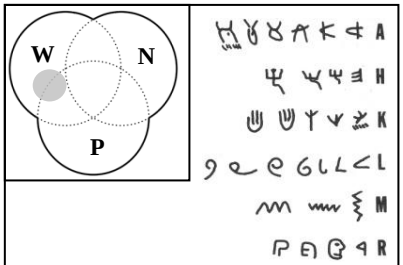


Fig. 0-5 The nature of the shapes of the letters of the Roman alphabet are originally pictorial. Elkins, *The Domain of Images*, 135.

[73] Elkins, *The Domain of Images*, 88-91 and 95-119.
[74] *Ibid*., 89-91; Elkins in Jackson, *Moche Art and Visual Culture in Ancient Peru*, 86. Elkins was not the first to suggest the tripartition of Writing, Picture and Notation. In 1986 the historian Drake already wrote that 'The pictures we form in science may be ordinary grammatical statements or *they may be special notation systems or they may be quite literally pictures drawn to represent structural relations among external objects, actual or hypothetical*.' Drake quoted in Boone & Mignolo, *Writing Without Words*, 10.
[75] Elkins, *The Domain of Images*, 89 and Part II.
[76] *Ibid*., 89, 95-109 and Plate 8.8 (p. 135).

architectural lay-out of the rooms and placement on the walls: the spatial arrangement of the inscriptions in the architectural space is a meaningful element that cannot be ascribed to 'Writing' or 'Picture', but is an element of Notation.

- Further removed from Writing and toward both Picture and Notation Elkins places those systems that tend 'to become more clearly pictorial'.[78] Instead of following this description, we would rather like to explain it by saying that such systems are 'open' in that they do not make use of a standard repertoire of fixed signs. Variation in signs is possible and new forms can be added if necessary. Also, the signs may, but do not have to be in linear sequence. Among the examples given by Elkins we find the following. Aztec and Mixtec manuscripts are composed of pictorial scenes in maps or registers. They may use phonoptic signs of writing, yet they only occasionally include them as captions to the scenes that narrate important events in a manner comparable to comic strips. A famous example of such a narration is presented in fig. 0-6.[79] Comparable to such manuscripts are Egyptian predynastic palettes, the most famous example of which is the Narmer Palette. This palette is further removed from the domain of Writing than later Egyptian inscriptions, and it is closer to the domains of Picture and Notation in that, instead of displaying a standard repertoire of signs in linear sequence, it shows pictorial variety in scenes and registers that visually narrate Narmer's victory over the north.[80] A third example given by Elkins are marking systems such as brand and potmarks.[81] The marks may include signs of writing, but also pictures and geometric elements (fig. 0-7). Linear sequence or linguistic syntax may be involved, for instance in reading 'NutriWareness' in fig. 0-7,[82] but such elements of Writing can be mixed with geometric (✓) or pictorial elements, or may be included in other forms of spatial arrangement.

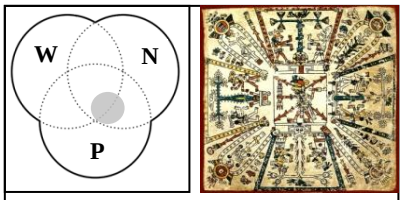


Fig. 0-6 Page 1 of the Aztec Féjéváry Codex, displaying the cosmological creation in map-form. Boone & Urton, *Their Way of Writing*, 200.

Fig. 0-7 Brand marks make use of signs of writing in linear sequence patterned on linguistic syntax, but also of pictures and geometric symbols. They are generally structured according to nonlinguistic spatial arrangements.

[77] Elkins, *The Domain of Images*, 90, 120-134. Elkins designates these systems as 'semasiographic systems'. I choose to reject that term on the basis of its traditional use in setting such systems apart from glottographic writing.
[78] *Ibid*., 90.
[79] *Ibid*.. See also Marcus mentioned in Jackson, *Moche Art and Visual Culture in Ancient Peru*, 84.
[80] Elkins, *The Domain of Images*, 170-173. See also Goldwasser, *From Icon to Metaphor*, 11-16, discussed in this dissertation in Part II, chapter 2, section 1.d.
[81] Elkins, *The Domain of Images*, 90.
[82] A company that gives advice in nourishment (rights: M.M.G. van der Moezel).

- Continuing further toward Picture and Notation, leaving Writing behind, Elkins sees systems that 'distribute what signs they have over a surface without comprehensible formatting'.[83] We do not agree with this description, because systems of visual communication may show an ordering of signs that is not clear *to us*, while their producers may have worked according to formats that were comprehensible *to them*. What Elkins appears to say is that these systems no longer show the linguistic linear sequence in lines or columns with which we are familiar, or that interpretation of the signs according to familiar linguistic sequence does not seem to make sense. Among his examples are Egyptian cryptomorphic scarabs and rock art.[84] The former, he says, may show clear signs that are well distinguishable, and that may even resemble signs of Writing. Yet, they only present a vague sense of Writing as any interpretation on the basis of linguistic signs and sequence fails. It seems that what counts is merely the impression of a written order,[85] perhaps to ensure the fortune or magical purpose for which many such scarabs were intended,[86] but in fact their signs are randomly distributed and do not reflect knowledge of Writing. In prehistoric rock art we do not even distinguish any sense of Writing, and we must search for other spatial organization and other forms of syntax that may exist between the pictorial and geometric signs (fig. 0-8). Rock art is therefore located even further toward the domain of Notation.[87]

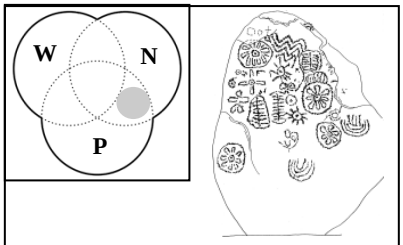


Fig. 0-8 Rock art is considered mainly geometric and pictorial, based on nonlinguistic forms of spatial distribution. This example is from Ireland, 3500 BC. Elkins, *The Domain of Images*, 190.

- Closest to pure Notation are what Elkins calls schemata: geometric configurations such as engineering maps, diagrams, graphs, charts and schemas that are almost exclusively based on reference lines, curves, scales, grids, nets or other geometric principles of ordering.[88] An example is presented in fig. 0-9. Certainly, they may include pictures or signs of Writing, but these only make sense within the overall geometric structure. Schemata make structural relations, which are very cumbersome to describe in words, perceptible at a glance.[89] They describe, interpret and communicate complex phenomena. They 'envision information',[90] making 'the invisible visible'[91] so that information can be grasped with ease and precision. Schematic forms of visual communication are primarily used in the physical sciences, chemistry and mathematics.

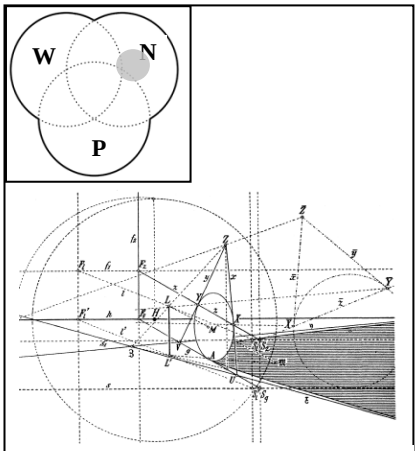
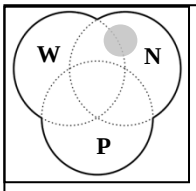


Fig. 0-9 Example of a schema that visualizes a hyperbolic shadow cast by the elliptical perspective representation of a circle. It is mainly Notation as the spatial arrangement is the primary element that conveys meaning. Elkins, *The Domain of Images* 233.

[83] Elkins, *The Domain of Images*, 90.
[84] *Ibid*.
[85] *Ibid*., 164.
[86] Ben-Tor, 'Pseudo Hieroglyphs' in Andrássy et al. (eds.), *Non-Textual Marking Systems*, 83-89.
[87] Elkins, *The Domain of Images*, 181-194.
[88] *Ibid*., 91, 213-235.
[89] Drake quoted in Boone & Mignolo, *Writing Without Words*, 10.
[90] Tufte quoted in *ibid*..
[91] Owen quoted in *ibid*..

- When, however, these sciences make use of formulas such as presented in fig. 0-10, the influence of the domain of Notation decreases somewhat and the influence of the domain of Writing increases. The domain of Notation is still important as it supplies geometric symbols among which numerals, and significant forms of nonlinguistic spatial interaction (a^2, for instance, means something quite different from 2^a, $^a/_2$ or $^2/_a$);[92] yet, the formulas also include a great number of signs of Writing and they are overall to be 'read' and understood in linear sequence.[93] As such, the circle is complete and we are back at the domain of Writing.



$$A = \frac{1}{2}\sqrt{a^2c^2 - \left(\frac{a^2 + c^2 - b^2}{2}\right)^2}$$

Fig. 0-10 A Chinese mathematical formula for the calculation of the surface of a triangle (by Qin Jiushao, 1247 AD), makes use of written and notational elements, in which the spatial arrangement is meaningful.

The model and its underlying theory are not perfect for the analysis of visual communication as a universal phenomenon. A fundamental problem is that the definitions of Writing, Notation and Picture are not clearly outlined. As a result, similar elements may be interpreted by some as Picture, by others as Notation, and by still others as Writing. An example is the interpretation of mathematical formulas just mentioned. The philosopher Goodman, from whom Elkins adopted the term 'notation', argued that these formulas comprise notation, while Elkins himself considered them to be more pictorial than notational. He says that 'Mathematics is replete with typographical morphemes that have the feeling of pictures, such as Π, Φ, ±, ÷, ≥ … '.[94] One could also consider to interpret the first two forms, Π and Φ, as signs of (Greek) Writing, and the latter three as geometric symbols of Notation. What is Writing, what is Picture, and what is Notation? Are signs that formally resemble written characters, but that are used in different functions (such as Π and Φ) counted as Writing? Are geometric symbols per definition Notation? Are numbers mathematical notational constructs even though they have sound-patterns that represent language ('one, two, three'; 'uno, duo, tre')?[95] Where would we accommodate punctuation marks in the Venn-diagram: under Writing because they are part of the linguistic structure; or under Notation because they have themselves no phonetic value, are (and have always been, cf. fig. 0-5) geometric in form, and only cooperate with Writing as a Notation structuring a text?

If such questions are already problematic in modern Western systems of visual communication, they are even more so with respect to ancient systems. A reason for Elkins to accommodate Egyptian cryptomorphic scarabs and rock art somewhere near the domains of Picture and Notation is, in fact, simply that we do not understand them. We are not familiar with their signs or ordering principles. Are those forms that resemble signs of writing on the scarabs, of which we do not know to what extent their producers and owners considered them to have phonetic value, belong to the domain of Writing or not? And how can we decide whether a geometric sign in prehistoric rock art is

[92] Jackson, *Moche Art and Visual Culture in Ancient Peru*, 83.
[93] Elkins mentions that mathematical notation does not follow the orders of reading, because a formula might demand many motions of the eye that a sentence does not, for instance in the case of fractions (p. 136). However, it may be argued that mathematical formulas simply combine the two forms of linear sequence that were previously mentioned as elements of Writing: horizontal linear sequence from right to left, conform Western alphabetic script, and vertical linear sequence from top to bottom.
[94] Elkins, *The Domain of Images*, 131.
[95] Coe, *Breaking the Maya Code*, 18.

indeed geometric rather than an abstract form of an object or being it directly denotes; or even a sign of Writing that was endowed with phonetic value, now lost to us? Elkins describes the sign in fig. 0-8 as 'the sun sign', but is it, in fact, the representation of a sun? And did it have phonetic value to its producers? Also, there are examples of rock art in which a linear sequence can be discerned, for instance in hunting scenes; to what extent is that an element of Writing?

In sum, the Venn-diagram and its underlying theory certainly provide no absolute answers as to the nature of different systems of visual communication; they are not an ultimate end in the analysis of visual communication. Descriptions of systems in terms of the three domains are loosely based on formal appearance and/or function and/or usage, mainly depending on how familiar we are with them. Interpretations remain subjective and liable to criticism as to why certain elements are Writing, Picture or Notation. However, the basic idea of three domains that contribute variously to different systems does bring the analysis of visual communication in general further than the traditional definition of writing, or the idea to consider everything writing and make distinctive classes, the borders between which are in fact blurred. When all systems are considered to contain elements from the domains in one way or another, from some domains more than from others, then divergent forms of visual communication can be relatively defined and compared *irrespective of any evolutionary notion*. Analysis in terms of Writing, Picture and Notation shows that alphabetic writing is not always the ideal medium for conveying thought: brand marks and traffic signs have their emphasis in the domains of Picture and Notation and as such convey thought in a quicker and more efficient way; scientific schemata have their emphasis in the domain of Notation and as such make complex phenomena perceptible at a glance in more comprehensible form than when described in words. The Venn-diagram simply deals with *different* systems, not with systems developed to greater or lesser extent.

In analyzing the marks from Deir el-Medina and in describing their relation to hieroglyphic and hieratic scripts we reject the traditional and narrow word–image dichotomy. For one thing, we do not want to depart from the idea that the marks would be a less developed form of visual communication than Egyptian script. That is, we do not want our analysis to depart from a comparison in which the marking system is already defined, or 'condemned', in relation to script; rather, we want to analyze the marking system *an sich*. For another, a first glance at the marks ostraca shows that they display elements that can be attributed to the three domains of the Venn-diagram. Thus, many marks resemble characters from script, several of which are also endowed with phonetic value,[96] while others are rather pictures without known linguistic value, or forms that appear to be simply geometric notations. Also, some marks ostraca display linear sequence in neat lines or columns, while others show jumbled clusters, a spatial distribution alien to script. In this dissertation, especially in the analysis of the palaeographic and semiotic nature of the marking system (Parts I-II), we will therefore take the Venn-diagram of visual communication into consideration, in which the marks and Egyptian script are not phases of development but rather two systems in their own right, the relation between which can be defined in terms of the domains they drew from in the course of the approximately five centuries of their coexistence.

[96] Haring, 'Towards decoding the necropolis workmen's funny signs', *GM* 178 (2000), 45-58; Soliman, *Of Marks and Men* (unpublished dissertation); this dissertation.

PART I

PALAEOGRAPHIC ANALYSIS

THE FORMS AND ORIGIN OF THE MARKS

AGAINST THE BACKGROUND sketched in the Introduction we can now begin analyzing the marking system from Deir el-Medina: where does it stand among the variety of systems of visual communication, how does it relate to systems of linguistic writing in terms of status and development, and does the Venn-diagram of visual communication as proposed by Elkins indeed serve as a useful tool for the accommodation and comparison of the formal structure of, theoretically, all sorts of visual communication systems, including the marks from Deir el-Medina? This Part focuses first of all on the forms of the marks, their classification and their possible origin to familiarize the reader with the marking system. In chapter 1 we present the classification as well as a description of forms and style, a discussion of formal and stylistic developments, and a discussion of the problems inherent in the act of classifying the marks. We specifically address the questions of what are the actual marks (signs from script, representations of concrete objects or beings, or abstract geometric configurations?), and to what extent was the system inspired by hieroglyphic or hieratic script. In chapter 2 we provide a discussion of other ancient Egyptian marking systems in order to find out to what extent they could have served as sources of inspiration for the marks from Deir el-Medina. Potmarks, builders' marks and quarry or masons' marks will receive ample treatment. The chapter specifically addresses the question of whether the forms of the marks from Deir el-Medina were newly created or selected from older sources. Chapter 3, then, concerns the palaeographic tables. It also provides information on the composition of the tables and the creation of the facsimiles and font-types used in the tables as well as throughout the dissertation. The tables themselves are provided separately in digital form, not only because they are too elaborate to be included in the text, but also in order to be consulted more easily while reading the text. Table I3-1 contains a list of all marks with metadata, and Table I3-2 tabulates all the specimens of the marks. It is strongly advised to consult the tables especially while reading chapter 1; references are given when consultation of the tables is necessary for correct comprehension of the text.

1

THE FORMS OF THE MARKS

1 CLASSIFICATION

The first thing that is noticed when one looks at the identity marks from Deir el-Medina is that they contain forms that are known from hieroglyphic and/or hieratic script, and forms that are not part of the repertoire of these scripts. It has been remarked that this is a feature common to non-textual marking systems in general, and that a further common feature is seen in the subdivision of the marks not related to script into concrete forms, and abstract linear and geometric forms.[1] Similar classifications have been suggested for the builders' marks from the Old and Middle Kingdoms by Verner and Andrássy,[2] for the New Kingdom potmarks by Ditze,[3] but also for medieval European masons' marks,[4] identity marks used by nomadic tribes and families throughout Central Asia in ancient and modern times,[5] and the non-textual systems from Pre-Columbian Mesoamerica.[6] An initial working classification for the Deir el-Medina marks therefore also followed two main groups and two subdivisions:

I Marks that are formally equivalent to characters from script and could carry phonetic value;
II Marks that do not have phonetic equivalents in script and that include:
   a. representations of concrete objects or beings;
   b. abstract geometric forms.

It gradually appeared, however, that it was difficult to draw a sharp line between abstract and concrete forms, as well as between marks related to script and those not related to script. Because of the fact that hieroglyphs are also representations of concrete objects or beings, it was not in all cases clear whether hieroglyphs were always the model for the marks assigned to group I. This problem was already discussed by Haring with respect to the marks that represent pots and scorpions,[7] and it will also be reviewed with respect to those marks on pages 24-25 below. In this first section we discuss the marks assigned to groups I and II, after which we review the problem of blurred borders in section 2 below.

[1] Haring in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 3; Haring, 'On the Nature of the Workmen's Marks' in Andrássy et al. (eds.), *Non-Textual Marking Systems*, 123-124. See also Part III Comparative Analysis.
[2] Verner, *Baugraffiti der Ptahschepses-mastaba*, 163-176; Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 5, 17.
[3] Ditze, 'Gedrückt – Geritzt – Gekratzt' in Pusch (ed.), *Die Keramik des Grabungsplatzes Q1* II, 286.
[4] Janse & De Vries, *Werk en Merk*, 51-56; Van Belle, *Dictionnaire des Signes Lapidaires*, xiii-xv.
[5] Yatsenko, 'Problems and Study Methods of the Ancient and Early Medieval Iranian-speaking Peoples' Nishan-Signs' and 'Marks of the Ancient and Early Medieval Iranian-speaking Peoples of Iran' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 109-152; Boardman, 'Seals and Signs' in *ibid*., 153-170.
[6] Boone, 'Writing and Recording Knowledge' in Boone & Mignolo (eds.), *Writing Without Words*, 3-26.
[7] Haring, 'On the Nature of the Workmen's Marks' in Andrássy et al. (eds.), *Non-Textual Marking Systems*, 129-132.

a. Group I

a.1 Codification

The marks that were assigned to group I bear formal resemblance to hieroglyphic, cursive hieroglyphic, pseudo hieroglyphic, or hieratic characters that have phonetic values in script. Internally the group follows codification according to Gardiner's sign list.[8] However, at the beginning of the project it was often uncertain whether marks that *resembled* characters from script also *behaved* as such in that they were endowed with phonetic values; therefore, we did not want to make the connection to Gardiner's list explicit. Thus, instead of using letters as in the codifications 'F12', 'Q1', 'Q4', 'M17' and so forth, we numbered the classes as a constant reminder to avoid direct equation of the non-textual marks with hieroglyphic signs: I 06.012, I 16.001, I 16.004 and I 12.017. The possibility of a connection is present, but full equation is prevented. This optical detachment from Gardiner's classes also provided us with more freedom to adapt the classes to the needs of the marking system. Thus, we removed superfluous distinctions present, for instance, in Gardiner's signs F23 and F24, or U6 and U7, which represent the same sign but in different orientations. In the classification of the marks different orientations are grouped under the same code, based on the semiotic theory that orientation is of no influence to the meaning of non-textual marks, because they contain their meaning within. That is, as opposed to linguistic signs their meaning does not depend on a 'reading' in a specific orientation or direction; they are recognizable and understood as individual entities in any orientation. A case in point are quarry or masons' marks on blocks of stone, which 'were very prone to be rotated many times'[9] before the stone was placed in its final position. Depauw therefore argues that 'Any kind of distinction based on orientation is therefore intrinsically improbable'.[10]

We also accommodated graphic variants of marks in subclasses under the code of their main mark. Thus, a variant of the mark in dynasties 19 and 20 shows a phonetic complement *s*: . The former could now be coded I 06.031a and the latter I 06.031b. Similar cases are found with I 06.012a and I 06.012b; with I 04.040a and I 04.040b; or with I 05.034a, I 05.034b and I 05.034c. Also classified under the main mark are double and triple occurrences of marks, which occur mainly with I 06.035a-d, I 18.034a-c and I 17.008a-b. Some of Gardiner's classes furthermore had to be rearranged, such as the several classes depicting pots and jars. Gardiner's pots and jars do not cover all the different forms and variants that are encountered in the marks. For instance, Gardiner accommodates a simple, plain jar under W22 () and a jar with handles under W23 (), but where would we accommodate a jar with handles and water spouting out such as ? We also have long-necked and short-necked pots and jars with or without handles, and with or without spouting water. As it turned out that many forms of pots and jars were graphic variants of the same identity mark at least in dynasty 20, we decided to accommodate all variants either under I 22.014a-b (,) or under I 22.022a-d (, , ,).

These and other modifications resulted in the classes I 01 to I 26 as shown in Table I1-1 below. The Table also includes a final class I 27, which is an addition specific to the classification of the marks. It

[8] As being the standard in Egyptology. Gardiner, *Egyptian Grammar*, 438-548.
[9] Depauw, 'The Semiotics of Quarry Marks' in Andrássy et al. (eds.), *Non-Textual Marking Systems*, 211.
[10] *Ibid*. The semiotic theory concerned is the theory of articulation: non-textual marks are generally thought to have first articulation only. See Part II, chapter 2 section 1.d.

accommodates group-writings that are not composed of a main mark with phonetic complements, but of two or more hieroglyphic or hieratic signs that have different phonetic values and together may convey a word or phrase, such as *nb tꜣ.w.y* (I 27.001), *nb nfr* (I 27.002), and *jmn* (I 27.036a-b), *jmj r pr*(*.w.y*)-*ḥḏ* (I 27.045) or *wn nfr*. In some cases the groups may simply be more elaborate variants of marks consisting of single signs, which come close to linguistically written abbreviations of names. Thus, *wn nfr* was a more elaborate variant of the mark *wn* used by *Wn-nfr* (iii), and the marks (interpreted as *ḥtp*) and in dynasty 20 were both simultaneously used to refer to *Rš.w-ptr=f* (i). Davies tentatively suggested that *Rš.w-ptr=f* (i) was the grandson of *Nfr-ḥtp* (ii).[11] If so, this would support the phonetic interpretation of the marks and as *ḥtp* respectively *nfr-ḥtp*.

The marks in class I 27 are internally organized according to component marks: from marks including , to marks including , to marks including , to marks including , to marks including , and so forth. However, since new marks were still being added to the list at the moment this dissertation was finalized, this internal ordering remains a loose one; instead of revising the codes with every change, new marks were simply added to the end of the list.

At present, it is still not in all cases certain whether a mark which we attributed to group I was in fact endowed with phonetic value. Although in many cases this could be evidenced or at least made plausible, as will become clear in the following pages and especially in Table I3-1, there remain cases in which marks with hieroglyphic equivalents may simply represent objects or beings that are connected to the workmen in another than phonetic way. This problem, which is caused by the fact that hieroglyphic script is a picture script, will be elaborated upon further below as well as in section 2.

Two important remarks must be made with regard to Table I1-1. First, some of the codes are followed by one or more of the capital letters G, P, D or T. These codes indicate classes of marks that do not occur on ostraca, but only on Pottery, in Graffiti, on Domestic objects and/or on Tools. They are included in the Table as well as in the Paleography in section 3 (Tables I3-1 and I3-2), but throughout this dissertation we focus primarily on the ostraca. Only when the marks from other sources provide, or support, relevant data we will include them in the analysis.[12] Second, the reader will notice a degree of inconsistency in the appearance of the font-types used in the Table. This is due to the fact that until recently classes of marks were still being added. The last significant revision of the classification and the creation of font-types on the basis of those classes took place at the end of 2014. Classes that were added later, such as I 06.055 (), I 19.022 () and all classes with codes including P, G, D and/or T, are represented in the table by a facsimile that was not included in the font. For more information on the development of the facsimiles and the font-types, see section 3 below.

[11] Davies, *Who's who in Deir el-Medina*, 248.
[12] This is not only a matter of lack of time, but also marks that occur only on potsherds, in graffiti, on domestic objects or on tools are often very difficult to interpret as they lack the context of hieratic documentation, which does exist for the marks on ostraca.

Table I1-1 Marks from group I

Code		Mark	Code		Mark	Code		Mark	Code		Mark
I 01.001			I 06.030	a		I 12.015			I 14.051		
I 01.002				b		I 12.017	a		I 15.001	a	
I 01.019			I 06.031	a			b			b	
I 01.028				b		I 12.022				c	
I 01.035G			I 06.035	a		I 12.023			I 15.002P		
I 01.040				b		I 12.034			I 15.005		
I 01.121c				c		I 12.040			I 15.006		
I 03.001				d		I 13.001			I 15.056G		
I 03.019			I 06.055			I 13.002			I 16.001		
I 04.002			I 07.001			I 13.005			I 16.004	a	
I 04.004			I 07.005			I 13.006				b	
I 04.006			I 07.017			I 13.007			I 16.005		
I 04.010			I 07.026			I 13.008			I 17.004	a	
I 04.021			I 07.038			I 13.012				b	
I 04.028			I 07.047	a		I 13.014	a		I 17.008	a	
I 04.036				b			b			b	
I 04.037			I 07.063			I 13.023	a		I 17.011		
I 04.040	a		I 08.006				b		I 17.012		
	b		I 08.007				c		I 17.014		
I 04.045			I 08.016				d		I 17.019		
I 04.046	a		I 09.001			I 13.025			I 18.003		
	b		I 09.009			I 13.026			I 18.012	a	
I 04.054			I 09.010			I 13.027				b	
I 04.058	a		I 09.012			I 13.028			I 18.014		
	b		I 10.001			I 13.035	a		I 18.023		
I 04.060			I 11.001				b		I 18.028		
I 04.063			I 11.002			I 14.004			I 18.033		
I 05.010			I 11.019	a		I 14.006			I 18.034	a	
I 05.017				b		I 14.021				b	
I 05.034	a		I 12.004			I 14.024				c	
	a		I 12.009	a		I 14.028			I 18.038		
	c			b		I 14.031			I 18.040	a	
I 06.012	a			c		I 14.036				b	
	b		I 12.013			I 14.045				c	
I 06.018			I 12.014	a		I 14.049	a			d	
I 06.023				bG			b		I 18.045		

I 19.003			I 22.011			I 27.005P			I 27.029		
I 19.010			I 22.014	a		I 27.006			I 27.031G		
I 19.018				b		I 27.007			I 27.032		
I 19.019			I 22.017			I 27.008			I 27.033		
I 19.022			I 22.022	a		I 27.009			I 27.034G		
I 19.032				b		I 27.010			I 27.035		
I 20.002	a			c		I 27.011			I 27.036	a	
	b			d		I 27.012				b	
	c		I 22.025			I 27.013			I 27.037	a	
	d		I 22.037			I 27.014			I 27.037P	b	
I 20.006			I 23.008	a		I 27.015			I 27.038		
I 20.015				b		I 27.016	a		I 27.039		
I 20.019			I 24.001	a			b		I 27.040		
I 20.021				b		I 27.017			I 27.041		
I 20.023			I 24.003			I 27.018P			I 27.042G		
I 20.037			I 24.005			I 27.019	a		I 27.043		
I 21.004			I 24.008				b		I 27.044		
I 21.006			I 26.009			I 27.020			I 27.045		
I 21.013			I 26.015			I 27.021			I 27.046		
I 21.016			I 26.026			I 27.022			I 27.047		
I 21.017			I 27.001	a		I 27.023			I 27.048		
I 21.026				b		I 27.024P			I 27.049GT		
I 21.030				c		I 27.025			I 27.050		
I 22.001			I 27.002	a		I 27.026	a		I 27.051		
I 22.004G				b			b		I 27.052		
I 22.009			I 27.003GD			I 27.027			I 27.053		
I 22.010			I 27.004GTD			I 27.028					

a.2 Development

Dynasty 18

The marks from group I display an interesting development from sometimes crude marks with a form that is incorrect when compared to hieroglyphic signs in dynasty 18 to marks of a true hieratic form or in group-writing in later periods. The marks assigned to dynasty 18 are given in Table I1-2:

Table I1-2 Marks from dynasty 18, group I

Code		Mark	Code		Mark	Code		Mark	Code		Mark
I 04.004			I 12.009	a		I 14.031			I 20.015		
I 04.021				b		I 14.049	a		I 20.037		
I 04.036				c		I 16.004	a		I 21.030		
I 04.037			I 12.013				b		I 22.014	a	
I 04.046	a		I 12.017	a		I 17.004	a		I 22.022	a	
	b			b		I 17.008	a			b	
I 04.058	a		I 12.034			I 17.014			I 23.008	a	
	b		I 13.001			I 18.012	a			b	
I 06.012	a		I 13.005				b		I 24.005		
I 06.031	a		I 13.006			I 18.033			I 26.009		
I 06.035	a		I 13.008			I 18.034	a		I 26.026		
I 07.017			I 13.012			I 18.038			I 27.001	a	
I 07.038			I 13.014	a		I 18.040	a			b	
I 08.007			I 13.025				b			c	
I 09.001			I 13.026				c				
I 09.009			I 13.028				d				
I 10.001			I 13.035	a		I 19.010					
I 11.001			I 14.004			I 20.006					

In comparison to the marks from later periods the 18th dynasty corpus shows some particularities.[13] A first particularity is the fact that the 18th dynasty corpus contains relatively many marks that resemble mono-consonantal hieroglyphic signs. It concerns: , , , , , , , , and . Of these marks the following disappear completely after dynasty 18: , , , , and .[14] Perhaps disappears as well: it is attested four times in dynasty 18 and once more on an undated ostracon, IFAO ONL 6521, of which the context and interpretation remain uncertain.[15] The marks and occur in later periods, but to a

[13] For more detailed descriptions of forms and formal developments, see Table I3-1.

[14] In this conclusion as well as in my following conclusion on the disappearance of the mark , I consider the ostracon IFAO C 1404 to date to dynasty 18. For my arguments, see Table I3-1 (remarks under codes I 08.016 and I 16.004).

[15] It cannot be dated on context, find-spot or other information, neither on account of the marks, if indeed it depicts workmen's marks at all, which is uncertain. If so, we could at least identify three marks that occur in dynasty 18 (, ,), of which only is encountered with certainty in dynasties 19 and 20 as well, but also two marks that otherwise occur only from dynasty 19 () and dynasty 20 () onwards. However, the overall interpretation of the ostracon remains too uncertain to base conclusions on.

much lesser extent. An exception is 𓌙, which is once dated to dynasties 18-19, once to dynasty 19, and thrice to dynasty 20. The earliest specimen, which is seen on ostracon IFAO ONL 6638, is, in fact, uncertain; it may not be a workman's mark, and therewith 𓌙 rather belongs to the later corpus of marks.

	18	**18-19**	**19**	**20**	**?**
𓎛 I 04.058a	10x			1x	1x
𓄡 I 12.017b	11x		1x	4x	
𓌙 I 04.036		1x	1x	3x	

If the marks that resemble mono-consonantal signs conveyed phonetic value, one could ask whether values such as *r*, *d/ḏ*, *b*, *m*, *f*, *j*, *n* and *h* are specific enough to distinguish workmen's names. Unfortunately, we have no hieratic sources against which to check the names and phonetic values of the marks.[16] Yet, they may have been specific in a period when the community of Deir el-Medina was still relatively small; that is, when some 40 to 45 workmen and their families came to live there and the marking system did not yet have long history of use. Moreover, the fact that mono-consonantal signs could indeed be used as abbreviations specific to certain names is seen already in the geographic section of the Ramesseum Onomasticon from the late Middle Kingdom, where several place names are abbreviated by means of mono-consonantal signs, conveying the first sound of the name.[17] The fact that marks which resemble mono-consonantal signs, with the exception of 𓌙, are no longer seen in dynasties 19 and 20 might be related to the continuing usage of marks in a growing community; more specific identity marks may have been needed or desired. In all cases, however, it remains unknown whether the marks indeed conveyed phonetic value, or whether they were selected and used on the basis of other reasons.

A second particularity of the 18th dynasty corpus is that variations in form and in orientation are relatively frequent. One example may be highlighted: 𓏲. When its specimens from dynasty 18 in Table I3-2 are compared with the specimens from dynasties 19 and 20, the first thing one will notice is that the mark in dynasty 18 occurs 180° turned (or 'upside down') at least three times, while all 19th and 20th dynasty specimens occur consistently in the same orientation which the hieroglyphic equivalent 𓈙 has in script. Graphic variants of 𓏲 are 𓏱 and 𓏳. The first, 𓏱, occurs thrice on ostraca from dynasty 18 and twice on ostraca from dynasty 20, but the 20th dynasty specimens are both in hieroglyphic orientation while two of the 18th dynasty specimens occur 180° turned. The second, 𓏳, occurs four times on 19th dynasty ostraca, but also once on a potsherd from dynasty 18 and once on an undated potsherd. The latter shows the form 𓏴, which by its 180° turn may tentatively be dated to dynasty 18, although there is one other turned specimen that dates to dynasty 19: 𓏴 on ostracon IFAO ONL 6477. On the basis of these data we can argue that variation in both form and orientation is encountered mainly in dynasty 18 and occasionally in dynasty 19, while the 20th dynasty ostraca generally display forms and orientations conform the hieroglyphic equivalent 𓈙.[18] Similar conclusions can be drawn from a study of the classes of birds (I 07), lotus flowers (I 12.009), and reed leafs (I 12.017), which in dynasty 18 all show a variety

[16] No hieratic sources are known from dynasty 18.
[17] Gardiner, *Ancient Egyptian Onomastica*, plate II. See also chapter 2 of this Part I, section 2.b, fig. I2-11.
[18] Certainly, the 20th dynasty forms do show minor variations in form. These are discussed in Table I3-1.

of forms and orientations as against more uniform specimens and orientations in dynasty 20.[19] The development may reflect a growing influence of script on the marking system, at least in the graphic appearance of the marks.

Further particularities of the 18th dynasty corpus concern specific formal variations. To begin with, we encounter a graphic characteristic that is quite rare. It concerns the addition of horizontal lines to the marks and . Consider the specimens of in Table I3-2. Eight specimens, all dated to dynasty 18, display a horizontal line underneath: four on pottery ( ) and four on ostraca ( ).[20] Initially, we were not certain whether this line belonged to the mark and we decided to simply classify the specimens as I 16.004. However, reason to assume that the line may be part of the mark was the discovery of the form on ostracon IFAO ONL 6298 during our visit to the *Institut Français d'Archéologie Orientale* in Cairo (IFAO) in 2014. Similar forms we identified on O.IFAO ONL 6354 and presumably also on O.IFAO C 1404. In all cases, a horizontal line is added which now crosses the mark. All three specimens date to dynasty 18, and were coded I 16.004b.

The exact relation between the marks , and remains unclear. When the clusters in which they appear on the ostraca are compared, we come to the conclusion that they are very similar: all three marks occur particularly often with , and . Therefore, they may be graphic variants. The marks furthermore do not occur on the same ostraca, except, however, for one instance. On O.IFAO ONL 6298 we see the forms presented in fig. I1-1a and b.

a. **b.**

Fig. I1-1a-b. Specimens of I 16.004 on ostracon IFAO ONL 6298.

The first specimen is somewhat problematic. It appears to have traces underneath, which may be understood as a horizontal line. Yet, the traces of paint also suggest that the vertical line runs all the way down, which could make this specimen another instance of I 16.004b. Double occurrences of marks do indeed occur in dynasty 18. However, there are two reasons to not immediately accept that this is the case here as well. First, the forms in fig. I1-1a-b differ very much in execution and in the relative position of the two horizontal lines, while in every other case of double occurrences in dynasty 18 the specimens are very close copies in form and execution. Second, when a mark is encountered twice on an 18th dynasty ostracon the occurrences are usually placed one after the other, or at least in very close proximity, which is not the case here: the forms of fig. I1-1a-b occur on different sides of the bowl that ostracon IFAO ONL 6298 is. All in all, the forms, the execution, and the relative position of the specimens in fig. I1-1a-b do not coincide with the usual forms, execution and relative position of double occurrences of marks in dynasty 18. A third option, then, is to consider the smudge of black paint underneath the mark as a horizontal black stroke. This interpretation is strengthened by the fact that another horizontal stroke in red appears below it. Similar black and red horizontal strokes, presumably a counting system perhaps to record the absence or presence of workmen, occur below the marks and , and above on the same object. In vertical position they occur with several other marks on the bowl. If we accept this option, we

[19] See the respective classes in Tables I3-1 and I3-2.
[20] Respectively the potsherds Bruyère Rap. 28 II 125 fig. 69 nr. 35 (2x), Nagel Céramique 134 DM 22.93 and SGP 2005 235; and the ostraca IFAO ONL 6260, IFAO ONL 6266, MMA 09.184.700, OWV 10.

have an occurrence of and one of on IFAO ONL 6298. From comparative analysis we learn that the addition of lines or other small elements to a mark could mean that there is a familial relation between the two persons who are identified by the marks: father and son, or brothers. This appears to be a universal practice, seen, for instance, in medieval European identity marks, and in Portuguese and Brazilian fishermen and herders' marks.[21] Could that also be the case here? Does the occurrence of both and on IFAO ONL 6298 indicate that a father was still a member of the crew at the moment his son joined as well?[22] Is, then, the mark with a horizontal cross line equivalent to the mark with a horizontal line *underneath*, or does this indicate another son or family member?

A similar situation we see with the mark . Although it is not encountered with a horizontal line underneath, there are three forms in which the mark is crossed by a number of one to three horizontal lines. Consider the marks I 18.040a-d in Table I3-2. In addition to , which occurs quite frequently in dynasty 18[23], we find the 18th dynasty variants , and . Again, the variants do not occur on the same ostraca except for one instance: and occur together on ostracon Cairo JE 96591. The ostracon depicts a line of 6 marks in succession: , , , , and . This strongly suggests that the two marks belonged to two different persons. The clusters in which the marks generally appear on the ostraca share some similar signs. Thus, , and all occur in proximity to ; and , and all occur in proximity to . But in fact, the occurrences of the marks , and are too few (resp. once, twice, once) to be able to compare clusters with in detail. If we would again consider the possibility that the horizontal lines represent family members, do , and , then, indicate the same family member of , or do they represent three different family members?

Of course, in both cases and it may be argued that the lines were simply added to distinguish the identity of two unrelated workmen who happened to use the same mark. However, an argument for family ties lies in the fact that in both cases the variants with lines are rare in relation to the frequent occurrences of and themselves; this may indicate that the horizontal lines were only a necessary distinction at the moment that fathers and sons worked together in the crew, after which the sons who continued would switch back to the original marks and . This remains mere speculation. As for the nature of the marks, both and occur as hieroglyphic signs, but the addition of the lines deforms them and turns them into non-linguistic marks; the variants are no longer equivalents to the hieroglyphic signs and . If without the additions there is still a chance that and are graphically and perhaps phonetically related to script, the deformations undo both graphic and phonetic connections. Does the fact that the additions could be made mean that these marks were, in dynasty 18 at least, never understood or meant as equivalents to linguistic signs? Whereas the inspiration for the mark could simply have been the plain object instead of the hieroglyph ,[24] may have been known purely as a form or powerful symbol occurring in texts on the walls of temples or tombs, while its full linguistic value remained unknown or was disregarded. As such, the marks could be deformed without serious consequences. It goes without saying that this suggestion concerns the 18th dynasty specimens only. In dynasties 19 and 20

[21] The system of passing on marks by means of additional lines is discussed in Part III, chapter 1, section 3.
[22] See also Soliman, *Of Marks and Men* (unpublished dissertation), chapter 2, section 2.6.3.
[23] 43.94% of the total occurrences of is dated to dynasty 18; only 27.27% of the total occurrences of is dated to dynasty 20. See Table I3-2.
[24] Which is even quite plausible as the occurrence of as a hieroglyphic sign with sound-value is rare, while the object was known and used on a daily basis.

we no longer see the addition of horizontal lines, and a graphic and perhaps phonetic connection of and to script is a possibility.

The last particularity of the 18th dynasty corpus to be emphasized here is the fact that several marks seem to indicate a low degree of literacy in that they appear to be crude or incorrect graphic variants of marks that in later periods have hieroglyphic equivalents. We already encountered some examples in and discussed above, but examples that show more consistent misrepresentations, making the misrepresentation the standard, are the following: , a crude form of ; forms such as , presumably representing ; and forms such as , , and , to be interpreted as . In many instances, the 18th dynasty marks are more abstract and geometric in appearance than the marks from later periods and their hieroglyphic counterparts. One particular example may be singled out: the mark with its variants and . It was initially interpreted as an abstract geometric form. However, after having collected all specimens, several of them seemed to display a transition toward the form of the hieroglyph , representing a collar. Two clear examples of specimens that can be related to that hieroglyph date to dynasty 18: (O.Cairo JE 72492) and (O.IFAO ONL 6266). After comparison of the marks I 18.012a and // I 18.012b in Table I3-2 the following is suggested:[25] the main difference in form between the two marks is the fact that specimens of the latter show a curved line above and a horizontal line below that together make a semi-circular form with the curve upwards, precisely where specimens of I 18.012a show a semi-circle with the curve below. Specimens of I 18.012b have three to five vertical lines protruding downwards from the horizontal line whereas specimens of I 18.012a may show this (e.g. in the case of on O.IFAO ONL 6303) but usually have a square or triangular form that represents the pendant of the collar (i.e. in the case of 20th dynasty specimens; the 19th dynasty specimens have no pendant at all). Specimens of I 18.012b such as , , and ,[26] as also the specimens of I 18.012a on O.Ashmolean HO 1114 and O.IFAO ONL 631 (resp.) may all said to be transitional forms that developed gradually from I 18.012b into I 18.012a in that they do not show a semi-circular form with a horizontal line below and curve above, but instead an almond-shaped form.[27] The alternative forms of I 18.012b occur only in dynasty 18, whereas the more developed forms continue into dynasties 19 and 20. It could be suggested that all specimens of I 18.012b and the two transitional forms of I 18.012a on O.Ashmolean HO 1114 and O.FAO ONL 6316 were made by persons who only had a vague idea of the appearance of the hieroglyph without being familiar with its details and exact execution. The correct form was only vaguely approached, because the semi-circle with the horizontal line above and the curve below, which is the basis of the form of the hieroglyphic sign, was reversed. The makers of these specimens were therefore presumably not fully literate.

Perhaps a similar case could be suggested for the marks I 04.028 and II 025. The mark resembles the hieroglyph *kꜣ*. It does not occur in dynasty 18, but it does occur four times on 19th dynasty ostraca, 12 times on ostraca dated to dynasty 19-20 and 105 times on ostraca dated to dynasty 20. The mark occurs 35 times on ostraca from dynasty 18, but not thereafter. We know that was

[25] The relation between specimens of the marks I 18.012a and I 18.012b is explained more elaborately in Table I3-1.
[26] Respectively ostraca Cairo JE 72450, IFAO ONL 6293, IFAO ONL 6405 and IFAO ONL 6588.
[27] Particularly telling is the fact that the mark I 18.012 occurs twice on the 18th dynasty ostracon Ashmolean HO 1114, and we initially interpreted one of them as the hieroglyphic necklace (), and the other as an abstract form of I 18.012b (). The ostracon contains four other marks that occur twice, and thus it is assumed that both and also represent the same mark, only the latter slightly better approaching the more correct form of the hieroglyph .

endowed with the phonetic value *kꜣ* at least during the reigns of Ramesses III and IV, when it was used by *Kꜣsꜣ* (v/vi) and subsequently by his son *Pn-ʿnḫ.t* (iii).[28] Whether was an early graphic variant of is not certain. We do not know anything about the identity of the workman who used in dynasty 18. It was decided to code as a mark of group II, not as a variant of I 04.028, because its specimens are generally turned 180° and none of them shows the protrusion in the middle which in some 19th and 20th dynasty specimens of indicates the neck or shoulders in between both arms. However, it may be stressed that there is one specimen of that shows the orientation of : on ostracon IFAO ONL 6509. This ostracon is dated to dynasty 18 with certainty on account of its marks as well as on account of the sequence of marks, which coincides with the sequence seen on the 18th dynasty ostracon IFAO OL 6788. Furthermore, the tradition of potmarks and builders' marks, which is discussed in the next chapter, shows several occurrences of the hieroglyph in the same orientation as , always interpreted as . Similarly to what we have suggested for and //, we could argue that the person(s) who executed the specimens of was, or were, faintly familiar with the hieroglyphic sign, which was perhaps seen on monuments or in tombs, but not with its details. The orientation may simply not have been considered significant, which indeed suits the semiotic nature of non-textual marks. In both cases, the inspiration for the marks may have been hieroglyphic script, but it is not likely that the nature of this inspiration was anything more than graphic.

All in all, the marks from group I that date to dynasty 18 do not bear witness to a high level of influence of script on the marking system, at least not in a phonetic sense. In a graphic way, signs from script may have been a source of inspiration.[29] Also, some forms may have been known and used as powerful symbols, such as , , , and , without these signs having been used to phonetically refer to a workman. They may simply have been a wish, or votive expression, for instance.

Yet, it must be mentioned that among the sometimes crude and incorrect marks of dynasty 18 there are certainly also correct and neatly executed marks ostraca which could in fact indicate some knowledge of script, or at least familiarity with hieroglyphic signs. Consider the ostraca in fig. I1-2 on page 16. These ostraca show very recognizable and properly executed marks. They were probably all made by the same hand: compare especially the birds and , but also the forms of , and .[30] The person in question, whether or not he was fully literate, was at least used to holding a brush and familiar with drawing hieroglyphic signs. The fact that he still executed mark II 025 as is therefore conspicuous. It may indicate that, even if the hieroglyph was initially the mark's graphic inspiration, it may not have been considered equivalent to it in value even by someone who appears to have had a greater knowledge of script than his contemporaries in dynasty 18.

In the lower line on OWV 10 we see a different hand that made larger signs in an untidy organization. For this style and format of the marks ostraca in dynasty 18 as compared to the marks ostraca from later times, see further below.

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[28] Haring, 'Towards decoding the Workmen's Funny Signs', *GM* 178 (2000), 49-51. Soliman, *Of Marks and Men* (unpublished dissertation), chapter 3, section 3.2.2.

[29] In anticipation of chapter 2 we must remark that marking systems throughout Egypt from the Early Dynastic period onwards include marks that are at least graphically inspired by script. In the next chapter we argue that their corpora show similarities to the early marks in Deir el-Medina, which means that script may not have been the only source of graphic inspiration for the marks from group I; earlier marking systems may also have led to their selection and use in dynasty 18.

[30] Another ostracon that belongs to this group is O.IFAO ONL 6316, but its marks are faded; see the database Symbolizing Identity, section 'Object', object number IFAO ONL 6316 for photographs.

Fig. I1-2 Neat handwriting in dynasty 18.

Dynasty 19

In dynasty 19 the identity marks still display hieroglyphic forms, but they also begin to show cursive and hieratic forms. Furthermore, in addition to the mark , which continued to be used in dynasty 19, the number of group-writings increases. The marks that were used in dynasty 19 are presented in Table I1-3:

Table I1-3 Marks from dynasty 19, group I[31]

Code		Mark	Code		Mark	Code		Mark	Code		Mark
I 01.001			**I 04.054**			**I 06.030**	**b**		**I 07.005**		
I 01.002			**I 05.034**	**a**		I 06.031	a		**I 07.026**		
I 01.028[32]				**b**			**b**		I 07.038		
I 04.006			I 06.012			I 06.035	a		**I 07.047**	**a**	
I 04.010			**I 06.018**				**b**		I 08.007		
I 04.028			**I 06.023**				**c**		**I 08.016**		[33]
I 04.036			**I 06.030**	**a**		**I 07.001**			I 10.001		

[31] Some marks have been excluded, because they do not occur on ostraca, and are very rare on objects or in graffiti dated to dynasty 19-20. They can be found in Tables I3-1 and I3-2, but we will not include them in the discussion here.
[32] Only 3 occurrences in dynasty 19. The mark is especially known from dynasty 20 as belonging to *Ḳꜣyḏr.t*. See Table I3-1.
[33] Only once in dynasty 19, on ostracon IFAO ONL 6587, of which the context and interpretation remain unclear.

I 11.002			**I 15.001**	**c**		**I 21.013**			**I 27.011**[34]		
I 12.004			**I 15.005**			**I 21.026**			**I 27.012**[35]		
I 12.009	a		**I 15.006**			I 21.030			**I 27.013**		
I 12.013			I 16.004			I 22.001			**I 27.013**		
I 12.014	**a**		**I 16.005**			**I 22.011**			**I 27.014**		
	b		I 17.004	a		**I 22.014**	**b**		**I 27.015**		
I 12.015				**b**		I 22.022	a		**I 27.017**		
I 12.017	a		I 17.008	a			b		**I 27.019**	**a**	
I 12.034			**I 17.011**			**I 22.025**				**b**	
I 12.040			**I 17.012**			**I 24.001**	**a**		I 27.020		
I 13.001			I 17.014				**b**		**I 27.021**		
I 13.005			I 18.012	a		**I 24.003**			**I 27.022**		
I 13.008			**I 18.023**			I 24.005			**I 27.023**		
I 13.014	a		I 18.034	a		**I 24.008**			**I 27.025**		
	b			**c**		I 26.009[36]			**I 27.026**	**b**	
I 13.028			I 18.040	a		I 26.026			**I 27.027**		
I 13.035	**b**		**I 18.045**			I 27.001	a		**I 27.028**[37]		
I 14.006			**I 19.010**				c		**I 27.029**		
I 14.028			**I 19.032**			I 27.002	a		**I 27.029**		
I 14.036			**I 20.002**	**b**			**b**		**I 27.031G**[38]		
I 14.045				**c**		**I 27.003GD**[39]			**I 27.042G**[40]		
I 14.049	a		I 20.006			**I 27.004GTD**[41]			**I 27.052**		
	b		I 20.015			**I 27.005P**[42]					
I 15.001	**a**		**I 20.021**			**I 27008**					
	b		**I 20.023**			**I 27.009**					

The marks that were newly introduced in dynasty 19 are presented in the Table in bold. We see that especially marks with phonetic complements and marks that are composed of two signs in group-writing differentiate the 19th dynasty corpus from the corpus in dynasty 18. Phonetic complements we see in , , , and . Of these marks, both and occur in dynasty 18 without complements. Another mark that we know from dynasty 18 which gains a complement in later times is . The combination is not yet encountered on 19th dynasty ostraca, but it is seen twice in graffiti dated to

[34] Once, in graffito 1748. Also once on pottery (dyn. 19-20).
[35] Once as a graffito (dyn. 19); twice on pottery (dyn. 19-20).
[36] Only five times on pottery.
[37] Only on two ostraca dated to dyn. 19-20.
[38] Only once in a graffito dated to dynasty 19 among other identity marks on the pavement of the Hathor temple (Bruyère Rap. 35-40 IV, fasc. II pl. IX).
[39] Thrice in graffiti. Once more on a domestic object (dyn. 19-20).
[40] Thrice in graffiti dated to dynasty 19 among other identity marks on the pavement of the Hathor temple (Bruyère Rap. 35-40 IV, fasc. II pl. IX).
[41] Once, in graffito 1748. Twice more in graffiti 1747 and 2722 (dyn. 19-20). Also on a tool and on a wooden comb (dyn. 19-20).
[42] Only once on pottery, but equivalent to the more frequent mark I 18.045.

dynasties 19-20 (Theban Graffiti 0660 and 2673). Yet, in both cases it cannot be indisputably interpreted as identity mark, for the combination may also belong to the remains of a now illegible text. The mark is, then, only attested with certainty in dynasty 20.

All marks with phonetic complements occur less often than their variants without complements. The mark occurs 11 times in dynasty 19 and is in three cases provided with a complement *d*: once on ostracon IFAO ONL 1383 and twice on pottery.[43] The date of the ostracon is, however, uncertain. The combination is truly hieratic in form. We initially thought that it was not an identity mark, but simply hieratic script reading *šd*. Yet, the group occurs immediately in front of ; the combination and does not make sense in writing. This shows how close the marks can be to writing: they can resemble it in every respect, yet make no sense when read linguistically. As marks, and do make sense in that they could refer to *Nb-nfr* (i) and his son *Pꜣ-šdw* (iv). This remains speculation since we neither know whether was indeed used by someone named *Nb-nfr*, nor is the identity of and secured by other sources.[44] Another option is to consider *Pꜣ-šdw* (xvi) as the person referred to on ONL 1383. He is attested with in dynasty 20.[45] This would, of course, change the date of IFAO ONL 1383 to dynasty 20. Although hieratic forms occur in both dynasties 19 and 20, as we will soon see, they are more frequent in dynasty 20 and such a date would thus fit ONL 1383 in style as well.[46]

The marks /, / and / are certainly marks with complements that are to be dated in dynasty 19, but each is extremely infrequent: occurs once, occurs four times, and twice. Both and show an ordering of the signs similar to the block-writings known from script. Instead of *t*, one specimen of shows a vertical stroke which functions to fill the space that is created in the lower left corner by combining with *p*: (IFAO ONL 6218). The signs in the mark are also combined in a group conform script, yet *wn* and *n* are not ligatured as seen in many hieratic examples. Specimens in which *wn* and *n*, even double *n*, are ligatured appear in dynasty 20 only.

There is one last mark that shows a phonetic complement, which is also a new introduction in dynasty 19. However, it differs from the previous marks in one respect: it is a ligature that had become standard in hieroglyphic writing, and conform hieroglyphic script, a variant without the complement is rarely, if at all attested in the marking system. It concerns . It occurs 25 times on 19th dynasty ostraca, which is 35.21% of its total amount of occurrences on ostraca in dynasties 19 and 20. This shows that in contrast to the previous marks with phonetic complements it was immediately well integrated in the marking system. A variant of the papyrus plant without complement *ḏ* was tentatively identified on two ostraca from dynasties 19-20, on one undated ostracon, on one potsherd from dynasties 19-20 and on one potsherd from dynasty 19, although the latter is damaged and might also be a specimen of . The inspiration and model for this mark was clearly the hieroglyphic ligature that was standard for the writing of *wꜣḏ*.

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[43] Potsherds Austin Shard 1 and Bruyère Rap. 28 II 113, fig. 63 nr. 039. Once more on a potsherd dated to dynasties 19-20: Bruyère Rap. 48-51 pl. XVII, 102.

[44] That is, there is an indication in the comparison of marks ostracon IFAO ONL 6536 with the hieratic ostracon DeM 0713+OIC 17007 for the identity behind being that of *Pꜣ-šdw* (xiv); both record wood deliveries by the same men, although the quantities do not coincide. The two hypotheses, the first about the user of being *Pꜣ-šdw* (iv), and the second about the user of being *Pꜣ-šdw* (xiv), are extremely speculative, and we cannot base on them any serious conclusions as regards the nature of the marks and their relation to each other.

[45] Cf. the remarks with in Table I3-1.

[46] Another option for an interpretation of the combination of with is given below, in the context of the frequent addition of the sign *nfr* to marks that are also attested without it.

The addition of complements and the organization of signs in blocks conform hieroglyphic script suggests a greater influence of script on the marking system. We can also discern this in the style of the marks. When we consult Table I3-2 in which all specimens of the marks are collected, we see that most of the marks that were used in dynasty 18 and continued to be present in the corpus of dynasty 19 maintain hieroglyphic forms. It concerns the marks , and . Only some specimens of , , and show cursive, pseudo-hieroglyphic or hieratic characteristics, while , and generally show no hieroglyphic specimens at all (see Table I3-1 for details on the forms these marks). Of those marks that were newly introduced in dynasty 19 several still show hieroglyphic forms, for instance specimens of , , , , , , , , , , , , and . But influence of cursive and hieratic script is to a larger extent present in specimens of , , , , , , , , , , and and one specimen of .

A difficulty in defining the forms of the 19th dynasty marks that are assigned to group I is the fact that the degrees in which signs of Egyptian script are cursive or hieratic are not yet fully defined.[47] We have just mentioned the terms 'hieroglyphic', 'cursive hieroglyphic', 'pseudo hieroglyphic' and 'hieratic', but the marks and their specimens cannot in all cases be satisfactorily placed within one or the other category. Thus, all 19th dynasty specimens of lack the details that indicate the pendant of the collar, which is a significant feature of both the hieroglyphic and hieratic equivalents; and none of the 19th dynasty specimens shows the loaf as it is represented in its hieroglyphic or hieratic forms. The specimens that represent a boat show three variants, of which 'a' and 'b' (resp.) could be called hieroglyphic, but c () is neither hieroglyphic nor hieratic. An abstract geometric trend seems to be present in these specimens, which causes them to appear as simplified linear representations of , and . Such an abstract linear style is even better seen in the mark , which occurs 11 times on ostraca from dynasty 19, but is hardly seen thereafter. It is only by comparing two specimens of the mark , which occurs exclusively in dynasty 20, that we can suggest that in dynasty 19 was a simplified linear representation of in dynasty 20: compare the specimens and of on ostracon IFAO C 7586 respectively ostracon IFAO ONL 6253. In the cases of , and the abstract linear forms disappear after dynasty 19, while the form remained to be used in dynasty 20.

Cursive forms have their first appearance in dynasty 19. A mark that is newly introduced is the *ỉ3*-bird (I 07.047): we find the cursive form on ostracon Schaden 153. Another cursive form is (I 07.001) on ostracon Schaden 061, which also shows cursive forms for (I 06.035a) and (I 20.015). Pseudo hieroglyphic forms also begin to emerge in dynasty 19. The term pseudo hieroglyphic applies to those specimens that combine hieroglyphic and hieratic features.[48] This is especially seen in the specimens (O.IFAO ONL 6215), (O.Cairo JE 96334)[49] and in on ostracon IFAO ONL 6226: neither of them shows a full hieratic form. Three other specimens of in dynasty 19 do show correct hieratic forms, but in Table I3-2 it can be seen that pseudo hieroglyphic forms remain present in dynasty 20, and are even more frequent (18 occurrences as against 14 of hieratic form). True hieratic forms in

[47] This problem is at the core of the long-term project *Altägyptische Kursivschriften* under the direction of prof. dr. Ursula Verhoeven of the Johannes-Gutenberg Universität Mainz. It is hoped that the digital palaeography which it aims to create will better define the various degrees of cursive scripts and that the identity marks and their development in relation to script can be better defined in relation to its results.

[48] Haring, 'On the Nature of the Workmen's Marks' in Andrássy et al. (eds.), *Non-Textual Marking Systems*, 124.

[49] The interpretation of O.Cairo JE 96334 is not entirely clear. It appears to represent commodities with marks and day numbers. Another specimen of on this ostracon shows the hieroglyphic form .

dynasty 19 are found in the specimen (I 01.002) on ostracon Cairo JE 96336; in the specimen (I 14.036) on ostracon IFAO ONL 6518; in the specimen (I 12.015) on ostracon IFAO ONL 6570;[50] and in (I 05.034b) on ostracon IFAO ONL 6585.

The last mentioned ostracon shows that one specimen of hieratic form does not automatically mean that the entire ostracon is in hieratic style: it also includes specimens that are hieroglyphic in form, such as and . Since all other specimens of the hare in dynasties 19 and 20 are hieratic in style, and all other specimens of and are hieroglyphic in style, this reveals something about the nature of the marks themselves rather than of the ostracon: the hieroglyphic forms and were the inspirational sources for respectively , while specifically the hieratic form of the hare was the inspirational source for that mark. The difference can be attributed to the complex form of the hieroglyphic hare, which is easier and faster to render in hieratic style.

There are more ostraca that show differences in style between the marks and other information they contain. Consider the ostraca Schaden 013 and Schaden 016 in the Database *Symbolizing Identity*. Both show marks primarily in hieroglyphic style, but they also include hieratic numbers and in the case of ostracon Schaden 013 even the hieratic sign for (*w*)*ḏ3.t*, 'remainder'. While the marks were apparently inspired by hieroglyphic script, there was at least some knowledge of hieratic as well.

A final note may be added on the group-writings of class I 27 which, except for , are all new introductions. Many of them can be read as workmen's names. Thus, the group , which occurs only in dynasty 19, can be read as *Rᶜ-ḥtp*. Indeed, a workman named *P3-Rᶜ-ḥtp* (i) is known to have lived in dynasty 19.[51] There is reason to assume that he used the mark , because on the potsherd Bruyère Rap. 48-51, pl. XVI.040 it occurs together with the mark , which belonged to *Nfr-ᶜ3b.t* (i).[52] *Nfr-ᶜ3b.t* (i) was *P3-Rᶜ-ḥtp*'s brother in law.[53] Another 19th dynasty group, , can be read *nb Rᶜ*.[54] The mark may in fact have been used by *P3-Rᶜ-ḥtp*'s brother, the workman *Nb-Rᶜ* (i).[55] The mark is also exclusive to dynasty 19 and can be read as *ḥry pḏ.t*. It may have belonged either to *P3-ḥry-pḏ.t* (i), *P3-ḥry-pḏ.t* (ii), or to *P3-ḥry-pḏ.t* (iii), who all lived in dynasty 19.[56] A final example is the group , *nfr rnp.t*. As a mark, it may have belonged to one of the *Nfr-rnp.t*'s of Deir el-Medina, perhaps *Nfr-rnp.t* (ii), who was a sculptor in dynasty 19: on ostracon IFAO ONL 6338 the mark appears with several others, as well as with the depiction of a chisel. The mark has a history in 18th dynasty Deir el-Bahri, where it is seen in the temple of Hatshepsut oftentimes accompanied by a date or a short note.[57] Presumably, it had functioned as a team mark there,[58] but this is unlikely in the case of the personal identity marks in Deir el-Medina. In

[50] Tentatively dated to dynasties 19-20. It is accompanied by drawings of uncertain nature.
[51] Davies, *Who's who at Deir el-Medina*, 149-151, 153.
[52] The mark can be linked to *Nfr-ᶜ3b.t* (i) because it is attested as determinative following his name spelled out or . See, for instance, his stela in the British Museum, BM EA 305. Compare also the potsherd Bruyère Rap. 48-51, 050 nr. 045 in the Database *Symbolizing Identity*.
[53] Davies, *Who's who at Deir el-Medina*, chart 11.
[54] Encountered on ostraca Cairo JE 46861 and IFAO ONL 0233; furthermore on the potsherd Nagel, Céramique 145, K.2.137.
[55] For this brother, see Davies, *Who's who at Deir el-Medina*, 153-154.
[56] *Ibid*., 2, 9-10, 13, 153-154.
[57] Wieczorek, 'Building Dipinti in the Temple of Hatshepsut. Documentation work, season 2007/2008', *PAM* 20 (2008), 203-211; Ibid., Building Dipinti in the Temple of Hatshepsut. Preliminary Remarks, 2005/2006' in Gawlikowski & Daszewski (eds.), *Polish Archaeology in the Mediterranean* XVIII. Reports 2006, 285-289.
[58] See chapter 2 for more information on team marks as well as on their connection to dates and notes.

all these group-writings the marks rather seem to have become abbreviations for personal names rather than non-textual identity marks without any linguistic affinity.

All in all, the marks from dynasty 19 show that script gradually gained influence on the marking system: not only in the addition of phonetic complements and the organization of signs in block-writing, but also in the introduction of cursive, pseudo hieroglyphic and hieratic forms which are true characters from script rather than the pictures hieroglyphic forms represent, as well as in the inclusion of group-writings as abbreviations of workmen's names. In comparison to the less standardized collection of forms and orientations seen in dynasty 18, it furthermore seems that the marking system gradually became more uniform, drawing on script, hieroglyphic as well as hieratic, to provide the growing number of the system's users with identity marks.

Dynasty 20

This development pushed through in dynasty 20. The marks of the 20th dynasty corpus are given in Table I1-4. Those marks that were newly introduced, either in dynasty 20 or at an undetermined moment in dynasties 19-20, are presented in bold.

Table I1-4 Marks from dynasty 20, group I

Code		Mark	Code		Mark	Code		Mark	Code		Mark
I 01.001			I 04.058	a		I 06.035	**d**		I 12.009	a	
I 01.002			**I 04.060**			**I 06.055**			I 12.014	a	
I 01.019			**I 04.063**			I 07.005				bG	
I 01.028			**I 05.010**			I 07.026			I 12.014	a	
I 01.035G			I 05.017[59]			I 07.038[60]			I 12.017	a	
I 01.040			I 05.034	a		I 07.047	a		**I 12.022**		
I 01.121c				b			**b**		**I 12.023**		
I 03.001				**c**		**I 07.063**			I 12.034		
I 03.019			I 06.012	a		**I 08.006**[61]			I 12.040		
I 04.002				**b**		I 08.007			I 13.001		
I 04.004			I 06.023			I 08.016			**I 13.002**		
I 04.010			I 06.030	a		**I 09.012**[62]			I 13.005		
I 04.028				b		I 10.001			**I 13.007**		
I 04.036			I 06.031	a		I 11.001			I 13.008		
I 04.040	**a**			b		I 11.002			I 13.012		
	b			a		**I 11.019**	**a**		I 13.014	a	
I 04.045				**b**			b			b	
I 04.054				**c**		I 12.004			**I 13.023**	**a**	

[59] The mark occurs mainly in dynasty 20. There is one uncertain occurrence in dynasty 18. See the remarks in Table I3-1.
[60] The interpretation of the bird-form as a duck in dynasty 20 is uncertain; I 07.038 seems to be a mark exclusive to dynasty 18.
[61] Not dated. Only two occurrences somewhere in dynasties 19-20.
[62] One specimen, on ostracon IFAO ONL 6473, might date earlier: the ostracon is tentatively dated to dynasties 19-20.

I 13.023	**b**		**I 17.019**			**I 22.010**			**I 27.018P**		
	c		**I 18.003**			I 22.011			I 27.019	a	
	d		I 18.012	a		I 22.014	a			b	
I 13.027			**I 18.014**				b		I 27.020		
I 13.028			I 18.023			**I 22.017**			I 27.021		
I 14.006			**I 18.028**			I 22.022	a		I 27.023		
I 14.021			I 18.034	a			b		**I 27.024P**		
I 14.024				**b**			**c**		**I 27.026**	**a**	
I 14.028			I 18.040	a			**d**		**I 27.028**		
I 14.031			I 18.045			I 22.025			I 27.029		
I 14.036			**I 19.003**[63]			**I 22.037**			**I 27.030**		
I 14.045			I 19.010			I 24.001	a		**I 27.032**		
I 14.049	a		**I 19.018**				**b**		**I 27.033**		
	b		**I 19.019**			I 24.003			**I 27.034G**		
I 14.051			**I 19.022**			I 24.005			**I 27.035**		
I 15.001	**a**		I 19.032			I 24.008			**I 27.036**	**a**	
	b		**I 20.002**	**a**		I 26.009[64]				**b**	
	c			**d**		I 27.001	a		**I 27.037**	**a**	
I 15.002P			I 20.006				b		**I 27.037P**	**bG**	
I 15.005			I 20.015			I 27.002	a		**I 27.038**		
I 15.006			**I 20.019**				b		**I 27.039**		
I 15.056G			I 20.021			I 27.004GTD			**I 27.040**		
I 16.001			I 20.037			**I 27.006**			**I 27.043**		
I 16.004	a		**I 21.004**			**I 27.007**			**I 27.044**		
I 16.005			**I 21.006**			I 27.008			**I 27.045**		
I 17.004	a		I 21.013			I 27.009			**I 27.047**		
	b		**I 21.016**			**I 27.010**			**I 27.049GT**		
I 17.008	a		**I 21.017**			I 27.011			**I 27.050**		
	b		I 21.026			I 27.012			**I 27.051**		
I 17.011			I 21.030			I 27.013			I 27.052		
I 17.012			**I 22.004G**[65]			**I 27.016**	**a**		**I 27.053**		
I 17.014			**I 22.009**				**b**				

The corpus from dynasty 20 shows more variation in classes of marks, especially in anthropomorphic figures and deities, in plants, buildings and in pots. Also, it includes a range of phonetic group-writings,

[63] Once only, and uncertain; see p. 32.
[64] Once in dynasty 20, but uncertain. The mark is rather specific for dynasty 18. In dynasty 19 it occurs five times on pottery.
[65] Only once in Theban Graffito 0077.

some of which occur only a few times and therefore seem to have been invented for specific workmen at the moment when necessary.[66] Others, especially those composed with the sign (I 27.002b to I 27.013) are oftentimes also attested in singular form. They may be considered more elaborate abbreviations of workmen's names, such as for ***Nfr-ꜥ3b.t***, otherwise attested with (I 18.045); or for ***Wn-nfr*** (iii), otherwise attested with (I 05.034). The same might be suggested for of ***Nfr-rnp.t*** (ii) and (I 12.004), and for of ***P3-Mn-nfr*** and (I 14.024). However, the addition of is not always so easily explained, for instance in those cases where a link between '*nfr*' and a workman's name cannot be made: (I 27.003GD), (I 27.004GTD), (I 27.007) and (I 27.013). The combination of and on ostracon IFAO ONL 1383 that was mentioned above could be another example of the addition of not related to the workman's name. Can the frequent addition of in group-writings from dynasties 19 and 20 be otherwise explained? A tentative suggestion would be that was added as an adjectival marker, emphasizing that the workman who was identified by means of the mark was 'tüchtig' or 'pflichtsgetreu'.[67] The duty rosters only appear in hieratic form in dynasty 20, but the practice of workmen on guard could be older than its first recordings. In fact, the 19th dynasty corpus of marks ostraca indicated as the Schaden ostraca appears to give the first recordings of duty rosters in marks.[68] For more details on the addition of in individual cases, see the remarks in Table I3-1.

With regard to the 20th dynasty corpus in general, it is again conspicuous that those marks which we encounter already in dynasty 18 are generally found in hieroglyphic form. It concerns especially the marks (04.036), (04.058a), (06.012a),[69] (06.031a), (06.035a), (10.001), (12.017a), (13.005), (13.008), (13.012),[70] (17.004a),[71] (17.014) and (24.005). Yet, in addition, we also find more influence of cursive and hieratic script on the forms and orientation of specimens in dynasty 20. Consider the specimens of (I 13.028). Among them, five appear in hieroglyphic form (especially on BTdK 565), but forms such as on Cairo JE 72491 and on IFAO ONL 6436 are rather cursive or hieratic, although none of the specimens shows the characteristic details and the exuberant arch which the rays of the rising sun can form in hieratic representations of .

Hieratic forms are also not clearly recognizable in the only two 20th dynasty specimens of (I 14.031).[72] However, whereas the 18th dynasty specimens are consistently orientated vertically as in on

[66] Examples are (I 27.033), (I 27.035), (I 27.038), (I 27.044), (I 27.045), (I 27.047), (I 27.050) and (I 27.053), if indeed all of them are workmen's identity marks. For details, see Table I3-1.
[67] WB II, 254.
[68] Soliman, *Of Marks and Men* (unpublished dissertation), chapter 5, section 5.3.2.2.
[69] The difference in hieroglyphic, cursive and hieratic forms of this mark cannot be clearly made on the occurrence of one isolated specimen, but compare the hieratic specimens in Möller II, nr. 148.
[70] Note the difference in orientation for this mark in dynasties 18 and 20. Cf. the remarks with I 13.012 in Table I3-1.
[71] Above was mentioned that the 19th dynasty specimens of this mark appear to indicate an abstract linear trend in that the form of the '+' is neither hieroglyphic nor hieratic. However, among the 20th dynasty specimens of this mark we do find some forms that approach the hieroglyphic form of a little better; cf. those on the ostraca IFAO ONL 6537, 6549 and 6874 (although damaged, the top is clearly hieroglyphic).
[72] Which is also due to the fact that the sign is very simple and hieratic forms do not differ considerably from hieroglyphic forms. See Möller II, nr. 364.

MMA 09.184.770, both 20th dynasty specimens are in horizontal orientation as seen in hieratic script.[73] Their forms are not clearly hieratic, but their orientation may reveal hieratic influence.

Among the 20th dynasty specimens of (I 12.009a) we do see several forms that are cursive or clearly hieratic. Specimens such as on ostracon Ashmolean HO 1094, and similar forms on, among others, the ostraca Ashmolean HO 1095, Ashmolean HO 1250, Berlin P 10842, Berlin P 12625, BTdK 538 and Cairo JE 96328 clearly show a cursive scribal ductus, not only in the style of this specific mark, but in their overall style. In addition to we find a more elaborate form of the lotus flower, for instance on ostracon IFAO OL 170 ( ). Similar forms are found on the ostraca Ashmolean HO 0704, BM EA 50731, Cairo CG 25317 and Cairo CG 25325. They remind of hieratic examples in form (cf. Möller II, nr. 275), but also in orientation, which is consistently from right to left. In contrast, the flowers in dynasty 18 generally hang downwards.

Among the new introductions in dynasty 20 we find primarily cursive and hieratic forms. An example is the mark with its variant (I 04.040a-b). Most specimens are hieratic in form (e.g. O.Glasgow D 1925.80 and O. IFAO ONL 0310), but even those of which the style appears drawn rather than written (in particular those on O.Munchen 398) still include a hieratic form for the complement *w*. They could be designated as pseudo-hieroglyphic in form. Hieratic forms we furthermore see in all variants of the hare (I 05.034a-c). The variant in which two phonetic complements *n* are added is exclusive to dynasty 20. In one example the complements occur in a true hieratic ligature with the hare: on ostracon BTdK 539. Curiously, this ostracon shows another ligature of the hare with only one *n*: . In other combinations of the hare the signs are hieratic in style, but they are not ligatured; that is, they remain separate as in on ostracon BTdK 550. This might indicate that, although the signs were influenced by hieratic style, the mark in general was still considered a non-textual entity, not embedded in linguistic context.

Although not a new introduction, the mark (I 07.047a) which is seen in hieroglyphic and cursive forms in dynasty 19 does show a curious transformation: all 20th dynasty specimens are hieratic (e.g. on ostracon Cairo JE 96647). We even find the variant , which shows the hieratic form of the *ṯ3*-bird in group-writing with the complement *t* and a vertical stroke for *ṯ3ty*, 'vizier'. Another group-writings, that is in fact a new introduction and shows hieratic forms, is represented especially in the specimens and (I 27.036b) on the ostraca IFAO ONL 1371 and IFAO ONL 6185.

Yet, hieroglyphic forms remain present also in the marks that first appear in dynasty 20. Examples are several of the other specimens of (I 27.036b), the mark (I 27.045),[74] specimens of (I 04.002), or specifically the specimen (I 09.012) on ostracon ARTP 99-027. Also, many specimens of (I 11.019a) are hieroglyphic, or drawn or figural rather than written in style. Consider and on the ostraca IFAO OL 170 respectively ARTP 99-027. The reason may be that the mark has been attested for the scorpion-controller *Jmn-ms*: rather than referring to his name it referred pictorially to his function.[75] This may also explain the large degree of graphic variety that is seen among the specimens: some, such as on ostracon ARTP 99-027 and on ostracon IFAO OL 170, have four legs on each side of the body, while others such as on ostracon IFAO ONL 6250 only have two. The variation

[73] See, for instance, the examples given by Möller II, nr. 364.
[74] See the remarks in Table I3-1.
[75] Cf. Soliman, *Of Marks and Men* (unpublished dissertation), chapter 4, section 4.2.7; chapter 6, section 6.5.1. In Part II chapter 2 we argue that this is metonymic signification.

only has one leg on each side. There are furthermore differences in the orientation of the tail and body. It seems that it was only important to convey the notion of the animal rather than the specific form it had in script. The same can be argued for a large group of specimens that show a variety of pots and jars, some of which are encountered already in dynasty 18 while others are new introductions. None of the specimens shows signs of cursive or hieratic influence: their forms remain hieroglyphic or, rather, figural in style. Similar to the scorpions, the pots and jars were perhaps not related to script: they may simply have referred to the depicted objects. This idea is strengthened by the fact that none of the values that we can ascribe to the pots coincides with a workman's name. The existence of many varieties, in which pots may or may not have one or two handles, spout liquid, have a neck or an oblong bulbous body, while many of them occur in the same or comparable sequences, suggests that details were insignificant and a specific rendering of one pot did not distinguish it from others. In other words, all variants could simply have conveyed the notion 'pot', referring to the object. This, Haring said, is 'an important difference with respect to the hieroglyphic writing system, in which the addition of details like handles and pouring liquid make(sic) different signs.'[76]

There are, thus, among the marks from group I examples that upon closer examination may not have been related to, or inspired by script. The underlying problem that blurs the distinction is the pictorial nature of hieroglyphic script. In general, however, most marks in dynasty 20 do seem to be related to script in that they convey meaning on the basis of phonetic value. The marks ostraca also contain more contextual information in dynasty 20 than in earlier times, especially in the case of the duty rosters which give a list of days, workmen and products brought by members of the outside personnel, the *smd.t n bnr*. They allow comparison with hieratic duty lists, on the basis of which matches between workmen and marks can be secured. These matches show that a mark, whether hieroglyphic or hieratic in form, was oftentimes a phonetic abbreviation of a workman's name. Thus we have for ***Ms*** (iv), for ***Kɜsɜ*** (v/vi), for ***Ḳɜy-ḏr.t*** (i), for *Jmn-**nḫt*** (ix), for *Wsḫ-**nmt.t*** (i), for ***Ḥnmw**-ms* (i), for ***Wn**-nfr* (iii), for ***Wsr**-ḥɜ*.t (ii), for ***Ḥr*** (ii), for *Sɜ-**Wɜḏ**.t* (ii) and so forth. With respect to those marks that have a match in dynasty 20 we may speculate about their users in earlier times. For instance, it has been mentioned that the mark was used by *Rš.w-ptr=f* in dynasty 20. He may have been the grandson of *Nfr-ḥtp* (ii) to whom the mark could originally have belonged. Another example is the mark , which could be read *nb-nfr*. It occurs eight times on ostraca in dynasty 19 and three times more in graffiti.[77] Although the mark is not attested for a person named *Nb-nfr* and no match exists for dynasty 19, it is attested in dynasty 20 for the workman *Bɜk-n-wrnr* (vii).[78] The name *Bɜk-n-wrnr* has no connection to the phonetic value *nb-nfr*, and therefore we may hypothesize that this man adopted the mark from a family member who used it before him in dynasty 19. Unfortunately, we do not know *Bɜk-n-wrnr*'s ancestors, but we do know that he had a son called *Nb-nfr*, who in turn had a son called *Bɜk-n-wrnr* (viii).[79] It is, then, possible that *Bɜk-n-wrnr* (vii) himself had a father called *Nb-nfr*, from whom he inherited the mark.

[76] Haring, 'On the Nature of the Workmen's Marks' in Andrássy et al. (eds.), *Non-Textual Marking Systems*, 131.
[77] The mark furthermore occurs 6 times on ostraca dated to dyn. 19-20, 3 times on pottery dated to dynasty 19-20, and 8 times in graffiti dated to dynasty 19-20. It is also frequent in dynasty 20 with 33 occurrences on ostraca and 2 in graffiti.
[78] On the ostraca Ashmolean HO 0068 and ARTP 99/27. O.Ashmolean HO 0068 contains a hieratic text that mentions *Bɜk-n-wrnr* and *Nfr-ḥr* on the obverse, and presents their marks on the reverse; O.ARTP 99/27 can be compared to the name list on ostracon DeM 831.
[79] Davies, *Who's who at Deir el-Medina*, chart 47.

The mark 𓄿𓏏 is very reminiscent of 𓏏, which also suggests a reading *nb-nfr*. Yet, it remains uncertain whether the two marks are variants used by the same workman, or whether the addition of an extra 𓏏 in 𓄿𓏏 functioned to distinguish two marks used by two different workmen. The mark 𓄿𓏏 is attested only twice on ostraca from dynasty 19, and once more in a graffito. It is much more common in graffiti dated to dynasties 19-20 or to dynasty 20. Three 20th dynasty graffiti (Theban Graffiti 0292b, 3284 and 3295) show 𓄿𓏏 in close proximity to the mark 𓍯. The latter belonged to *Pn-tꜣ-wr.t* (vii), who happened to be a son of a man called *Nb-nfr* (vii).[80] If indeed 𓏏 and 𓄿𓏏 were variants of the same mark, we may theorize that the *Nb-nfr* whom we suggested was *Bꜣk-n-wrnr*'s father was in fact *Nb-nfr* (vii), and *Bꜣk-n-wrnr* was the older brother of *Pn-tꜣ-wr.t*. Davies remarks that *Nb-nfr* (vii) was active in the crew at least in years 23-24 of Ramesses III;[81] therefore, the use of 𓏏 and 𓄿𓏏 in dynasty 19 must go back even earlier. Here, however, we lose track: the name *Nb-nfr* is not known among the ancestors of *Nb-nfr* (vii).[82]

All in all, the influence of script on the marking system seems to be clearly present in the marks from dynasty 20, not only in their forms and orientation inspired by hieroglyphic, cursive and hieratic characters, but also in their use of phonetic value. The marks ostraca with duty rosters in particular highlight a development that shows an even stronger increase of the system of writing on the marking system. This is a development not so much concerned with the nature of single marks and specimens, but with the marks ostraca themselves. Consider figure I1-3, a compilation of ostraca from dynasty 18. They show a variety of formats in which the ordering and size of the marks differs. Ostracon IFAO OL 6788 we have seen above as an example of the neat handwriting in dynasty 18. It shows marks that are all of the same relative size, ordered in tidy lines. These are two characteristics which the marks share with writing: linearity in lines or columns has traditionally been considered a characteristic of writing,[83] and the importance of the relative size of signs was stressed by Goldwasser, who said that in writing all characters are 'let loose in a wonderland where a house is the same size as a snake, a child and a locust'.[84] If the marking system would be of pictorial nature, would one not rather expect that the two mountains (𓈙) are larger than the loaf (𓉔), and the bird (𓅱) at least somewhat bigger than the bird's paw (𓂝)? There are several other ostraca in dynasty 18 that show similar neat lines with same size marks;[85] clearly, the system shared these characteristics with writing from its beginning onwards. Yet, this cannot be said for all 18th dynasty ostraca. Ostracon OWV 10 shows an untidy line with rather coarse marks underneath the line drawn up by the neat hand. The marks are differently sized compared to those in the line above, as well as compared among each other: especially 𓊹 (I 17.004a) and 𓍿 (I 27.001b) on the far right are smaller in size than 𓎛 (I 12.009a). Although minor, these differences give the line less the standardized appearance of writing than the line above. Even coarser and in untidy grouping are the marks on ostracon Cairo JE 96603. The order in which the marks must be interpreted is not clear. The same problem concerns the ostraca Cairo JE 96631, CG 24106, and OWV 05.

[80] Davies, *Who's who at Deir el-Medina*, 228.
[81] *Ibid.*.
[82] *Ibid.*, chart 8.
[83] Which it is, but not of writing alone. See the Introduction to this dissertation; Marcus in Jackson, *Moche Art and Visual Culture*, 84.
[84] Goldwasser, *From Icon to Metaphor*, 24.
[85] Examples include the ostraca Stockholm MM 14130, OWV 03 and Cairo JE 72490. Cf. fig. I1-2 and the Database *Symbolizing Identity*.

Fig. I1-3 Ostraca from dynasty 18.

The marks on the 18th dynasty ostraca are sometimes accompanied by dots and strokes, possibly a system for counting absence or presence, but not by any other sort of information. This gradually changes in later times. Fig. I1-4 shows examples of marks ostraca dated to dynasty 19. Although we still find marks in horizontal lines such as on the ostraca Schaden 016 and Hawass, we also find them in columns as seen on the ostraca Schaden 001 and IFAO ONL 6347. We do, however, occasionally still encounter untidy orderings such as on ostracon Schaden 137.[86] Generally, the marks on the ostraca are all of the same relative size. We sometimes see the addition of hieratic or pseudo hieratic numerals, for instance on ostracon Cairo JE 96352, or of commodities as on ostracon IFAO ONL 6221. The latter shows the marks , , , and accompanied by vessels and mats(?). The dots inside the vessels may be a numeral system. All in all, the marks become embedded in more encompassing, multi-informative records.

Fig. I1-4 Ostraca from dynasty 19.

Fig. I1-5, finally, shows examples of marks ostraca dated to dynasty 20. Some are organized in neat lines,

[86] Vague lines may be discerned, but they are not straight lines and certainly do not give the impression of linguistic writing.

others in columns. Ostraca such as IFAO OL 170 even show tidy delineated columns such as those found on tomb and temple walls. Many of the 20th dynasty marks ostraca contain other information in addition to the marks, for instance a date indicated by means of the sign *s* for *s*(*w*), hieratic numbers – although not the hieratic numbers one regularly finds with dates in written sources –, and products brought by members of the *smd.t*-personnel. The ostraca with most information, such as O.IFAO ONL 0300, O.Fitzwilliam EGA 6120.1942 and O.Ashmolean HO 1247, contain similar data as the hieratic duty rosters.[87] Most of them were drawn up by the same hand. The person in question embedded the marks in the records, notating them among abbreviated hieratic notations for date and products. The marks are all of the same size, not only as compared to each other, but also as compared to the other pieces of information. They fit right into the lines, in size and in style; there is no optical disturbance in 'reading' the lines from the date on the right to the end of the lines on the left; an orientation that is moreover consequently adhered to and that is conform to hieratic script. Optical disturbance was, for instance, still seen on ostracon Cairo JE 96352 from dynasty 19 (fig. I1-4) where large spaces are left open between the marks and hieratic numbers. The 20th dynasty records were clearly drawn up by someone who was used to writing hieratic records, and he embedded the marks almost as if they were writing. That is, the marks as a system *are* not writing in that they still include abstract and concrete representations, and in that they do not convey meaning in combinations based on linguistic rules; yet, textual and non-textual elements cooperate in these records to an extent that has made the line between writing and non-writing very thin.

Fig. I1-5 Ostraca from dynasty 20.

To sum up, a close look at the workmen's identity marks that are allocated to group I creates the image of a growing *presence* of linguistic script and a growing *influence* of script on the marking system: in form, in orientation, and in contextual embedding. The question is now to what extent the marks that do not seem to be related to hieroglyphic or hieratic script confirm this image? What was their share and status in the marking system throughout the dynasties, and how did they develop?

[87] Haring, 'Towards decoding the necropolis workmen's funny signs', *GM* 178 (2000), 45-58.

b. Group II

b.1 Codification

The marks that were assigned to group II are marks that do not have equivalent forms in hieroglyphic or hieratic script, or that may occasionally occur in script as pictorial, or semantic classifiers, but that have no phonetic value (examples are and [88]). They appear to be either abstract-geometric in form, or they pictorially represent objects or beings. Initially, we simply collected these marks without internal organization under the codes II 001, II 002, II 003, and so forth. Since the corpus of marks was still growing and new marks were frequently added, we first needed to arrive at an overview before any form of classification could be suggested. At the end of 2014 we decided on a classification that was very loosely based on form. Roughly said, the classification runs from the double triangle, via marks with curved elements, to rectangular marks, to linear animal-like marks, to squares, to marks with a triangular element in them, to T-forms, to marks that contain full circles, to 'ladder'-forms and to A-forms. However, in ongoing research it is inevitable that changes keep taking place. The most recent classification of the marks ascribed to group II is given in Table I1-5, but two remarks must be kept in mind:

- First, until recently new marks were still being added to the list.[89] They could not be fitted into the classification without rigorously adapting it. Rigorous adaptation of the classification, however, implied an adaptation of the coding system that we necessarily already incorporated in the dissertations. It was made a priority to finish the dissertations and to concern ourselves with changes in the corpus of marks at a later time. New marks were therefore simply included at the end of the list (in particular the marks II 048 to II 061G);

- Second, several marks were reinterpreted as being early forms of marks inspired by hieroglyphic or hieratic script. It concerns the mark that was previously coded II 002, but that was discussed above as an early form of I 18.012; the mark that was previously coded II 013, but that is now considered an early form of I 27.026; the mark that was previously coded II 003, but is now considered to be a form of I 04.046; and the mark that was previously coded II 047, but is interpreted as a form of and , I 15.001a-b. Again, in order not to make last-minute changes to the coding system, it was decided to leave such gaps open until a rigorous reorganization can be carried through.

[88] WB IV, 86.15, *sbꜣ*, 'level'.

[89] That is, some were newly discovered, and others were uncertain as workmen's identity marks, but were ultimately included on the basis of new finds or contextual information. Details are found in Table I3-1.

Table I1-5 Marks from group II

Code		Mark	Date	Code		Mark	Date	Code		Mark	Date	Code		Mark	Date
II 001	a		18-20	II 014	b		18	II 030			18-20	II 045			19-20
	b		18-20	II 015			18	II 031			18	II 046	a		19-20
II 002	-	-	-	II 016			18	II 032			18-19		b		19-20
II 003	-	-	-	II 017	a		18, 19	II 033			18	II 047	-	-	-
II 004			18		b		18-20	II 034			18	II 048	a		18-20
II 005	a		18	II 018			18-20	II 035			18		b		18
	b		18	II 019			19	II 036	a		18	II 049			?
	c		18	II 020			18, 19		b		18, 19-20?	II 050			20
II 006			18	II 021			18-20		c		18	II 051			18, 20
II 007	a		18-20	II 022			?	II 037			18	II 052			20
	b		18	II 023			19	II 038	a		18	II 053			20
II 008			18-20	II 024	a		18		b		18	II 054			20
II 009	a		18		b		18	II 039			18-19	II 055			20
	b		18		c		18	II 040			18-20	II 056			18
	c		18	II 025			18	II 041	a		18-20	II 057			20
	d		18	II 026			18		b		19-20	II 058			20
II 010			18	II 027			18	II 042	a		19-20	II 059			19-20
II 011			18	II 028			18, 20		b		19-20	II 060			19
II 012			18, 20	II 029	a		18-20	II 043			18-20	II 061G			19-20
II 013	-	-	-		b		19-20	II 044	a		19-20				
II 014	a		18		c		18-20		b		19-20				

Although it has been mentioned that non-linguistic marks are often subdivided according to concrete forms and abstract geometric forms, it was decided not to make such a distinction for the identity marks in group II. The reason is that it became increasingly uncertain whether indeed the marking system contained forms that were of pure abstract geometric nature. As in the cases of , , and there are several others of which we suspect that they are either early forms of hieroglyphically or hieratically inspired marks, or linear representations of concrete objects or beings. It has, for instance, already been mentioned that may be an early form of I 04.028. Furthermore, may be a variant of I 13.001; , , and may all represent offering basins or altars; may be an early form of a papyrus plant; may represent a fan; could represent the sun, I 13.005; and both and may be hieroglyphic or hieratic forms of *p*, or represent the stool as an object. Even for and / we will make suggestions further below. In other words, the border between abstract geometric and concrete forms, and consequently the border with forms inspired by hieroglyphic script,[90] became increasingly blurred as research progressed; increasingly fewer marks could be designated as abstract geometric in nature or origin. It was decided that an explicit distinction between the two subclasses would not add significantly to the classification or the interpretation of the marks; in fact, it would rather complicate matters as we

[90] As hieroglyphic forms are in nature and origin representations of concrete objects or beings.

would have to deal with a distinction in speculative degrees of concreteness and abstractness within a group of marks that is already relatively small: 57 classes of marks as compared to the 201 classes in group I. Thus, in addition to a group with marks that are almost certainly concrete in form, such as , and , we would have to create groups for marks of which we suspect that they are concrete to decreasingly lesser extent such as , or , until we would end up with a very small group of marks that are presumably purely abstract geometric, mainly forms such as or ; yet, none of these groups would be based on evidence that supports their status as 'concrete', 'less concrete' or 'abstract'. In order to avoid arriving at an explicit distinction in the concrete or abstract nature of marks that we would not be able to defend, all marks with presumably different degrees of concreteness or abstractness are included in group II. Certainly, the fact that Table I1-5 does not contain distinctions does not mean that distinctions between concrete and abstract geometric forms are not at all present in the marking system. Degrees of concreteness and abstractness of individual cases are discussed in Table I3-1, if not in the following text.

b.2 Development

Table I1-5 shows that the majority of marks from group II dates to dynasty 18. A fairly small corpus dates to dynasty 19 and a corpus comparable in size dates to dynasty 20. The corpora from dynasty 18 and dynasties 19 and 20 differ in several respects with regard to form as well as frequency of the marks.

In dynasty 18 we encounter marks that are certainly part of the standard corpus of the time in that they are frequent and used recurrently and systematically in similar or closely comparable clusters. Many of them seem to represent a concrete object or being, or the notion of an object or being. This can be said for marks such as (II 034, 'mirror') and (II 039, 'papyrus plant'?), but also for marks that at first sight may appear to be abstract geometric in nature. Reasons to assume otherwise are their sometimes fairly complex and specific forms, as well as the fact that in some cases many graphic variants exist. Similar to the pots and the jars, the variants may indicate that details were insignificant because the notion would be evident in the approximate form. If the marks were pure abstract geometric in nature, it would be more important to stick to one form, since no underlying notion would guide one to the correct interpretation and identification. It concerns especially the marks , , and ; and ; ; and , and . The mark with its variants and is an example as well: it has a fairly specific form with a number of details on one or both sides that may vary in number. The form of the 'body' varies as well in that it can be oval or diamond in shape. This, however, is probably due to the method of production: the oval forms having been drawn, the diamond shapes having been embroidered or incised. A further reason to assume that the mark represented a concrete object or being is that it occurs in the exact form of as a builders' mark in the pyramid of Amenemhat II at Dahshur.[91] There, we also see the variants and . The possibility that the forms were linear abstractions of a concrete object or being is considered more likely than that they were purely abstract geometric inventions which occurred in exactly in the same form at two sites that were geographically and temporally far removed.[92] The question what the mark represents remains unanswered thus far. Suggestions concerned a kind of pot or a sandal, but neither one is irrefutable.[93]

[91] Arnold, *The Control Notes and Team Marks*, 161 (AII.8).

[92] For a discussion of builders' marks and the question to what extent they may have been sources of inspiration for the marks from Deir el-Medina, see the next chapter.

[93] See the discussion in Table I3-1, as well as in Part II, chapter 3.

It is notable that most of the marks that could be interpreted as early, abstract linear variants of hieroglyphic signs, are found in the 18th dynasty corpus. Thus, in addition to (II 025) we find (I 004) exclusively in dynasty 18. A relation to (I 17.008) could be suggested, although that mark occurs in correct hieroglyphic form on several 18th dynasty ostraca, among which UC 31988 where we also find . The mark (II 010) as well is found in dynasty 18 only and may be considered a variant of (I 13.001). The latter is already attested in dynasty 18, but the stroke underneath the lower horizontal line in might perhaps be interpreted in similar manner as the horizontal lines crossing or underlining (I 16.004a) and (I 18.040), discussed above. The form can hardly be taken as a variant of (I 13.002), because occurs only rarely in dynasty 20. Another example is the mark (II 031), which occurs frequently in dynasty 18 but disappears thereafter. The form reminds of the mace in hieroglyphic script. However, Haring noted that 'one significant feature of both the hieroglyph and its hieratic equivalent – the top of the stick projecting from the macehead – is absent … and so it is possible that this is not a mace, but a mark of the 'abstract' or 'geometric' category: a mere combination of a circle and vertical stroke.'[94] Another reason to interpret it as such is the fact that the actual hieroglyphic mace, also in later times, does not seem to be part of the main corpus of identity marks; it is encountered only once, in dynasty 20.

In addition to , almost all of the marks that are well-known from the 18th dynasty corpus had disappeared in dynasties 19-20: , , , , , , , , , and are no longer seen. The corpus that remained is notably different, not only in marks, but also in the frequency in which they occur. Thus, we encounter a variety of square forms in , , , and , but they are all very infrequent and their status as identity marks is very uncertain.[95] Furthermore, we see , and from dynasty 18, but they occur only once or twice in dynasty 19. The mark (II 023) is seen four times in dynasty 19, but it may in fact concern a variant of (I 23.008b); yet, that mark occurs only in dynasty 18 and the clusters of marks in which and occur do not compare well. Lastly, dynasty 19 contains a group of marks among which are (II 059), (II 060) and (II 061G). They appear to be figural, but their meaning escapes us and their overall interpretation as workmen's identity marks is not secured.

The core group in dynasty 19 is formed by five classes of marks, the specimens of which are relatively frequent or become frequent in dynasty 20: notably (II 042a) and its double variant (II 042b), and in addition (II 041a), (II 041b), (II 044a), (II 044b), (II 045), (II 046a) and (II 046b). Most of them can be interpreted as representations of concrete objects or beings. Thus, the specimens , , and of clearly show that the middle vertical line ends in a circle. This may have represented the weight at the end of the rope of a level, a tool that was used in construction work and as such perhaps formed a source of inspiration for selection among the identity marks.[96] The mark and its variant could represent the bouquets of flowers that were used in offering rituals depicted on temple walls, as well as in private funerary culture.[97] The mark represents a pomegranate, especially seen in the specimen on ostracon Schaden 001. The marks and are less easy to interpret, but a

[94] Haring, 'On the Nature of the Workmen's Marks' in Andrássy et al. (eds.), *Non-Textual Marking Systems*, 128.
[95] See Table I3-1.
[96] See also p. 174 and fig. II2-40.
[97] Eaton, *Ancient Egyptian temple ritual*, 171ff. See, for instance, the reliefs in the courtyard of Ramesses II in the temple of Amun, Luxor, depicted in Part III, fig. III1-7. Dittmar, *Blumen und Blumensträuße*, 33-37, Abb. 69, 73-77, 81, 85, 87 (Stabstrauß).

suggestion can be made on the basis of the knowledge that the mark 𓏏𓏏𓁹 (I 27.012) can be ascribed to *Nfr-ḥr* (vi) in dynasty 20.[98] Because of the fact that the marks 𓏏 and 𓏏𓏏 alone were also used to refer to him,[99] it appears that 𓏏𓏏𓁹 can again be considered a more elaborate abbreviation of 𓏏 and 𓏏𓏏. Could, then, 𓏏 respectively 𓏏𓏏 be interpreted as an extremely abstract sketch of the human face, 𓁹 *ḥr*, forming the second component in the name *Nfr-**ḥr***? Consider fig. I1-6. The lines of the marks 𓏏 and 𓏏𓏏 could be considered the grid lines that indicate the most important facial features: the eyes, the ears or sides of the head, and in case of 𓏏𓏏 the mid- or nose-line. A mark that represents the human face as 𓁹 (I 04.002) is encountered in dynasty 20, but only 7 times as against a total of 99 occurrences of 𓏏 and 𓏏𓏏 in dynasties 19 and 20. Certainly, 𓏏 and 𓏏𓏏 are easier and quicker to draw than the face. Moreover, grid lines would not be an uncommon feature to the workmen; they were, after all, artisans.

An argument against equating 𓏏 and 𓏏𓏏 with the mark 𓁹 is, however, found on ostracon IFAO C 7638. There, we find 𓏏𓏏 as the second mark in the rightmost column, while 𓁹 is found as the last mark in the leftmost column. A way out would be to consider 𓏏/𓏏𓏏 and 𓁹 as different identity marks that belonged to different workmen, yet both represented a human face: one in figural style and the other in abstract geometric style.

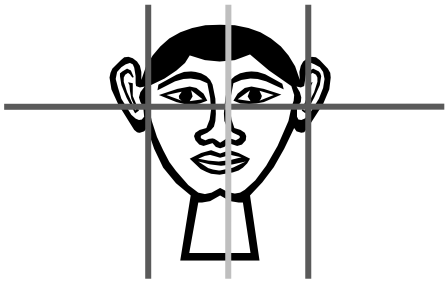


Fig. I1-6 The human face in grid lines, giving the marks 𓏏 and 𓏏𓏏.

The marks 𓀀, 𓀁, 𓀂, 𓀃, 𓀄, 𓀅, 𓀆, 𓏏 and 𓏏𓏏 that dominate in dynasty 19 continue to dominate the corpus of group II in dynasty 20. In addition, dynasty 20 shows several specimens of 𓏏𓎟 (II 030) and 𓏏𓎠 (II 021). The latter, however, is predominantly found on pots as a pre-firing mark. That makes an interpretation of workman's identity mark unlikely and instead suggests an interpretation as potmark. The specimens, e.g. 𓌙 on BTdK K56, are very reminiscent of similar pre-firing potmarks found at Qantir.[100] They may relate to a specific workshop or potter. Finally, we find in dynasty 20 a group of marks that appear to be representations of concrete objects. It concerns 𓀇, 𓀈, 𓀉, 𓀊, 𓀋, 𓀌 and 𓀍. They

[98] Cf. Soliman, *Of Marks and Men* (unpublished dissertation), chapter 3, section 3.2.2.
[99] Personal communication with Daniel Soliman. *Nfr-ḥr* occurs in many sources with duty rosters and the position of 𓏏 and 𓏏𓏏 on the marks ostraca compares well with his position in the hieratic sources.
[100] Ditze, 'Gedrückt – Geritzt – Gekratzt' in Pusch (ed.), *Die Keramik des Grabungsplatzes Q1. Teil* II, 398-401. See also the next chapter, in which potmarks are discussed as a possible source of inspiration for the marks from Deir el-Medina.

occur in the context of the workmen's identity marks, yet may not in all cases be interpreted as such. Their meaning and interpretation escapes us.[101]

The reader may have noted that two marks have thus far been left out of the discussion. They stand out because they are universal: (II 001) and (II 029). Both are frequently attested in all periods, not only in Deir el-Medina as identity marks but, as we will see in chapter 2, also as potmarks since the Early Dynastic period and as builders' marks in the Old and Middle Kingdoms. The form of the mark has been interpreted as the designation *ṯs.t* for 'team',[102] especially in the context of the Old Kingdom builders' marks. However, it is in those cases usually orientated horizontally in hieroglyphic form: . An indication for *ṯs.t* in Deir el-Medina is unlikely for at least three reasons: first, we are dealing with individual workmen and not with teams; second, the designation *ṯs.t* is not at all known from the written sources on the organization of work in the Theban Necropolis; and third, the identity mark II 001 is consistently orientated , at least in dynasty 20, with only two examples of in dynasty 18, and one in dynasties 19-20. The mark has a variant, , which contains a vertical line that crosses the mark in the middle. This variant is consistently orientated in dynasty 18, but often in horizontal position in dynasty 20. Perhaps this reflects that the mark had a different origin, but was conceptualized as *ṯs.t* in dynasty 20, the horizontal line being a crude designation of the knot in that sign? The variant , however, remains dominant throughout the dynasties. Another suggestion was made by Pierre Grandet, who related the form to the determinative of a folding stool ('*jsbw.t*') as seen on the hieratic ostracon IFAO ONL 1263.[103] Although such an association may indeed have arisen in dynasty 20, the hieratic determinative is unlikely to have been the source of inspiration for the forms and in dynasty 18. Nonetheless, the folding stool *as an object* was perhaps a source of inspiration. Although that suggestion would leave the crossing line in unexplained, one could resort to the idea of familial derivation as suggested for and , a practice which in this case would continue into dynasty 20. It is, however, questionable whether the stool was also the source for encountered as potmark at Early Dynastic Abu Roash or Abydos (see Table I2-1, chapter 2).

The mark has also received multiple interpretations, from soul-house to the form of funerary constructions, basins, pools, and harbours.[104] Goldwasser related the form to the *bet*-grapheme in Proto-Sinaitic script from the time of Amenemhet III and IV.[105] This grapheme, seen for instance in Sinai inscriptions 359 and 346a, differs from the hieroglyphic, cursive or hieratic forms for the Egyptian sign *pr* which represents a house and is used to write the word 'house'. Following Hamilton, Goldwasser rather suggests a connection to the soul-houses which were 'common in the Middle Kingdom' and 'certainly

[101] That is, resembles a broom, but speculation ends here. The form resembles a necklace, but we do not know whether it indeed represented a necklace and, if so, if is in any way related to the marks I18.012a and b (,). The form occurs only once and resembles the hieratic sign seen in Theban Graffito 1224: , which Ali interprets as a Middle Hieratic form of (Möller I, nr. 33). See Ali, *Hieratische Ritzinschriften aus Theben*, 95. Yet, it also reminds of Möller I-III, nr. 524 (). Both (I 01.001) and (I 21.004), however, occur only once as workmen's marks in dynasty 20.

[102] WB V, 402.

[103] Pierre Grandet on 'Quelques ostraca de l'IFAO' during the conference Deir el-Medina and the Theban Necropolis in Contact, 27-29 octobre 2014, Université de Liège.

[104] Bomann, *The Private Chapel in Ancient Egypt*, chapter 7.

[105] Goldwasser, 'Canaanites Reading Hieroglyphs II. The Invention of the Alphabet in Sinai', *Egypt and the Levant* XVI (2006), 143, 145-146.

appropriate to the social environment of the miners' of Canaanitic origin in Serabit el-Khadim.[106] She argues that this representation in the *bet*-grapheme is a 'clear example of the mixture, in one grapheme' of two referents: one taken from written hieroglyphic forms and another taken from a 'real life' object.[107] As such, the grapheme forms the bridge between the concept 'house' and the concept 'soul-house' as a specific type. The concept 'soul-house' may also be understood as a type of offering table,[108] and as such is related to specific types of offering altars or basins shaped in the form . Such altars and basins are particularly a feature of the New Kingdom:[109] several have been found at the villages of Amarna and Deir el-Medina, as well as at Deir el-Bahri, and they are depicted in tomb paintings in the Theban Necropolis.[110] Curiously, two different identity marks of this shape were in use in dynasty 18: and (with graphic variants and). The fact that they cannot be equated appears from their fairly frequent occurrence on the same ostraca, for instance on O.KV 10002, O.IFAO ONL 6340 and O.IFAO ONL 6316. The form disappeared after dynasty 18 while // remained in use.

All in all, a development parallel to the increase of marks from group I in dynasties 19 and 20 is seen in the decrease of marks from group II. Whereas in dynasty 18, 56 of the approximately 111 marks in total[111] could be argued to belong to group II (i.e. 50.45%), the numbers for dynasties 19 and 20 are 33 out of 141 in total (23.40%), respectively 36 out of 203 in total (17.73%). Moreover, the marks from group II in dynasty 18 are well-known and were recurrently used in similar clusters, while the marks from group II in dynasties 19 and 20 are all very infrequent and uncertain, with the exception of 'the big five': , , , and . This supports the idea of a growing influence of hieroglyphic and hieratic script on the marking system in the course of dynasties 19 and 20: in the repertoire of marks, and in their style, orientation and contextual embedding. The result is consistent with Haring's conclusions on the growing number and formalization of texts in general at the end of dynasty 19 and in the first half of dynasty 20. It seems indeed that 'people had discovered that' writing 'offered advantages', or could serve as '*aide-mémoire*'.[112] The marking system may have formed itself more and more in accordance with linguistic script, because it had to function in a growing community: whereas a limited number of approximately 40 to 45 marks that functioned to identify workmen in the earliest community in dynasty 18 could quite be easily remembered, it became increasingly difficult to remember which workman used which mark in a system that was continually and intensively used by succeeding generations in an ever changing community for over several hundreds of years. The recourse to signs from script that phonetically linked a workman to his mark may have been a mnemonic aid when the number of users of the system and the records of their work increased.

[106] Goldwasser, 'Canaanites Reading Hieroglyphs II. The Invention of the Alphabet in Sinai', *Egypt and the Levant* XVI (2006), 145.
[107] *Ibid*., 146.
[108] *Ibid*., 146, referring to Žába (1974).
[109] Bomann, *The Private Chapel in Ancient Egypt*, chapter 7.
[110] *Ibid*., 107. The T-shaped basins found at Deir el-Bahri and Deir el-Medina were found in connection with funerary gardens. For altars, see also Weiss, 'Personal Religious Practice', *JEA* 95 (2009), 206 with note 114.
[111] The marks in Table I1-2 and those from dynasty 18 in Table I1-5.
[112] Haring, 'From Oral Practice to Written Record in Ramesside Deir el-Medina', *JESHO* 46/3 (2003), 266.

2 THE PROBLEM OF BLURRED BORDERS

The description we have given of the marks as being divided in groups I and II may initially be convenient and helpful in describing and gaining an overview of the corpus in its totality. However, it soon leads to problems, some of which we have already encountered. The problems can be summarized as follows:

- There is uncertainty as to whether marks of hieroglyphic form convey phonetic sound, especially in dynasty 18 when marks may only approximate the forms of hieroglyphic signs. The degree of uncertainty is larger for marks with hieroglyphic forms than for marks with hieratic forms as the latter show at least knowledge of script, and therefore presumably make use of it. Yet, even in hieratic cases there is the possibility that only the form was used to convey the notion depicted in the hieroglyphic equivalent. The problem that underlies this uncertainty is the fact that hieroglyphic script, and in derivation hieratic script as well, is pictorial in nature;
- As such, group I may contain marks that may look like signs from script, but that are unrelated to it in their origin. Examples were the scorpions and the pots and jars with all their graphic variations. They did not originate in a standardized, specific graphic representation that was used in script, but rather found inspiration in the notion of the object or animal itself. In conveying merely this notion, details that were standardized in script were insignificant; a pot is a pot, whether with or without handles;
- There is further uncertainty as to whether marks of a concrete form do or do not refer to phonetic words in the language, especially in the cases of , , , and . The first four may be encountered as pictorial signifiers, and may therefore relate to linguistic concepts such as ‘level’, ‘pomegranate’ and ‘mirror’; the latter may be ‘*kꜣ*’;
- Finally, there is uncertainty as to whether ‘abstract’ marks are in fact abstract.

The classes are therefore far from defined. Although it is a universally encountered classification, the distinction between groups I and II is made purely on the basis of a modern interpretation of forms. Closer examination reveals that marks as well as single specimens may cut across borders. We are dealing with degrees of abstractness or concreteness, or *degrees of iconicity*, present in the execution of marks from both groups I and II. These degrees of iconicity may, moreover, change over time: were the forms , , and considered abstract geometric in dynasties 18 and 19, or was their pictorial nature recognized? Perhaps a phonetic value was even attached to them if this pictorial nature was related to a particular sound-pattern?

Thus, can we in fact draw a line, first, between concrete and abstract forms and, second, between forms related to script and forms not related to script? In doing so, we actually lapse into traditional perspectives on ‘writing’ and ‘visual communication’. Recall fig. 0-2 from the Introduction, here presented in adapted form:

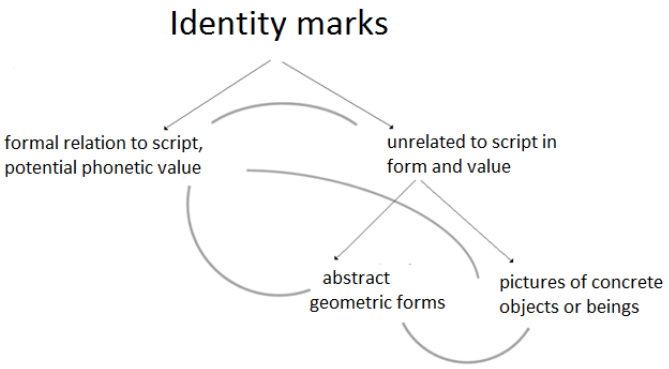


Fig. I1-7 The universal classification of marking systems in traditional perspectives.

We need a more fluent representation that allows transitions and overlapping classes in which marks and single specimens can be considered 'more or less concrete', 'more or less abstract', 'more or less inspired by script'; a model that furthermore allows to accommodate the development of the marking system as it was described above; a model, such as the one proposed by James Elkins.

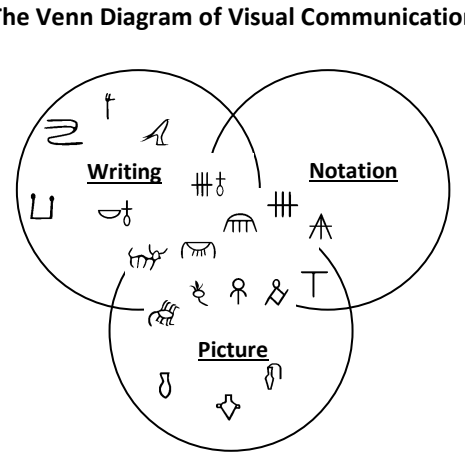


Fig. I1-8 The Venn-diagram of visual communication as proposed by James Elkins. Elkins, *The Domain of Images*, 85-86.

The model by Elkins appears to be a convenient tool to represent the flexibility in the nature and origin of the marks if we understand the domains as follows:

- The domain of Writing contributes where marks have a form that is related to script and convey meaning on the basis of phonetic value. It contains especially marks from dynasty 20 such as 𓇋, 𓌳, 𓃀, 𓂋𓏏, 𓀀𓏏 and 𓀁. Yet, it is open toward the other domains and may therefore also relate to 'fuzzy members' such as 𓁹, which may be located more toward the domain of picture in that it is uncertain whether the mark conveyed phonetic value, and 𓌳 which may be located more toward the domain of notation in that it is neither a sign from script, nor a pictorial representation, but rather an abstract notation of the pictorial 𓁹;

- The domain of Picture contributes where marks represent a concrete object or being, whether or not they convey phonetic sound. Those marks that prove to convey sound but that are of hieroglyphic or pictorial form, such as , are located closer to the domain of Writing; those marks that prove not to convey sound but are pictorial in form, such as the pots and jars, are located toward the core of the domain; and those marks that prove not to convey sound and in their pictorial nature approach a geometric abstraction, such as or are located more toward the domain of Notation. Marks such as and may, similarly to , be located in the domain of Picture in possible overlap with the domain of Writing;
- The domain of Notation contributes where marks are of a form that is neither known from script, nor known as a pictorial representation. Rather, it concerns other forms of notation that have, to modern eyes at least, an abstract appearance. Marks such as and may be tentatively located toward the middle overlap in that they might be a schematic representation of a phonetic hieroglyph from script. In the variant it is even closer to the domain of Writing. A mark such as may be tentatively located toward the domain of Picture in that it is possibly a semantic classifier in the word ,[113] and could thus have pictorial value.

It is crucial to leave the borders between the domains open. Each domain, then, contributes to the nature of the marking system as a whole, but the degree of each domain's contribution may vary over time. Without anchoring the marks, we can say that the corpus from dynasty 18 with its relatively large portion of pictorial and abstract marks in addition to forms that may be hieroglyphic in nature is spread over the domain of Picture, fanning out to the domain of Writing on the one hand and the domain of Notation on the other. The corpora of dynasties 19 and 20 shift further toward the domain of Writing, but stay in touch with the domains of Picture and Notation. In a visual representation:

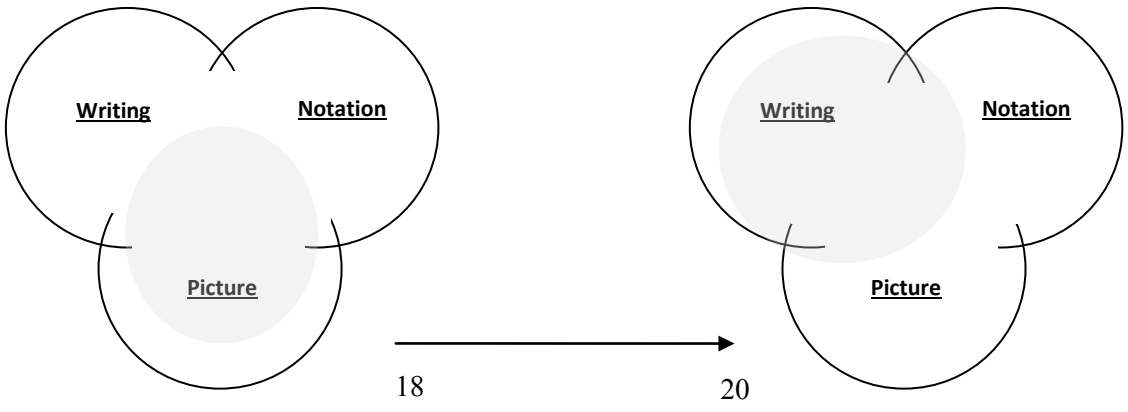


Fig. I1-9 The changing nature of the marking system over time, represented as a shift of emphasis with regard to the contributing domains.

This remains, however, an approximation to a classification of the marks, which is to a large extent still based on form as we do not know precisely how most of the marks were used. We may recognize in their specimens aspects from a domain of Writing, a domain of Picture and a domain of Notation, but how did

[113] WB IV, 86.

the marks convey meaning? To answer this question, we must submit the marks to meticulous semiotic study, which we will do in Part II. For now, the model as presented in figs. I1-8 and 9 is offered as a consideration in overcoming the problem of representing blurred borders. Instead of ignoring them, these blurred borders must be recognized, for it is not in the distinct classes of a classification that we find the nature and origin of the workmen's identities marks; it is rather in the transformations and the overlapping areas that the nature of the system is defined, synchronically per time-frame as well as diachronically over time.

2

THE ORIGIN OF THE MARKS

Identity marks have been used throughout Egyptian history. They are amply attested at several sites in Egypt, in the Early Dynastic Period as potmarks, and in the Old, Middle and New Kingdoms as potmarks, builders' and quarry marks. The use of identity marks for individual workmen, however, and the extent to which they were used on ostraca for administrative purposes are peculiar to Deir el-Medina and the Theban necropolis. Also, the intensity of applying the marks in private context on personal objects such as neck supports, pots, bowls, stools, combs and linen found in the village, the workmen's huts as well as in tombs, and their use in graffiti throughout the Theban mountains is unique for the community. How can we explain this? To what extent are the marks from Deir el-Medina a continuation of earlier practices? Why and when do we begin to observe the trend toward individuality and personal use?

In this chapter we discuss the marks from the Theban necropolis in a broader Egyptian context in order to find out how the system came about, in form as well as in function and usage. We begin with a discussion of potmarks (section 1), followed by a discussion of builders' marks (section 2), and finally a discussion of quarry marks (section 3). We will see that a core group of forms had been used at least since the Old Kingdom, but that their meaning and manner of usage was limited to the geographic and temporal frame of each particular system.

1 POTMARKS

Nearly as old as the introduction of pottery itself is the practice of applying marks to jars, bowls and other types of vessel.[1] In Ancient Egypt the origin of this practice can be traced back to the Predynastic period, but it was not until the Early Dynastic period, in particular dynasties 0-1, that they were frequently and systematically applied at several sites throughout Egypt, among which Abydos, Saqqara, Tarkhan, Minshat Abu Omar, Kafr Hassan Dawood, Abusir, Tell el-Farkha, Tell Ibrahim Awad and Adaïma.[2] Old Kingdom corpora of potmarks are known, among others, from Buto and Giza; Middle Kingdom corpora derive particularly from Kahun, Gurob and el-Lisht; and New Kingdom potmarks have been found for example at Qantir, Amarna, Malqata and Karnak. By the time of Thutmosis III, when we encounter the first traces of habitation in Deir el-Medina, the practice of applying marks onto pots and vessels had thus been known for some 1700 years already. Did this practice inspire the form and usage of the Deir el-Medina identity marks?

[1] Van den Brink, 'Corpus and Numerical Evaluation of the 'Thinite' Potmarks' in Friedman & Adams (eds.), *The Followers of Horus*, 265.
[2] *Ibid*., 265, 270; Van den Brink, *The International Potmark Workshop*: http://www.potmark-egypt.com/. For individual corpora, see Bréand, 'The corpus of pre-firing potmarks from Adaïma (Upper Egypt)' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1015-1042; Kroeper, 'Corpus of Potmarks from the Pre/Early Dynastic Cemetery at Minshat Abu Omar' in Krzyzaniak, Kroeper & Kobusiewicz (eds.), *Recent Research into The Stone Age of Northeastern Africa*, 187-218; Mawdsley, 'The corpus of potmarks from Tarkhan' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1043-1072; Tassie et al., 'Corpus of Potmarks from the Protodynastic to Early Dynastic cemetery at Kafr Hassan Dawood' in Midant-Reynes & Tristant (eds.), *Egypt at its Origins* 2, 203-235; Wodzińska, 'Potmarks from Early Dynastic Buto and Old Kingdom Giza' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1073-1095.

a. The forms of potmarks

In Table I2-1 we have tabulated the most common potmarks from the Early Dynastic period and the Old, Middle and New Kingdoms. With respect to their forms we can make the following remarks.

The potmarks from the Early Dynastic period can be roughly divided into two groups:

1. Linear abstract geometric marks that consist of dots and strokes;
2. Representations of concrete objects, buildings and creatures;

The marks of the first group show various combinations of dots and strokes, for instance , , , , , , and .[3] They could represent counting systems, although it is not clear what exactly was counted (pots, batches, contents).[4] The marks of the second group show resemblance to early hieroglyphic signs. They have not been interpreted, or 'read', with certainty, but it is assumed that they represent place names or the names of institutions or estates that functioned as administrative centers in a regional network of (re)distribution of products. This suggestion was made by the archaeologist Van den Brink and will be discussed in more detail in section 1.b below.[5] Yet, it is interesting to note here that the most frequent potmark which occurs in the Early Dynastic period is the square, alone or in combination, for instance: , , , , , , , , .[6] The square has been interpreted as *ḥw.t*, and as such it may refer to a location, institution or estate. Especially in combination with the fish it has been suggested to refer to a locality in the Delta: in view of the occurrence of this mark at Minshat Abu Omar Kroeper stated that 'In particular the large amount of double signs consisting of squares (*ḥw.t*) with fish or other signs may indicate a place of origin from some centre of distribution in the Delta, especially as some main estate names in the Delta known from the Old Kingdom contain a fish sign in the name.'[7] Because of the fact that the largest concentration of fish- and *ḥw.t*-marks has been found at sites in the Eastern Delta[8] this is the most plausible origin of the mark. A few fish- and *ḥw.t*-marks were found at Abu Roash, and those found at sites in the Nile Valley mostly come from the Memphite region (primarily the elite cemetery at North Saqqara with smaller amounts at Abusir, Tura and Tarkhan near the Fayum), with a small amount deriving from Umm el-Qaab. This distribution pattern is in accordance with the large royal administrative centers that acquired or appropriated goods, particularly wine and other foodstuffs from (East) Delta localities.[9]

The idea that potmarks refer to a locality, institution or estate has become widely supported and is considered plausible with respect to Van den Brink's suggestion of a (re)distributional network. In

[3] Taken from Table I2-1: the first five from Abu Roash, the latter three from Adaïma. References are given with Table I2-1.
[4] Bréand, 'The Corpus of Pre-Firing Potmarks' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1033-1035; Mawdsley, 'The corpus of potmarks from Tarkhan' in *ibid*., 1050. Bréand mentions the suggestion made by Fairservis that vertical lines could have referred to simple numbers and one horizontal line could indicate the number 10. This remains, of course, hard to proof.
[5] Van den Brink, 'Corpus and Numerical Evaluation of the 'Thinite' Potmarks' in Friedman & Adams (eds.), *The Followers of Horus*, 265-296.
[6] Taken from Table I2-1; references are given there.
[7] Kroeper, 'Corpus of potmarks from Minshat Abu Omar' in Kryzaniak, Kroeper & Kobusiewicz (eds.), *Resent Research into the Stone Age of Northeastern Africa*, 216. See also Tassie et al., 'Corpus of Potmarks from Kafr Hassan Dawood' in Midant-Reynes & Tristant (eds.), *Egypt at its Origins* 2, 215. For Old Kingdom locations or estates in the Delta with a fish in their name, Tassie et al. refer to Bietak, *Tell ed-Dab'a* II.
[8] In addition to Minshat Abu Omar also at Kafr Hassan Dawood, Ezbet el-Tell/ Kufur Nigm, Minshat Ezzat, and Tell el-Samara. See Tassie et al., 'Corpus of Potmarks from Kafr Hassan Dawood' in Midant-Reynes & Tristant (eds.), *Egypt at its Origins* 2, 215-216.
[9] *Ibid*., 216.

addition to the fish- and *ḥw.t*-combination, there are several other sign-groups that are notably recurrent, first of all marks that make use of what are presumably *kз*- and *mr*-signs, for instance: , , , , , , , , , and in combination with *ḥw.t* .[10] The three mountains combined with a circular sign that in one instance at least seems to be *njw.t* is also recurrent, for instance: , , , , and . Van den Brink suggests that the frequency of some marks may reflect the existence of a few large administrative centers versus smaller centers throughout the country.[11] The overall idea that the marks refer to toponyms, institutions or estates is interesting with regard to the builders' marks from the Old and Middle Kingdoms some of which, as we will see, are references of a similar nature.

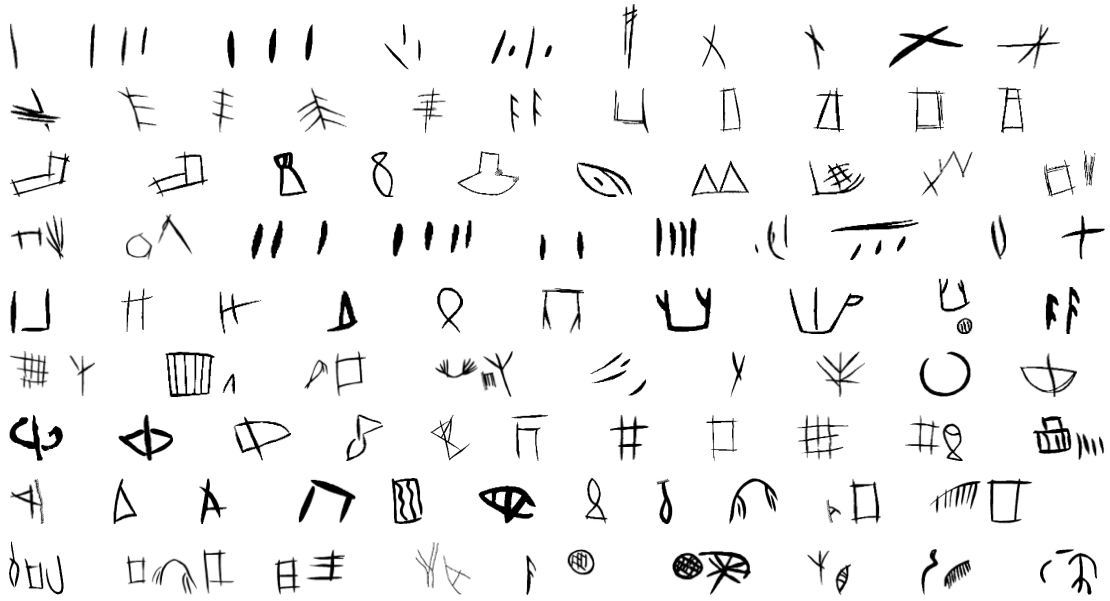
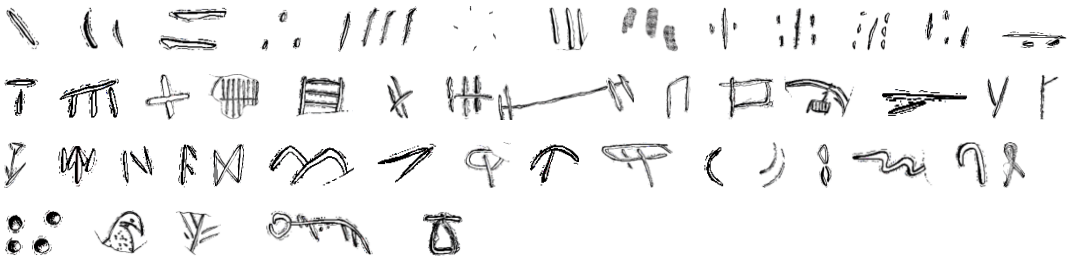
The marks found on Early Dynastic pottery discussed by Van den Brink do not include the so-called *serekhs*, which are contemporaneous and may also be found incised or stamped on pottery. *Serekhs* are rectangular enclosures representing a palace façade in which the names of kings were written. They are generally not considered part of the same potmark tradition and date slightly earlier than the systematically applied Early Dynastic potmarks.[12] Nevertheless, they are of interest with respect to the development of early hieroglyphic writing and the nature of potmarks as related to script. The *serekhs* are considered part of the same tradition to which also the Early Dynastic dockets and seal impressions belong: they represent the early writing tradition in that they consistently make use of signs in linguistic context, while the potmarks remained to be used in nonlinguistic context. The dockets and seal impressions even become hieratic over time, while the potmarks may include signs of writing, but never become hieratic. The potmarks, at least in the Early Dynastic period, show a fairly consistent corpus in which signs of writing may be included, but always combined with abstract geometric marks and representations of other nature. The fact that they are found in the same archaeological context on the same types of vessel as the linguistic dockets, seal impressions and *serekhs* is understood as an indication for them being clearly part of a separate, nonlinguistic system of communication.[13] This nonlinguistic system continued to be used on pottery while the dockets, impressions and *serekhs* in the 1st and 2nd dynasties at Umm el-Qa'ab show the development to hieroglyphic writing.[14] Hieroglyphic script presumably influenced the nonlinguistic system of potmarks to some extent, lending it several of its signs and possibly even linguistic values, but it did not change the nonlinguistic nature of that system; it did not turn it into writing. Bréand, who studied the Early Dynastic potmarks from Adaïma in Upper Egypt, refuted a relation of these potmarks to the 'official' system of hieroglyphic writing. By using the term 'official' she refers to Regulski's suggestion that '… the creation of a writing system was a conscious

[10] Taken from Table I2-1; references are given there.
[11] Van den Brink, 'Corpus and Numerical Evaluation of the 'Thinite' Potmarks' in Friedman & Adams (eds.), *The Followers of Horus*, 275.
[12] *Ibid*., 267. They are not included in Table I2-1.
[13] Both Kroeper and Tassie et al. argue that, since abstract marks appear together with preformal hieroglyphic marks, and both occur on vessels in the same graves and are therefore contemporaneous, it cannot be said that the hieroglyphic-like marks developed out of the abstract signs. Rather, the potmarks in general and early hieroglyphic writing were two different systems, although their relation can be detected in an adaptation of some hieroglyphic signs as marks or, vice versa, of some marks as hieroglyphic signs. Kroeper, 'Corpus of Potmarks from Minshat Abu Omar' in Krzyzaniak, Kroeper & Kobusiewicz (eds.), *Recent Research into The Stone Age of Northeastern Africa*, 188; Tassie et al., 'Corpus of Potmarks from Kafr Hassan Dawood' in Midant-Reynes & Tristant, *Egypt at its Origins* 2, 218, 220.
[14] For examples, see Dreyer, *Umm el-Qa'ab* I; For the development, see Regulski, 'The origin of writing' in Midant-Reynes & Tristant (eds.), *Egypt at its Origins* 2, 985-1009.

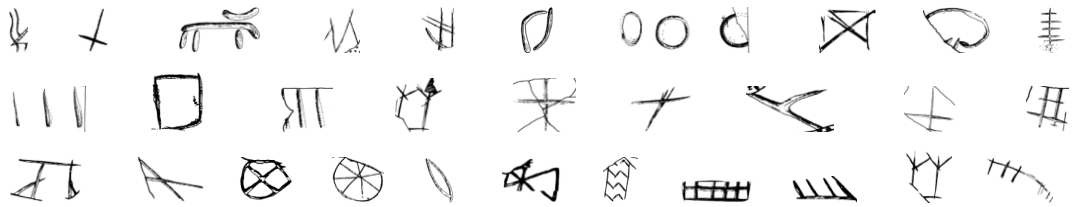
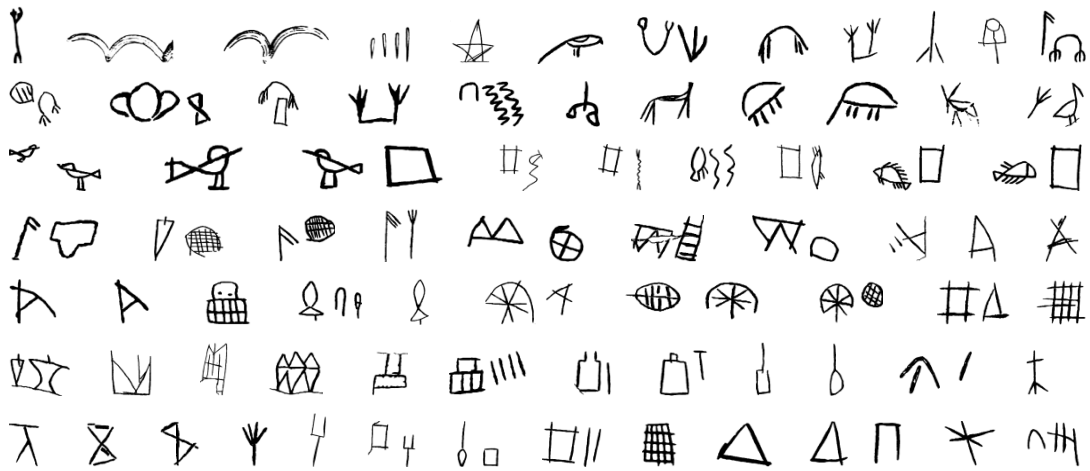
court initiative in a time when many clusters of alternative systems of communication existed'.[15] Bréand explains that, since the abstract potmarks consisting of dots and strokes at Adaïma appear at the same time as the official numerical system depicted on the labels in Tomb U-j at Umm el-Qa'ab, they cannot be considered 'an 'official' transcription of numerals, and therefore cannot be identified as hieroglyphic signs'.[16] They do 'not belong to the official counting system, and they are not readable as signs encoding the language'; rather, they are a 'non-official system of counting … *an alternative system of communication* which cannot be deciphered outside of its context of use, and can therefore not be considered as a transcription of hieroglyphic signs'.[17] In sum, potmarks on the one hand and *serekh*s, dockets and seal impressions on the other are considered two different systems, which share some signs, but follow their own traditions. The non-linguistic system potmarks were therewith apparently not considered 'less' than the developing writing tradition as they clearly continued to be used throughout Egyptian history, and even up to the present day. When we look at the potmarks from the Old, Middle and New Kingdoms we do see some changes, such as the lack of the fish- and *ḥw.t*-combination perhaps due to the disappearance or a change in the (re)distributional network form Early Dynastic times.[18] Yet, we still encounter the combination of linear abstract geometric marks consisting of dots and strokes that may relate to a counting system with hieroglyphic-like marks. Of the latter, , , , and are particularly recurrent, marks that we also encounter in Deir el-Medina from dynasty 18 onwards. It is conspicuous that, in contrast to the Early Dynastic potmarks which are primarily incised prior to the firing process of the pots regardless of their graphic form, the 'counting marks' of later times are pre-fired whereas the concrete and hieroglyphic-like marks are generally incised post-firing. This difference is usually related to a difference in function, an idea to which we return in section 1.b below.

[15] Regulski (ibid) quoted in Bréand, 'The Corpus of Pre-firing Potmarks from Adaïma' *BMSAES* 13 (2009), 60.
[16] Bréand, 'The Corpus of Pre-firing Potmarks from Adaïma' *BMSAES* 13 (2009), 60-61.
[17] *Ibid*.. Italics are mine.
[18] Van den Brink, 'Corpus and Numerical Evaluation of the 'Thinite' Potmarks' in Friedman & Adams (eds.), *The Followers of Horus*, 271 notes that the number of potmarks associated with the (re)distributional network dropped during the reigns of Djer and Djet. The occurrence of potmarks faded out almost completely during the reign of Qa'a, the last king of Dynasty 1.

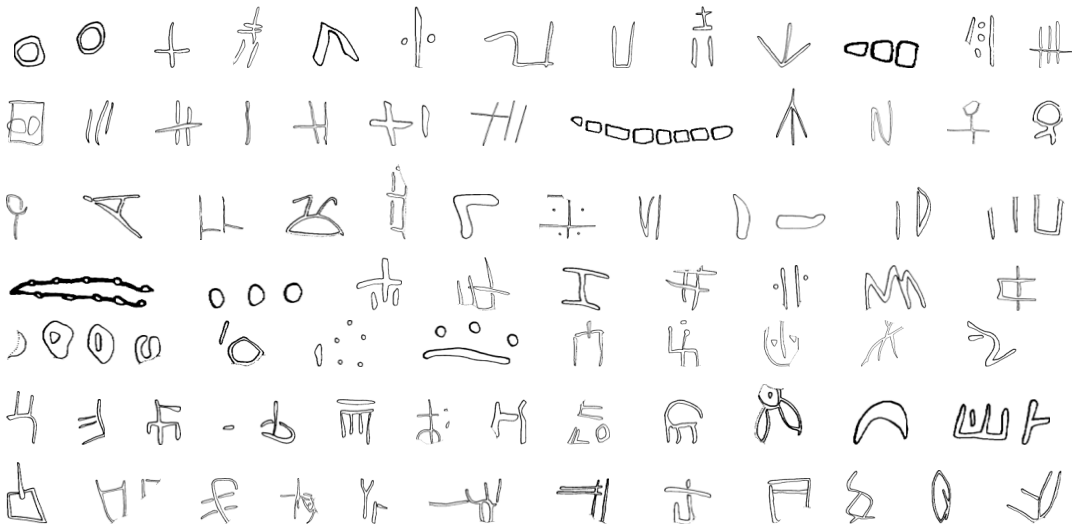
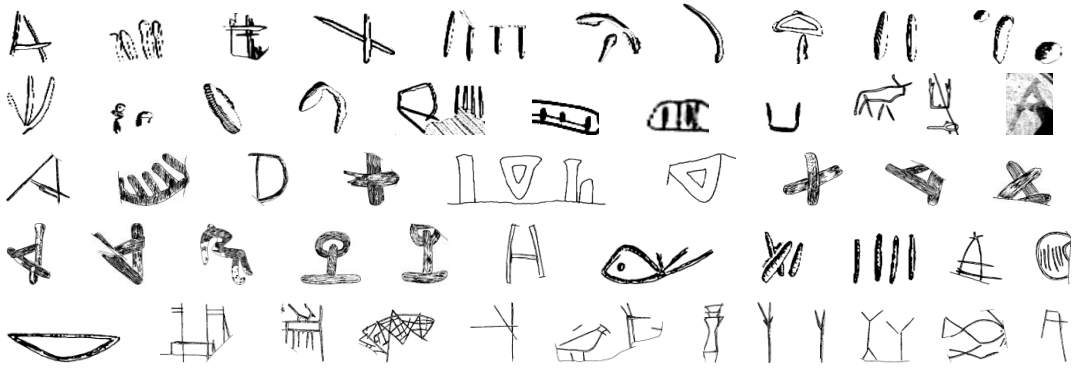
Table I2-1: Potmarks[19]

Early Dynastic Period	
Abu Roash[20]	
Adaïma[21]	
Kafr Hassan Dawood[22]	
Minshat Abu Omar[23]	

[19] The Table contains selections only. For a more complete overview of potmarks, see The International Potmark Workshop (http://www.potmark-egypt.com/).
[20] Klasens, *The Excavations of the Leiden Museum of Antiquities at Abu-Roash* (1957-1959).
[21] Selected from Bréand, 'The corpus of pre-firing potmarks from Adaïma' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1021 (Table 1).
[22] Tassie et al., 'Corpus of Potmarks from Kafr Hassan Dawood' in Midant-Reynes & Tristant (eds.), *Egypt at its Origins* 2, 223-225, 227.
[23] Kroeper, 'Corpus of potmarks from Minshat Abu Omar' in Kryzaniak, Kroeper & Kobusiewicz (eds.), *Recent Research Into the Stone Age of Northeastern Africa*, 187-218.

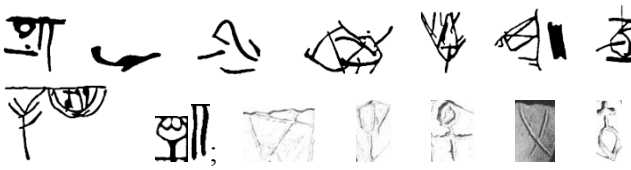
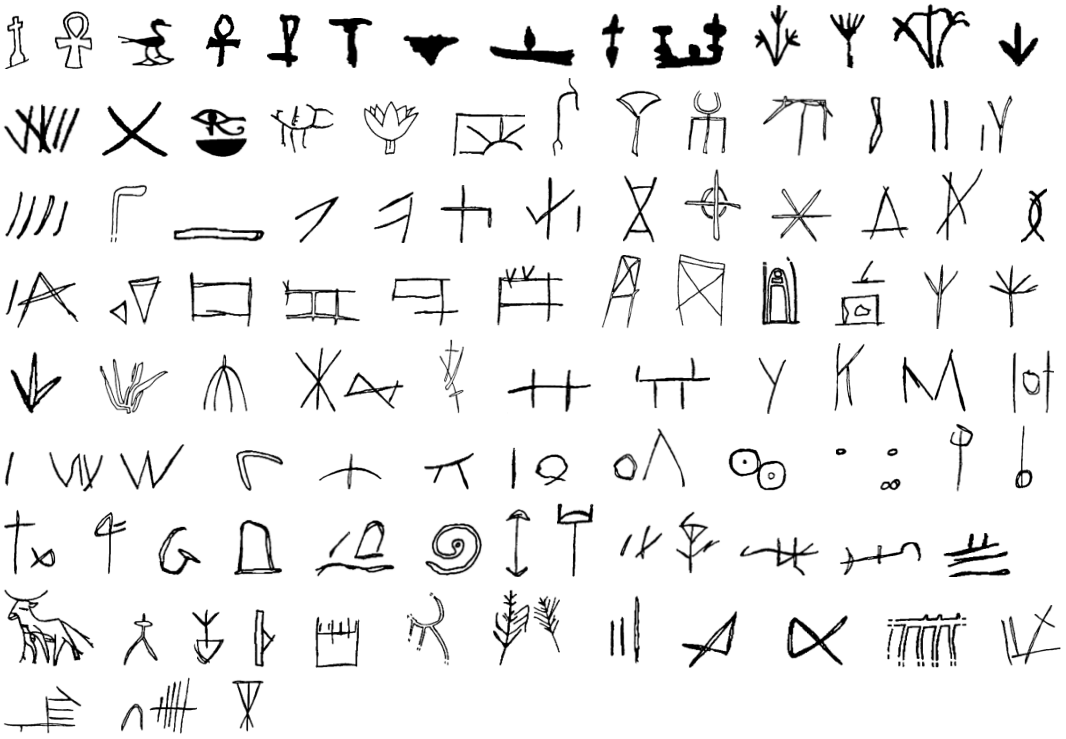
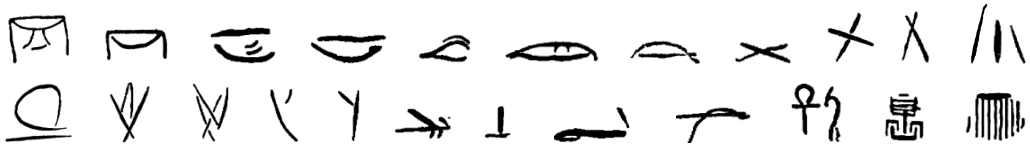
Tarkhan[24]	
Buto[25]	
Umm el-Qaab/ Abydos[26]	
Old Kingdom	
Balat[27]	

[24] Mawdsley, 'The Corpus of potmarks from Tarkhan', *BMSAES* 13 (2009), 216-219; The International Potmark Workshop (http://www.potmark-egypt.com/).
[25] Köhler, *Tell el-Fara'în – Buto* III, pls. 12, 23.12, 41-6, 52.9, 65-67, 72.
[26] Köhler, 'Bearbeitung der Keramik' in Dreyer et al., 'Umm el-Qaab', *MDAIK* 52 (1996), 52-53.
[27] Soukiassian, Wuttmann & Pantalacci, *Le palais des gouverneurs de l'époque de Pépy II*, figs. 262-263, 265-266.

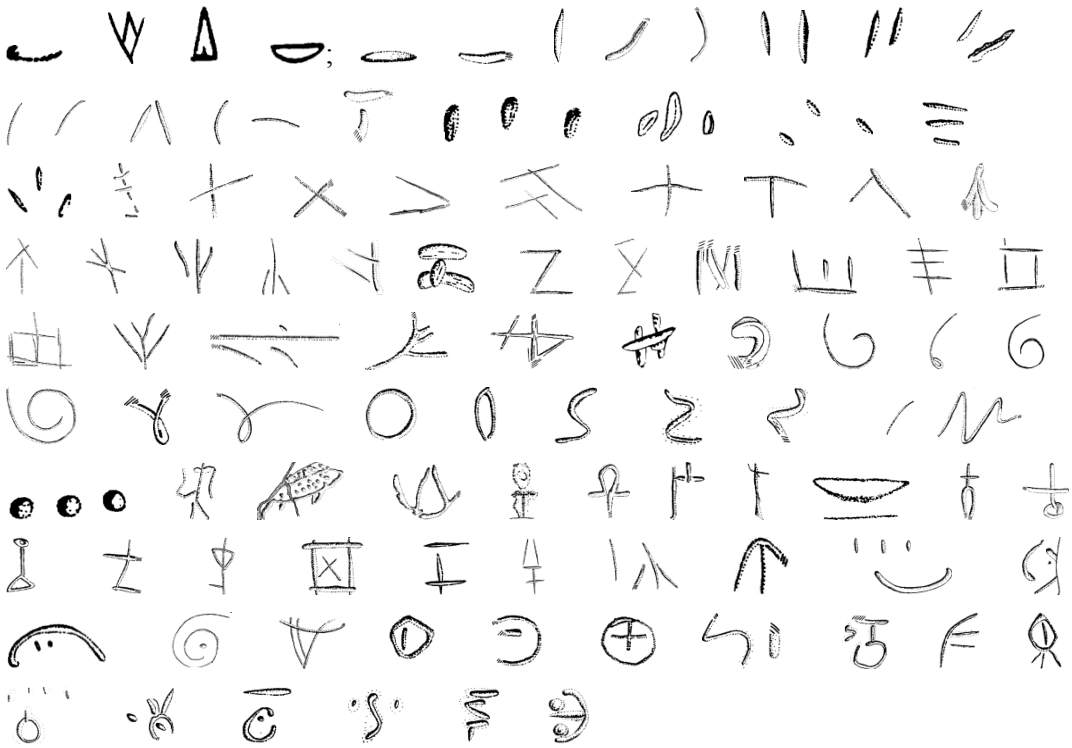
	
Giza[28]	
Middle Kingdom	
Kahun and Gurob[29]	
Qasr el-Sagha[30]	

[28] The first two lines: Wodzińska, 'Potmarks from early dynastic Buto and old Kingdom Giza' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1078-1079, 1082-1084. The first 14 are pre-firing marks, the last seven are post-firing marks. The latter three lines: Kromer, *Siedlungsfunde aus dem frühen Alten Reich in Giseh*, Tafel 28-29.

[29] Selected from Gallorini, 'Incised marks on pottery and other objects from Kahun' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 125-142. Only the pre-fired marks are published there. The last two lines present post-fired marks: the first 5 are from Gallorini, *idem*, 115-116; the remainder is selected from Petrie, *Illahun, Kahun and Gurob*, pl. XV and Petrie, *Kahun, Gurob, and Hawara*, pls. XVII-XVII (on 'foreign pottery').

El-Lisht	
New Kingdom	
Amarna[31]	
Karnak[32]	
Malqata[33]	
Qantir[34]	

[30] Śliwa, 'The Middle Kingdom Settlement at Qasr el-Sagha', *Studies in Ancient Art and Civilization* 5 (1992), 31 (fig. 10). The final mark occurs on a limestone axe (idem, 32 (fig. 14.1).
[31] Hope, 'Some Remarks on Potmarks of the Late Eighteenth Dynasty' in A Leahy and J. Tait (eds.), *Studies on Ancient Egypt in Honour of H.S. Smith*, 129 (fig. 4); Stevens, *Akhenaten's Workers* II, chapter 8.
[32] Hope, 'Some Remarks on Potmarks of the Late Eighteenth Dynasty' in A Leahy and J. Tait (eds.), *Studies on Ancient Egypt in Honour of H.S. Smith*, 125 (figs. 2-3).
[33] Selected from *ibid.*, 140-143.
[34] The first three lines contain marks on moulds, selected from Hamza, 'Excavations of the Department of Antiquities at Qantîr', *ASAE* 30 (1930), figs. 12-13. The latter nine lines: Ditze, 'Gedrückt – Geritzt – Gekratzt' in Pusch (ed.), *Die Keramik des Grabungsplatzes Q1*. Teil 2, 290-481.



Late and Ptolemaic	
El-Assasif[35]	

[35] Budka, 'Benchmarks, team marks and pot marks from the Asasif' in Haring & Kaper (eds.), *Pictograms or Pseudo Script*, 91.

b. The function of potmarks

The meaning and function of marks on pottery have received multiple interpretations since the 19th century, depending among others on the context in which the marked pottery was found as well as on whether the marks were incised before or after the firing process. While some hypotheses are now considered unlikely there is probably not one explanation, and multiple possibilities must be kept in mind. We present an overview of traditional interpretations and discuss them in the light of the marks from Deir el-Medina, especially those on pottery.

b.1 Alphabetic characters

One of the first theories concerning the interpretation of potmarks equated them with early Greek alphabetic letters. This was first suggested by Hayter-Lewis and Brugsch in 1881 respectively 1886 with regard to the marks on faïence tiles from Tell el-Yahudieh. Brugsch dated the tiles in the Ptolemaic period, and Hayter-Lewis thought the marks to be Ptolemaic restorations. Both argued to interpret them as the Greek letters A, E, I, Λ, M, O, C, T, and X,[36] and so did Naville and Griffith in 1890.[37] The hypothesis was refuted by Hamza in 1930.[38] He compared the marks on the Tell el-Yahudieh tiles with marks he found on terracotta moulds from Qantir and concluded that many of them were equivalent. He pointed out that, since the moulds from Qantir dated to the reign of Ramesses III, the idea that the marks were Greek letters was 'absolutely absurd'.[39] Rather, he suggested to re-interpret each of the 'letters' as simplified or cursive hieroglyphic or hieratic signs (fig. I2-1). As such, they would simply be 'incised by the Egyptian artist as a sort of initial'.[40]

Fig. I2-1 'Greek letters' on the Tell el-Yahudieh tiles reinterpreted as hieroglyphic or hieratic potmarks by Hamza, Excavations of the Department of Antiquities at Qantîr', *ASAE* 30 (1930), 55, 57-58.

In 1977, however, the theory of the Greek letters was resurrected in Velikovsky's book *Ages of Chaos* III *Peoples of the Sea*. Velikovsky refuted Hamza's hieratic equivalents, especially the first form of which Hamza had suggested that it represented a lotus flower, because it would never have 'been found on a papyrus or on stone and, of course, is not included in the complete catalogue of hieratic signs'.[41] It is unclear what Velikovsky meant with 'complete catalogue of hieratic signs', as a complete catalogue is as

[36] Aston (David), 'Theban Potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script*, 49; Hayter-Lewis, 'Tel-el-Yahoudeh', *TSBA* 7 (1881), 182; Brugsch, 'On et Onoion', *RT* 8 (1886), 5; Hamza, 'Excavations of the Department of Antiquities at Qantîr', *ASAE* 30 (1930), 57; Griffith, *The Antiquities of Tell-el-Yahudieh*, 41.
[37] Naville and Griffith cited in Velikovsky, *Ages in Chaos* III, 24 with footnotes 1 and 2.
[38] Hamza, 'Excavations of the Department of Antiquities at Qantîr', *ASAE* 30 (1930), 31-68.
[39] *Ibid*., 57.
[40] *Ibid*., 58. See the next section b.2 below.
[41] Velikovsky, *Ages of Chaos* III, 28.

yet non-existent.[42] He argued that the marks on the tiles were 'well-shaped Greek letters'[43] and used this observation to support his radical change in chronology, placing Ramesses III and the 20th dynasty 800 years later in the early 4th century BC.[44] However, before the chronology is changed, a different explanation for the marks on the tiles must be offered. They are very simple geometric forms that may indeed show similarity to Greek letters,[45] but in that case may just as well be considered similar to African scripts, or marking systems from the Near East, even Mongolia, medieval Europe or present-day Norway. In Part III of this dissertation the universality of such simple geometric forms is discussed.[46] The combination of hieroglyphic signs and such geometric forms that is found on the faience tiles is precisely the mix that is encountered in other ancient Egyptian marking systems, including the marks from Deir el-Medina. Thus, forms for the lotus flower among the marks include , , and in dynasties 19 and 20.[47] The form , interpreted as the hieratic *p*, the number 60 or the sign is found as , , and among the identity marks between dynasties 18 and 20.[48] The form can be recognized in , and in dynasty 20[49]; and the forms and are frequent among the identity marks in dynasty 18, but are seen among potmarks ranging from prehistoric Minshat Abu Omar until at least New Kingdom Qantir (Table I2-1). Without equating the marks on the faience tiles with the identity marks from Deir el-Medina (any kind of relation between them in form and/or usage remains uncertain), it should at least be recognized that the forms of the marks on the tiles, rather than being Greek letters per definition, may simply have been part of inherently Egyptian potmark traditions. To strengthen this idea, compare the forms in Table I2-1, where we find forms such as , , , , and already in prehistoric and Old Kingdom times.

With respect to the 12th dynasty potmarks found at Kahun and Gurob Petrie had argued in 1890 that, rather than early Greek letters, the 'strange signs scratched on pottery' actually represented early Phoenician alphabetic characters connected to an early Libyo-Greek community of Aegean origin around 2500 BC.[50] This idea was related to a theory suggested by the Egyptologist De Rougé in 1859 which stated that 'the origin of the Phoenician alphabet' lies in Egyptian hieratic writing.[51] Petrie considered this 'the most probable truth'.[52] He argued that the hieratic from which the Phoenician alphabet derived was 'expressly the hand of the XIIth dynasty, and not that of the XVIIth or later times'; 'the Phoenician alphabet must therefore have been developed before 2000 BC.'[53] This would coincide, he said, with the presence of prisoners of Mediterranean origin who were taken captive during the wars at the end of dynasty 11, and who were employed at public works such as at Kahun and Gurob. They would not have

[42] Möller's *Hieratische Paläographie* I-III is based on merely 32 sources.
[43] Velikovsky, *Ages of Chaos* III, 28.
[44] *Ibid*., 53.
[45] See *ibid*., 26-27.
[46] The reader is reminded of the traditional bias the west and western scholars have dealt with: our focus on the alphabet feeds a recognition of it in forms we can at first not otherwise explain.
[47] Potsherds Bruyère Rap. 48-51, pl. XVII.017-0.18; Theban Graffito 3975.
[48] Ostraca IFAO OL 6788, IFAO ONL 6223, Stockholm MM 14130 and Cairo JE 46864.
[49] Ostracon BTdK 586; Theban Graffiti 2844 and 3624.
[50] Petrie, *Illahun, Kahun and Gurob*, 11.
[51] Petrie, *Kahun, Gurob and Hawara*, 43-44.
[52] *Ibid*..
[53] *Ibid*..

been able to read Egyptian and could therefore have initiated a system of marks based on Egyptian hieratic, which they used on pottery and which would develop into the Phoenician alphabet.[54]

This hypothesis is nowadays rejected. Although a relation between Egyptian characters of writing and the development of an early Semitic alphabet is generally assumed, the suggestion that this development had already taken place before 2000 BC has been much debated.[55] The role assigned by Petrie to the potmarks from Kahun and Gurob is, moreover, to be questioned because several of the marks occur as potmarks already in the Early Dynastic period and the Old Kingdom: compare, for instance, the linear abstract geometric counting marks as well as the marks , , , , and from Kahun and Gurob in Table I2-1 with marks from Abu Roash, Buto, Minshat Abu Omar, Tarkhan and Old Kingdom Giza. Again, as seen with the marks on the faïence tiles, they rather may have been part of an inherently Egyptian potmark tradition.

b.2 Potters' or artists' marks

In addition to the idea that potmarks were early Phoenician characters, Petrie played with a number of other interpretations, one of which came forth from his realization that some potmarks had been made before the pots had been fired, while others had been made post-firing. The difference he explained in terms of function: the pre-firing marks functioned as potters' marks that referred to the potters of a particular workshop, and the post-firing marks functioned as ownership marks referring to the later owners of the pots.[56] Similar interpretations were suggested by the Egyptologist Firth, who argued that potters' marks from Nubia enabled an individual potter to identify his own products after they had been fired in a communal kiln,[57] and by the Egyptologist Junker, who argued the same for potmarks from El-Kubanieh.[58] With respect to the Qantir bread moulds Hamza even suggested the potters' marks to be the signatures of artists; they were 'equivalent to the initials of modern artists', 'symbols which the Egyptian artist scratched on the back of every mould that his hand produced, so as to mark off his work from that of any other in the same factory'.[59]

A major problem for the interpretation of potmarks as aids to distinguish the products of individual potters, however, lies in the fact that very few pots were actually marked. Hamza reported to have found more than ten thousands moulds and only 'some of them bear marks'; indeed, 'Thousands of moulds … do not bear any mark at all'.[60] While he considered this reason to refute the idea that the marks were trade-marks, functioning to distinguish the work of one factory from that of another ('for, if that was the idea, each mould should have been marked'[61]), the same reasoning may in fact argue against his interpretation of the marks as artists' marks.[62] The statistical infrequency of marked pottery is a general

[54] Petrie, *Kahun, Gurob and Hawara*, 43-44.
[55] On chronology and development, see Sass, *The Alphabet at the Turn of the Millennium*.
[56] Petrie, *Tarkhan* I *and Memphis* V, 28.
[57] Firth, *The Archaeological Survey of Nubia* I, 52. Interestingly, exactly the same function has been suggested for ancient Peruvian pre-firing potmarks by the anthropolist Christopher Donnan. On the basis of ethnographic analogy to the present-day practice of potters, he suggests that the marks were made 'to facilitate the identification of the pots of each potter during production and prior to the actual marketing of the pots'. Donnan, 'Ancient Peruvian Potters' Marks through Ethnographic Analogy', *American Antiquity* 36.4 (1971), 460, 464-466.
[58] Junker, *Friedhöfen von El-Kubanieh-Nord*, 80; Junker, *Friedhöfen von El-Kubanieh-Sud*, 74.
[59] Hamza, 'Excavations of the Department of Antiquities at Qantîr', *ASAE* 30 (1930), 53.
[60] *Ibid*., 57.
[61] *Ibid*..
[62] Hamza attempted to explain the small amount of artists' marks on the moulds by saying that 'some artists did not mind much about marking their work'. Yet, this contradicts the distinguishing function he ascribes to the marks, as well as the comparison he

phenomenon. Aston, in his study of Theban potmarks, points out that marked vessels are relatively rare if one considers the best documented New Kingdom sites (Amarna, Malkata, Qantir), as well as the major New Kingdom cemeteries at Gurob and Saqqara.[63] For Qantir, Ditze mentions that only an 'unbedeutende Prozentsatz' of 0.0291% of potsherds was marked.[64] For Late Period and Ptolemaic pottery from El-Assasif the numbers are also low: 0.8% of the complete vessels was marked (5 out of 600), and only 0.1% of all sherds was marked (16 out of 14800).[65] The statistics are not much better for Middle Kingdom Kahun and Gurob: Gallorini speaks of only a 'small percentage of marked vessels in the overall excavated pottery'.[66] With respect to Old Kingdom Heit el-Gurob at the Giza Plateau Wodzińska remarks that 0.17% of the vessels yielded potmarks; for Old Kingdom Buto the number is 1.3%.[67] It seems that potmarks were more frequently applied in the Early Dynastic period, with 14% of all ceramic vessels from the cemetery of Minshat Abu Omar marked; 8-12% of the vessels from Tarkhan; and 4.9% of the ceramic vessels as well as 0.72% of the stone vessels from Kafr Hassan Dawood.[68] However, for Adaïma the percentage of marked vessels equals only to 0.55% of the entire assemblage, which moreover covers a period of approximately 700 years (c. 3300-2600 BC). The average creation of marks could then be calculated to be less than one per year.[69] In other words, the marking of pottery was 'far from a systematic practice'.[70] With the exceptions of Kahun and Adaïma, all percentages are totals including both pre- and post-firing marks.[71] The number of pre-firing marks alone thus comes down to even less. In this light, a consideration of pre-firing marks as 'potters'' or 'artists'' marks with a distinguishing function is highly unlikely; it seems indeed that 'most of the time the 'artists' did not want their work to be recognized'.[72]

b.3 Workshops, institutions, estates: provenance and/or destination

The hypothesis of potters' or artists' marks was effectively dismissed by the Egyptologist Dunham in 1965. After study of Nubian potmarks on both ceramic and metal vessels over a period ranging from the Egyptian Middle Kingdom to the Meriotic period he found that many of them were of the same type. On the basis of the different materials, which may indicate specialization, and the long period of usage he postulated that the marks could not refer to a particular potter or manufacturer, but were rather indicative of a particular estate or concern, such as the royal house.[73] Similarly, Gallorini considers the idea that the marks from Kahun referred to different workshops. She found that the same types of mark occur on vessels in Marl clay and in Nile silt.[74] If the marks would be individual potters' marks, these finds are incongruent with the general assumption that potters specialized either in Marl clay or in Nile silt vessels,

himself makes to early dynastic marks on page 56, where he argues that the great amounts in which the latter occur proofs that each workman was 'anxious to distinguish his work'.

[63] Aston (David), 'Theban Potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script*, 52. See also Hope, 'Some Remarks on Potmarks' in Leahy & Tait (eds.), *Studies on Ancient Egypt in Honour of H.S. Smith*, 138-139.

[64] Ditze, 'Gedrückt – Geritzt – Gekratzt' in Pusch (ed.), *Die Keramik des Grabungsplatzes Q1*. Teil 2, 273.

[65] Budka, 'Benchmarks, Team marks and Potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 81.

[66] Gallorini, 'Incised marks on pottery and other objects' in *ibid*., 122

[67] Wodzińska, 'Potmarks from early dynastic Buto' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1075-1076, 1090.

[68] Kroeper, 'Corpus of Potmarks from Minshat Abu Omar' in Krzyzaniak, Kroeper & Kobusiewicz (eds.), *Recent Research into The Stone Age of Northeastern Africa*, 215; Mawdsley, 'The corpus of potmarks from Tarkhan' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1046; Tassie et al., 'Corpus of Potmarks from Kafr Hassan Dawood' in Midant-Reynes & Tristant, *Egypt at its Origins* 2, 203.

[69] Bréand, 'The Corpus of Pre-Firing Potmarks from Adaïma' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1022.

[70] Ibid. in *BMSAES* 13 (2009), 53.

[71] The numbers for Kahun and Adaïma concern pre-firing marks only.

[72] Aston (David), 'Theban Potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script*, 51.

[73] Dunham, 'A Collection of Potmarks from Kush and Nubia', *Kush* 13 (1965), 131-147.

[74] Note, however, that this only concerns 7 out of 116 mark types in total. Gallorini, 'Incised marks on pottery and other objects from Kahun' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 113.

and that vessels of different fabric were produced either in different workshops or in one workshop by different potters. Either the assumption of specialization is incorrect, or the marks do not refer to individual potters. The latter idea Gallorini supports with the observation that differences between mark-types are minor and inconspicuous; there is nothing in the design of the marks that suggests an intention of clearly separating one individual type (i.e. potter) from another.[75]

A specialization of potters is also adhered to by Wodzińska, who argues for specialization in different shapes of pottery, 'a practice that can also be observed in modern Egyptian pottery workshops'.[76] She found differences in the marks from Heit el-Gurob that occur on conical respectively flat bread moulds and argued that they must indicate different workshops or production areas. Yet, she also suggested that the marks could perhaps be linked to different recipients; that is, they could indicate the specific baking area within the settlement that specialized in conical or flat loaves.

The interpretation of potmarks as indicators of a workshop, institution or estate, either as the production area or as the destination to which the pottery was to be sent, is a plausible one. According to Gallorini, the marks could have been applied by the potters themselves, or by someone not directly involved in the production, in order 'to facilitate the identification of batches ordered from different workshops, to ease the daily account keeping, or with the aim of distinguishing lots of production destined to supply particular royal projects.'[77] In fact, she finds support for the idea that the marks were indicators specifically of destination in the presence of marked vessels in the foundation deposit of the valley temple of Sesostris II at Kahun; in the presence of exclusively marked vessels in the deposits outside the southern wall of the inner enclosure of the pyramid of Sesostris I at el-Lisht; and in the fact that many of the Middle Kingdom sites with large amounts of pre-firing marks were either newly founded settlements in relation to royal domains (e.g. Ezbet Rushdi, Qasr el-Sagha, Kahun, the Nubian forts, Gebel el-Asr), or royal funerary complexes (Lahun, Dahshur, el-Lisht).[78] Such sites would presumably have ordered large batches of pottery which were needed during construction and maintenance of the sites. For the post-firing marks from Kahun Gallorini suggests a similar function, where the mark is of 'particular interest as the same combination is found in the Kahun papyri to render the place-name Ankh-Senwosret'; it may indicate one of the destinations of the vessels.[79] As such, the mark is very similar to builders' marks from nearby contemporary pyramid sites at el-Lisht and Dahshur, which have also been argued to be abbreviations for place names or the names of institutions, estates or domains, and which were used on the construction sites as well as in the Kahun and other account papyri with the only difference that the builders' marks did not concern the destination of workmen, but rather their provenance. We discuss them in section 2 of this chapter.

The destination hypothesis is furthermore suggested by Budka with respect to Late Period and Ptolemaic potmarks from el-Assasif. She argues that in some cases a relation of the potmarks to the

[75] Gallorini, 'Incised marks on pottery and other objects from Kahun' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 112, 120.
[76] Wodzińska, 'Potmarks from early dynastic Buto' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1087.
[77] Gallorini, 'Incised marks on pottery and other objects from Kahun' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 119-120.
[78] *Ibid*., 121-122 with footnotes 55-58. With regard to Gebel el-Asr, she refers to Shaw & Bloxam, 'Survey and Excavation at the Ancient Pharaonic Gneiss Quarrying Site of Gebel el-Asr', *Sudan & Nubia* 3 (1999), 17. However, we will see that Shaw appears to suggest a different function for the marks at Gebel el-Asr, which is in congruence with Arnold's suggestion for marks on very similar vessels at el-Lisht: indicators of capacity. See below.
[79] Gallorini, 'Incised marks on pottery and other objects from Kahun' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 115-116. Note, however, that the mark is post-fired and can therefore also indicate ownership. See below.

context in which the vessels were found, that is 'a relation to the cemetery, graves and burials', is likely. In particular the find of post-firing marks on Ptolemaic Hadra ware from cemeteries and burial sites seems to suggest a funerary destination since similar marks on Hadra ware were not found in domestic context.[80] Aston remarks that the hypothesis is feasibly possible where the pottery industry was state controlled. He mentions New Kingdom amphorae which bear pre-fired stamps that refer to certain temples, 'a case in point being amphorae impressed pre-firing with the stamps of the temple of Seti I at Abydos, found in Swiss excavations near the tomb of Seti I in the Valley of the Kings.'[81] Yet, he considers the hypothesis unlikely in the case of locally made pots to fill local demand. Hope refutes the idea altogether with regard to the potmarks on late 18th dynasty blue painted vessels from Karnak, Amarna and Malqata. Only certain examples of two specific types of jar among his material were marked, while in the case of workshop marks, he says, 'one would expect to find the same mark/marks upon a wider selection of vessels with greater regularity.' Moreover, he found a number of at least twenty different designs and wonders why, 'If the marks were to indicate destination, … was one mark not used?'[82]

The hypothesis that assigns a function of indicating provenance and/or destination to potmarks is thus not an all-encompassing explanation, yet it may have been the main function of potmarks in the Early Dynastic period. It has been mentioned that Van den Brink considered these marks in the context of a system of (re)distribution. Especially the figurative and hieroglyphic-like potmarks dated to dynasties 0-1, which were primarily incised prior to the firing process, could relate to various workshops, institutions, estates and domains within a regional network of the (re)distribution of food and other products. A study of 2474 marks from 15 sites throughout Egypt led Van den Brink to the following conclusions:

- 78.6% of the potmarks derived from the Royal Tombs at Umm el-Qa'ab or from the Great Tombs at Saqqara. This percentage seems to reflect a high degree of involvement of the earliest kings in the practice of marking pots, while the sharp decline in number of potmarks outside of Umm el-Qa'ab and Saqqara perhaps reflects a lesser involvement of the provinces in the marking practice;[83]
- Relatively few potmarks were applied to vessels before and during the reign of Horus Aha, the first king of dynasty 1. During the following reigns of Djer and Djet there was a steady increase in the frequency of potmarks, with a peak in the reigns of Merneit and Horus Den/Udimu. During the reigns of Anedjib and Semerkhet the frequency of marking vessels appears to be reduced to the same level as seen during the reigns of Djer and Djet, while the practice of marking almost faded completely during the reign of Qa'a, the last king of dynasty 1.[84] This trend appears to suggest a systematic use of potmarks initiated by the Thinite royal administration.

Van den Brink argued that the potmarks 'reflect, and should be linked to certain authoritative and perhaps centralized administrative bodies, responsible for the collecting and/or (re)distributing of commodities

[80] Budka, 'Benchmarks, team marks and pot marks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 82-83.
[81] Aston (David), 'Theban Potmarks' in *ibid*., 51-52.
[82] Hope, 'Some Remarks on Potmarks of the Late Eighteenth Dynasty' in Leahy & Tate (eds.), *Studies on Ancient Egypt in Honour of H.S. Smith*, 136-13, figs. 2-3.
[83] Van den Brink, 'Corpus and Numerical Evaluation of the 'Thinite' Potmarks' in Friedman & Adams (eds.), *The Followers of Horus*, 270.
[84] *Ibid*., 271.

contained in these marked vessels'.[85] The fact that many of the potmark-designs are found on several of the 15 sites under study suggests that 'the information contained in' them 'was not limited 'physically' to the place where these vessels were produced'[86]; rather, it demonstrates a more complex mobility of the vessels. The idea of an administrative network was supported by separate studies on the potmark corpora from Tarkhan, Minshat Abu Omar and Kafr Hassan Dawood.[87] Thus, the majority of a total of 356 marks from Tarkhan could be allocated to those groups of marks recognized by Van den Brink in the material from various sites. A total of 76 marks are unique to Tarkhan, a fact which Mawdsley explains as indicating ultimate destinations of jars in Tarkhan. This would imply the assumption that some products were pre-ordered and delivered to exact destinations.[88]

The systematicity and the frequency with which potmarks were applied in the Early Dynastic period is not seen in later times. Gallorini remarks that therefore an administrative network of (re)distribution cannot be assumed for potmarks from the Old, Middle and New Kingdoms. While certain designs of potmarks seen in the material from Kahun are also found at other sites (e.g. Qasr el-Sagha, Tell el-Dab'a, Tell el-Mashkuta, as also Deir el-Medina), these designs are usually simple and universal, and we cannot assume that the marked vessels from these sites were supplied or distributed by the same center.[89] A single workshop, institution, estate or domain, either as provenance or as destination remains therefore one of the most plausible explanations for potmarks after dynasty 1.

b.4 Internal workshop codes

It has been suggested that pre-firing potmarks functioned as internal workshop codes. Ditze, for instance, remarks that potmarks may relate to specific phases in the *chaîne opératoire*, the manufacturing process. She suggests that they may have functioned to inform the next person in the assembly line whether a particular batch of vessels was to be white slipped or red slipped. Only the first vessel of a batch would have to be marked, since if each batch was kept together, the next worker needed only to find the marked pot to know what should be done to the whole batch.[90] Gallorini as well considers the idea of internal workshop codes: it is conceivable that the Late Middle Kingdom marks from Kahun functioned in connection with particular aspects of the manufacturing process, conveying information on for instance the date of production, the length of the drying phase, or the completion of an order.[91] Also, a potter may have marked the last vessel made during the day, each day with a different sign to distinguish groups of vessels that were shaped over a period of a few days. This information may have been helpful at the time of loading the kilns, to avoid mixing vessels that had been left to dry for different lengths of time. However, Gallorini admits that the data that emerge from Kahun, as well as from other sites, seem to suggest that not all pottery types were marked with the same frequency (although this is part be due to

[85] Van den Brink, 'Corpus and Numerical Evaluation of the 'Thinite' Potmarks' in Friedman & Adams (eds.), *The Followers of Horus*, 274.
[86] *Ibid*.. See Table I2-1 for the distribution of potmark-designs.
[87] Mawdsley, 'The corpus of potmarks from Tarkhan' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1043-1044, 1048; Kroeper, 'Corpus of Potmarks from Minshat Abu Omar' in Krzyzaniak, Kroeper & Kobusiewicz (eds.), *Recent Research into The Stone Age of Northeastern Africa*, 216; Tassie et al., 'Corpus of Potmarks from Kafr Hassan Dawood' in Midant-Reynes & Tristand (eds.), *Egypt at its Origins* 2, 215.
[88] Mawdsley, 'The corpus of potmarks from Tarkhan' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1046. See also Hope's idea of the marking of pre-ordered batches of vessels for a specific cultic function below (*Indicators of festive function*).
[89] Gallorini, 'Incised marks on pottery and other objects from Kahun' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 121.
[90] Ditze, 'Gedrückt – Geritzt – Gekratzt' in Pusch (ed.), *Die Keramik des Grabungsplatzes Q1*. Teil 2, 279-280.
[91] Gallorini, 'Incised marks on pottery and other objects from Kahun' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 119.

unsystematic recording in the site's archaeological history). If the marks were related to the production process, one would expect to find them relatively evenly distributed over all types.[92]

Closely related to the idea of workshop codes is the suggestion that the marks were *aides-mémoires* for the potters themselves. With respect to some of the pre-firing marks from Early Dynastic Adaïma Bréand argues that they could have been applied by the potters either to count the pots or as an indication for stacking in the kilns.[93] A similar function was suggested by Wodzińska for the post-firing potmarks on jars from Heit el-Gurob. Ethnographic research has revealed that modern potters of el-Nazla in the Fayum make nine basic types of pots, each with a different function and name. The potmarks from earlier times may also indicate specific type or function. When the function of a jar changed over time, this may also have been indicated by means of a mark scratched onto the surface.[94] In contrast to internal workshop codes, which had to be understood and followed by the workshop in general, the more personal nature of *aides-mémoire* would account for a less systematic application.

b.5 Indicators of content

In 1897 Quibell suggested that potmarks were notes that referred to the contents of jars.[95] This idea was followed by Seidl who, with respect to potmarks from Bogazköy, suggested that they 'könnten ein Gefäss für eine bestimmte Menge einer bestimmten Ware auszeichnen'.[96] Yet, with respect to the Early Dynastic marks from Minshat Abu Omar Kroeper refuted the idea: 'The possibility that the marks may be an indication of contents seems rather small since most marks were already applied at the ceramic workshop/s, and similar marks are found on different vessel types.'[97] Furthermore, she notes that the 27 of 322 pots with marks found in Minshat Abu Omar, which actually had remains of contents in them (mostly consisting of animal and fish bones, botanical remains and shells in a mixed context), could not be related in any consistent way with the marks. Tassie et al. refute the hypothesis for similar reasons with respect to the potmarks from Kafr Hassan Dawood.[98]

Gallorini rules out the possibility that the marks from Kahun could have been indicators of content. Of 103 large storage jars with pre-firing marks, 55 had the marks applied on the rim and 44 on the shoulder. But since these storage jars were used for transport and long term storage of grain or other dry commodities, they would be sealed with a dish and a mixture of mud and chaff that was smeared all around the upper part of the vessel. The marks would become invisible and therefore would have been 'of no importance after the jars were filled up and during transport'.[99] In contrast, post-firing marks on large storage jars from Heit el-Gurob were located on the highly visible upper part of the shoulder. Therefore, Wodzińska does not rule out the possibility that they referred to 'the contents of the stored products inside

[92] Gallorini, 'Incised marks on pottery and other objects from Kahun' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 120.
[93] Bréand, 'The Corpus of Pre-Firing Potmarks from Adaïma' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1036-1037.
[94] Wodzińska, 'Potmarks from early dynastic Buto' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1089.
[95] Quibell, *The Ramesseum*, 20.
[96] Seidl, *Bogazköy-Hattusa*, VIII, 74.
[97] Kroeper, 'Corpus of Potmarks from the Pre/Early Dynastic Cemetery at Minshat Abu Omar' in Krzyzaniak, Kroeper & Kobusiewicz (eds.), *Recent Research into The Stone Age of Northeastern Africa*, 216.
[98] Tassie et al., 'Corpus of Potmarks from the Protodynastic to Early Dynastic Cemetery at Kafr Hassan Dawood' in Midant-Reynes & Tristant (eds.), *Egypt at its Origins* 2, 221.
[99] Gallorini, 'Incised marks on pottery and other objects from Kahun' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 113.

certain ceramic vessels', especially not 'if they were different from the original contents' or 'if they were used to contain a specific product.'[100]

b.6 Indicators of capacity

The idea that potmarks rather refer to the capacity of jars was first postulated by Petrie in 1921, and then by Brunton in 1927, 'although the latter had to rather sheepishly admit that the same mark sometimes occurred on different sized vessels'.[101] Nevertheless, as Aston remarks, the idea was further suggested by Lacau and Lauer as well as by Kromer with regard to Old Kingdom potmarks from Saqqara and Giza.[102] In view of the Early Dynastic potmarks, it could indeed be suggested that those consisting of dots and strokes were numerical indicators of capacity. Yet, Bréand argues that the marks from Adaïma could not have been measures of quantity or capacity of goods 'because similar signs occur on bowls and jars.'[103] For the same reason she refutes the idea that the marks identify a product that was transported and/or stored, because 'By definition, an open form, like a bowl, cannot be used for the transport or the storage of goods.'[104] Kroeper also refutes the idea for the potmarks from Minshat Abu Omar, arguing that 'parallels could not be found as regards volume or size and the amount of strokes or points scratched into the surface of the vessels.'[105]

The marks from Kahun also did not function to indicate capacity. Gallorini notes that two marks in particular occur on vessels of different shapes, sizes, volumes and fabrics. For instance, is found on all types of large storage jars (in Marl C1 and C2), on a small jar with pointed base (Nile C), and on a beer jar (Nile C). The mark occurs on large storage jars, medium- and small-sized ovoid jars, on large ovoid bottles, but also on basins and lids.[106] The unlikelihood of the hypothesis is stressed by Wodzińska as well, who argues that the vessel types with marks from Giza were rather standard in size and that their capacities were commonly known. Moreover, if the capacity was marked, 'such cases would have been rare since potmarks generally are not very numerous.'[107]

With regard to pre-firing marks on the inside of the rims of 22 large, open-mouthed, flat-bottomed jars that were found along the southern enclosure wall of el-Lisht, dated to dynasty 12, Arnold does suggest a function of indicating capacity.[108] The same idea seems to be suggested by Shaw for another group of 22 large 12th dynasty storage jars found at Quartz Ridge at the gneiss quarries of Gebel el-Asr. He emphasizes the similarities between both groups, both bearing pre-firing marks on the inside of the rim. The jars from Quartz Ridge in addition show post-firing numbers on their shoulders. Shaw suggests that vessels of this type were probably produced in the Memphis-Fayum region and were

[100] Wodzińska, 'Potmarks from early dynastic Buto and old Kingdom Giza' in Friedman & Fiska (eds.), *Egypt at its Origins* 3, 1089.
[101] Aston (David), 'Theban Potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 51. See Petrie, *Corpus of Prehistoric Pottery and Palettes*, 27; Brunton, *Qau and Badari* I, 18.
[102] Aston (David), 'Theban Potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 51. See Lacau and Lauer, *La Pyramide à degrés* V, 24; Kromer, *Siedlungsfunde aus dem frühen Alten Reich in Giseh*, 70. Kromer, however, was hampered by the fact that most of his vessels were too fragmentary to prove his hypothesis.
[103] Bréand, 'The Corpus of Pre-Firing Potmarks from Adaïma' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1036.
[104] *Ibid*..
[105] Kroeper, 'Corpus of Potmarks from the Pre/Early Dynastic Cemetery at Minshat Abu Omar' in Krzyzaniak, Kroeper & Kobusiewicz (eds.), *Recent Research into The Stone Age of Northeastern Africa*, 216.
[106] Gallorini, 'Incised marks on pottery and other objects from Kahun' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 113, 114, 120.
[107] Wodzińska, 'Potmarks from early dynastic Buto and old Kingdom Giza' in Friedman & Fiska (eds.), *Egypt at its Origins* 3, 1089.
[108] Arnold (Dorothea), 'Pottery' in Arnold (Dieter), *The Pyramid of Senwosret* I, 115.

particularly suited to the transportation and long-term storage of dry substances.[109] However, the same problem arises as we saw with the hypothesis on the marks being indicators of contents: during transport and storage, when the jars were sealed, the marks were no longer visible. They are, then, no longer functional in informing about the amount of products transported or stored.

b.7 Direct references to the supposed meaning

There have been attempts to equate potmarks with abbreviations of hieroglyphic words. Parkinson, for instance, suggested that an *jn*-sign could have something to do with bringing the pot to a certain destination.[110] With regard to a post-firing mark in the form of *nfr* on a cooking pot from 12th dynasty Kahun Bourriau argued that 'The hieroglyphic sign *nfr*, which means 'good', 'fortunate', or 'beautiful'…, rather than any precise meaning, was intended simply to confer good luck. Perhaps it guaranteed that the food would not burn!'.[111] Aston argues that this interpretation is unlikely to be correct, because only very few potmarks lend themselves to a direct relation with a hieroglyphic word.[112] Yet, Hope does refer to the idea with respect to late 18th dynasty marked blue-painted pottery from Karnak, Amarna and Malqata. He suggests that 'the marks convey a wish or quality deemed appropriate for the context in which the vessel was to be used. This can easily be understood for such signs as *ꜥnḫ*, *wꜣḏ*, *mn*, *nfr*, *sḏ*, the possible *ḥtp*, *ḏd* and *wꜣs*, and combinations thereof.'[113]

b.8 Indicators of festive function

However, Hope preferred the hypothesis that the 18th dynasty marked vessels were destined for use at a particular festival. He argued that the jars found at Karnak North were intended for use in the Aten temples at East Karnak, possibly during the *ḥb-sd* jubilee festival of Akhnaton. Contemporary marked blue-painted vessels from Malqata would have been intended specifically for use during the three jubilees of Amenhotep III.[114] At both sites, similar types of vessels were marked: types that could easily be carried and could have been used for making offering.[115] He thus relates the practice of marking blue-painted vessels in 18th dynasty Karnak and Malqata to a specific festival function or cultic use: the vessels intended for these festivities were commissioned in large consignments and marked as such.[116]

b.9 Ownership marks

Among Petrie's suggestions for the function of potmarks was, finally, the interpretation that post-fired marks indicated ownership. Ownership marks 'must, by their very nature, be post-fired, since the owner

[109] Shaw & Bloxam, 'Survey and Excavation at the Ancient Pharaonic Gneiss Quarrying Site of Gebel el-Asr', *Sudan & Nubia* 3 (1999), 17.
[110] Aston (David), 'Theban Potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 51. See Parkinson, *Cracking Codes: The Rosetta Stone and Decipherment*, 95.
[111] Bourriau, *Umm el-Ga'ab. Pottery from the Nile Valley before the Arab Conquest*, no. 119.
[112] Aston (David), 'Theban Potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 51. See the relatively infrequent occurrence of hieroglyphic signs as potmarks in Table I2-1.
[113] Hope, 'Some Remarks on Potmarks of the Late Eighteenth Dynasty' in Leahy & Tate (eds.), *Studies on Ancient Egypt in Honour of H.S. Smith*, 127.
[114] This idea suggests why fewer marked blue-painted vessels of similar type as those at Karnak were found at Amarna. *Ibid*., 128-130.
[115] *Ibid*., 126.
[116] *Ibid*., 138-139. A similar idea was referred to by Tassie et al. in particular with regard to painted marks and short inscriptions on vessels. See Tassie et al., 'Corpus of Potmarks from the Protodynastic to Early Dynastic Cemetery at Kafr Hassan Dawood' in Midant-Reynes & Tristant (eds.), *Egypt at its Origins* 2, 211.

can only mark the pot once it has come into his possession'.[117] Aston notes that the idea was also followed by Bruyère who, with regard to potmarks from Deir el-Medina, pointed out that the same marks appeared not only on pots, but also on household linen, wooden items, toilet objects and tools.[118] For the marks from Kahun Gallorini argues that it is difficult to find proof of ownership in the material due to the fact that Petrie, the excavator, rarely recorded find-spot and context. However, she does remark that amongst the post-firing marks we can sometimes 'recognize personal names'.[119] Moreover, in one instance four body sherds from four different large storage jars, which were all incised with the same mark type, were found together in a room in one of the houses in the southern part of town.[120] This may indicate ownership, although it does not rule out other hypotheses, especially since the original find-spot and context of the sherds remain unknown. Wodzińska suggests the function of ownership marks with regard to the post-firing marks from Heit el-Gurob. She argues that 'Vessels used in the daily consumption of different kinds of food could have carried marks indicating their owners. The Heit el-Gurob site is characterized by white carinated bowls, which probably served as receptacles used in daily consumption by the workmen housed in the galleries. These bowls could have been easily taken to the activity areas by the workmen, where could have contained the food to be eaten during work. Notably, the marks executed after firing on the white carinated bowls are usually unique, and their motifs are not frequently repeated.'[121] This is a situation which, as we will see, may be very comparable to the application of marks on pottery by the workmen in the Theban necropolis.

With regard to all these hypotheses that have been suggested to explain the phenomenon of potmarks, Aston remarks that none of them is entirely convincing.[122] Many of them concern only part of the potmark corpus (such as those marks that resemble hieroglyphs, or only pre- or post-firing marks), or they are incongruent with the (lack of) systematicity and frequency of applying potmarks. It must be assumed that potmarks served multifunctional purposes. Thus, Ditze found that none of the hypotheses was able the fully explain the function of potmarks from Qantir and she states that it is 'nicht möglich, das Auftreten der Topfmarken durch einen einzigen Interpretationsansatz zu erklären'[123]; and Budka explains the fact 'that identical potmarks were used on different vessels in different contexts, but also that they were found on the same types of vessels in similar contexts' by proposing 'a multifunctional use of these marks'.[124] Even with regard to the Early Dynastic marks, for which a function within a system of (re)distribution was suggested, Bréand concludes that 'The variety of signs, the different types of functional categories [of pottery] on which they occur, and the different positions of the potmarks on the vessels point to the fact that the various markings do not all have a single meaning, and suggest that there were several systems involved.'[125] Certainly, given the time-span within which potmarks are encountered,

[117] Unless a buyer told a potter to make a certain mark in the pot at the time of manufacture. Aston (David), 'Theban potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 52.
[118] *Ibid*.; Bruyère, *Rapport sur les Fouilles de Deir el Médineh (1948-1951)*, 60.
[119] Gallorini, 'Incised marks on pottery and other objects from Kahun' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 115.
[120] *Ibid*., 115-116.
[121] Wodzińska, 'Potmarks from early dynastic Buto and old Kingdom Giza' in Friedman & Fiska (eds.), *Egypt at its Origins* 3, 1089.
[122] Aston (David), 'Theban Potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 49. Cf. Ditze, 'Gedrückt – Geritzt – Gekratzt' in Pusch (ed.), *Die Keramik des Grabungsplatzes Q1*. Teil 2, 500,
[123] *Ibid*., 500.
[124] Budka, 'Benchmarks, team marks and pot marks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 83.
[125] Bréand, 'The Corpus of Pre-firing Potmarks from Adaïma (Upper Egypt)', *BMSAES* 13 (2009), 58.

from the Predynastic period 'throughout Dynastic and Post-dynastic Egypt virtually until the present day',[126] it is sensible to keep in mind that reasons for applying potmarks as well as the specific meaning given to them may have differed from one period to another.

If we now turn to the marks from Deir el-Medina, especially those that occur on pots, and compare them to the practice of marking pottery in general, we can establish the following characteristics:

- While after a relatively intensive and systematic usage of potmarks in dynasties 0-1 the phenomenon becomes quite rare, potmarks in the Theban necropolis are suddenly relatively numerous, especially from dynasty 19 onwards. The number of marks on pots that were placed in tombs even increases through time;[127]
- The number of post-fired potmarks in the Theban necropolis is much larger than in any of the potmark corpora from earlier times. In the Early Dynastic period post-fired marks were the exception rather than the rule, while in later times the numbers for pre- and post-firing marks are fifty-fifty at best;[128]
- As Bruyère and Aston already remarked, the marks found on pottery in the Theban necropolis are the same as those seen on a variety of objects, as well as on the marks ostraca and in graffiti.[129] Even sequences of marks on ostraca and the combination of different marks on pottery can be compared. For instance, consider the mark on the sherd of a vessel that is Nagel *Céramique* 049 fig. 31 nr. 315 (fig. I2-2 below). This mark has been attested as the identity mark for the scorpion-controller *Jmn-ms*. Davies identifies the scorpion controller *Jmn-ms* with *Jmn-ms* (ii).[130] However, if we would assume instead that he was identical with *Jmn-ms* (xi), son of *Sꜣ-Wꜣḏ.t* (ii), we can account for the second mark that occurs on the Nagel sherd, which is or . *Sꜣ-Wꜣḏ.t* (ii) is indeed attested with this mark in the administrative lists on the marks ostraca. This strongly suggests, not only that there is a correlation between the marks that occur on pottery and those on the marks ostraca – they were clearly part of the same system –, but also that the potmarks from Deir el-Medina were presumably owners' marks referring to the workmen from Deir el-Medina. Aston explains the context in which they may have been used, which makes a function as owners' marks very likely. He states: 'in a normal settlement the need for owners' marks would be less necessary since the pots used in a given house must presumably belong to the householder, and there would thus be no question as to who owns what, but with the Deir el-Medineh workforce, we have a group of men who went away from their village to work in the Valley of the Kings for periods of ten days at a time, where in a more communal, and probably more regimented working environment, certain individuals may have felt the need to mark their

[126] Van den Brink, 'Corpus and Numerical Evaluation of the 'Thinite' Potmarks' in Friedman & Adams (eds.), *The Followers of Horus*, 265.
[127] Aston (David), 'Theban Potmarks' in *Pictograms or Pseudo Script?*, 52, 54, 58-62.
[128] In Early Dynastic Minshat Abu Omar only 9 of the 322 marks were incised after firing. In Old Kingdom Heit el-Gurob 51.97% of the potmarks was pre-fired, while 48.03% was post-fired. In contrast, of the New Kingdom Theban potmarks, only 10 out of 91 potmarks (10.98%) was pre-fired. Kroeper, 'Corpus of Potmarks Minshat Abu Omar' in Krzyzaniak, Kroeper & Kobusiewicz (eds.), *Recent Research into The Stone Age of Northeastern Africa*, 216; Wodzińska, 'Potmarks from early dynastic Buto' in Friedman & Fiske (eds.), *Egypt at its Origins* 3, 1076; database *Symbolizing Identity*, search terms 'pottery', 'pre-firing', 'post-firing'.
[129] For an overview we refer to the Database *Symbolizing Identity*, where the marks on pottery as well as on other objects and on ostraca and in graffiti are collected.
[130] Davies, *Who's Who at Deir el-Medina*, 233.

own property, otherwise just like Goldilocks and the three bears there will come the question "Who has been eating out of my dish?". It would also explain why the same mark occurs on a variety of different vessels; in the Valley of the Kings this is usually dishes, ringstands and storage jars [perhaps the typical repertoire that a particular workman used], and at the same time why a number of different marks occur on the same type of vessel.'[131] As such, the potmarks from the Theban necropolis are comparable to the marks on the white carinated bowls from Heit el-Gurob, for which Wodzińska, as we have seen, suggested a function as owners' marks to identify the property and foodstuffs of workmen.

In general, however, it can hardly be argued that the marks from Deir el-Medina found inspiration in the phenomenon and tradition of marking pottery.[132] Some forms of marks are indeed similar to potmarks that occur already in the Early Dynastic period, and marks such as , , , , and seem to recur throughout history – although it is to be noted that occurs in Deir el-Medina only from dynasty 19 onwards and is seen neither on ostraca nor on pottery before that time. We will see, however, that these forms are not exclusive to the potmark tradition and their inclusion in the corpus from the Theban necropolis may just as well have been inspired by the tradition of builders' or quarry marks to be discussed in sections 2 and 3 below. The intensive use of marks in the Theban necropolis and their systematic functionality on ostraca, pottery, in graffiti and on domestic and funerary objects of various kinds is in sharp contrast to the infrequency and lack of systematic application of potmarks in general. The phenomenon of marking pottery will have been known, but nothing points to a direct derivation of the former from the latter in form and in function.

All in all, the search for an origin of the Deir el-Medina identity marks in the phenomenon of potmarks seems to be the least promising.

Fig. I2-2 The sherd Nagel *Céramique* 049 fig. 31 nr. 315 with the marks and or of, presumably, *Jmn-ms* (xi) and *Sꜣ-Wꜣḏ.t* (ii).

[131] Aston (David), 'Theban Potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 54, 58.
[132] See also Haring, 'Popular, but unique? The early history of the royal necropolis workmen's marks', in: Dorn & Polis (eds.), *Deir el-Medina and the Theban Necropolis in Contact* (in press).

2 BUILDERS' MARKS

'Builders' inscriptions' is a broad term applied to written notes and marks that are encountered on construction sites from the Old Kingdom (first seen in the Djoser pyramid complex) into Graeco-Roman times, but that are especially known from Old and Middle Kingdom pyramid, tomb and temple sites. The notes and marks were applied to building blocks during various phases of transport and treatment of the stones in the process from the quarry to their final place in the construction. They were 'von nicht offiziellem Charakter'[133] and can be seen as a preliminary administration system that kept track of the work's progress. It is generally assumed that the information was taken over by professional accounting scribes and incorporated into the administrative hieratic papyri archives (e.g. the Kahun and Reinser Papyri).[134] The notes and marks allow to reconstruct different phases of the construction process and they contain information about the workmen involved. After the blocks were placed in their position in the masonry, however, they lost their function and were not meant to be seen any longer. This is apparent from the positioning of the marks on those rough unprocessed faces of the blocks that were invisible after the blocks had been set in place, as well as from the fact that several notes and marks were erased when no longer needed, or damaged during later phases of treatment such as the dressing of the stone, the cutting of lever holes or the mortaring of stones.[135]

Felix Arnold distinguished the following kinds of builders' inscriptions: [136]

- Control notes
- Team marks
- Setting marks
- Measurement lines

We are particularly concerned with the team marks, which convey the identity of teams of workmen who were assigned a specific task or phase in the process of construction. However, we shall see that these marks are closely connected to the written 'control notes'. For the sake of comprehension, it is necessary to first create a context based on the written notes, in which we can subsequently place an interpretation of the nature and function of team marks.[137]

a. Control notes: the context

The notes are short (Old Kingdom) or longer (Middle Kingdom) texts that were written on the building blocks and that usually mention the date, phase of transportation and the workmen in charge of a block of stone.[138] They were painted, most often in red ochre, but sometimes in black ink or yellow ochre. According to Arnold, the notes were clearly written by scribes, who may possibly be identified as the

[133] Andrássy, 'Teammarken der Bauleute des Alten und Mittleren Reiches' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 5.
[134] *Ibid*., 15; Arnold (Felix), *The Control Notes*, 14.
[135] *Ibid*..
[136] *Ibid*..
[137] We will not go into the setting marks and measurement lines here, as they do not convey identity. For further information, see Arnold (Felix), *The Control Notes*, 14-15.
[138] *Ibid*., 14.

scribes present in every crew of workmen to assist the overseer.[139] Yet, not every scribe used the same degree of care in the execution of a note. On the basis of quality Arnold distinguished two groups of notes that would reflect different grades of literacy:[140]

1. The first group contains notes with characters that are approximately 1 to 2 centimeters in height, written with a thin brush approximately 2 millimeters in width. The notes are generally in cursive style and carefully executed. They were probably written by scribes who were accustomed to writing accounts with the same implements and ink as were used on papyrus;
2. The second group contains the majority of notes, which have characters ranging from 5 to 20 centimeters in height. They were written with a thick brush that was approximately 1 to 2 centimeters in width. They generally contain more abbreviations than the smaller notes and sometimes leave out information, such as the date.

When the notes are complete, they contain the date followed by a formula that indicates the phase of transport, and in a second line information about the workers who were responsible for that phase (fig. I2-3). This format as well as the formulas that are used, are similar to the texts known from account papyri.[141] They present the same administration, which was apparently kept on site in the form of notes and marks that were later processed into neat documents. The formulas for transport generally express three kinds of effort:

- 'removing' (*šdj*) a block of stone (from a certain place);
- 'transporting' (*jtḥ*, *jn*(*j*)) a block of stone (from one place to another);
- 'delivering' (*rdj*, *sꜥḳ*) a block of stone (to a certain place).

The location from or whereto the stone was moved is sometimes mentioned, but was usually excluded. Its addition probably became important especially when different phases of transportation were performed by different teams of workmen. In such a case, the number of control notes written on a stone would reflect the number of separate operations carried out by different teams.[142] Indeed, there are stones that carry more than one note. This occurs, however, without any perceivable regularity and is therefore difficult to interpret.[143]

The formula in the notes allow to reconstruct the following phases of transportation:[144]

Phase 1 Removal from quarry. Arnold remarks that the more specialized work in the quarries was done by *jk.y.w*, 'quarrymen', not by the unskilled laborers who were assigned the transport of the blocks. The notes do not mention actions or people involved in the actual quarrying of the

[139] Arnold (Felix), *The Control Notes*, 19, 22. He remarks that a crew of workmen was supervised by a *ḫrp*, 'controller', who was assisted by a scribe. Cf. Griffith, *Hieratic papyri from Kahun and Gurob*, 40.
[140] Arnold (Felix), *The Control Notes*, 14.
[141] E.g. the Kahun and Reisner papyri. *Ibid*., 19; Griffith, *Hieratic papyri from Kahun and Gurob*, pls. 15-19. A close parallel to the control notes is pl. 22. See also Simpson, *Papyrus Reisner* I-III.
[142] Arnold (Felix) suggests that such a system may have been initiated because some workmen lived in the vicinity of the construction site while others lived nearer to the quarry. Each team of workmen would have been employed during that phase of transportation that took place closest to his living quarters. Indeed, it could be conceived that such a system is logistically efficient since only the stones, and not entire teams, would have to be shipped from the quarries to the building site. *Ibid*., 19.
[143] It should be kept in mind, however, that some notes may have been removed during the operations, while others may still be hidden on invisible sides of the blocks. *Ibid*., 20.
[144] This is a summary of the phases given by Arnold (Felix) in *The Control Notes*, 19-22.

stones inside the quarry. The only action they mention is the removal of the blocks: *šdj*(.*w*) *m ḥtt* <*jn*> *NN*, 'removed from the quarry <by> (the workmen) *NN*'; or *jn*(*j*.*w*) *m ḥtt*, 'brought from the quarry'.[145] The notes and their closely associated team marks should therefore not be confused with 'masons' marks' or 'quarry marks'.[146]

Phase 2 Shipment. The actual shipment of the blocks is rarely mentioned in the notes. We only know of a formula encountered in one note published by Arnold, which says *šdj*(.*w*) *m ḥtt rdj*(.*w*) <*m*> 𓊹, 'removed from the quarry, delivered <at> the ship'.[147]

Phase 3 Landing and unloading. These actions are better represented. The ships docked at *mry*.*t*, the 'embankment'. Formulas that refer to this are *rdj*(.*w*) *mry*.*t*, 'delivered <at> the embankment', and 𓊹 *smꜣ*(.*w*) *tꜣ rdj*(.*w*) *mry*.*t* 'the ship docked, delivered <at> the embankment'. Unloading is referred to in the formulas *šdj*(.*w*) *m ḫnm*.*t* , 'removed from the eight-ship'[148] and *jn*(*j*.*w*) *ḥr mry*.*t*, 'brought from the embankment'.[149]

Phase 4 Storage and delivery. The stones were brought from the embankment probably to workshops and storage rooms near the quay. Two notes recorded by Arnold speak of the delivery of the stones to the 'ramp': *rdj*(.*w*) *ḥr smꜣ*.[150] Arnold suggests that this ramp led up to the actual construction site where the stones would be put in place. Other notes mention *rdj*(.*w*) *js n* ////, 'delivered <at> the workshop of ////';[151] *jṯ*(*j*.*w*) *m ꜥ.t*, 'taken from the chamber;[152] *rdj*(.ꜥ) *r mꜣꜥ mr*, 'delivered at the *mꜣꜥ* of the pyramid';[153] and *sꜥḳḳ*(.*w*) *mr*, 'brought <to> the pyramid'.[154]

All actions mentioned in the notes were performed by workers who are sometimes identified through their place of origin, the institution from which they came, or through the name and titles of the official who supervised them or had dispatched them to the construction site. The notes include this information in written form as 'place X', 'institution Y', or 'official NN', referring in brief to 'men from place X', 'men from institution Y' and 'men from official NN'.[155] The same information could, however, also be added in the form of single team identity marks.

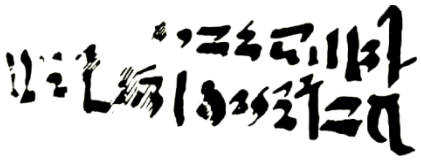


Fig. I2-3 Control note from the southern pyramid at Mazghuneh, giving in the first line the date ('year 2, 3rd month of summer, day 2'), followed by information about what was done and by whom ('what the individuals of the troops <of> the southern province brought'. Arnold (Felix), *The Control Notes*, 174 (Ma1).

[145] Arnold (Felix), *The Control Notes*, e.g. 94 (NW15d), 95 (NW16a.2), 98 (NW28.c), 107 (N12), 109 (N16).
[146] *Ibid*., 20. See section 3 below.
[147] Ideographic writing of 𓊹; therefore, the reading is uncertain. E.g. *ibid*., 130 (E1.3).
[148] E.g. *ibid*., 107 (N11). The eight-ship is a special kind of boat, cf. p. 20.
[149] E.g. *ibid*., 103 (NW46).
[150] E.g. *ibid*., 76-77 (W27-28). For *smꜣ*, see Goedicke referred to by Arnold on pp. 21-22, note 37.
[151] E.g. *ibid*., 106 (N7).
[152] E.g. *ibid*., 83 (W44).
[153] Arnold (Felix) notes that the determinative used with the word *mꜣꜥ* (⊗) 'seems to indicate that the term did not have the usual meaning of riverbank..., but rather was the name of a workmen's village. The purpose of the *mꜣꜥ* is uncertain' (*ibid*., 21, 67 (W3).
[154] E.g. *ibid*., 104 (N1), 108 (N13).
[155] This is metonymic reference. For metonymy, see Part II, chapter 2, especially sections 1.d, 2 and 3. Cf. Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 7.

b. Team marks

In referring to the workmen the marks are in close connection with the notes, but they are often superimposed on, or covered by the notes, which indicates that they were made during a different phase of the work. The marks were painted in red or yellow ochre or in black ink, drawn in charcoal or scratched into the stone. They indicate the teams of workers who are mentioned in the notes and who carried out the work.[156] Arnold's suggestion that these workers were unskilled laborers who were recruited or forced to do heavy unspecialized work was briefly mentioned above. He furthermore argued that, while the control notes were clearly written by scribes, the workers themselves must have executed the marks:[157] not only are the marks much larger and more crudely executed, having been applied with easily accessible implements such as a chisel, rough brush or a stick one end of which was hammered soft; also, their simple designs (linear, geometric, or simple hieroglyphic) could be easily memorized and used to mark stones by illiterate laborers.[158] Andrássy remarks that, in this respect, the simple cross was a logical choice by those members of the 'team of the foreign land of *Ḏsḏs*', encountered in the 6th dynasty mastaba of Khentika in Dakhla Oasis, 'da wir unter diesem Personenkreis ganz sicher nicht mit Schriftkundigen rechnen können'.[159] However, she argues that the situation in general is more nuanced. We cannot distinguish sharply between those who left the notes and those who left the marks. Many marks are indeed crudely executed, but there are also examples that show care and detail, and which suggest at least some familiarity with script by their makers.[160] Since the notes themselves show crude as well as neat examples, a distinction based on quality between the notes on the one hand (related to literacy) and the marks on the other (related to illiteracy) cannot hold ground. It should also be kept in mind that the quality of a mark was influenced by its execution in paint, charcoal or by means of a sharp tool. Differences in execution may not be taken as a measure for the degree of knowledge and control of script.[161] In sum, Andrássy argues that the marks were not developed only by and for illiterate workers; rather, they were an integral part of the administrative system. There are even several notes which show that the marks were incorporated by scribes.[162] This supports the idea that the marks were not a system merely for illiterate workers, but were actually part of the account keeping method by scribes.

Thus, a clear connection exists between the notes and the marks. Both concern the workers who were involved in the construction process. Yet, they were not necessarily executed at the same moment. In Table I2-2 we present an overview of builders' marks from Old, Middle and New Kingdom sites, after which we discuss their forms in relation to their meaning and function in order to come to a closer understanding of how and why the builders' marks were used. Subsequently, we must ask ourselves to what extent the marks from Deir el-Medina may have found inspiration in the tradition of builders' marks. They were, after all, similarly used in the administration of the long-term construction works in the Theban necropolis.

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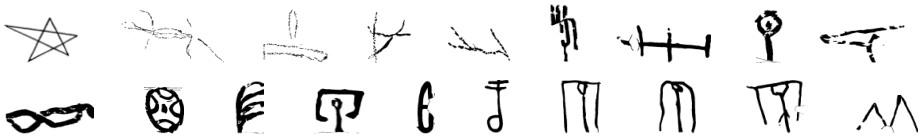
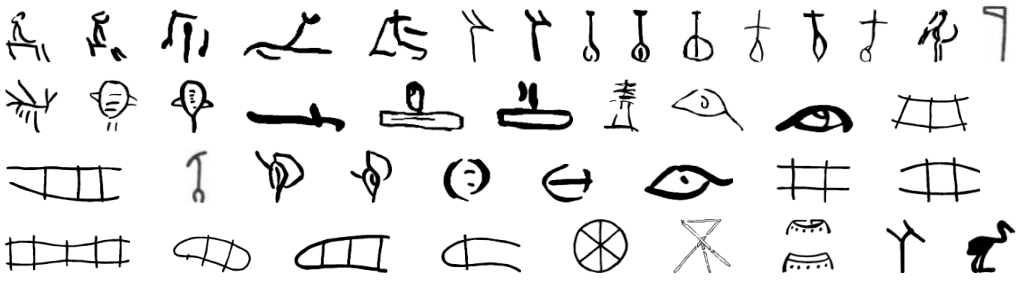
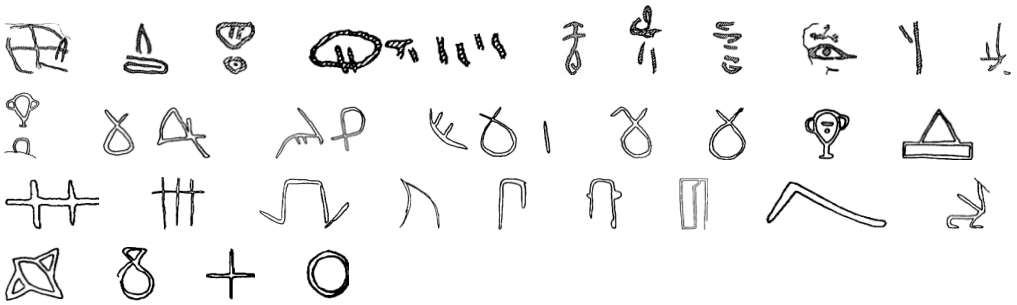
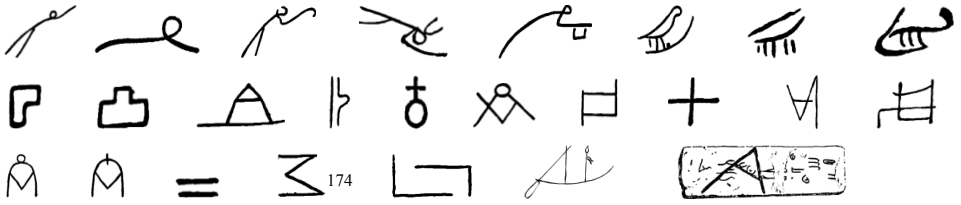
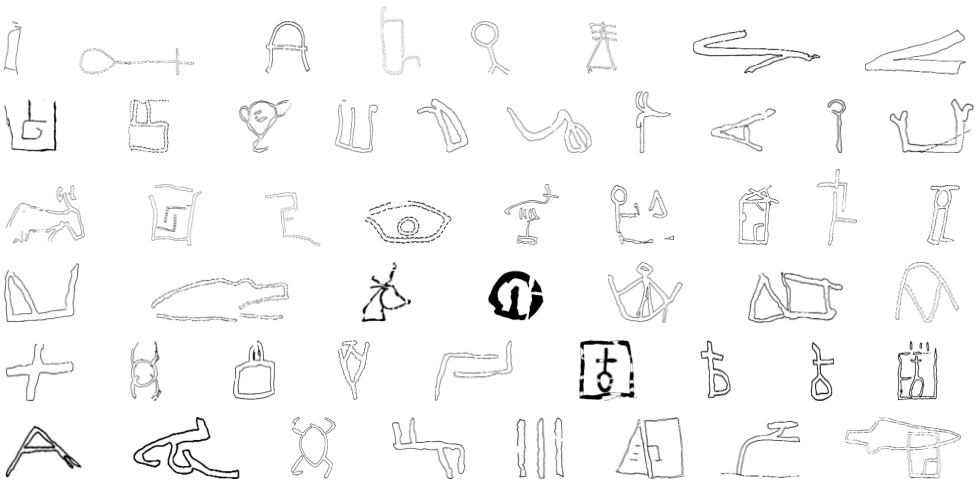
[156] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 5-7; Arnold (Felix), *The Control Notes*, 22.
[157] *Ibid*., 19-22.
[158] *Ibid*., 14, 19-22. We will see, however, that the marks do not all have simple geometric or hieroglyphic forms. See Table I2-2.
[159] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 15.
[160] *Ibid*..
[161] *Ibid*., 17.
[162] Arnold (Felix), *The Control Notes*, 22. The best example is note M5 on p. 156: it contains a mark drawn in the same neat lines and at the same scale as the text. See also Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 15, who for the same reasons refers to Castel et al., *Le mastaba de Khentika*, fig. 99 blocs 299, 415.

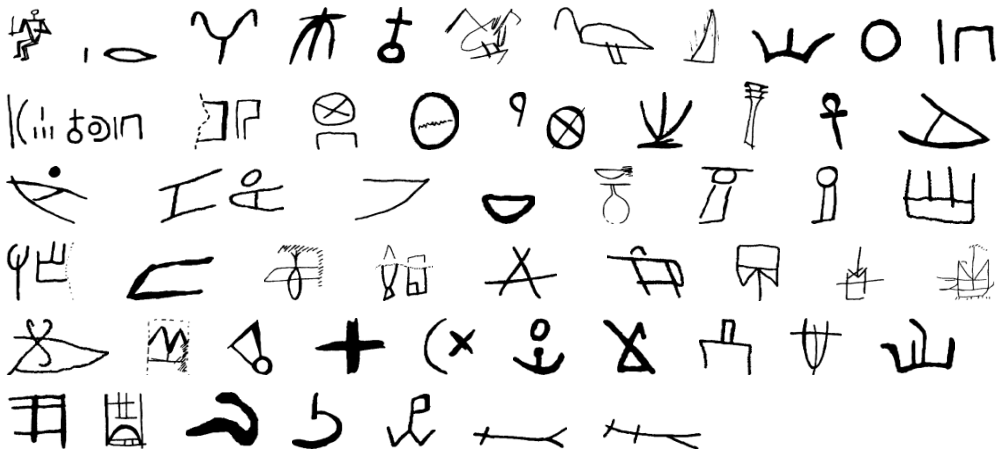
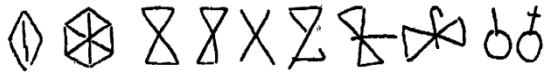
Table I2-2: Builders' marks[163]

Old Kingdom	
Djoser[164]	
Khentika[165]	
Khentkaus[166]	
Mycerinus[167]	
Pepi I[168]	
Ptahshepses[169]	
Raneferef[170]	

[163] The Table contains selections only. For an overview of builders' marks from Old Kingdom Saqqara and Abusir, see Dobrev, Verner & Vymazalová, *Old Hieratic Palaeography* I.
[164] Pyramid at Saqqara: Lauer, *La Pyramide à degrés* I, 245-247.
[165] Mastaba at Balat, Dakhla Oasis. Castel et al., *Le mastaba de Khentika*, 137-149 (figs. 90-99).
[166] Pyramid at Abusir. Verner, *The Pyramid Complex of Khentkaus*, 43-54.
[167] Pyramid at Giza. Reisner, *Mycerinus*, pl. XI-XII.
[168] Pyramid at Saqqara. Dobrev, Verner & Vymazalová, *Old Hieratic Palaeography* I.
[169] Mastaba at Abusir. *Ibid*..
[170] Pyramid at Abusir. Verner, *The Pyramid Complex of Raneferef*, 187-204.

Userkaf II[171]	
Middle Kingdom	
Amenemhet I[172]	
Amenemhet II[173]	
Amenemhet III[175]	
Khendjer[176]	
Kom el-Sultan[177]	
Mastaba of Mazghuneh[178]	
Senwosret I[179]	

[171] Temple at Abusir. Haeny, 'Die Steinbruch- und Baumarken' in Ricke (ed.), *Das Sonnenheiligtum des Königs Userkaf* II *Die Funde*, 23-47.
[172] Pyramid at el-Lisht. Arnold (Felix), *The Control Notes*.
[173] Pyramid at Dahshur. *Ibid*..
[174] Arnold (Felix) described this as an 'Unidentifiable team mark'. Compare, however, fig. I2-1, in which Hamza showed this could represent a hieratic writing of .
[175] Pyramid at Dahshur. Arnold (Felix), *The Control Notes*.
[176] Pyramid at Saqqara. *Ibid*..
[177] Twelfth dynasty temple. *Ibid*..
[178] *Ibid*..
[179] Pyramid at el-Lisht. *Ibid*..

New Kingdom	
El-Assasif[180]	
Deir el-Bahri[181]	
Medinet Habu[182]	

The forms of the builders' marks can be distinguished roughly into 1) hieroglyphic, cursive hieroglyphic or hieratic characters from script, and 2) geometric forms that cannot be identified as belonging to the inventory of hieroglyphic or hieratic signs, for instance 𓉔 or 𓊪. The latter were, according to Arnold, geometric designs 'invented' by the workmen themselves, and probably did not carry phonetic value.[183] From an inventory of the builders' marks dated to the Old and Middle Kingdoms set up by Andrássy it appeared that the first group contained approximately 100 different marks that can all be related to categories from Gardiner's sign list, while another 40 marks do not belong to the standard inventory and rather show combinations of signs from script. Approximately 50 different marks belong to the geometric group. They make up ¼ of all the documented Old and Middle Kingdom builders' marks, which means that hieroglyphic- and hieratic-like marks are predominant.[184]

Looking at Table I2-2, it is seen that several marks are recurrent at different sites and at different periods. The simple cross, for instance, is seen in the pyramid of Khentkaus from dynasty 5 in Abusir, in the pyramid of Raneferef from the same time and place, in the pyramid of Pepi I from dynasty 6 in Saqqara, the mastaba of Khentika from dynasty 6 in Balat, and in the pyramids of Senwosret I and Amenemhet II in el-Lisht respectively Dahshur. In fact, a number of 47 out of the total of 190 different Old and Middle Kingdom marks is encountered on blocks in more than one construction.[185]

[180] Budka, 'Benchmarks, team marks and pot marks from the Asasif' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 85-91.
[181] Wieczorek, 'Observations on building dipinti in the temple of Hatshepsut at Deir el-Bahri' in Dolińska & Beinlich (eds.), 8. *Ägyptologische Tempeltagung: Interconnections between Temples*, 213-218, pl. II; Carnarvon & Carter, *Five Years' Explorations at Thebes 1907-1911*, 40 fig. 11.
[182] Anthes in Hölscher, *The Excavation of Medinet Habu* II, 99.
[183] Arnold (Felix), *The Control Notes*, 14.
[184] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*,17. It should, however, be kept in mind that we probably miss a lot of data due to the fact that early excavators often did not record the builders' marks, at least not in a systematic way, as well as due to the fact that several marks and notes may have faded in the sun. Also, many marks may still be on invisible faces of stone blocks, hidden in the masonry.
[185] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 17-18, and Abb. 9.

Approximately 86% of these marks (40 out of 47) occurs in buildings between which there is no direct spatial or chronological relation (fig. I2-4).[186] The majority of the marks, however, was used only in a narrow temporal and geographical frame; that is, within one construction project or within neighboring or successive projects where the same teams were put to work. The fact that the total number of different marks did remain limited is explained by Andrássy with the existence of 'konstante Formationen';[187] that is, when teams of workmen were relieved by new teams of workmen, these new teams were embedded within the existing system and were allocated already existing marks. It is, however, difficult to say to what extent this was indeed general practice. Against the existence of a strict system with formations and marks that had been determined at some point and retained thereafter is the fact that several constructions from the Old and Middle Kingdoms yielded marks that are only encountered a few times, and only on one or two sites. Andrássy suggests that these could indicate new teams of workers that had been recruited from new places or institutions or had been sent by new officials.[188] In general, however, a centrally fixed or long-term allocation of specific marks to specific teams, or a national inventory systematically applied in construction works throughout Egypt cannot at present be evidenced. There was probably some systematicity in the allocation of marks to teams of workers, for instance on construction sites that were in close geographic and temporal proximity and especially with regard to the hieroglyphic- and hieratic-like marks, as we shall soon come to see. However, a rather loose *ad hoc* practice of selecting, creating and allocating marks to teams whenever there was need must also be reckoned with, particularly in view of marks that occur infrequently as well as those with geometric appearance.[189] The fact that the simple cross was encountered from Balat to Dahshur, from dynasty 5 to dynasty 12, supports this, as it is unlikely that it concerned the same team each time at all sites.[190]

Fig. I2-4 Builders' Marks from the Old and Middle Kingdoms which occur on construction sites that are geographically and temporally distant. Andrássy in *Pictograms or Pseudo Script?*, 18 (Abb. 10).

As for the hieroglyphic- and hieratic-like marks, Arnold remarks that it is not certain whether they still carried their phonetic values.[191] Yet, this seems increasingly to be the case, especially at the end of the Old Kingdom when the organization of the workers on the construction sites changed. There are roughly four groups into which the builders' marks can be divided on the basis of the manner in which they refer to the workers. We present them in chronological order reflecting first the organization of workers on the construction site in the Old Kingdom, and subsequently their organization from the end of the Old Kingdom onwards.

[186] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, Abb. 10.
[187] *Ibid*., 18.
[188] *Ibid*., 18-19.
[189] *Ibid*., 17
[190] *Ibid*., 22.
[191] Arnold (Felix), *The Control Notes*, 14.

b.1 ꜥpr.w-crews, zꜣ-phyles, ṯs.t-teams

From the beginning of stone-construction in the Old Kingdom the workers were organized into crews, teams and sub-teams.[192] The largest formations on site were the *ꜥpr.w*-crews, who were designated in the notes with names that referred to the reigning pharaoh, for example *ꜥpr smr.w Mn-kꜣ.w-Rꜥ* or *ꜥpr smr.w Rꜥ-nfr=f*.[193] These names seem to have been quite consistent, occurring also in other variations such as *ꜥpr mr.w [pharaoh NN]* and *ꜥpr rḫ.w [pharaoh NN]*, changing only the name of pharaoh throughout time.[194] The designation *ꜥpr* originally stems from the expression *ꜥpr-wjꜣ*, 'boat's crew'.[195] On blocks from the causeway of the pyramid complex of Sahure such crews are represented. On one block (Sc-1) they are shown dragging the pyramidion to the pyramid (fig. I2-5), accompanied by the message *ḏꜥm bnbn.t Ḥꜥ(j)-bꜣ-Sꜣḥ.w-Rꜥ jn ꜥpr.wj-wjꜣ*, '…(bringing?) the pyramidion [covered with] fine gold [to] the pyramid "The soul of Sahure rises in glory" by both boat crews'. On another block (Sc-3) a row of men is said to consist of members of the crews *Sꜣḥw-Rꜥ* …(?) and *Nbty-Nb-ḥꜥw-rḫw*. They are bending towards the pyramid and are engaged in the celebrations and offering ceremonies of the finished complex.[196]

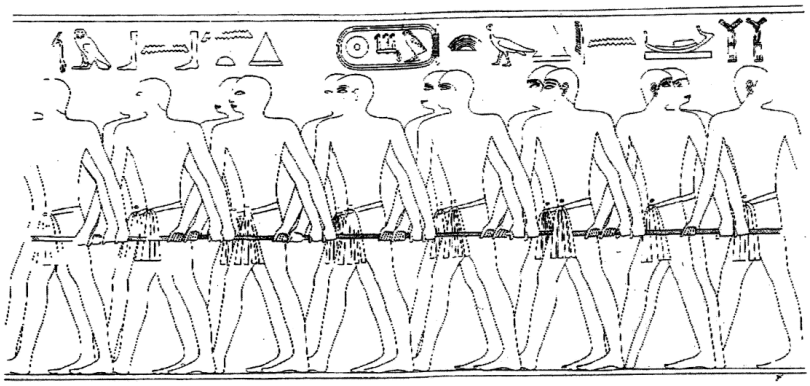


Fig. I2-5 Block Sc-1 from the causeway of Sahure, mentioning 'both *ꜥpr.w*-crews' dragging the pyramidion. Hawass & Verner, 'Newly Discovered Blocks from the Causeway of Sahure', *MDAIK* 52 (1996), fig. 1a.

The *ꜥpr.w*-crews on the construction site were further divided into *zꜣ*-divisions. This organization was also derived from the marine world, where boat crews were organized into four divisions that were named after that part of the boat to which they were assigned: the starboard of the bow (*jmj-wr.t*, abbreviated), the port of the bow (*tꜣ-wr*, abbreviated),[197] the starboard of the stern (*wꜣḏ.t*, abbreviated), and the port of the stern (*jmj-nḍs.t*, indicated by means of) (fig. I2-6).[198]

[192] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 7-17.
[193] Reisner, *Mycerinus*, 275; Verner, *The Pyramid Complex of Raneferef*, 187-189.
[194] Several more variations are listed in Reisner, *Mycerinus*, 275-276.
[195] Sethe in Borchardt, *Das Grabdenkmal des Königs Sáʾḥu-reʿ* II, 85-86; Reisner, *Mycerinus*, 275-276; Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 7 and her note 6.
[196] A similar scene is represented on yet another block (Sc-4). Hawass & Verner, 'Newly Discovered Blocks from the Causeway of Sahure', *MDAIK* 52 (1996), 181-185. See also Borchardt, *Das Grabdenkmal des Königs S'Aꜣḥu-Reʿ* II, 84-86, 121 and Blätter 9, 52.
[197] 'backbordseite': WB V, 230.16-17. But see Verner, *Baugraffiti der Ptahschepses-mastaba*, 31.
[198] *Ibid*., 30-33.

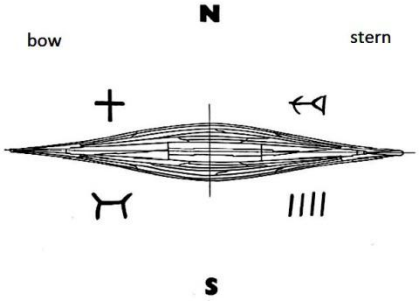


Fig. I2-6 The divisions of a boat's crew according to the four parts of a ship. Abubakr & Mustafa, *The Funerary Boat of Khufu*, 12.

This nomenclature of the divisions of the boat crews was adopted for the organization of temple personnel, which assigned priests to certain phyles that rotated in shifts.[199] These phyles were designated with the names of the four boat-divisions, as well as with a fifth one: *jmj-wr.t, tȝ-wr, wȝḏ.t, jmj-nḏs.t*, and *jmj-nfr.t*. For the workers on construction sites we find these same five designations, often in abbreviated form of a single hieroglyphic sign: (*wr*), (*tȝ*), (*wȝḏ*), (*nḏs*), (*nfr*). In addition, Andrássy records two more divisions: (*sṯ*)[200] and the four vertical strokes .[201] The divisions were sometimes explicitly designated as *zȝ*-divisions by means of the sign , such as in *zȝ nḏs*,[202] but this sign was often left out. Not every construction site has revealed all of the *zȝ*-divisions. For instance, in the pyramid of Mycerinus only two *zȝ*-divisions were found: those of *wȝḏ.t* and *nḏs*.[203] The number of divisions that were introduced will have depended on the amount of work and the length of time in which it had to be done; in other words, on the amount of workers needed for the job.

The crew-names and *zȝ*-divisions have not only been encountered on blocks of stone. Several sherds of pottery show the sign followed by , and once apparently by .[204] Even a copper chisel is said to contain the name of a crew, which is interesting especially with respect to builders' marks from the Middle Kingdom found in the copper tool accounts of Papyrus Reisner, for which Andrássy suggested they were copies of real identity marks on the tools themselves.[205]

Arnold notes that the *zȝ*-divisions each seem to have consisted of approximately 20 workers.[206] They were further subdivided into teams of approximately ten workers. This may be gleaned from an ostracon from 4th dynasty Giza, which records the *zȝ*-division *sṯ* with two subdivisions: *sṯ.t* and *wȝḏ.t*.[207] The supervisors of these subdivisions, *Pr-nb* and *Jwfy*, were named as 'overseers of ten'.[208] The subdivisions are sometimes explicitly indicated as *ṯs.t*-teams by means of the sign .[209] It has been

[199] Reisner, *Mycerinus*, 276; Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 7; Roth, *Egyptian Phyles of the Old Kingdom*.
[200] Perhaps out of confusion with *tȝ-wr*, for 'Backbordseite', which resembles the *sṯ*-sign. See above, note 184.
[201] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 7.
[202] Reisner, *Mycerinus*, plan XI. The mark interpreted as *nḏs* closely resembles *wr*, but Reisner notes that 'after careful consideration', he believed the mark to be *nḏs* (276). See also Verner, *Baugraffiti der Ptahschepses-mastaba*, 31.
[203] Reisner, *Mycerinus*, 276, plan XI (ii, iii, v, x, xi, xxiv).
[204] is not known as a *zȝ*-division. Perhaps it rather indicated a team? Kaplony, 'Bemerkungen zu einigen Steingefässen mit archaischen Königsnamen', *MDAIK* 20 (1965), 1-47, especially 30 (Abb. 63), 31 (Abb. 33), 32 (Abb. 69).
[205] See further below. *Ibid*., 46.
[206] Arnold (Felix), *The Control Notes*, 22.
[207] The *wȝḏ* sign is broken off at the upper right. See Smith, 'Inscriptional Evidence for the History of the Fourth Dynasty', *JNES* 11 (1952), 120 (fig. 8 no. G5110), 126.
[208] *Ibid*.; Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 8.
[209] Griffith, *Hieratic papyri from Kahun and Gurob*, pls. 14, 15-65; 15, 13-31. Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 10.

remarked that the term *ṯs.t* particularly belongs to the Middle Kingdom and that 'Wegen des zwischen Altem und Mittleren Reich angenommenen Systembruchs bezüglich der Organisationsstrukturen der Arbeitskräfte auf dem staatlichen Baustellen … die kleinsten Arbeitergruppierungen des Alten Reiches in der Literatur gewöhnlich neutral als ‚subdivisions of phyles', ‚Phylenunterabteilung' o.ä. bezeichnet [werden]'.[210] However, the term *ṯs.t* is encountered already among the builders' inscriptions in the pyramid of Khentkaus (dynasty 5),[211] in the mastaba of Khentika (dynasty 6),[212] as well as in the Letter of Protest dated to the reign of Pepi II.[213] It may therefore be assumed that combinations of builders' marks such as and from the pyramid of Khentkaus, which show a form that has been termed 'hourglass' accompanied by a mark, are indeed indications of the smallest *ṯs.t*-subdivisions of workers.[214]

The marks that were used as indicators of the *ṯs.t*-teams could be of various kinds. In the two last-mentioned examples they were respectively . On the Giza ostracon the *ṯs.t*-subdivisions were *sṯ.t* and *wꜣḏ.t*. It thus appears that the designations of *ṯs.t*-teams could be identical to those of the *zꜣ*-divisions. Since both the signs for *zꜣ* and for *ṯs.t* may be lacking, we cannot in all cases be certain whether the marks , , , , , and indicate a *zꜣ*-division or a *ṯs.t*-subdivision.[215] The repertoire of *ṯs.t*-marks is, however, much broader than that of the *zꜣ*-divisions, including a variety of hieroglyphic and non-hieroglyphic marks. Examples of hieroglyphic marks are , , , , , , , and . It is uncertain whether they have phonetic value by means of which they refer to a conventional name given to the team (e.g. *ꜥnḫ* 'life', *ḏd* 'stability', *wsr* 'strength', *nfr* 'goodness'[216]), or to an origin of the workers from a certain geographic or institutional place. Some marks have been interpreted as nome-signs referring to topographical origin. Examples are , , and from the pyramid of Mycerinus for respectively the 3rd and 15th Lower-Egyptian nomes and the 16th and 17th Upper-Egyptian nomes.[217] In addition, on blocks from the mastaba of Khentika in Dakhleh Oasis the place name *ꜣj(r)* is mentioned in which the sign *rwḏ* is used; this sign also occurs as a team mark ( ), perhaps referring to an origin of the workers from that locality.[218] Generally, however, such topographical references seem to date to later times.[219] Examples of marks of a kind that is not recognized as hieroglyphic or script-like are , , , , , , and perhaps .[220] The nature and origin of these marks is uncertain.

All in all, the builders' inscriptions from the Old Kingdom reflect an organization of the workers into *ꜥpr.w*-crews, *zꜣ*-divisions and *ṯs.t*-teams whereby the latter were indicated by means of marks of various kinds. Andrássy presented a visual reconstruction of this organization:

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[210] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 9.
[211] Verner, *The Pyramid Complex of Khentkaus*, 43-54.
[212] Castel et al., *Le mastaba de Khentika*, e.g. fig. 90 nos. 38, 84.
[213] Gardiner, 'An administrative letter of protest', *JEA* 13 (1927), 75 (*ṯs.t n.t ꜥpr.w*).
[214] For more examples, see the Old Kingdom section of Table I2-2.
[215] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 8.
[216] *Ibid*., 21.
[217] Reisner, *Mycerinus*, plans XI-XII.
[218] Castel et al., *Le mastaba de Khentika*, 141 and fig. 90 (nr. 176), fig. 95 (nrs. 180b, 69b).
[219] See the following two sections.
[220] Perhaps ⊙; otherwise a representation of the sun or some other circular object, or a geometric figure.

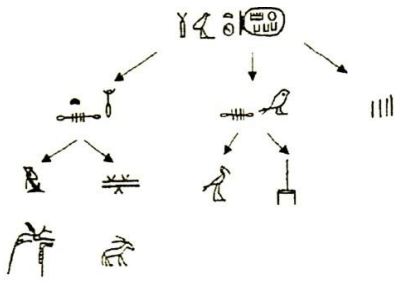

Fig. **I2-7** The division of workers into *ꜥpr.w*-crews, *zꜣ*-divisions and *ṯs.t*-teams. Based on Andrássy in *Pictograms or Pseudo Script?*, 8 and Reisner, *Mycerinus*, plans XI-XII.

b.2 Officials' names and titles

The designation of workmen by means of *ꜥpr.w*-crew names diminished dramatically in the course of dynasty 6. Although hundreds of builders' notes and marks were revealed in the pyramid complex of Pepi I, which do show the *zꜣ*-divisions and *ṯs.t*-teams, no crew-names were found among them.[221] Instead, a practice started to emerge already in dynasty 5 that indicated crews and teams of workers through the names and titles of private persons who were directly connected to the organization of the work: as overseers or as officials who dispatched a number of workers to the construction site.[222] This gradually came to be the predominant manner to refer to workmen from the end of the Old Kingdom onwards. Thus, among the blocks from the pyramid of Pepi I there are examples of the title *tꜣjtj zꜣb ṯꜣtj* accompanied by one or more *ṯꜣ* marks ( ).[223] Rather than interpreting these marks as another writing of 'vizier', Andrássy argues they were team marks that referred to the workers who were sent by the vizier.[224] Other examples come from the mastaba of Ptahshepses, where blocks of stone frequently show *špss*- and *ḫnm*-signs. These signs could have been part of longer inscriptions mentioning Ptahshepses himself and Chnumhotep or Nianchchnum, two officials who are frequently mentioned in the control notes on blocks from the mastaba; but they could also have been used as identity marks that referred to Ptahshepses, Chnumhotep or Nianchchnum as persons who dispatched workers to the site.[225]

In some cases the marks themselves cannot be interpreted as an individual's name or title, but their occurrence in close proximity to personal names and titles does indicate a relation. For instance, in the 6th dynasty mastaba of Khentika in Dakhleh Oasis we find examples of the mark being connected to a number of different personal names, among which *Ḏdy*, *Jdj* and *Jd*(*j*)*-jb*(*j*)(?).[226] Andrássy argues that, 'Soweit man es von diesen Personen sagen kann, kamen sie aus der direkten Umgebung des Gouverneurs'[227]; each could have sent a number of workers to the construction site, where these workers

[221] Personal communication of Verner with Dobrev, see Verner, *The Pyramid Complex of Raneferef*, 202 with note 26. The names of known divisions and sub-divisions are, however, attested. Dobrev, 'Observations sur quelques marques de la pyramide de Pépi Ier' in Leclant, *Hommages à Jean Leclant* I, 149-154; Dobrev, 'Les marques sur pierres de construction de la nécropole de Pépi Ier', *BIFAO* 96 (1996), 103-142; Dobrev, 'Les marques de la pyramide de Pépy Ier', *BIFAO* 98 (1998), 151-170.

[222] Verner, *The Pyramid Complex of Raneferef,* 201-202; Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 9; Arnold (Felix), *The Control Notes*, 22.

[223] Dobrev, 'Les marques de la pyramide de Pépy Ier', *BIFAO* 98 (1998), 152.

[224] Andrássy, Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 19; Dobrev, 'Les marques sur pierres de construction de la nécropole de Pépi Ier', *BIFAO* 96 (1996), 121, 124.

[225] Andrássy, Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 19. In Verner, *Baugraffiti der Ptahschepses-mastaba* more examples can be found of notes that describe workers by means of an individual's name or title. These descriptions are not always accompanied by marks. See, for instance, pl. XIV, nr. 422, which mentions *sḫḏ ḥm.w-kꜣ Wr-bꜣ.w-skr*, 'overseer of the *ḥm*-priests Werbausokar', without team mark. The practice is more frequent in the Middle Kingdom, see below.

[226] Castel et al., *Le mastaba de Khentika*, 142 and fig. 92 blocs 215, 60, 204.

[227] Andrássy, Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 12.

were organized together in team . [228] A similar case may be suggested for blocks from the mastaba of Ptahshepses, on which we find one mark connected to three different names and titles. On block no. 300 in fig. I2-8[229] we read a date (*ꜣbd* 3 *šmw sw* 16) followed by the name of *Rᶜ-wsr*. To the right and left we see a mark that resembles the hieroglyphic form of *njw.t*: . Another block, no. 410,[230] gives the next day (*ꜣbd* 3 *šmw sw* 17) with the note *jmj-rꜣ iz.w.t Ḥtpj*, 'leader of the troops, *Ḥtpj*'. In front of the note we see again the -mark. Block no. 299[231] shows two notes, both without a mark. The rightmost note mentions the same day 17, but this time with the title *sḫḏ pr-ᶜꜣ*[*jw*] *Ny-ᶜnḫ-rᶜ*, translated by Andrássy as 'Untervorsteher der Palastleute'.[232] The leftmost note mentions day 18 of 3 *šmw*, but again with the name *Rᶜ-wsr*. Finally, on block no. 408,[233] we find the same day 18 of 3 *šmw*, now connected to *Ny-ᶜnḫ-rᶜ* and the -mark. How can we explain these combinations? We see the -mark once connected to *Rᶜ-wsr*, once to *Ny-ᶜnḫ-rᶜ*, and once to *Ḥtpj*; and we see different names connected to three consecutive days (day 16 *Rᶜ-wsr*; day 17 *Ny-ᶜnḫ-rᶜ* and *Ḥtpj*; day 18 *Rᶜ-wsr* and *Ny-ᶜnḫ-rᶜ*). How are the mark and personal names related to each other?

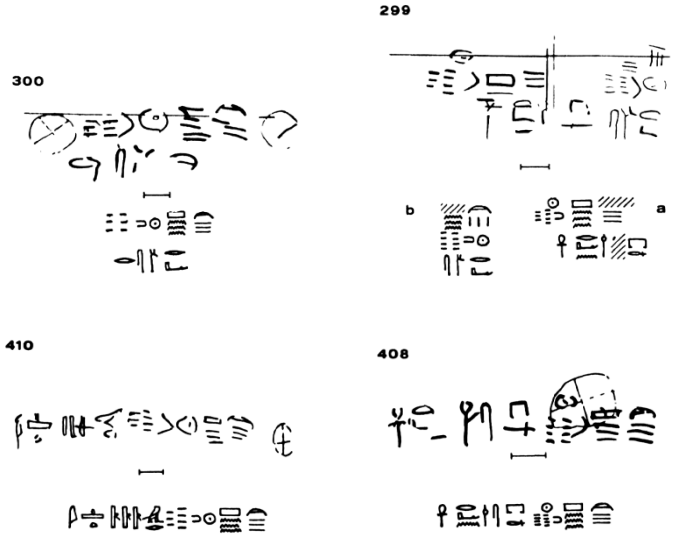

Fig. I2-8 Four blocks from the mastaba of Ptahshepses on which the mark is connected to three different names on three consecutive days. Andrássy in *Pictograms or Pseudo Script?*, 13.

Andrássy argues that the -mark connected to three different persons on three different days is unlikely to indicate changes in the supervision of the team. Such daily changes in supervision would neither be effective nor efficient. Thus, rather than indicating a system of control, she suggests that the members of the team denoted by the -mark formed a collective of individuals having been sent by at least three different officials. The names *Rᶜ-wsr*, *Ny-ᶜnḫ-rᶜ* and *Ḥtpj* then refer to the origins of the workers rather than to men who supervised the work *in situ*. The changes in names on the three different days may

[228] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 12.
[229] *Ibid*., 12-13 and Abb. 7; Verner, *Baugraffiti der Ptahschepses-mastaba*, pl. XLI (300).
[230] *Ibid*., pl. LVII (410).
[231] *Ibid*., pl. LI (299).
[232] *Ibid*., 13.
[233] *Ibid*., pl. LVI (408).

indicate a further subdivision of the workers in the ⊗-collective who were responsible for separate phases of the work: for instance, they may indicate the passing on of the work conducted by the ⊗-members sent by *Rˁ-wsr* on day 16 to the ⊗-members sent by *Ny-ˁnḫ-rˁ* and *Ḥtpj* on day 17, and subsequently to the ⊗-members sent by *Rˁ-wsr* and *Ny-ˁnḫ-rˁ* on day 18.[234] We could even speculate about shifts, for instance morning and afternoon shifts fulfilled by the teams of the ⊗-collective sent by *Rˁ-wsr*, *Ny-ˁnḫ-rˁ* and *Ḥtpj*. In such a manner, we could attempt to interpret and understand the grammar of the marks and the notes on the building blocks.

In both the examples from the mastabas of Khentika and Ptahshepses the question remains why the marks and ⊗ were used to refer to the workers sent by the officials. Neither of the marks has a phonetic relation to any of the officials' names or titles. In particular the mark ⊗ has been interpreted in many different ways, but not one is satisfactory or bears relation to the workers.[235] The two marks are both universal,[236] and it is to be assumed that they had different meanings on different sites, in different reigns, and in relation to different construction projects. Yet, a tentative suggestion might be that both are geographical indicators of the origin from where the officials dispatched the workers. In the case of in Dakhleh we have, however, no suggestions. In the case of ⊗ in the mastaba of Ptahshepses this could be *njw.t* as in the 'Residenz' or 'die Pyramidenstadt'.[237] As such, the mark would have a function similar to the topographical marks mentioned above. Again, however, topographical references are generally believed to date to later times.

In the Middle Kingdom officials' names and titles that refer to teams of workers are found more often. Such builders' inscriptions do not in all cases include single marks, but simply give written descriptions of the workers involved. Thus, fig. I2-9 shows four builders' inscriptions that record actions such as 'delivered at the ramp by the overseer of the work *Mk*' or 'removed by the foreman *Ḫtj*'.[238] It is, of course, unlikely that the officials did the work themselves.

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[234] Andrássy, Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 14.

[235] It has been called a 'control mark' by Verner (e.g. *Baugraffiti der Ptahschepses-mastaba*, 71, pl. IV (nr. 29)), or even a 'quarry mark'. The latter hypothesis was suggested by Borchardt, who believed that during the reign of every king a special sign was in use to mark the quarry from where the stone was obtained. Since he frequently encountered the sign ⊗ in the sun temple of Niuserre, he argued this was the mark for the quarry exploited by this king. However, ⊗ is already encountered on foundation blocks from the pyramid of Djoser at Saqqara, as well as on blocks from the pyramids of Meidum and Dahshur. It is moreover found in the sun temple of Sahure, in the tomb of Kaninisut in Giza, and in the temple of Pepi II. Even if it would be assumed that all these monuments derived their stone from the same '⊗-quarry', Andrássy remarks that an indication of quarry had no function and value in the records of the Old Kingdom construction projects. Written notes may mention actions such as 'bringing the stone from the quarry', as we have seen above, but the quarry itself is never mentioned. Moreover, if ⊗ was a quarry mark, one would expect it to occur on every block that derived from the quarry, and it must be the first mark applied. This, according to Andrássy, is not the case. See Borchardt, referred to by Haeny, 'Die Steinbruch- und Baumarken' in Ricke (ed.), *Userkaf* II, 33-34, and by Verner, *Baugraffiti der Ptahschepses-mastaba*, 65, 164; Andrássy, Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 23.

[236] Not only as builders' marks; we have encountered both of them as potmarks in the previous section, occurring from the Early Dynastic period through to the New Kingdom.

[237] WB II, 200.C, 6.

[238] Arnold (Felix), *The Control Notes*, 76-77 (W27-28), 71 (W13-14), 170 (AIII 1), 110 (N19).

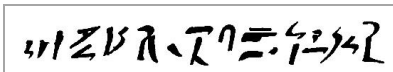
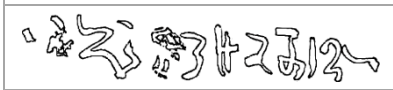
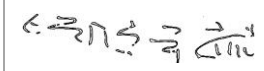
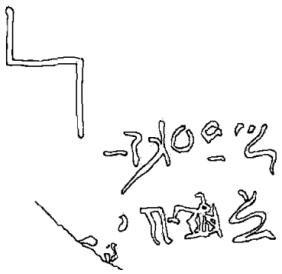
	*wᶜrtw n ṯt ḫḳꜣ Snb jn(j.w) ḥr mry.t* 'commander of the governor's troops *Snb*, brought from the embankment'
	*rdj(.w) ḥr smꜣ jmj-jr.ij Mk* 'delivered at the ramp, the overseer of the work *Mk*'
	*ḫtm.tj bj.ty jmj-rᶜ pr* <*wr*> *Nḫt* 'seal-bearer of the king, the <high> steward *Nḫt*'
	[*šdj(.w)*] *jmj-rᶜ mšᶜ.w Ḫty* 'removed, the foreman *Ḫty*'

Fig. I2-9 Middle Kingdom builders' inscriptions that refer to workmen by means of the names and titles of officials who supervised or dispatched them. Arnold (Felix), *The Control Notes*, W14, W27, N19, AIII.1.

When the builders' inscriptions that record titles and names do include team marks, the relation between the workers and the mark is not always straightforward. This we saw with and ⊗ above, but it is, of course, also the case with marks that are geometric in appearance. An inscription from the pyramid of Senwosret I mentions the foreman *Ḫtj* and includes the following team mark (fig. I2-10):[239]



////// [*ꜣbd*] *ꜣḫ.t sw* 24 /////// *jmj-r Ḫtj*
'////// [month] of the Inundation, day 24 ////// the foreman *Ḫtj'*

Fig. I2-10 Builders' inscription from the pyramid of Senwosret I recording the team of foreman *Ḫtj* as well as a team mark. Arnold (Felix), *The Control Notes*, W10.

The same combination of *Ḫtj* and the mark occurs in a similar inscription from the fourth month of the Inundation, day 10.[240] May we assume that the crew or a team of foreman *Ḫtj* was alternatively identified by this mark ? It does, however, not occur in several other inscriptions that mention work done by workers of *Ḫtj*.[241] The inclusion of the team mark, which is contemporaneous to the note, would make sense only if it somehow specifies the information in writing, for instance by informing that the work was done by a subdivision of *Ḫtj*'s crew, indicated with .

In the New Kingdom the practice of naming teams of workers after individuals of high status may have continued, although the evidence is scarce. This is to a large extent due to the fact that the study of New Kingdom builders' marks has lagged behind, and relatively few marks and inscriptions have been published. Yet, among the Thutmoside builders' inscriptions from el-Assasif titles such as *jmj-r*, 'overseer', *ḥm-nṯr snw*, 'second priest (of Amun)' and *ḥm-nṯr tpj*, 'high priest' are found.[242] The title

[239] Arnold (Felix), *The Control Notes*, 70 (W10).
[240] *Ibid*., 93 (NW10).
[241] Compare inscriptions W11-15 and NW43 in Arnold (Felix), *The Control Notes*, 70-71, 103.
[242] Budka, 'Non-Textual Marks from the Asasif' in Andrássy et al., *Non-Textual Marking Systems*, 190-191.

ḥm.w nṯr tpj, as well as another title *mr.w pr wr*, 'overseers of the treasury', is also known from ostraca from el-Assasif and Deir el-Bahri. These ostraca relate to the construction works and mention the people who contributed.[243] Other examples come from the builders' inscriptions found at the temple of Ramesses IV in West Thebes. There, a reference to 'the stonemasons of Usermaatrenakhte' is encountered. Budka suggests that Usermaatrenakht is 'probably identical with a priest of the temple of Min, Horus and Isis in Coptos of this name who led an expedition to Wadi Hammamat in year 1 [of Ramesses IV] and is attested as the son of the well-known high-priest Ramessesnakht. The latter fulfilled, according to an inscription from Wadi Hammamat, the function of overseer of all works … Usermaatrenakht might have inherited this office from his father as the oldest son'.[244] Budka notes that 'The exact kind of contribution by these officials to the royal building remains unclear', but 'they might have been responsible for workmen and material'.[245] A final example of the reference to workmen by means of the name and title of a high status person is found in the temple of Ramesses III at Medinet Habu. On the doorsills in the Second Palace of Ramesses III are found two hieratic inscriptions that read *ḥm-nṯr tpj n Jmn-Rᶜ Rᶜ-ms-sw-nḫt.w*, 'high priest of Amun, Ramsesnakht'.[246] Ramsesnakht is also attested with the titles 'chief steward in the temple of Medinet Habu' and 'overseer of works on all monuments of the estate of Amon of Karnak'. He may, then, be mentioned here in the guise of overseer. Two further inscriptions were found nearby. They both mention the date ('first month of winter, 3rd day' respectively '26th(?) day'), preceded by a mark: . Anthes interprets this mark to refer to the destination of the blocks, that is, 'temple'. This is possible, but it would not be a very specific destination referring to where the blocks would have to be positioned in the construction.[247] Alternatively, it would refer to a team of workmen responsible for the block. Similar team marks, sometimes combined with builders' notes that mention a personal name, were found on foundation blocks in the temple of Eye and Horemheb.[248]

b.3 Toponyms

In addition to names and titles that are included in the builders' inscriptions as identifiers for teams of workmen we also find topographical references. Arnold remarked that this practice of indicating workers after their hometown is unknown before the Middle Kingdom.[249] Yet, we have already seen possible cases for the Old Kingdom above, especially in the form of nome-signs. Moreover, since many of the Old Kingdom *ṯs.t*-marks are not explained, for instance and , the practice of identifying teams via topographical origin in this period cannot be ruled out.

It does, however, seem to be the case that the practice is more frequent in the Middle Kingdom, when place names also come to be included in the written notes to refer to the workers responsible for the actions recorded. In el-Lisht, for example, we encounter a short note *sw* 19 *Ḥw.t-<kɜ>-Ptḥ*, 'day 19,

[243] Budka, 'Non-Textual Marks from the Asasif' in Andrássy et al., *Non-Textual Marking Systems*, 189, 191. We will see below that they also mention the names of localities that contributed by sending workers and/or materials.
[244] Budka, 'Benchmarks, team marks and potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 73-75.
[245] Budka, 'Non-Textual Marks from the Asasif' in Andrássy et al., *Non-Textual Marking Systems*, 191. Budka also mentions the find of several 18th dynasty name stones from the valley temple of Hatshepsut as well as from the temple of Medinet Habu. These name stones mention royal names and titles, or the names and titles of high officials. They may denote the officials that contributed to the construction work. It is not clear, however, whether teams of workmen were identified on the basis of those names and titles. See *ibid*., 191-193.
[246] Anthes in Hölscher, *The Excavation of Medinet Habu* IV, 48.
[247] *Ibid*..
[248] Anthes in Hölscher, *The Excavation of Medinet Habu* II, 99.
[249] Arnold (Felix), *The Control Notes*, 20.

Memphis'[250]; or an inscription that records *ꜣbd* 3 *šmw sw* 10 *jn*(*j.w*) *m ḥtt mr wᶜr.t snw.t n<.t> Jwnw*, 'Month 3 of summer, day 10. Brought from the quarry <to?> the pyramid <by> the second district of Heliopolis'.[251] In some cases such inscriptions are accompanied by a team mark that can be connected to the toponym in the inscription. Thus, on blocks from the pyramids of Senwosret I at el-Lisht and Amenemhet II at Dahshur we find notes that refer to workers from the locality *Nmtj*. The name is written with a sign that depicts a falcon on a moon sickle, ; this sign also occurs alone as a team mark when it singly refers to workers from that place.[252] In the pyramid of Senwosret we also find a mark that resembles the sign for *sḫ.t*, , connected to an inscription that mentions (workers from) *Sḫ.t-ḏᶜw*, a locality in the 14th Lower Egyptian nome.[253] The mark elsewhere occurs alone, presumably to refer to the team from *Sḫ.t-ḏᶜw*.[254] Two further examples are the locations *Ḥw.t-kꜣ-Ptḥ* and *Mn-nfr*, which are both connected to a mark that is a combination of a *Ḥw.t-* and a pyramid-sign: . *Ḥw.t-kꜣ-Ptḥ* and *Mn-nfr* were both designations of quarters in Memphis and the mark presumably refers to workers from both quarters put together in one team, or to two teams from either quarter working together.[255] On blocks from the pyramid of Amenemhet III at Dahshur we see the mark , which as a hieroglyph bears the value *ḳjs* and occurs in the writing of the toponym *Ḳjs*. It identifies workers from *Ḳjs*, Qusiya, a place that is mentioned in one inscription from the same pyramid.[256] In the pyramid of Senwosret I we also find a mark that is not once related to a written toponym; it only occurs alone. Yet, on the basis of its appearance, an origin of the workers identified through this mark from the 16th Upper Egyptian nome could be suggested: .[257] Finally, a less direct, but still geographical connection between workers and locality is suggested for the mark in relation to a group of people denoted as *jmn.w* in several builders' inscriptions from the pyramids of Senwosret I.[258] Andrássy suggests that the mark could refer to the name of the pyramid city of Snofru, *Ḏd-Snfr.w*. *Jmn.w*-people are known from the Dahshur decree of Pepi I as a group among whom are also mentioned the *ḫnt.j.w-š*, who derived from the pyramid city of *Ḫᶜ-Snfr.w*. If the mark indeed refers to *Ḏd-Snfr.w*, this would suggest a settling area for the *jmn.w* people in the surroundings of Dahshur and Meidum.[259]

Thus, several marks from the Middle Kingdom pyramid and tomb sites at el-Lisht and Dahshur can be said to identify teams of workers by means of a mark that refers to their topographical origin:

[250] Arnold (Felix), *The Control Notes*, 62 (A4).
[251] *Ibid*., 151 (S4).
[252] *Ibid*., 23, 27. For Senwosret pp. 111 (N23, mark), 122 (N59, note); for Amenemhet II p. 161 (AII 2 mark; AII 7.2 note). Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 19.
[253] Arnold (Felix), *The Control Notes*, 25, 95 (NW16, note and mark). See also 98 (NW28c), 111 (N24.2), 115 (N33-34), 117 (N41), 120 (N50.2), 124 (N66). The locality is probably also mentioned in the pyramid of Amenemhet I at el-Lisht (61, A2-2).
[254] *Ibid*., e.g. 96 (NW17c.2).
[255] *Ibid*., 23-24, 139 (E27.2, mark; E28b-2, note; E28b-3, mark), 140 (E29b1-2, note with mark; E30.1, mark), 141 (E33.2, mark). Also in the mastaba of Senwosret I: 156 (M4.2, mark; M6, mark); and in the pyramid of Amenemhet I: 64 (A11).
[256] *Ibid*., 25, 172 (AIII 8, note). As a mark also in the pyramid of Senwosret I (153, S11.2), in the mastaba of Senwosret I (155, M1), and in the 12th dynasty temple at Kom el-Sultan (184, Ab2).
[257] Arnold (Felix), *The Control Notes*, 27, 113 (N29), perhaps also 101 (NW41b). Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 19.
[258] Arnold (Felix), *The Control Notes*, 23, 28, e.g. 113 (N27), 114 (N30).
[259] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 20.

	Nmtj		*Ḳjs*
	Sḫ.t-ḏʿw		16th Upper Egpyptian nome
	Mn-nfr with *Ḥw.t-kɜ-Ptḥ*		*Ḏd-Snfr.w*

This practice is not unknown from papyri accounts. At least two papyrus documents from the Middle Kingdom support the existence of identity marks the nature of which is a topographical reference. For instance, in the copper tool accounts of the dockyard workshop at This recorded in papyrus Reisner II, we see among usual hieratic script several marks, some of which can be interpreted as geographical abbreviations very similar to the team marks found on the Middle Kingdom constructions.[260] After study, Andrássy concluded that the place name marks in papyrus Reisner were copies of real identity marks on the copper tools themselves, which allowed 'proper allocation of a tool … after recasting in the dockyard-workshop.'[261] It is probable that, instead of the individual workmen themselves, the towns from which they came were rather the 'primary owning institutions'[262] of the tools, which would be a reason for linking user to tool by means of a geographical marker. The marks from papyrus Reisner for which an identification has been suggested are the following:

 Ḥpš.y.t, a place that occurs in the Heqanakht papers, located on the west bank south of Thebes;

 Wɜḏ.y.t, a place in the 10th Upper Egyptian nome;

 Wɜs.t, Thebes;

Ḥw.t-n-mrw, a village in the 3rd Upper Egyptian nome;

 Nb.y.t, 'Ombos' in the first Upper Egyptian nome.

The last two identifications can be checked against another Middle Kingdom document that contains a list of marks which function as abbreviations for geographic locations: the Ramesseum Onomasticon. This Late Middle Kingdom document contains a geographic section with a list of 29 place names, each followed by a sign that represents the place in abbreviated form (fig. I2-11). Both and occur as abbreviations for *Ḥw.t-n-mrw* respectively *Nb.y.t*.[263] Certainly, Andrássy is right in remarking that the correspondence does not mean that and on the copper tools were abbreviations for *Ḥw.t-n-mrw* respectively *Nb.y.t*: 'the actual meaning of one symbol was … well-defined and understandable only in the frame of a certain building project. The same symbol used in projects far away or at another time could have had a different meaning.'[264] Yet, the Onomasticon is evidence, not only for the fact that indeed a practice of using marks to refer to a locality was known, but also for the fact that such marks were frequently established on the basis of extraction of phonetic characteristics (e.g. , , ,) or on the basis of nome-signs or marks otherwise related to a characteristic of the town (e.g. , ,). This gives us sufficient reason to consider a similar nature for some of the team marks that occur in the builders' inscriptions. According to Andrássy, the fact that place name marks in the Middle Kingdom

[260] Simpson, *Papyrus Reisner* II, 44-47; Andrássy, 'Symbols in the Reisner Papyri' in Andrássy et al., *Non-Textual Marking Systems*, 113-122.
[261] *Ibid*., 120.
[262] *Ibid*., 121.
[263] Gardiner, *Ancient Egyptian Onomastica*.
[264] Andrássy, 'Symbols in the Reisner Papyri' in Andrássy et al., *Non-Textual Marking Systems*, 118.

were used in builders' inscriptions as well as in papyri documents could indeed mean that the marks were part of 'a marking system which existed besides' the written administration.[265]

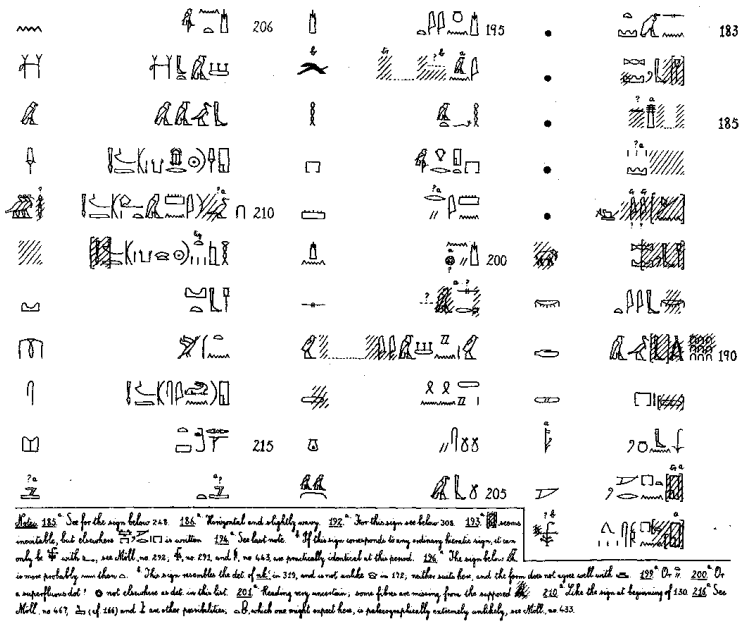


Fig. I2-11 The geographical section from the Ramesseum Onomasticon. Gardiner, *Ancient Egyptian Onomastica*, pl. II.

Yet, we cannot always link a mark to a team of workers from a specific locality. For instance, in the pyramid of Senwosret I builders' inscriptions reveal that workers from the city of Hermopolis (, *Wnw.t*), which was the capital of the 15th Upper Egyptian nome represented through the nome-sign , did not make use of the hare as their mark; rather, they seem to have used the mark , which is clearly connected to *Wnw.t* in at least two inscriptions.[266] Andrássy argues that, similar to what may have been the case with *Mn-nfr* and *Ḥw.t-kꜣ-Ptḥ*, perhaps more teams were sent from Hermopolis because that was such a large city; one mark to indicate the entire city was therefore excluded from the possibilities.[267] There are indeed connections of more than one team mark to only one toponym, which may indicate several teams from one locality.[268] In such cases, the workers recruited from the same home town may simply have been too many in number to be organized into one team.[269] Support is found in those written notes that mention work done by 'the second district of Heliopolis', or 'the third district of Heliopolis'.[270] It is strange, however, that the mark of the hare is not at all encountered as team mark in the pyramid complex of Senwosret I as published by Arnold. Either it has not been preserved or found, or the workers from Hermopolis simply preferred the mark over the hare for a reason unknown to us.

[265] Andrássy, 'Symbols in the Reisner Papyri' in Andrássy et al., *Non-Textual Marking Systems*, 121.
[266] Arnold (Felix), *The Control Notes*, 133 (E9), 156 (M5).
[267] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 20.
[268] See, for instance, Arnold (Felix), *The Control Notes*, 112 (N25), 125 (N72), 128 (N80).
[269] Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 12. Arnold notes that the other way around, i.e. several toponyms connected to one mark, is not found in the Middle Kingdom.
[270] Arnold (Felix), *The Control Notes*, 23.

The practice of identifying teams of workmen after a place name is also discerned in the New Kingdom among the builders' marks found in el-Assasif. A combination of hieroglyphic and non-hieroglyphic marks was found on the causeway built by Thutmosis III leading to his terrace temple in Deir el-Bahri. Among the former are several that have been interpreted to be abbreviations of toponyms:[271]

Ḥw.t-n-mrw, present Komir;[272]

Mn-jtj, a place between present Gebelein and Armant;[273]

Jwny.t, present Esna;

Nby.t, present Ombos;

Nḫ, Hierakonpolis(?);

Pr-ḥw.t-ḥr, present Gebelein(?). Otherwise perhaps an abbreviation for *Pr-mrw*, another name for *Ḥw.t-n-mrw*, which would, however, be represented already by means of . A third possibility is that *pr* is an abbreviation for *pr-Nfr.w-Rˁ*, a domain or royal estate (for which, see below).

The search for matches between the builders' marks and toponyms in the Asasif may find support in ostraca that were found *in situ*, which list towns that participated in the construction processes. For example, ostracon MMA Field no. 23001.39 lists among others Esna, Ageni (Asfun el-Matana) and Hefat (Moalla).[274] It also lists El-Kab, the Egyptian name for which was *Nḫb*. El-Kab may therefore be considered another possible reading for the mark above.

b.4 Institutions and estates

A last manner of reference to workers that we can discern in the builders' inscriptions is reference by means of institution, estate or domain from where the workers were sent. We may see such information included in the notes already in dynasty 5, for instance on blocks from the pyramid of Raneferef where we read *s.t pr-ḥḏ n.t*[sic] *ḥw.t-wr.t,* 'the place of the great hall's treasury'.[275] In Middle Kingdom el-Lisht, the inscriptions inform about workers from *pr ḥm.t-nsw.t*, 'the house of the king's wife', or from *rmny.t jry ˁt n<.t> jnb Snb*, 'the domain of the hall keeper of the enclosure, Seneb', or from *rmny.t jmj-rˁ ḫnwty <n> kȝp Snb.ty.fy*, 'the domain of the chaimberlain of the palace, Senebtifi'.[276] At Saqqara we read about workers from the *rmny.t Ḥrj*, 'the domain of *Ḥrj*'.[277] The inscriptions that include such notes, however, are usually not related to marks. Only in two cases do we see an inscription that records *pr-*

[271] Budka, 'Non-Textual Marks from the Asasif' in Andrássy et al. (eds.), *Non-Textual Marking Systems*, 186-189; Budka, 'Benchmarks, team marks and pot marks from the Asasif' in Haring & Kaper (eds.), Pictograms *or Pseudo Script?*, 80-81.

[272] Although Budka remarks that the distribution of this mark in el-Assasif might correspond to a more complex meaning: it appears to be particularly frequent also in combination with other marks. Budka, 'Non-Textual Marks from the Asasif' in Andrássy et al. (eds.), *Non-Textual Marking Systems*, 184-186, 188.

[273] Although Budka remarks that the sign also occurs together with other marks on one block and 'might as well be an abbreviation for something else in the context of stone delivery: an adjective ('durable) or a short note 'the remainders are …', 'valuable kind of stone', 'really delivered/landed' or the like'. *Ibid*., 188.

[274] *Ibid*., 188-189.

[275] With an indication of a subdivision; i.e. *jmj-wr.t*. Verner, *The Pyramid Complex of Raneferef*, 188-189 (no. 2).

[276] Arnold (Felix), *The Control Notes*, 26, 146-147 (C1, C2.2, C4, C7, C11), 178 (Kh8) 183 (Kh28).

[277] *Ibid*., 182 (Kh26).

nsw.t with a team mark of the kind respectively related to it.[278] However, since in both cases the inscriptions also mention a damaged, but probable place name that may be read *Ḥw.t-/////-jb*,[279] it is not certain to what the team mark pertains exactly.

That the practice of abbreviating the names of estates, institutions or domains did exist in the Middle Kingdom may again be gleaned from papyri in the Kahun archive that relate to the pyramid town of Senwosret II.[280] Among the account papyri we find a hieratic list that contains the names of the ten men of a team, each one accompanied by a mark that can be understood as an abbreviation for the institution from where he was sent. We find the following marks and institutions: for *Ḫ^{c}-Z-n-wsr.t*; for *^{c}nḫ-Z-n-wsr.t*; for *^{c}nḫ-Jmnj*, which is *^{c}nḫ-Jmn-m-ḥ$_{3}$.t*, the pyramid temple of Amenemhet III.[281]

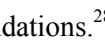
In the New Kingdom the practice of referring to workmen via institution, estate or domain is, according to Budka, present in the builders' marks from el-Assasif. Among the marks from the causeway of Thutmosis III she found examples that can be interpreted as *ḥm.t-nsw.t*. As such, they can refer to *pr ḥm.t-nsw.t*, which is attested on ostraca from Deir el-Bahri and denotes an estate of the Queen (perhaps Hatshepsut or her daughter Neferura).[282] The group , *pr Nfr.w-R^{c}*, is also attested on ostraca and at least five times among the builders' marks.[283] It is probably the name of a domain, or royal estate of, or called after Hashepsut's daughter. The group *pr* also occurs alone. It was mentioned above in relation to the toponyms *Pr-ḥw.t-ḥr* (Gebelein) and perhaps *Pr-mrw*/ *Ḥw.t-n-mrw*, but in fact the word *pr* in Egyptian language may simply denote an estate in general.[284] The group may, then, also be an abbreviation for *pr-Nfr.w-R^{c}*.

Undetermined

In addition to the Old Kingdom *^{c}pr.w-*, *z$_{3}$-* and *ṯs.t*-designations, the officials' names and titles, toponyms and institutions, estates and domains, we find among the builders' marks many examples that cannot at present be explained. Several marks of hieroglyphic nature, such as *nfr*, *mr* and *wsr*, are found quite often in different contexts and periods. They may refer to a toponym, a personal name or title or to conventional names such as 'good' or 'powerful' given to the teams. Also, *nfr* has been understood as an architectural note conveying the meaning '0 level', or 'end'.[285] Because of the multiple interpretations that are possible, the meaning and nature of a mark cannot always be pinpointed, even when it occurs in a particular context.

For the meaning and nature of other marks, none of the above suggestions seems to be a satisfying explanation. For instance, a mark that resembles the hieroglyph *snṯ* is found quite often. Its first occurrence as a team mark is found on a copper axe from dynasty 4 from Lebanon, which mentions

[278] Arnold (Felix), *The Control Notes*, 146 (C2) and 149 (C11).
[279] *Ibid*., 25.
[280] Griffith, *Hieratic papyri from Kahun and Gurob*, 39-42, pl. XIV; Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 14.
[281] *Ibid*., 14.
[282] Budka, 'Non-Textual Marks from the Asasif' in Andrássy et al. (eds.), *Non-Textual Marking Systems*, 188, note 62.
[283] Budka, 'Benchmarks, team marks and pot marks from the Asasif' in Haring & Kaper (eds.), Pictograms *or Pseudo Script?*, 80, note 88.
[284] WB I, 511-518.
[285] Haeny in Ricke, *Userkaf* II, 27-28; Verner, *The Pyramid Complex of Raneferef*, 187-188. The word *nfr.y.t* 'Ende' is, however, only attested from the late Middle Kingdom onwards: WB II, 262.

the *ꜥpr*-crew *Ḥr.w.y-nb sḫtp.w.y*, 'the two Golden Horuses are satisfied'.[286] It further mentions the *zꜣ*-division *sṯ*, and the *ṯs.t*-subdivision *snṯ*. As a team mark, *snṯ* also appears on the blocks from the pyramid of Senwosret I in el-Lisht.[287] In the New Kingdom we still see it on blocks from the Valley temple of Hatshepsut,[288] and in Amarna it has been found on blocks from the small Aton temple as well as scratched in stones used in the foundations.[289] On the basis of the meaning of the words  *snṯj*, 'gründen', 'schaffen', and *snṯ*, 'Fundament', 'Grundriss',[290] Howard Carter suggested the mark to refer to 'ground plan' with regard to its occurrence in the temple of Hatshepsut.[291] Yet, its exact meaning and nature remain undetermined.

The group of non-hieroglyphic and geometric marks also remain undetermined. Some of these marks may represent objects or beings. We find, for instance, the pentagram star as a team mark in Saqqara, Giza, Abusir and Amarna;[292] and a mark , which occurs in many variations and has been interpreted by Dobrev et al. to be a sledge (the hieroglyphic sign *tm*), is especially common in dynasties 5 and 6, in the mastaba of Ptahshepses and the pyramid of Pepi I.[293] It is uncertain whether such marks were simply choices of illiterate workmen as has been argued in the past. It seems at least clear that they were used in the same manner and context as the hieroglyphic marks that have been interpreted as crew-designations, or titular, topographical, or institutional references to teams, but their nature and exact meaning remain as yet unexplained.

To summarize, the builders' marks range from the Old into the New Kingdom and show a variety of manners in which they functioned to identify teams of workmen that were put to work on the construction sites. In the Old Kingdom, we see many designations of *ṯs.t*-teams of about ten workmen each and of their groupings in *zꜣ*-divisions and *ꜥpr.w*-crews according to the nomenclature used in the organization of boat crews as well as temple personnel, while from the end of the Old Kingdom onwards into the New Kingdom we particularly see teams indicated by means of marks that are abbreviations of names or titles, toponyms or institutions, estates or domains. As such, the builders' marks are adapted to the information in the written notes they sometimes accompany, and rather than being merely references to teams of workmen, they *specify* the identity of the workers involved in the construction in terms of their origin. How does this compare to the marks we find in the Theban necropolis?

An answer to this question may concern the forms of the marks from the Theban region, as well as their meaning and function. If we first compare forms, we see that in general many of the forms found among the builders' marks in Table I2-2 are also encountered in the Theban region. In particular, the following marks are recurrent, most of them of hieroglyphic nature: , and . As a recurrent sign repertoire, these

[286] Rowe, *A Catalogue of Egyptian Scarabs, Scaraboids, Seals and Amulets in the Palestine Archaeological Museum*, pl. XXXVI; Andrássy, 'Teammarken der Bauleute' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 8 note 16.
[287] Arnold (Felix), *The Control Notes*, 85 (W49).
[288] Carnarvon & Carter, *Five Years' Explorations at Thebes 1907-1911*, 40 fig. 11.
[289] Pendlebury, *The city of Akhenaten* III, 92-93 (fig. 17) and pls. XXXV (6), XLVII (3).
[290] WB IV, 177-178.
[291] Carnavon & Carter, *Five Years' Explorations at Thebes 1907-1911*, 41.
[292] Lauer, *Pyramide à degrees* I, 242 (fig. 239); Reisner, *A History of the Giza Necropolis* II, fig. 18; Verner, *The Pyramid complex of Raneferef*, 195 (no. 38); Roeder, *Amarna-Reliefs aus Hermopolis*, pl. 219. It is also encountered as a workman's mark in Deir el-Medina from dynasty 20 on. As a potmark, it is encountered in Abydos and Kahun.
[293] Dobrev, Verner & Vymazalová, *Old Hieratic Palaeography* I, 52.

builders' marks may in fact have been a source of inspiration for the forms of many Deir el-Medina identity marks. Although it cannot be argued that a fixed catalogue or repertoire of marks existed that was systematically used throughout the country from the late Old Kingdom onwards, the frequent recurrence of the set of mainly hieroglyphic marks may have been the reason for their selection in the Theban necropolis. Such an adoption of forms was not necessarily a conscious process; simply the fact that the forms may have been seen on monuments that were already in decay by the time of dynasty 18 may have unconsciously triggered their selection. It is, however, difficult to imagine how the process would have taken place in detail, mainly because we know so little about Deir el-Medina in dynasty 18. How did the marking system begin in the early workmen's community? Did the workmen select their own marks? Were they inspired by what they knew from the construction work in el-Assasif, and/ or had they visited or worked on other sites where they may have encountered builders' marks? Or were the marks imposed on the workmen by an administration of which we find nothing in the early community? If so, was this administration familiar with the recurrent repertoire of builders' marks and did it draw from it, applying the marks in the new construction processes that were set up in the Valley of the Kings? If we compare the corpus of 18th dynasty marks from the Theban necropolis in particular (Tables I1-2 and I1-5 in chapter 1) with the recurrent builders' marks, we see that especially the hieroglyphic marks are indeed almost all attested earlier as builders' marks: , , , , , , , , , , , , , , , , and . Even the 18th dynasty mark from Deir el-Medina, the nature of which still puzzles us, is found in several variants at el-Lisht as well as at Dahshur. If the form was a concrete representation of an object or being, its occurrence in the Theban Necropolis and at el-Lisht and Dahshur some 500 years earlier may be coincidence, but as a relatively specific geometric form one should not ignore the possibility that its occurrence at Deir el-Medina might have been influenced by its use in the Middle Kingdom.

Skipping the interlude of Amarna, which will be discussed below in section 3, we see that many of the 19th and 20th dynasty identity marks in the Theban necropolis are new introductions with respect to the 18th dynasty corpus. Several of these new introductions are of a form that is encountered in the tradition of builders' marks, for instance , , , , , , , , , and . Yet, a direct relation to the builders' marks can hardly be argued for: the corpus of marks in the Theban necropolis grew to such a large repertoire that these few similarities become insignificant in view of the amount of newly introduced marks the origin of which seems to lie in the Theban necropolis. If the builders' marks initially may have formed a source of inspiration to the graphic appearance of the Theban marking system, it seems to be the case that this marking system under influence of script and a growing number of users gradually began to lead a life of its own.

If we now compare the meaning and function of the builders' marks and the Theban identity marks, we must immediately note a sharp contrast the reader will already have picked up: the marks from Deir el-Medina were not team marks, but individual marks. Moreover, in contrast to the builders' marks, they were not used to indicate an organizational form of the workmen on the construction site; that is crews, divisions and teams involved in particular phases of construction. The individual marks from Deir el-Medina were not references to, for instance, the right- and left-side crews; nothing in the marks themselves indicates such attachment to a group. Whereas the builders' marks, as team marks, were significant not with regard to individual members but with regard to the group as a collective, the marks

from Deir el-Medina were significant in precisely the opposite way: with regard to the individual rather than the collective. This means that from the onset the *nature and usage* of the marking system from Deir el-Medina did not originate in the tradition of builders' marks.

Nevertheless, it is interesting to note that especially among the identity marks from dynasties 19 and 20 there are several that might be interpreted as references to toponyms, titles or estates. We have seen the mark which referred to *Ḥw.t-kꜣ-Ptḥ* and *Mn-nfr*. The pyramid alone is seen among the Deir el-Medina identity marks in dynasty 20 when it referred to workman *Pꜣ-Mn-nfr*: . The name of this man, possibly a nickname, suggests that he originally came from Memphis. This information seems to have been expressed through his mark, not so much, perhaps, because it was relevant information to be processed in the administration, but simply because it was characteristic information on the basis of which the link between mark and workman was quickly made. Several other marks that we encounter in Deir el-Medina, such as , , , , and , have been interpreted to refer to place names in earlier times. Although it cannot be excluded from the possibilities since we know from the accounting documents that in addition to workmen from Thebes some came from more or less distant places, such as Arman, Neferusy, Qau el-Kebir or Hermopolis,[294] we have, however, no evidence on the basis of which it can be argued that they were also topographical references in Deir el-Medina; in contrast to for *Pꜣ-Mn-nfr* there are no indications either as to who used the marks, or as to where they were from. In dynasty 20 we furthermore find various group-writings that can be read as a title or the name of an institution: , also in the form , for *ṯꜣtj*; for *jmj-r pr*(*.w.y*)-*ḥḏ*; for *ḥm-nṯr*; even for *nb tꜣ.w.y* from dynasty 18 onwards. Of course, these marks should not be interpreted as references to the names of officials or institutions from where the respective individual workmen were sent. It is highly unlikely that the vizier, the *jmj-r pr*(*.w.y*)-*ḥḏ*, or even the lord of both lands himself, sent one man each to contribute to the work. Yet, the references might indicate a relation of some sort between mark and workman. Such a relation might even have found explicit expression on ostracon Cairo 25317, which is dated to the second half of the 20th dynasty. It contains a list with at least 16 workmen's marks. Toward the end of the list we find the mark , which is probably that of a doorkeeper, followed by the mark , which could well be interpreted as a reference to a chapel of the king.[295] The doorkeeper may be referred to by means of two marks: one relating to his title (*jrj-ꜥꜣ*), and one that specified the institution (i.e. the chapel) he was related to.

The majority of marks, however, we can at present not explain on the basis of either topographical, or institutional, or titular references.

All in all, the search for an origin of the marks from the Theban necropolis in the tradition of builders' marks breaks down on the collective nature and usage of the latter in contrast to the individual nature and usage of the former.[296] Yet, the possibility that the builders' marks were at least a source of graphic inspiration for the marks from Deir el-Medina in dynasty 18 is an attractive option; as is the possibility that some of the marks from Deir el-Medina were created or selected on the basis of topographical, institutional or titular characteristics of the workmen.

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[294] Laboury, 'Tracking Ancient Egyptian Arsists' in Kóthay (ed.), *Art and Society*, 202-203. Laboury mentions that this may not have been the geographic origin of the workmen, but their administrative origin.
[295] For details: Soliman, *Of Marks and Men* (unpublished dissertation), 57-58.
[296] See also Haring, 'Popular, but unique? The early history of the royal necropolis workmen's marks', in: Dorn & Polis (eds.), *Deir el-Medina and the Theban Necropolis in Contact* (in press).

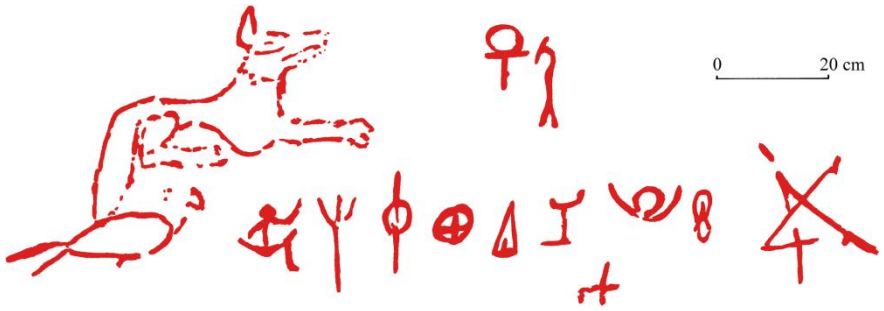
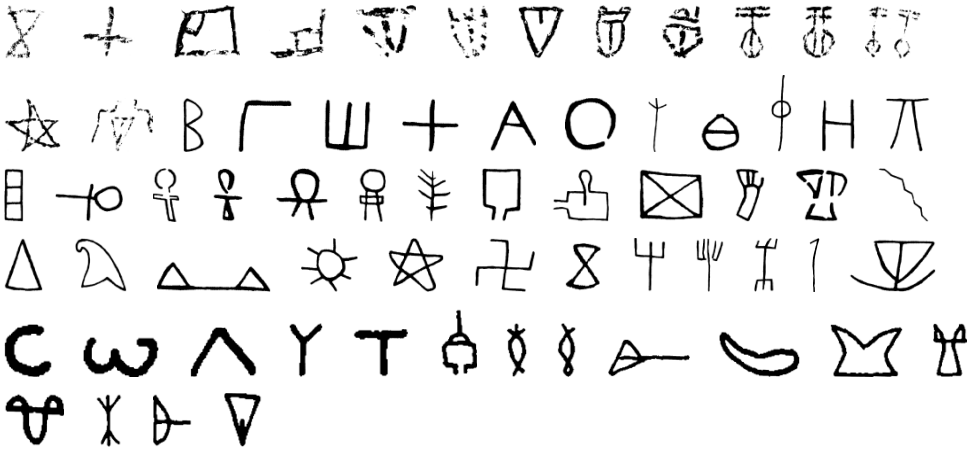
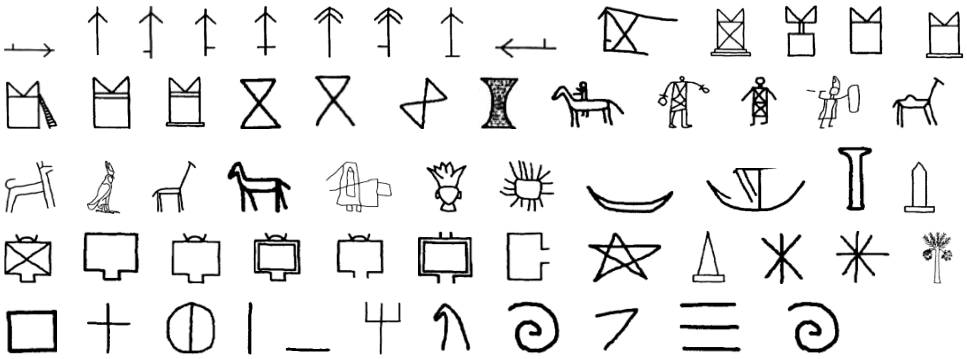
3 QUARRY AND MASONS' MARKS

It has been mentioned above that the builders' marks from the Middle Kingdom were interpreted as team marks rather than quarry marks on the basis of their connection to the notes: they do not at all mention work done inside the quarry. Yet, it must be admitted that the line between builders' and quarry marks, which may include masons' marks, may be very thin.[297] Especially with regard to large single marks on blocks from the pyramid of Raneferef Verner considers the possibility that 'they may have served for the control of either the stone quarried in different quarry sectors, or the output of different teams working in the quarry'.[298] Andrássy remarks that several examples of large hammered marks from the pyramid of Senwosret I could certainly be considered quarry or masons' marks.[299] Among them is a large horizontal *nfr*-sign. It was overwritten by a later hieratic graffito that says 'brought from the quarry <by> [workers of] the 3rd district of Heliopolis.'[300] The mark was therefore applied before it had left the quarry. Still, such marks are generally interpreted as referring to teams of unskilled laborers who transported the stones from the quarry rather than to skilled workers who carried out the more specialized work inside the quarries. According to Felix Arnold, the system that was used to administrate the work of the latter must have been different as there are no control notes recording their kind of work.[301] In fact, he argued that no actual quarry marks existed in the Middle Kingdom.

The first clear examples of quarry marks then date to the New Kingdom. We find them, for instance, in the quarry at Qurna at the northeast end of the West Bank of Thebes, the quarry that was used in the construction of the temples of Hatshepsut and Amenhotep III.[302] From later times they are known especially from the quarries at Deir el-Bersha and Gebel Silsila. Table I2-3 gives a select overview of forms.

[297] See also Haring, 'Popular, but unique? The early history of the royal necropolis workmen's marks', in: Dorn & Polis (eds.), *Deir el-Medina and the Theban Necropolis in Contact* (in press), who discusses builders' and quarry marks together.
[298] Verner, *The Pyramid Complex of Raneferef*, 200.
[299] E.g. those in Arnold (Felix), *The Control Notes*, 66 (W1), 78 (W30), 112 (N25), 128 (N80), 136 (E22), 150 (S2).
[300] *Ibid*., 66 (W1).
[301] *Ibid*., 22. One control note (p. 140, E38) mentions the *wḥɜ*, 'hewing' of the stone by the *jdw*. The note, however, reads *šdj m ḥtt wɜḥ jn jdw*, 'removed from the quarry and cut by *jdw'*, which suggests the cutting took place after the work in the quarry was done. No control note accompanies the note.
[302] Nishimoto, Yoshimura & Kondo, 'Hieratic Inscriptions from the Quarry at Qurna', *BMSAES* 1 (2002), 20.

Table I2-3: Quarry marks

New Kingdom	
Qurna[303]	
Late Period and Early Roman Period	
Daygah[304]	
Deir el-Barsha[305]	
El-Gaaphra[306]	
Gebel el-Silsila[307]	

[303] Nishimoto, Yoshimura & Kondo, 'Hieratic Inscriptions from the Quarry at Qurna', *BMSAES* 1 (2002), 26 (fig. 6).
[304] Harrell, 'Ancient Stone Quarries at the Third and Fourth Nile Cataracts', *Sudan & Nubia* 3 (1999), 26 (pl. 6). The quarry at Daygah was in use between the 8th and 2nd centuries BC. Harrell notes that the mark resembles the double crown, yet differs in important details. He states that 'It cannot be a graffito intended for others to see because it is not visible to anyone standing on the ground'.
[305] Depauw, 'Quarry Marks in Deir el-Barsha' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 99-106. The first marks are dated to Nectanebo I; all other marks are early Roman.
[306] Klemm & Klemm, *Steine und Steinbrüche*, 269-270.
[307] Nilsson, 'Quarry Marks in Partition B, Main Quarry at Gebel el-Silsila', *JSSEA* 39 (2012-2013), 168-176.

A first striking similarity is seen between the marks recorded in the quarry of Qurna and the workmen's identity marks we know from Deir el-Medina. In fact, most of the marks recorded by Nishimoto et al. are known from the 18th dynasty corpus of identity marks: , , , , , , , , , and perhaps at the lower left of the inscription. Did these marks represent masons at work in the quarry of Qurna, involved in the construction of the temples of Hatshepsut or Amenhotep III? If so, the inscription is of importance in that it may suggest that the same men worked at Qurna as well as at Deir el-Medina in the pre-Amarna period. A group of ostraca from the Valley of the Kings, which was found in the archaeological context of the tomb of Amenhotep III, in fact shows very similar marks (fig. I2-12).[308]

Fig. I2-12 Three of the ostraca that were found in the archaeological context of the tomb of Amenhotep III, from left to right: OWV 10, 05 and 04.

Three marks in the Qurna inscription are, however, not seen in the 18th dynasty corpus at Deir el-Medina. Two of them, the pentagram star and the seated men, are only attested as identity marks in dynasties 19 and 20, and the depiction of Anubis is not attested at all. We do know of a mark that depicts a jackal (I 05.017), which was used to identify *Jmn-nḫt* (xii), nicknamed *Pɜ-wnš*, but it is not securely attested before dynasty 20. It is conspicuous, however, that the depiction of Anubis in the Qurna inscription is much larger than most other marks. An explanation that comes to mind is that it perhaps indicates a team, and we would thus be dealing with 'team Anubis', the members of which were identified through personal marks. The slightly larger size of the pentagram is perhaps to be explained as resulting from a higher status or hierarchical position of this man with respect to his team members. A similar case we might see on a 20th dynasty marks ostracon, where the mark (I 05.010) of *Ḥnmw-ms* (i) is larger than the other marks; a feature that is perhaps related to his financial power (see Table I3-1, under 'remarks' with I 05.010). The size of the bird, which is slightly larger than the other marks, may perhaps also be explained as such.[309]

In the corpus of quarry marks from the Late period onwards we see several marks that we know as potmarks and builders' marks from earlier times. Especially the corpus in Deir el-Bersha, dated to the Late and Graeco-Roman periods, shows similar forms in at least six of the marks dated to the reign of Nectanebo I as well as in several of the early Roman marks, while with regard to Gebel Silsila we are already familiar with marks such as , , , , and . In general, however, the later quarry marks seem to distance themselves from the forms traditionally seen in Egypt in that they include, in

[308] For details on the archaeological context and a connection of the OWV ostraca to the quarry marks in Qurna, see also Soliman, *Of Marks and Men* (unpublished dissertation), 63.
[309] Perhaps even the positioning of the two larger marks at the far left and the far right ends of the inscription is significant in that it relates to two prominent men in the team?

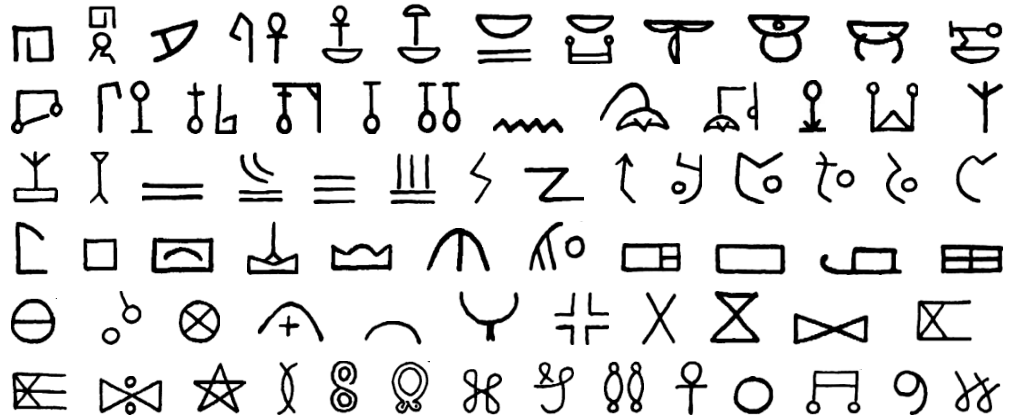
particular, many variations of the harpoon, many variations of horned altars and a large variety of anthropomorphic beings and animals not encountered in earlier times.

It is not in all cases clear whether the quarry marks referred to individual persons. With respect to Deir el-Bersha, Mark Depauw does not exclude the possibility, but a function as team marks also seems likely.[310] With respect to the quarry marks at Gebel el-Silsila, Maria Nilsson does seem to favor the option of individual marks.[311]

a. Masons' marks from Amarna?

Individual reference seems at least plausible for marks found in Amarna. They occur on talatat-blocks, which are of a size perfectly fit for one mason. In view of the suggestion that (some of) the workmen from Deir el-Medina moved to Amarna during the reign of Akhnaton,[312] it is conspicuous that these marks, as recorded by Roeder and Pendlebury, show relatively few similarities to the 18th dynasty corpus of identity marks from the Theban necropolis. The corpus is given in Table I2-4:

Table I2-4: Masons' marks from Amarna

New Kingdom	
Amarna[313]	

The differences between Amarna and Deir el-Medina that follow from a study of the marks are the following. First of all, the number of different marks recorded for Amarna is approximately 70. That is almost twice the amount of different marks we find in Deir el-Medina in dynasty 18. It is possible that some of the marks recorded by Roeder are in fact graphic variants, such as , , and ; or and ; and certainly and . Yet, even then the amount of approximately 40-45 marks in the Theban necropolis is transcended. The number of marks from Deir el-Medina that are also seen in Amarna reaches only 13 to 15: , , , , , , , , , , , , ,[314] and perhaps if it is

[310] Depauw, 'Quarry Marks in Deir el-Barsha' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 98; Depauw, 'The Semiotics of Quarry Marks' in Andrássy et al. (eds.), *Non-Textual Marking Systems*, 206.
[311] Nilsson, 'Pseudo Script in Gebel el Silsila' in Accetta et al. (eds.), *Current Research in Egyptology* XIV (2013), 123, 137-139.
[312] The similarities between the workmen's villages in Deir el-Medina and Amarna have been emphasized. See, for instance, Kemp, 'Patterns of Activity at the Workmen's Village' in Kemp (ed.) *Amarna Reports* I (1984), 1-4; Kemp, 'The Amarna Workmen's Village in Retrospect', *Journal of Egyptian Archaeology* 73 (1987), 21-50; Stevens, 'The Amarna Stone Village Survey and life on the urban periphery in New Kingdom Egypt', *Journal of Field Archaeology* 36 (2011), 100-118.
[313] Roeder, *Amarna-Reliefs aus Hermopolis*, pl. 219.
[314] Encountered in the Theban necropolis only once, on ostracon Parker H5, and uncertain because two drawings of the ostracon exist, one of which gives ⊖ while the other shows ⊕. The ostracon itself is lost.

interpreted as . Did these marks belong to workmen from Deir el-Medina? To whom, then, did the other marks belong?

Although the smaller amount of different marks in the Theban necropolis is perhaps to be explained as the result of incomplete preservation,[315] it might also be suggested that the discrepancy with Amarna is related to another dissimilarity that concerns the workmen's villages in general. Kemp stressed that even though there are striking similarities between the villages at Deir el-Medina and Amarna, and it would in fact make sense to transfer an entirely organized community of skilled laborers and artists to the new construction site at Akhetaten, there are certainly differences in the organization and functioning of the villages;[316] the village at Amarna was not a copy of the village at Deir el-Medina. Perhaps this reflects more general differences in the organization of the work at Amarna, including a different organization of workmen and a different repertoire of marks. A different organization of workmen is at least to be expected in view of the different nature of the construction works at Amarna with the use of the newly introduced talatat blocks.

A third difference between Deir el-Medina and Amarna that appears on the basis of a study of the marks is that the marks in general seem to have been less intensively used in Amarna. If the Amarna marks were the marks of individual men, and if they were influenced by the usage of marks in the Theban necropolis, perhaps even used by some of the same men, one would expect to encounter them more often, not only on blocks and in construction works, but on private objects, in tombs, on ostraca and in particular on pottery (dishes, bowls, and jars in the village as well as taken to the construction sites).[317] Very few potmarks, however, have been recorded at Amarna.[318]

It is possible that workmen from Deir el-Medina had worked in Amarna during the reign of Akhnaton, but that they simply did not bring the marking system they had used in the Theban Necropolis. We have seen before that marks could have had use only in the frame of one certain building project.[319] If so, it is not clear whether upon return they resumed this marking system from pre-Amarna times. Some pre-Amarna marks continued in dynasties 19 and 20, such as , , , , , and (cf. chapter 1 Tables I1-3 and I1-4), but most post-Amarna marks that were used in the Theban necropolis seem to have been new introductions. It might be of interest that some of these new introductions can be compared to the marks from Amarna. Thus, in Amarna we find , while in the Theban Necropolis we see entering into the system in dynasty 19; and known from Amarna is seen at least twice in dynasty 19 in the Theban Necropolis. The mark known from Amarna is quite frequently seen in the 19th dynasty Theban Necropolis (attested at least 22 times), but not in dynasty 18. The fact that we also encountered it in the Qurna inscription may be interesting. Why is the mark encountered at both Qurna and Amarna, two sites for which a relation to the workmen from Deir el-Medina could be suggested, but not in 18th dynasty Deir

[315] We may not have all the data. However, note that at least ostraca IFAO OL 6788 and ONL 6298 seem to contain a corpus of marks that was more or less complete, showing the marks that may have belonged to a crew of approximately 40-45 men; a size not unfit for a crew in dynasty 18. Haring, 'On the Nature of the Workmen's Marks' in Andrássy et al. (eds.), *Non-Textual Marking Systems*, 124-125.

[316] For instance in the location respective to the worksite, in the utilization of the surrounding grounds, as well as in the apparent absence of a system of *smd.t*-personnel in Amarna. See Kemp, 'The Amarna Workmen's Village in Retrospect', *Journal of Egyptian Archaeology* 73 (1987), 43-49; Stevens, 'The Amarna Stone Village Survey', *Journal of Field Archaeology* 36 (2011), 111-117.

[317] Cf. Aston (David), 'Theban Potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 58.

[318] Stevens, *Akhenaten's Workers* II, chapter 8.

[319] See p. 80 and note 264 above.

el-Medina itself? In addition to the pentagram star, only three other marks from the Qurna inscription are found at Amarna (, ,). Although close in time, it is unknown whether they represented the same men; as it is also uncertain whether the pentagram star in 19th and 20th dynasty Deir el-Medina is in some way related to its earlier occurrences at Qurna and Amarna. Yet, given the fact that this form of the star is encountered already both as a potmark and a builders' mark since at least the Old Kingdom we should perhaps not attach too much importance to the question whether or not the users of this mark were identical or related. It may simply have been one of the more universal marks, its frequency perhaps having inspired its selection.

b. An individualizing trend?

We could ask whether we find in the quarry and masons' marks a category of identity marks specifically used by skilled workers who by means of the personal marks conveyed their own, individual identity, and whether this can be related to the expression of individuality in other fields in the New Kingdom as well, for instance in art and personal religion. To start with the latter, 'Persönliche Frommigkeit' was, according to Assmann, a thing specific to the New Kingdom.[320] On the one hand, he says, it developed out of religious festivals in which the population could take part. He mentions the 'Talfests' already in the reigns of Thutmosis III and Amenhotep II as examples.[321] On the other hand, he mentions a 'Verschiebung des Loyalitätsverhaltens' in literature at the end of the Middle Kingdom and the Second Intermediate Period, when people started looking for protection with a 'Gott als Patron' instead of the king.[322] This led to a 'neue Form und Dimension der Konnektivität. Die Gott-Mensch-Beziehung wird hier zu einem sozialen Band'.[323] This religious phenomenon would have its roots already at the end of the Middle Kingdom, but found expression especially in the New Kingdom.[324]

Places where this personal bond between man and god can be seen are, according to Assmann, especially the Theban area, including Deir el-Medina and Medinet Habu, but Amarna, Malqata and Asyut may be added to this. In Asyut hundreds of votive stelae were found which express individualism of different kinds and at different levels, including religious, artistic, iconographic, and social individualism.[325] They date from the 18th to 21st dynasties, include a choice of gods and in several cases depict very specific personal events for which a god is thanked and honored.[326] Most clearly, however, the bond between man and god is argued for Deir el-Medina and Amarna.[327] Especially the 'fixed features

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[320] Assmann, 'Gottesbeherzigung. 'Persönliche Frömmigkeit'' in Brancoli (ed.), *L'Impero Ramesside*, 17-43; Ibid., *Theologie und Weisheit im alten Ägypten*, 96-106.
[321] Ibid., 'Gottesbeherzigung. 'Persönliche Frömmigkeit'' in Brancoli (ed.), *L'Impero Ramesside*, 21
[322] *Ibid*., 25; Ibid., *Theologie und Weisheit im alten Ägypten*, 75-79; Luiselli, 'Die >persönliche Frömmigkeit< in der Ägyptologie' in Eckert (ed.), *Hephaistos Themenband Persönliche Frömmigkeit*, 41. The role of the king was taken over by a god, who was chosen as 'persönlicher Beschützer', 'dem gegenüber man sich verpflichtet fühlte'. >(Persönliche) Frömmigkeit< war gleichbedeutend mit Loyalität gegenüber einem Gott.' (ibid.)
[323] Assmann, 'Gottesbeherzigung. 'Persönliche Frömmigkeit'' in Brancoli (ed.), *L'Impero Ramesside*, 29; Ibid., *Theologie und Weisheit im alten Ägypten*, 99-106.
[324] Luiselli, 'Die >persönliche Frömmigkeit< in der Ägyptologie' in Eckert (ed.), *Themenband Persönliche Frömmigkeit*, 41.
[325] DuQuesne, 'Individualism in Private Religion during the Egyptian New Kingdom' in Eckert (ed.), *Hephaistos Themenband Persönliche Frömmigkeit*, 51-58. The stelae are of varying quality, ranging from very finely executed to the crudely rendered, and belonged to donors from a broad social spectrum, including members of the privileged classes to the very poor.
[326] For instance *ibid*., 52 (fig. 2).
[327] Assmann, 'Gottesbeherzigung. 'Persönliche Frömmigkeit'' in Brancoli (ed.), *L'Impero Ramesside*, 21; Weiss, 'Personal Religious Practice', *JEA* 95 (2009), 193-208; Weiss, *Religious Practice at Deir el-Medina*; Stevens, 'The material evidence for domestic religion at Amarna', *JEA* 89 (2003), 144-168; Stevens, *Private Religion at Amarna*; Stevens, 'Domestic religious practice' in Wendrich et al. (eds.), *UCLA Encyclopedia of Egyptology* (http://escholarship.org/uc/item/7s07628w).

and artefacts'[328] such as domestic altars in the houses of these villages may suggest personal religious preferences and activities. Domestic altars were an invention of the New Kingdom:[329] Weiss notes that the 'custom of building stepped house altars in the domestic sphere may have been introduced at the end of the reign of Amenhotep III in Malqata.'[330] That is, they may have been inspired and modeled after the official temple altars and the earliest palace altars found in the residence of Amenhotep III at Malqata.[331] Dated to the late 18th dynasty they are found in Amarna, however, mainly in the Main and Central Cities and the Northern Suburb apparently being the 'prerogative of those of relatively high socio-economic status'.[332] Only some altars were found in the Workmen's Village. Yet, at that village were many chapels and reliefs inside the houses that attest personal activities related to the veneration of gods and the commemoration of ancestors.[333] In Medinet Habu Hölscher identified domestic altars in houses dated to the 18th and 20th dynasties as well. Those 18th dynasty alters would date shortly before the altars found in the houses of Deir el-Medina, which probably date to the 19th and 20th dynasties.[334] On the basis of the decoration on some of the altars from Deir el-Medina, Weiss concludes that they were an 'ideal space for rituals playing an important role for the well-being of all members of the household', having had a prophylactic and protective main function, but that they were not necessarily used by all households for exactly the same kind of cult practice. The decoration combined with contextual information derived from artefacts and pictorial ostraca suggests that the cult of a certain god may have been 'tailor-made to meet the demands of the individual family.'[335]

This suggests that personal piety in the Ramesside period was not mainly a reaction following the Amarna period[336] but that, possibly already rooted in the Middle Kingdom, it gradually developed in relation to the festivals from the reign of Thutmosis III onwards and the official temple and palace alters in use at least from the reign of Amenhotep III onwards. The latter may have been transferred to the domestic sphere during the Amarna period, initially mainly for the rich and wealthy, but soon spread also to the middle class. Are the altars and personal stelae expressions of the 'neue Form und Dimension der Gott-Mensch-Beziehung' of which Assmann speaks, and does this indicate a more individual attitude, a concept of individuality and self-consciousness that gained more expression from approximately the middle of the 18th dynasty onwards? And are, then, the personal identity marks expressions of a similar concept of individuality and self-consciousness? In view of personal piety it is interesting to see that one of the applications of the identity marks in Deir el-Medina had a clear religious and votive purpose: they are found on the pavement of the temple of Hathor, dating to dynasty 19.[337]

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[328] A description taken from Weiss, 'Personal Religious Practice', *JEA* 95 (2009), 195, who explains that fixed features and artefacts are more reliable as a source of information on personal religious practices than mobile artefacts, which have often been taken away or placed out of context.
[329] *Ibid*., 206.
[330] *Ibid*., 207-208.
[331] *Ibid*., 206-208.
[332] Stevens, 'The Material Evidence for Domestic Religion', *JEA* 89 (2003), 168.
[333] Stevens, 'Visibility, private religion and the urban landscape of Amarna' in Dalton et al. (eds.) *Seen & Unseen Spaces*, 77-84. Not only Aten and the royal family were worshiped. Stevens has shown that the elimination of the traditional religion by Akhenaton during the Amarna period was much less thorough than once thought. Stevens, *Private Religion at Amarna*, 290-295.
[334] Weiss, 'Personal Religious Practice', *JEA* 95 (2009), 208; Hölscher, *The Excavation of Medinet Habu* II, 69 and V 68 (fig. 54).
[335] Weiss, 'Personal Religious Practice', *JEA* 95 (2009), 206. Stevens suggests a general 'protective backdrop to household activities' as main function. Stevens, 'Domestic Religious Practices' in Wendrich et al. (eds.), *UCLA Encyclopedia of Egyptology* (2009), 7.
[336] Weiss, 'Personal Religious Practice', *JEA* 95 (2009), 207.
[337] A religious or votive purpose for identity marks is also seen in marking systems from other times and places. This is discussed in Part III, chapter 1, section 3, where we also comment upon the marks on the pavement of the Hathor temple in Deir el-Medina.

The expression of individuality has also been proposed to have taken place in the field of art, especially among the artists who worked in the Theban Necropolis during dynasties 18 to 20.[338] Laboury argued that there are indications in the style, composition and sign-inventory used in paintings in private as well as royal tombs that 'traduit assurément une volonté de reconnaissance individuelle de la part de l'artiste'.[339] On the basis of signed drawings and texts on ostraca he was able to define the personal styles of Nebnefer and Hormin (sons of the *chef des peintres* Hori) as well as of the well-known Amenhotep son of Amennakht. Their stylistic characteristics were recognized in several tombs throughout the Necropolis.[340] Especially for Amenhotep it became clear that 'il révèle parfaitement la présence d'un style formel à côté d'un façon de faire plus libre, mais aussi une évolution manifeste du style personnel du chef des peintres de Deir el-Médina au cours de sa carrière'.[341] According to Laboury, the conventional, formal styles that were generally followed in Egyptian art certainly left 'une certain marge de créativité et – de ce fait – d'expression de leur individualité', which makes it possible to follow artists throughout the Theban Necropolis. This would not only be possible for dynasty 20, but already for dynasty 18, as a detailed study of the scenes in the tomb of the vizier Amenemopet from the reign of Amenhotep II led to the identification of certain stylistic characteristics that were also found in the neighbouring tomb which was decorated only a few years earlier.[342]

We can and must not, however, deny that individuality was expressed in earlier times. In addition to the examples from the New Kingdom Theban necropolis, Laboury gives examples of the recognition of individual hands of artists already in earlier periods, from the Old Kingdom onwards.[343] In statuary and relief work from individual features of the ones depicted seep through.[344] Autobiographical texts in private tombs from the same period onwards are filled with formulas such as 'I was the one who built this monument' or, in the case of artists, 'I am the one who decorated the tomb of the count Kheni and moreover, I am the one who decorated this tomb, being alone'.[345] Outlines of human hands and feet have marked individual presence at religiously relevant sites since the Old Kingdom,[346] and a handful of marks encountered on the walls of watchtowers in Dakhleh Oasis carved next to or inside the outline of a foot or a human figure have been interpreted as identity marks for the soldiers who spent time in the towers being on watch.[347] As such, it is not our intention to speak of a 'rise of individualism' originating in the New

[338] Laboury, 'De l'Individualité de l'Artiste dans l'Art Égyptien' in Andreu-Lanoë (ed.), *L'Art du Contour*, 36-41; referring to the work by Mékhitarian.
[339] Laboury, 'De l'Individualité de l'Artiste dans l'Art Égyptien' in Andreu-Lanoë (ed.), *L'Art du Contour*, 36.
[340] *Ibid*., 38, referring also to the work by Cathleen Keller in note 9.
[341] *Ibid*., 38.
[342] *Ibid*., 41; Laboury & Tavier, 'À la recherché des peintres de la nécropole thébaine sous la 18e dynastie' in Warmenbol & Angenot, *Thèbes aux 101 portes*, 91-104.
[343] Laboury, 'De l'Individualité de l'Artiste dans l'Art Égyptien' in Andreu-Lanoë (ed.), *L'Art du Contour*, 36-39.
[344] Russmann (ed.), *Eternal Egypt*, 32-39.
[345] Quoted from Laboury, 'Tracking Ancient Egyptian Artists' in Kóthay (ed.), *Art and Society*, 201. For individuality expressed in the arts in dynasty 4 and later, see also Laboury, 'De L'Individualité de l'Artiste dans l'Art Égyptien' in Andreu-Lanoë (Ed.), *L'Art du Contour*, 36.
[346] Kaper, 'Soldiers' Identity Marks' in Haring & Kaper (eds.), Pictograms or Pseudo Script?, 171 with note 17; Kaper & Willems, 'Policing the Desert' in Friedman (ed.), *Egypt and Nuba*, 85.
[347] Kaper, 'Soldiers' Identity Marks' in Haring & Kaper (eds.), Pictograms or Pseudo Script?, 172-174. Especially the example of the sign *ꜥnḫ* is mentioned, once incised near a large rectangle filled with diagonal intersecting lines, the meaning of which is unknown, and once incised in the same hut next to a large human figure depicting a soldier. It is argued by Kaper and Willems that this is a personal identity mark. The mark perhaps relates to the name of the figure depicted, although it has been argued that 'There is no evidence that this group was literate, in accordance with what is to be expected' (*ibid*., 174 with note 28). It may also have had a more general meaning, expressing for instance a wish for life, or in relation to the builders' marks from Dakhleh Oasis possibly refer to an organization unit of soldiers.

Kingdom; only of perhaps a more elaborate trend or encouragement[348] to express it personally, or at least a more widespread use of it in administrative context.

Are the display and mention of personal styles and choices, that is of personal identity in addition to collective identity in tomb art between dynasties 18 and 20, in the phraseology in literature at the end of the Middle Kingdom, in the phraseology and iconography on stelae from dynasties 18 to 21, and in the practice of personal religion in private context on domestic altars from at least the Amarna period onwards cases that are related to a growing self-conscious, a trend concerned with the individual to which we can also relate the use of personal identity marks at Qurna, Deir el-Medina and Amarna? At present, this question cannot be answered and we must remain skeptical. Unfortunately, although the idea has been suggested especially with regard to personal piety, it has not yet been researched well. As a result it is not clear what such a personal trend would entail precisely and how and when it would have begun to develop. Thus, there are indirect and speculative hints at individuality in domestic and private religion as well as in art throughout Egyptian dynastic history; yet, literary and archaeological sources only really become prominent and expressive in the New Kingdom. Does this indicate a more prominent domestic and personal religious landscape in the New Kingdom, or are sources from earlier times simply denuded?[349]

It is at least clear that the intensive and elaborate systematic and administrative use of personal identity marks that were developed for, and relate specifically to certain individuals has no match before dynasty 18; it was unprecedented. The hypothesis remains whether this was a self-contained development or rather part of a more encompassing trend in society.

[348] Weiss, 'Personal Religious Practice', *JEA* 95 (2009), 208.
[349] Stevens, 'Domestic Religious Practices' in Wendrich et al. (eds.), *UCLA Encyclopedia of Egyptology* (2009), 3.

4 CONCLUSIVE REMARKS

In concluding this chapter on the origin of the marks from Deir el-Medina, we can argue that the *idea* of using marks as abbreviations or symbols, as well as a core group of especially hieroglyphic forms, were not new at the time of dynasty 18. Especially the builders' marks may have formed a source of inspiration. We do not know the details about the initiation of the marking system at Deir el-Medina: did the workmen themselves introduce the use of marks, or was it imposed by the administration that sent them to the village? However, in the former case, it could be argued that the earliest workmen in Deir el-Medina may themselves have been familiar with the tradition of using marks in construction projects, having seen them on monuments in decay or even having worked with them in other projects in the Asasif. In the latter case, it could be argued that the administration may have followed the tradition that made use of marks as a part of the account keeping system on construction sites; that is, if there was such an administration. In the light of the traditional relation between builders' marks and account keeping records it is unfortunate that we have no administration from Deir el-Medina to which we can relate the earliest identity marks.

It at least appears to be the case that the majority of the 18th dynasty identity marks is comparable in form to the marks traditionally encountered on building sites. In later times the Deir el-Medina marking system seems to have begun to lead a life of its own, possibly caused by the intermezzo of the Amarna-period, but plausibly caused by a growing community and the influence of script as we have seen in chapter 1: more workmen's marks were needed, the majority of which were increasingly created on the basis of hieroglyphic or hieratic signs. They even formed combinations that can be read as abbreviated words or phrases. We can interpret some of them as references to toponyms, institutions or titles to which the workmen in question may have had a relation of some sort, but in many cases such references remain purely speculative. Many of the new forms of workmen's marks that were introduced in dynasties 19 and 20 are seen neither in the potmark tradition, nor in the builders' mark tradition, nor in contemporary mark corpora from the New Kingdom or later. Rather, they seem to have had their origin in the Theban necropolis, having been developed purely within the frame of the marking system in Deir el-Medina.

The *nature and the usage* of the Deir el-Medina identity marks did not find their origin in the Old and Middle Kingdom traditions. The more personal nature and the intensive individual usage of the marks, not only on the marks ostraca, but also to a large extent in private and funerary contexts on pottery and objects to indicate ownership or other forms of personal attachment (affiliation, or a votive as seen in the marks on the pavement of the Hathor temple) is entirely new, first seen in the marks from Qurna, Deir el-Medina, and a little later Amarna. Do they reflect a growing trend of expressing personal identity, seen in the practice of religion and in art, and now perhaps in the world of construction and masonry as well?

3

PALAEOGRAPHICAL TABLES

Tables I3-1 and I3-2 are provided separately in order for them to be consulted easily while reading the text. Table I3-1 contains metadata. It lists each class of marks with font-type and code, and provides it with the following data:

- the identity or identities of the workman or workmen who used the mark (if known);[1]
- a short description of the form. This description includes any reference to characters from script and the degree of cursiveness for the marks from group I, and a coded description of the compositional lines for the marks from group II. This coded description is mainly meant to facilitate the search for a specific mark. It makes use of the following abbreviations that describe a mark from left to right and top to bottom:

  h horizontal line
  v vertical line
  d diagonal line
  b bent line
  c circle

  The form of the mark , for instance, is coded h1d2h1; is coded v1h1v2; and is coded b1d2v1. The second code is purely meant as a tool to search for a mark from group II in the database *Symbolizing Identity*[2];
- the number of specimens in total, per period and, if applicable, per graphic variant;
- the methods that were used to execute the specimens (painted in black, red or yellow, incised, charcoal, embroidered, unknown);
- remarks that include a palaeographic description of forms and their development and further discussion on dating and possible identities.

The following abbreviations are used:

- With regard to the different nature of surfaces and objects on which specimens occur:

O	Ostraca	T:	Tool
P:	Pottery	Do:	Domestic object
G:	Graffiti	Ns:	Name stone

[1] Identifications have been established in personal communication with Daniel Soliman. For details on the identifications, for as far as they are not included in Table I3-1, see Soliman, *Of Marks and Men* (unpublished dissertation).
[2] But see also Part II, chapter 2, section 3, pp. 200-202.

- With regard to the specimens that are painted:

b:	black	br:	black over red	y:	yellow
r:	red	rb:	red over black	?:	uncertain

Table I3-2 contains facsimiles of all the specimens, classified under their code and font-type and presented in chronological groups. The facsimiles were made digitally on the basis of photographs. Photographs, however, can be deceitful, as depending on light and angle forms may appear different than they look on the ostraca themselves. Therefore, in the process of making the facsimiles, we made use of complementary drawings and notes in order to interpret the forms on the photographs correctly and to present facsimiles that are as objective as possible. Fortunately, we were able to study the majority of ostraca ourselves: during visits to the *l'Institut Français d'Archéologie Orientale* (IFAO) in Cairo, the Petrie Museum in London, and the Rijksmuseum van Oudheden in Leiden we were given the opportunity to make detailed notes, drawings and high quality photographs for study.[3] Moreover, we obtained facsimiles and photographs of the marks' ostraca from the Museo Egizio in Turin. There remain cases, however, where only a handmade drawing or facsimile, and no photograph or possibility to study the objects themselves were available to us. For instance, we only have drawings and a note by Černý on two ostraca that are now lost, Parker H5 and H7; and we only have a facsimile of Cairo CG 25651, and of the reverse of Turin CG 57140; and we only have drawings of Bruyère Rap. 48-51, pl. XVIII nrs. 07, 12, 24 and 24. That such documents can only be used with caution appears, for example, from a comparison between Bruyère's drawing of IFAO ONL 6324 and the photograph taken on March 20, 2014 (fig. I3-1):

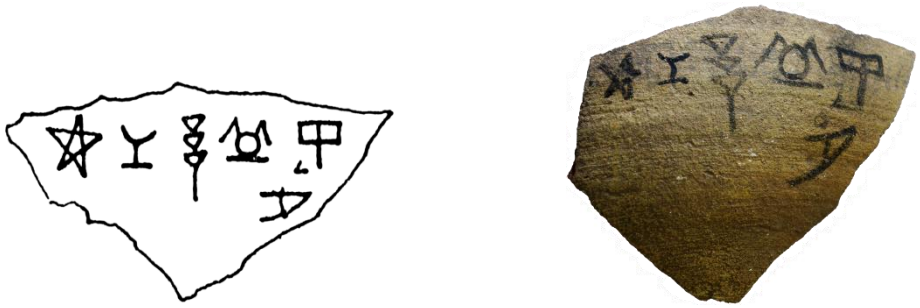

Fig. I3-1 O.IFAO ONL 6324. Left the drawing made by Bruyère. Right the photograph taken on March 20, 2014 in the IFAO, Cairo. Photograph by the author.

Bruyère missed the sun that accompanies the mark 𓇋. Reinterpretations or suggestions for reinterpretations of drawings and facsimiles are mentioned in Table I3-1.

The facsimiles of the marks in Table I3-2 were made on the basis of the photographs by extracting the forms from their context and background. For the process of extraction we used Photoshop CS6. After selecting the form to be given treatment we used the Channel Mixer to create a large contrast between the form and the background. Subsequently, we used the option Levels to even further contrast the form from its background. As a result the form of the specimen was as dark as possible against a background that was as light as possible. The remaining background could now be deleted by means

[3] We are most grateful to Pierre Grandet and Nadine Cherpion of the IFAO, to Stephen Quirke of the Petrie Museum and to Maarten Raven of the RMO, who gave us permission to conduct detailed study of the ostraca.

of the Eraser Tool or simply by means of the actions select and delete. The facsimiles were saved as TIFF files with lossless data compression so as to prevent noise creeping into pictures saved as jpg.

This method results in facsimiles that are all in grayscale, which may be considered a disadvantage with respect to the use of black, red and even yellow ink. However, because of the fact that the palaeography was going to be printed in black and white, and because we only have black and white photographs of some of the ostraca in the corpus, it was decided to consistently work in grayscale and indicate the color of the ink in Table I3-2 by means of '(r)', '(br)', '(rb)', '(y)' or '(?)', respectively for 'red', 'black over red', 'red over black', 'yellow' and 'unknown'. If no such indication is given the specimen was made in black ink.

Unfortunately, we were not able at this point to represent each specimen to scale. Many photographs we were able to collect (e.g. of the Ashmolean, Berlin and BM corpora) were made without a scale, and even though approximate dimensions of most ostraca are known, the amount of work it would have taken to calculate the dimensions per specimen would not compensate for the results obtained from the information. Thus, no absolute dimensions of the specimens are given. However, as described above in chapter 1, it is precisely the relative dimensions that are most interesting as they reveal a development from large and variously sized specimens in dynasty 18 to specimens all of similar size comparable to signs of writing in the later periods. All specimens, in their original color and relative dimensions as they occur on the photographs that were available to us can be checked in the database.[4]

In the following cases it was considered better to not make a facsimile in Photoshop, but to include the original photograph in Table I3-2:

- when the paint was faded completely, or to such an extent that we were forced to guess a specimen's form. The element of subjectivity became too high in examples such as , or .[5] In some cases nothing of the form remains and we were only able to interpret and classify it on the basis of sequence. Such examples have been left untreated;
- when treatment in Photoshop would in fact make the form of a specimen less clear than the original photograph. This is the case in some faded painted specimens, but also in examples where the specimens are incised. Examples of painted specimens that are fairly clear in photograph, but which became less clear when given treatment are and .[6] Similar examples of incised specimens are and .[7]

A final word should be added about the selection and method of creating the font that is used in both the Tables, as well as in the text throughout this dissertation. Instead of simply drawing the font-types

[4] Available to those who have received a guest account.
[5] Hardly recognizable, but on the basis of sequence to be identified as, respectively, I 04.010 on IFAO ONL 6303, I 04.036 on BTdK 541 and I 04.036 on IFAO ONL 6449
[6] Respectively I 04.028 on IFAO ONL 6439 and I 13.008 on IFAO ONL 6472.
[7] Respectively I 04.028 and I 04.036 on IFAO ONL 6240.

by hand or use hieroglyphic signs, it was decided to base the font-types on existing specimens with a form that appeared representative for the whole class (the prototypical 'best member' specimens). However, in some cases the most representative specimens of a class could not serve as reliable sources, because they were damaged or faded, or because we only have facsimiles that we were not able to check against the originals. The degree of preservation and accessibility were thus criteria that were reckoned with in selecting the specimens to be used as the basis for the font-types.

To create the font-types, the selected specimens were given the same treatment in Photoshop as described above, but subsequent treatment followed in Adobe Illustrator CS6. The TIFF files of the selected specimens were turned into vector images by tracing them through the option 'Image Trace'. The vector traces are incorporated in the Tables as pictures, but they were also sent to Hans van den Berg who turned them into a font that could be used in Word.[8]

The Tables are given as appendices.

[8] I am grateful to Hans van den Berg for providing us with the technical support. Also, the work carried out by Rikst Ponjee was indispensible. A remark that is unrelated to the good work done by Hans and Rikst, but does concern the font is the following. The font was created at the end of 2014, but at the moment that this dissertation and the palaeography were finalized, there were still changes taking place in the classification of the marks: some marks were reinterpreted and in a few cases classes were added (e.g. I 06.055; I 19.022). At present, the font does not yet contain characters for such new classes.

PART II

SEMIOTIC & COGNITIVE ANALYSIS

THE MEANING OF THE MARKS

WHEN WE ASK how the marks convey meaning we find ourselves in the field of semiotics. Semiotics is, in short, the study of signs and sign systems. The term semiology is sometimes found to denote the same, although it may be used specifically in affinity with a French tradition whilst semiotics may relate particularly to an American tradition.[1] The study of semiotics goes back at least to Plato and Aristotle, but it tends to be closed off to non-initiates mainly due to the use of a jargon that seems to 'keep out those who are not already 'members of the club''.[2] Therefore, we begin Part II with an introduction to semiotics that explains the issues it has traditionally focused on and the reasons to use its theories and models (chapter 1). We continue with a detailed discussion of selected leading theories and models on the functional structure and signification of signs in systems of visual communication, highlighting aspects on the generation and conveyance of meaning and reflecting upon them with regard to the marks from Deir el-Medina (chapter 2). In the final chapter we turn to cognitive science, which complements and supports the study of semiotics with neurological theories and psycholinguistic models on human communicative behavior, specifically the production and interpretation of communication in the human brain. The ultimate aim of the semiotic and cognitive analysis is to suggest a model in which we can accommodate the marks that explains and visualizes how they, as a system of visual communication other than linguistic writing, can be decoded and interpreted in the context of the life and work in Deir el-Medina and the Valley of the Kings.

[1] These French and American traditions will be discussed in detail in chapter 2. In the present dissertation I choose to use the more generally accepted term semiotics, except where it concerns specific French models and theories, such as in chapter 2, sections 1a-c.
[2] Chandler, *Semiotics*, xiii.

1

INTRODUCTION TO SEMIOTICS: WHAT AND WHY?

1 DEFINITIONS

There is little consensus as to what semiotics precisely entails and what are the scope, basic principles and concepts of its research. Semiotics involves no widely agreed theoretical assumptions, models or methodological tools. It is neither a science nor an academic discipline. Rather, semiotics has spread in as many directions as there are academic disciplines. It is a vast field of study ranging from 'a(nthropology) to z(oology)',[3] involving especially linguistics, philosophy, psychology, sociology, biology, mathematics, musicology, architectural, literary and media studies, each discipline adding its own theoretical stances and methodological tools.[4] While many semioticians have sought to establish coherence, their divergent schools and currents only highlight the lack of a firm theoretical foundation.[5] In the words of the philosopher and semiotician Pelc, the term 'semiotics is polysemic and … depending on which meaning we have in mind, every differently conceived semiotics has something else for its theoretical basis.'[6]

Accordingly, definitions of semiotics are divergent, some being more inclusive than others. Because of a traditional close relationship with linguistics, some have highlighted especially the role and function of marks in human communicative behavior, where signs are first of all interpreted as linguistic signs, but in extension also signs of other forms of visual communication. The semiological linguist De Saussure, for example, conceived of semiology as a study of the role and nature of signs as part of social life, and of the structural laws they obey in generating social communication. Signs for him were 'manifestations of human language', especially spoken language. Although he acknowledged that other forms of human expression, among which 'writing, the deaf-and-dumb alphabet, symbolic rites, forms of politeness, military signals', were semiological phenomena as well, he did not direct himself to their detailed study.[7] The structuralist linguist Jakobson also focused on linguistic semiotics and on the verbal sign, although he considered it within a somewhat broader frame, defining semiotics as dealing *'with those general principles which underlie the structure of all signs whatever and with the character of their utilization within the message, as well as with the specifics of the various sign systems and of the diverse messages using those different kinds of signs.' 'The subject matter of semiotic[s] is the communication of any messages whatever, whereas the field of linguistics is confined to the communication of verbal messages'*.[8] Other semioticians shifted the

[3] Nöth, *Handbook of Semiotics*, 4.
[4] The status of semiotics is a topic of debate. Assessments run from 'activity', 'movement', 'area of interest' and 'project' to 'field', 'approach', 'method', 'discipline', 'doctrine', 'meta-discipline', 'theory', and 'science'. Several of these terms we rule out because of divergence in, and thus plurality of, theor*ies*, method*s*, disciplines, movement*s* and approach*es*. Because of the lack of consensus and the characteristic of semiotics as being open to multiple disciplines, we have decided to refer to it as a 'field' of research or study throughout this dissertation. This is in accordance with Eco, *A Theory of Semiotics*, 8-9. See also Nöth, *Handbook of Semiotics*, ix, 4; Chandler, *Semiotics*, 4.
[5] *Ibid*., xiv, 4.
[6] Pelc, 'Theoretical foundations of semiotics', *American Journal of Semiotics* 1 (1981), 15.
[7] De Saussure, *Course in General Linguistics*, 6, 15-17. De Saussure's theory is discussed in detail in chapter 2, section 1a.
[8] Jakobson, 'Towards a Linguistic Classification of Aphasic Impairments' in Jakobson, *Selected Writings* II, 289; Jakobson, 'Language in Relation to Other Communication Systems' in *ibid*., 698.

realm of semiotics from merely human systems to include animal communication as well. According to the philosopher Morris semiotics *'has for its goal a general theory of signs in all their forms and manifestations, whether in animals or men, whether normal or pathological, whether linguistic or nonlinguistic, whether personal or social. Semiotics is thus an interdisciplinary enterprise.'*[9] The semiotician Sebeok likewise included sign processing by all organisms, arguing that semiotics has *'as its subject matter all systems of signs irrespective of their substance and without regard to the species of the emitter or receiver involved.'*[10] He advocated extension of semiotics to include the disciplines of biology and zoology (bio- or zoosemiotics), collecting all human and animal communication under the term 'global' or 'universal semiotics'.[11] Still other semioticians went even further by proposing a definition of semiotics in accordance with a pansemiotic view of the universe. The American philosopher and logician Peirce argued that a sign is *'something which stands to somebody for something in some respect or capacity'* and that '*the entire universe is perfused with signs, if it is not composed exclusively of signs'.*[12] With this definition of the sign Peirce followed an ancient tradition, that is the Greek formula of *aliquid pro aliquo*, 'something stands for something else'.[13] Everything around us (words, images, sounds, odors, flavors, actions, objects, natural phenomena, and so forth) can be a sign as long as someone interprets it as signifying something. One of the broadest interpretations of semiotics that follows Peirce in the notion of a potential omnipresence of signs is outlined by Eco: semiotics is *'concerned with the entire universe ... with everything that can be taken as a sign. A sign is everything which can be taken as significantly substituting for something else.*[14]

But no matter how broad or narrow the implications of the definitions are, every semiotic exercise is generally considered to contain:

- a theory of the sign, addressing the questions 'What is a sign?' and 'What are the components it is constituted of?';
- a theory of signification, addressing the questions 'How do the sign-components interact to convey meaning?' and 'What are the possible sign-functions, or manners in which signs generate and convey meaning?';
- and a theory of communication, addressing the questions 'What are the processes that exploit the potential sign-functions?' or 'What is the code within which signs function as communication system and according to which they combine into meaningful messages?'

In other words, semiotics is generally understood as a search for the nature and function of signs as individual entities and as elements being part of a system. It studies the signification underlying the sign and the code underlying the system.[15] As regards the code, Eco points to the role of culture which creates cultural codes that in turn create 'a cultural order which is the way in which a society thinks and speaks'. That brings semiotics into the field of culture and cognitive studies.

A final, essential question that semiotics should address is the question of meaning: 'What sorts of meanings can signs and sign systems produce?'. A famous dichotomy of meaning was

[9] Morris, *Signification and Significance*, 1.
[10] Sebeok & Umiker-Sebeok (eds.), *Speech Surrogates: Drum and Whistle Systems*, 64. See also Nöth, *Handbook of Semiotics*, 37.
[11] Sebeok, *Global Semiotics*.
[12] Buchler, *The philosophy of Peirce*, 99 (Peirce §5.448); Nöth, *Handbook of Semiotics*, 41.
[13] *Ibid*., 84-88.
[14] Eco, *A Theory of Semiotics*, 3, 7.
[15] *Ibid*.: Semiotic theory 'should be able to explain every case of sign function in terms of underlying systems of elements mutually correlated by one or more codes'.

proposed by the literary theorist Barthes, that is denotation versus connotation, but more nuanced perspectives on meaning may be better in line with the nature of signs and sign-functions, as we shall advocate in chapter 2.[16]

2 TRADITIONAL TOPICS

This brief outline of how semiotics is understood and which questions it should address relates primarily to a relatively recent interest, that is semiotics as a systematic study from the beginning of the 20th century up to the present day, of which particularly De Saussure and Peirce are seen as the founding fathers. However, questions of semiotic nature go back much earlier. Discussions relating to the nature of the verbal sign are first found in the works of Plato and Aristotle. They addressed the question to what extent names are signs that are correct in that their form represents the true nature of the things or objects they stand for. The relations between the form of a sign, the idea it signifies, and the thing or object to which it refers remains a core topic of semiotics today.[17] The crucial point in Plato's *Cratylus* was the question whether expression could be distinguished from idea. Plato presents two stances:[18]

- personified by Hermogenes there was the doctrine that signs are conventional. Expressions are invented and may be applied to things and their notion at pleasure. Language is artificial; convention and agreement are the principles of correctness in signs;
- personified by Cratylus there was the doctrine that signs are the perfect expressions and notions of things. Language is not agreed upon, but is naturally given.

Plato's own view was that verbal signs, whether natural or conventional, are only incomplete representations of the true nature of things, since the realm of ideas exists independently of its representation in the form of words. Knowledge mediated by verbal signs is therefore indirect and inferior to immediate knowledge; and truth about things through verbal signs, even if they are excellent likenesses, is inferior to knowing the truth itself.[19] This view led to a current of realism as opposed to nominalism in the middle ages with regard to the problem of universals; that is, the question whether properties or qualities that two or more entities have in common exist independently of particular objects. For instance, in addition to individual persons, does *humanity* with the property of being human, or *femininity* or *masculinity* with the property of being female respectively male, have independent existence? Where realism assumed the existence of individuals as well as of their shared properties as universals, nominalism argued that universals are only conventional names that refer to nothing; they have no existent referent, merely their individual objects have true existence.[20]

The idea that names have no existence in that they are purely conventional was expressed by Aristotle in *Peri Hermeneias* (*On Interpretation*). In the opening words he provides a definition of the linguistic sign that contains the roots for a theory of signs:[21]

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[16] Sections 1c-d and section 2.
[17] See the dyadic and triadic traditions discussed in chapter 2: sections 1a-d respectively section 2.
[18] Plato, *Cratylus*. Translated by Jowett: http://classics.mit.edu/Plato/cratylus.html. See also King, *Semantics and Mental Representation in Aristotle's Peri Hermeneias*, 1-41.
[19] *Ibid*.; Nöth, *Handbook of Semiotics*, 15.
[20] *Ibid*., 17-18.
[21] Aristotle, *On Interpretation*, sections 1-2. Translated by Edghill: http://ebooks.adelaide.edu.au/a/aristotle/interpretation/.

> *'Spoken words are the symbols of mental experience and written words are the symbols of spoken words. Just as all men have not the same writing, so all men have not the same speech sounds, but the mental experiences, which these directly symbolize, are the same for all, as also are those things of which our experiences are the images. … By a noun we mean a sound significant by convention … . The limitation 'by convention' was introduced because nothing is by nature a noun or name – it is only so when it becomes a symbol*.'

Some followers recognized in these words at least three sign-components: 1) spoken sounds and their written marks, 2) mental images, and 3) the actual things. They founded a theory on the idea that a sign consists of an expressive form (1) that denotes a referent (3) which evokes an idea or notion in the minds of men (2).[22] However, other followers focused more on the realist idea that signs have independent existence of the actual things and objects they refer to. They therefore only recognized the first two elements as form and mental image, or expression and content of a sign, arguing that differences between signs and sign systems only find expression in these two elements, because the actual things and objects remain the same for all.[23]

After Plato and Aristotle, Stoic logic upheld a tradition of a tripartite sign which consisted of a *sēmaínon* (expressive form), an object or referent it referred to and a sense (*lektón*) made of the sign. Especially the *lektón* was concerned with meaning, and this was intentional meaning. By observing the *sēmaínon* and through mediation of the referent one could infer this intentional meaning by a process of logical induction.[24] The Epicureans rejected the intentional meaning, and therewith the complete element of the Stoic *lektón*. They pursued a model of a dualistic sign in which logic induction of intentional meaning was exchanged for a more natural and self-evident process of signification between form and sense impression of a sign. They therewith also rejected the idea of a purely conventional nature of signs. Rather, they were especially open to what Peirce later denoted as 'indexical relations': form and sense impression were linked by a direct connection found in nature. Consequently, their theory was not only open to human linguistic signs, but also especially to animal and gestural signs.[25]

The currents of realism and nominalism to which the discussions from antiquity gave rise, and their questionings on whether the thing or object referred to was or was not a sign-component in addition to form and mental image or sense, and whether the relation between the components of these dyadic or triadic signs was conventional or naturally based, remained core topics during the middle ages. In addition, medieval semiotics (also called scholastic semiotics after the schools of medieval universities in which semiotic topics regarding theology, grammar, dialectic, logic and rhetoric were taught) also contributed to the theories of supposition and signification. The first explained the production of meaning within the context of other signs: supposition is the contextual meaning of a sign. The second, to which it was opposed, argued for a context-independent production of meaning: it argued

[22] Nöth, *Handbook of Semiotics*, 89-90. See also chapter 2, section 2.
[23] They furthermore found inspiration in Aristotle's theory on form, substance and matter in *Metaphysics* and argued that differences between signs are only differences in formed matter, while substance and unformed matter remained the same for all. The most elaborately worked out theory on form, substance and matter within the dyadic tradition is the theory by Hjelmslev. This is discussed in chapter 2, section 1b. Nöth, *Handbook of Semiotics*, 67-70, 83.
[24] *Ibid*., 15-6, 90. The Encyclopædia Britannica explains the Stoic lektón: 'It recognized… that such sentences as 'John Smith is a boy', 'Johnny Smith is a lad', and 'Jean Smith est un garçon' could have an identical meaning (lekton 2013. *Encyclopædia Britannica Online*. Retrieved 22 August, 2013 (http://www.britannica.com/EBchecked/topic/1580320/lekton)).
[25] Nöth, *Handbook of Semiotics*, 16.

that meaning was only generated within the sign itself by the components of which it is constituted.[26] One group concerned with the theory of signification called themselves the Modistae, or Modist grammarians (13th-14th centuries). They were convinced of an essential iconicity between things and language; language was iconically dependent upon the nature of things (Cratylus' view).[27] The Modistae explained the production of meaning as an interaction between a *vox* (vocal noise), *res* (thing) and *intellectus* (understanding). This, and their focus on iconicity, made them forerunners of Peirce's well-known triadic sign theory, which is discussed in chapter 2 section 2. However, their focus on vocal sounds as sign expressions and on a mental understanding of these expressions, resulting in mental entities as the products of signification rather than in actual things or objects referred to, were direct sources of inspiration for De Saussure's well-known dyadic sign theory and his mental definition of the immaterial sign, discussed in chapter 2 section 1a.[28]

During the Renaissance The School of Port Royal had at the basis of its theory also a mentalist and dyadic model in which the sign comprised two ideas: 'representer' and 'represented'. Both are conceptual elements and exist only in the mind as perceived and interpreted by the sender and receiver of a sign. The philosopher Hobbes (1588-1679) explored this mentalist definition, arguing that 'names … are signs of our conceptions, … they are not signs of the things themselves'.[29] The School of Port Royal furthermore introduced a classification of four different kinds of signs based on the manner in which they convey meaning:

- Natural iconic signs consists of 'representers' that resemble in detail what they represent; they are mirror images;
- Iconically and indexically motivated signs consist of 'representers' that resemble or refer to what they represent only in certain aspects, qualities or characteristics;
- Natural indexical signs consist of 'representers' that demonstrate either a certain or a probable link to what they represented. 'Breathing', for example, is a certain 'representer' of 'life';
- And arbitrary signs consist of 'representers' that are only linked to what they represent on the basis of agreement and convention, such as linguistic names.

This classification was a direct source of inspiration for Peirce's famous sign-classification which included icon, index and symbol (cf. chapter 2, section 2), while in the first two kinds of signs one may find the seeds for a theory of multiple layers of meaning with different degrees of iconicity or similarity, especially emphasized by Jakobson (chapter 2, section 1d).

Another great mind of the Renaissance was the German polymath and philosopher Leibniz (1646-1716), who was a source of inspiration especially for Peirce. Leibniz proposed a theory in which tripartite signs stand for things of which they create an idea in the mind. He argued that 'semiosis' (i.e. another term for signification that came to be especially connected to the triadic sign tradition as proposed by Peirce) was based on the association of perceptions as an instrument of

[26] Nöth, *Handbook of Semiotics*, 18.
[27] This view led, in combination with Aristotle's idea that mental experiences and actual things are the same for all, to the idea that languages must have an underlying structure which is the same for all. Descartes (1596-1650) elaborated upon it and concluded that, since thought is prior to language, diversity of languages is only a surface-structural phenomenon. In other words, the structure of thought and reason was common to all men. His philosophy laid the foundation for a search for universal language – the universal language project. The Modistae in fact already developed a universal grammar called *grammatical speculative et universalis*. Nöth, *Handbook of Semiotics*, 19, 21, 267-278.
[28] *Ibid*., 19-20.
[29] *Ibid*., 23.

human cognition to make sense of the world. Signs, Leibniz explained, function as necessary tools to abbreviate and communicate in an efficient manner more complex semantic concepts. Similar to the pansemiotic definitions of Peirce and Eco, Leibniz acknowledged not only linguistic signs such as words and letters, but also 'chemical, astronomical, Chinese and hieroglyphic figures; musical, stenographic, arithmetic and algebraic marks; and all the others we use for things when thinking'.[30]

A topic of semiotic nature that gained interest especially in the French Enlightenment from the 17th century onwards was the connection of signs to the idea of an evolutionary development of language, discussed in the Introduction to this dissertation. On the basis of the Greek distinction between natural and conventional signs, the French philosopher and epistemologist Bonnot de Condillac (1715-1780) distinguished a pre-linguistic developmental stage of human communication through natural signs from a fully developed conventional language proper.[31] The French mathematician and philosopher De Maupertuis (1698-1759) advocated a more holistic genesis of language, according to which language originated in global messages only after which simple linguistic signs such as words and letters and linguistic structure in general were developed.[32] This idea contradicts, however, to results from modern psycholinguistic experimental research on early language development in children, who begin with letters and words and via telegraphic speech end up with more global messages.[33] Notably, there was also a theory that objected to the evolutionary ideas from nonlinguistic towards linguistic signs. The French philosopher Diderot (1713-1784) argued that the nonlinguistic signs of nonverbal communication were superior to linguistic signs because the linearity of spoken and written language led to a distortion of reality.[34] This view can be related to the function ascribed to signs by Leibniz: when signs act as economic and abbreviated tools to convey concepts, then translation and description of these concepts into words may lead to loss and distortion.

A product of the German Enlightenment was the theory of phenomenology of the philosopher Husserl (1859-1938). Although usually not considered a semiotic tradition, but rather one of philosophy and psychology, its focus on meaning is relevant to Peirce's theory especially. Phenomenology may be defined as the study of structures of experience, or consciousness. It is the study of phenomena as appearances of things, of things as they appear in our experience; in other words, of the ways in which we experience things, thus of the meanings things have in our experience. The structure of experience typically involves 'intentionality'; that is, the directedness of experience toward things in the world, and the property of consciousness that it is a consciousness of or about something. According to Husserl's phenomenology, our experience is directed toward things only through particular concepts, thoughts, ideas, images, and so forth. These make up the meaning or content of a given experience and are distinct from the things they represent or mean. In our experience we gain a temporary awareness, for instance of linguistic activity in a certain context (involving meaning, communication, understanding others), or of social interaction. Phenomenology allows not only to see the experience of a sign, or the sense made of it, as a separate meaningful sign-component in addition to form and the thing it refers to; it also connects the semiotic enterprise to a cognitive and neural substrate of experience. Nowadays, phenomenology has evolved into

[30] Nöth, *Handbook of Semiotics*, 22.
[31] *Ibid*., 25-26.
[32] *Ibid*., 26.
[33] Harley, *The Psychology of Language*, 103-152.
[34] Nöth, *Handbook of Semiotics*, 26-27.

'neurophenomenology', a branch of cognitive neuroscience, which assumes that conscious experience is grounded in neural activity. It involves experiments that tend to confirm or refute aspects of experience on the basis of brain scans that show electrochemical activity in a specific region of the brain thought to subserve a type of vision or emotion, or motor control. As such it shares common questions and experiments with cognitive semiotics into which traditional semiotics is nowadays evolving.[35]

In sum, although this historical outline of semiotic inquiry is by no means complete, it does reveal several major questions with which it has been involved since antiquity and that we will encounter again in some form or another when we discuss leading theories and models of the sign in the following two chapters. They concern:

- How do the forms in which signs occur relate to how they can be interpreted? Is there a conventional, a natural or an iconic relation?
- Do signs exist in the real world? Are they related to something in the real world, or do they only exist in the mind?
- (How) Does the individual sign in its generation of meaning relate to a context of other signs?
- How do signs relate to the development of linguistic scripts?
- How is the production and interpretation of signs accommodated in the cognition and neurology of the human brain?

3 WHY SHOULD WE BOTHER?

At this point, the reader may wonder why it is profitable to busy ourselves with semiotic inquiry at all. The semiotician Daniel Chandler notes that the difficulty for most beginners in the field lies in the fact that we are normally unaware of the signs and sign systems we use, and particularly of how we use them. Consequently, we normally take the world around us for granted as something which is independent of human interpretation, while in fact meaning is not *contained* within that world. 'Meaning is not transmitted to us – we actively create it according to a complex interplay of codes or conventions of which we are normally unaware.' '… our sign systems … play a major part in the social construction of reality' (or at least 'the construction of social reality') '… realities cannot be separated from the sign-systems in which they are experienced.'[36] This entails that signs have an ideological function; they can be used to construct and maintain the specific representations of reality by particular social groups. By becoming aware of, and making more explicit, the codes and conventions that are assigned to signs in order to generate and convey meaning we become aware of how particular social groups represent and experience their reality. As such, Roland Barthes wanted to break through the ideology of the ruling bourgeoisie and the mass media in mid-20th century France, who enforce their will and opinions by making them seem natural in a reality taken for granted. It is also precisely the question of how ideology is constructed which Egyptologist Goldwasser poses for ancient Egyptian hieroglyphic script. She argues that we must 'ask how the script represents the

[35] Smith, D.W., 'Phenomenology' in Zalta (ed.), *Stanford Encyclopedia of Philosophy* (2013); Sonesson, 'The View from Husserl's Lectern', *Cybernetics and Human Knowing* 16 nos. 3-4 (2009), 107-148; Sonesson, 'The Foundation of Cognitive Semiotics in the Phenomenology of Signs and Meaning', *Intellectica* 58/2 (2012), 207-239. See also this Part, chapter 3.
[36] Chandler, *Semiotics*, xv, 11.

ideology of its inventors and what part the given pictures play in the reader's mind'.[37] Only then can we discover the multiple layers of meaning generated by hieroglyphic signs and the ancient Egyptian conceptual world view which they represent. As regards the marks from Deir el-Medina, we should not be satisfied with an identification between marks and workmen. We should direct ourselves to semiotic inquiry to find answers to questions concerning the nature of the system and of the individual marks in relation to hieroglyphic writing, the sorts of meaning they convey and the manners in which they do that, as well as the reason(s) why marks were used instead of writing while the latter was practiced at least in dynasties 19 and 20 by trained scribes. Only then can we grasp the full meaning of the system and the reality it created in Deir el-Medina in the first half of the second millennium BC.

[37] Goldwasser, *From Icon to Metaphor*, 29.

2

MODERN SEMIOTICS – LEADING MODELS OF THE SIGN

The previous chapter made clear that the field of semiotic research is extensive. Semiotic questioning can be traced back to ancient Greece and it has spread in many directions ever since, surfacing in the ideas of many diverse groups, currents and traditions throughout the course of history. It is from that eclectic cradle that 'modern semiotics' was born at the beginning of the 20th century.

The term 'modern semiotics' suggests a change at that time; a breach between all semiotic thought before, and that which came after. In a sense, such a breach is defendable, since it was only in the 20th century that semiotics became a systematic study of signs and sign systems that was the object of scientific and, to a certain extent, acknowledged and institutionalized research.[1] Yet, that change of attitude towards semiotics did not delimit its multifaceted interpretations and applications.[2] On the contrary, in the course of the first half of the 20th century semiotic questioning became central to a great number of disciplines, including the cognitive sciences, to the point that Eco spoke of 'an expanding galaxy' that demands 'an ecumenical tolerant approach' by the scholar interested in the field.[3] Yet, 'everyone, no matter how tolerant he may be of other people's opinions, must also enunciate his own'.[4] Writing about semiotics has become a matter of thorough and all-encompassing preparatory study followed by stern selection of only those models and theories that are of interest and relevance for the specific enquiries of the scholar, for indeed, 'no treatment of it can claim to be comprehensive'.[5]

In order not to lose track of our main goal, i.e. the quest for a comprehensive theory in which we can accommodate and explain the Deir el-Medina marking system, the present chapter does not attempt to be comprehensive. Its composition is the result of a preparatory explanatory research phase that was characterized by ecumenical tolerance, and a second phase of selection that highlights the relevant aspects of several models and theories belonging to the dyadic and triadic interpretations of the sign. The main criteria of selection were: 1) the relevance of these models and theories to the Deir el-Medina marking system with respect to the questions of what constitutes a sign and how signs generate meaning within human society, and 2) influential innovations and a disciplinary character brought into the field by these theories and models, which were often the start of a new school or current.

The models and theories are not mutually exclusive. They show growth and development from a structuralist birth to a poststructuralist childhood and recently into a social cognitive semiotic adolescence. They are presented chronologically within their respective traditions (section 1 dyadic

[1] Even though there are no faculties and hardly any academic chairs in the field of semiotics, there are scientific journals, conferences and university programs. See, for instance, *Semiotica*: the journal of the International Semiotic Association, edited by Sebeok; or the *Congress of the International Association for Semiotic Studies*, the first one held in Milan in 1974.

[2] It was mentioned in chapter 1 that there is as yet no consensus regarding the scope of the subject, core concepts or methodological tools.

[3] Eco, *Kant and the Platypus*, 2-3.

[4] *Ibid*.

[5] Chandler, *Semiotics*, xiv.

models; section 2 triadic models) in order to be able to follow this growth.[6] The relevant aspects and their developments, to which each of the semioticians discussed in this chapter contributed,[7] are important to take into consideration in an overall assessment of the divergences and compatibilities of the traditions as well as of their ultimate significance for the Deir el-Medina marking system. Such assessment and significance will be commented upon in the course of sections 1 and 2, while in section 3 there follows a discussion of the marks from Deir el-Medina in the light of a synthesis of the relevant aspects extracted from the traditions.

1 DYADIC MODELS OF THE SIGN

a. Semiology according to De Saussure[8]

> *'It is … possible to conceive of a science which studies the role of signs as part of social life. … We shall call it semiology (from the Greek sēmeîon, 'signs'). It would investigate the nature of signs and the laws governing them.'*[9]
>
> Ferdinand de Saussure

Ferdinand de Saussure (1857 – 1913) was a Genevan linguist who taught Indo-European and general linguistics at the university of his hometown between 1891 and 1912. His study of linguistics is considered revolutionary particularly because of its reaction against the nomenclaturist view on linguistics that had existed since ancient Greek times.[10] Instead of considering words merely as vocal labels which had come to be attached to things and qualities already given in advance by nature, or to ideas already grasped independently by the human mind, De Saussure considered language a product of social interaction which supplied the conceptual framework for man's analysis of reality as well as the verbal equipment for a description of it. Put differently, while in earlier times words were seen as peripheral to man's understanding of reality, De Saussure made man's reality revolve around the social use of words as verbal signs;[11] he considered language to consist of signs through which man's reality is formed and described. The behavior of these signs adhered to a general theory of sign systems. This theory De Saussure called semiology (*sémiologie*).[12] Semiology theoretically comprised a variety of sign systems through which man creates his reality. Apart from language as a system of expressing ideas De Saussure mentioned 'the deaf-and-dumb alphabet, symbolic rites, forms of

[6] The development into cognitive science will be discussed in section 1.d and particularly in chapter 3.
[7] All too often ideas and semiotic breakthroughs are ascribed to famous semioticians, e.g. Barthes or Jakobson, while they had already been suggested by De Saussure or by the semiotician Hjelmslev, be it in different wording. This is, for instance, the case with the idea of syntagmatic and paradigmatic axes or dimensions of sign systems, usually credited to Jakobson, but present already in De Saussure's theory. My decision to present a chronological discussion of the dyadic respectively triadic sign traditions, which some might find rather comprehensive, comes forth partly from my attempt to set this misattribution right, but also partly from my attempt to present a clear introduction to a field that is often considered deeply obscure by people who are not already members of the club (Chandler, *Semiotics*, xiii).
[8] Part of this subparagraph has been published: Van der Moezel, 'Signification in Ancient Egyptian Builders' Marks' in Kammerzell & Rzepka (eds.), *Non-Textual Marking Systems in Ancient Egypt (and elsewhere)*. Lingua Aegyptia, Studia monographica (Seminar für Ägyptologie und Koptologie, Göttingen).
[9] De Saussure, *Course in General Linguistics*, 15.
[10] *Ibid*., 65-67. Cf. the previous chapter.
[11] Harris in De Saussure, *Course in General Linguistics*, ix.
[12] The French term for 'semiotics', as briefly mentioned in the previous chapter .

politeness, military signals' and other social customs, legal procedures and religious rites.[13] Yet, he considered language the most important sign system and linguistics the only branch of semiology: 'The laws which semiology will discover will be laws applicable in linguistics, and linguistics will thus be assigned to a clearly defined place in the field of human knowledge.'[14] De Saussure's theory of semiology is thus strongly linguistic; it was in his account of linguistics that the dyadic tradition of semiology was born. The task to apply the laws of linguistic semiology onto other sign systems was left to his followers, and indeed they did in such diverse fields as art, architecture, fashion, photography, philosophy, literary criticism and social anthropology. Although the implications of De Saussure's technique for dealing with semiological analysis therefore extend far beyond the boundaries of language, we will in this paragraph adhere to his linguistically oriented basic account as it is represented in *Cours de linguistique générale* (1916), a post-mortem publication of De Saussure's theory of signs and sign systems issued from notes taken by his students.[15]

De Saussure's theory was strongly structuralist. In fact, it was a key text in the formation of the intellectual movement of structuralism in the first half of the 20th century.[16] For the first time linguistic research was presented as a systematic study of signs and sign systems with the potential to 'discover the true nature of language systems' by identifying their linguistic structures.[17] Linguistic structures were described as those general, stable structures that underlie language systems as a whole and that are essential catalysts of language manifestations.[18] The study of linguistics, and of semiology as being represented through linguistics, could only depart from these general structures at the expense of particular, individual and ephemeral occurrences of language manifestation. The laws of linguistics and of semiology could thus only be extracted from the study of linguistic structures.

This distinction, between linguistic structure and language manifestation, was one among several dichotomies that came to embody the study of the dyadic tradition of semiology. It represented a first structural level of analysis that came to be variously known as the distinction between *langue* and *parole*, *system* and *usage*, *structure* and *event*, or *code* and *message*.[19] The other dichotomies that represent further structural levels of analysis in De Saussure's theory are:

- the dyadic concept of the sign: *signifier* versus *signified*;
- the dyadic concept of the sign system: *syntagmatic* versus *associative relations*.

We will explain the principles of the dyadic tradition of semiology departing from these three structural levels of analysis.

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[13] De Saussure, *Course in General Linguistics*, 15, 17, 68, 74.
[14] *Ibid*., 16.
[15] De Saussure never published his complete theory himself, according to Culler because he 'had doubts about the foundations of linguistics as then practiced'. Culler, *The pursuit of signs*, 22. One of the earliest and most frequently consulted translations of the French work is by the hand of one of De Saussure's main critics: Harris, De Saussure, *Course in General Linguistics* (2009, first published 1983). It is the translation used throughout this dissertation (referred to as De Saussure, *Course in General Linguistics*), but with consideration of the French original as well as the remarks on translations of terms such as *signifiant* and *signifié* from Chandler, *Semiotics*, xvi and Nöth, *Handbook of semiotics*, 56-57.
[16] Harris in De Saussure, *Course in General Linguistics*, ix. The term 'structuralism' was coined only years later, in 1929, by Jakobson. Waugh & Monville-Burston, *On Language*, 6; Chandler, *Semiotics*, 5.
[17] De Saussure, *Course in General Linguistics*, 9, 17.
[18] *Ibid*., 10. Only by means of linguistic structure can language be articulated.
[19] Chandler, *Semiotics*, 8-9; Nöth, *Handbook of semiotics*, 62-63. De Saussure used the terms *langue* and *parole*; his followers, among whom Hjelmslev, Barthes and Jakobson introduced their own terms for the same distinction.

a.1 Langue versus parole

The semiotic analysis of sign systems must first of all distinguish between *langue* as the study of the system in general, with structure as its sole object, and *parole* as the study of the particular instances of its signs. In De Saussure's linguistic semiotics *langue* comprised the study of linguistic structures, while *parole* concerned the study of the particular instantaneous combinations of individual verbal signs.[20] De Saussure preferred the study of *langue* over the study of *parole*, for he considered a sign system graspable and definable only through study of its structure: 'The linguist must take the study of linguistic structure as his primary concern, and relate all other manifestations of language to it. Indeed … linguistic structure seems to be the one thing that is independently definable and provides something our minds can satisfactorily grasp'.[21] In other words, it is only linguistic structures that can define the meaning of instantaneous *parole* by situating it within linguistic unity. Culler, structuralist and literary theoretical critic who reviewed De Saussure's theory in *The Pursuit of Signs* (2001), describes this principle as follows: 'to understand phenomena is to reconstruct the system of which they are manifestations'.[22]

Yet, in order to identify the exact role of linguistic structures in the totality of a language system, that is, to identify the role of these structures in the generation of meaning through a language, the individual manifestations have to be considered, for it is due only to these manifestations that a language can truly be established.[23] De Saussure focused on spoken language at the expense of writing: following the Aristotelian definition – 'written words are the symbols of spoken words'[24] – he considered writing an artificial representation of 'authentic language', which obscures our view of language by providing (written) signs of (spoken) signs. Therefore, the manifestations of language in his theory were primarily acts of speech.[25] The analysis of these manifestations of speech, i.e. the analysis of *parole*, is a further structural level of analysis, which is characterized by the concept of the dichotomous sign: *signifier* versus *signified*.

a.2 The concept of the sign: signifier versus signified

Signs, according to De Saussure, are then acts of speech, but they are not to be equated with sounds. Sounds merely form the vehicle through which signs are expressed. De Saussure argued that signs are essentially dual entities, uniting a sound pattern (*signifier*) and a concept (*signified*):[26]

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[20] De Saussure, *Course in General Linguistics*, 13-14, 19-20.
[21] *Ibid*., 9.
[22] Culler, *The pursuit of signs*, 27-28. The structuralist idea in which the meaning of the particular (parole, usage, event, message) is dependent upon the underlying structures and rules of the general system (langue, system, structure, code) gave rise to new perspectives in a number of disciplines, e.g. structuralist anthropology (Lévi-Strauss), structuralist literary criticism (Barthes, Greimas) and structuralist psychoanalysis (Lacan). See also De Saussure, *Course in General Linguistics*, 11, 17, 77; Culler, *The pursuit of signs*, vii, 4, 22-23, 26-32; Burke, *History and Social Theory*, 134-136; Chandler, *Semiotics*, 5.
[23] De Saussure, *Course in General Linguistics*, 19.
[24] Cf. chapter 1.
[25] De Saussure considered the sole reason for the existence of writing to be the representation of spoken language, whereas speech truly *established* language: 'the spoken word … is a language's natural sphere of existence' (the spoken word here being a metonymic reference to 'spoken language' – *langue* – which is prioritized over its single manifestation. De Saussure, *Course in General Linguistics*, 19-29. Derrida explains this idea in its historical context, but refutes the deterministic models of 'speech' and 'writing' it implies. Derrida, *Of Grammatology* (1997), 27-44. Nota bene: De Saussure's arguments relate only to modern Western writing. De Saussure did mention two kinds of writing systems: ideographic and phonetic. He did not, however, elaborate on other systems of writing, restricting himself to the modern Western phonetic system. De Saussure, *Course in General Linguistics*, 26-27; Derrida, *Of Grammatology*, 32-33.
[26] De Saussure, *Course in General Linguistics*, xi, 66. The English terms in brackets are mine.

'A linguistic sign is not a link between a thing and a name, but between a concept and a sound pattern [image accoustique]. The sound pattern is not actually a sound; for a sound is something physical. A sound pattern is the hearer's impression of a sound, as given to him by the evidence of his senses. …This other element is generally of a more abstract kind: the concept.'

A sign is the association of an abstract concept with the sound pattern that expresses this concept as it is heard or imagined. This is what De Saussure meant to express through his term *image accoustique*: the sound pattern is not a vocalized sound, it rather is the psychological impression of a vocalized sound inside the head of a receiver. De Saussure's sign is, then, a purely psychological entity that exists only the minds of its sender and receiver (fig. II2-1).[27]

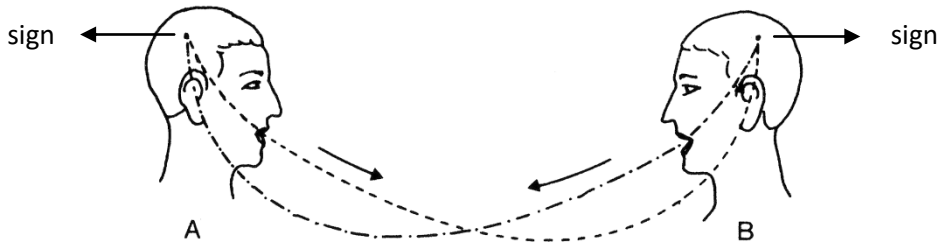

Fig. II2-1 De Saussure's representation of the speech circuit: signs are purely psychological entities that exist only in the mind of their senders and receivers. Based on De Saussure, *Course in General Linguistics*, 11.

De Saussure called the constituents of the sign *signifier* (*signifiant* – sound pattern) and *signified* (*signifié* – concept).[28] Bound together they form the sign: the sign is the whole that results from reciprocal association of the *signifier* with the *signified*.[29] This association is denoted *signification*. It makes a sign unique: any other association between *signifier* and *signified* – even when the *signifier* is the same, but related to a different *signified*, as is the case in homonymy – would form a different sign. This is represented in De Saussure's model of the sign as follows (fig. II2-2a-b):

a

[27] De Saussure, *Course in General Linguistics*, 12-13, 66-67.

[28] *Ibid.*, 67. In his translation of De Saussure Harris chose to replace the original terms *signifiant* and *signifié* with 'signal' respectively 'signification'. However, these terms are confusing because De Saussure himself used the term 'signification' to refer to the interaction between signifier and signified. Moreover, someone who is familiar with other sign theories, such as Peirce's semiotics, will encounter the term 'signal' with a different meaning. We will therefore adhere to what most scholars who refer to De Saussure do and use the English translation of De Saussure's original terms. A remark similar to this one was made by Sturrock, *Structuralism*, 32 note 17.

[29] De Saussure described the relation between *signifier* and *signified* as two sides of a sheet of paper. De Saussure, *Course in General Linguistics*, 111.

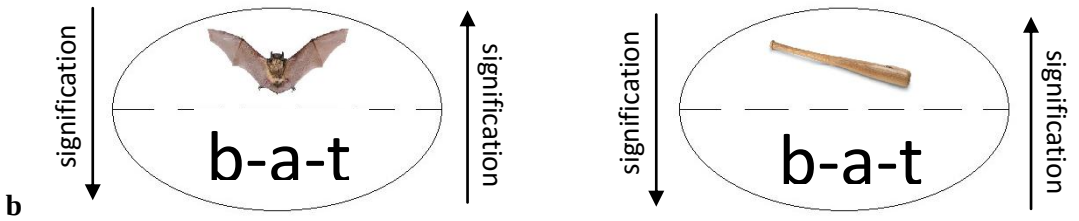

Fig. II2-2a The dyadic sign model of De Saussure, consisting of a signifier signifying a signified, and a signified being signified by a signifier. The reciprocal connection between signifier and signified is called signification. **b**. Each signification between a signifier and a signified is unique. Even when the sound pattern remains the same but refers to a different signified, as in b-a-t referring to the concept of the animal or the concept of the object, we are to distinguish two different signs. Based on Chandler *Semiotics*, 14 (fig. 1.1).

The sign is furthermore unmotivated; that is, the link between signifier and signified is arbitrary.[30] De Saussure argued that the signifier is not determined by that which it signifies; there is no internal, intrinsic or natural relation between the two sign constituents. 'No specific signifier is naturally more suited to a signified than any other signifier.'[31] The signification between signifier and signified is based merely on convention and fixed rule: 'The structure of a language is a social product … a body of necessary conventions adopted by society to enable members of society to use their language faculty'.[32] In De Saussure's account, other than collective agreement there is no reason why for instance the pattern of sounds s-i-s-t-e-r should refer to the concept everyone with an understanding of English thinks of when hearing those sounds. He states that 'The same idea might as well be represented by any other sequence of sounds'.[33] In theory, any other sequence of sounds could do the trick, an idea which is nicely expressed in the quote 'That which we call a rose by any other name would smell as sweet'.[34]

a.3 The concept of the sign system: syntagmatic versus associative relations

De Saussure emphasized that signs do not make sense on their own. Only in relation to other signs as part of a system do they gain value.[35] In going from signs as language manifestations (*parole*) to the system of linguistic structures (*langue*) a 'faculty of association and coordination' must come into operation. The study and definition of this faculty, which creates the linguistic structures that play 'the major role in the organization of language as a system',[36] is dominated by the structural analysis of two kinds of relations signs become involved in: syntagmatic and associative relations.

Signs are in syntagmatic relation when they are 'strung together one after another' and 'enter into relations based on the linear character of languages' (fig. II2-3)'[37] Linearity, said De Saussure,

[30] De Saussure, *Course in General Linguistics*, 68-69. De Saussure has often been criticized for denoting the sign as *arbitrary* as he does in his 'First principle: the sign is arbitrary' (p. 67). Critics have argued that the link between signifier and signified cannot be arbitrary, because this would imply that the individual has the power to alter it at will, which is not the case once a linguistic sign has become established in a community. They have rather called the link between signifier and signified *unmotivated*. Yet, despite De Saussure's use of the term *arbitrary*, he foresaw this criticism and the critical reader will find that De Saussure already called the sign *unmotivated* instead of *arbitrary* himself on pp. 68-69. Cf. Chandler, *Semiotics*, 27-28.
[31] Chandler, *Semiotics*, 22-23.
[32] De Saussure, *Course in General Linguistics*, 9-10.
[33] *Ibid*., 67-68. De Saussure argued the same for signs of writing: pp. 117-118.
[34] Shakespeare, *Romeo and Juliet* (ca. 1591) Act II Scene II. For a translation, see Craig (ed.), *The Complete Works of William Shakespeare*, 772.
[35] De Saussure, *Course in General Linguistics*, 110-116; Chandler, *Semiotics*, 20.
[36] De Saussure, *Course in General Linguistics*, 13.
[37] *Ibid*., 121.

precludes the possibility of uttering two signs simultaneously. These signs must be arranged consecutively in spoken sequence. They form linear, sequential combinations which De Saussure called syntagmas.[38] A syntagma comprises two or more consecutive signs. In linguistics these signs may be morphemes, or words, or groups of words, or complex units of any size and kind such as compound words, phrases and sentences. Examples of syntagmas given by De Saussure are *re-lire* (sequential combination of morphemes), *contre nous* (sequential combination of words), *contremaître* (sequential combination of two compounds), *la vie humaine* (sequential combination of words in a phrase) and *s'il fait beau temps, nous sortirons* (sequential combination of words in a sentence).[39] De Saussure acknowledges that the most frequent syntagmas are sentences, but warns that, although sentences are phenomena of *parole* in that they are language manifestations, syntagmas are not. They are rather the moulds in which particular instances of language can be formed.[40]

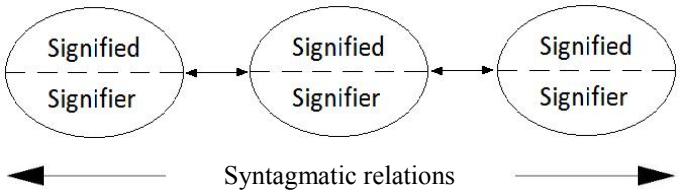

Fig. II2-3 Linear, sequential relations between signs, designated as syntagmatic relations. The signs form a syntagma. Based on Chandler, *Semiotics*, 20.

Beyond the syntagmas, those signs that have something in common are associated together in memory. They form mnemonic, or semantic and/or grammatical associative groups which are not based on linear sequence, but are rather constituted from members that form connections in the brain.[41] While syntagmas present signs in a fixed sequence with a specific number of elements, associative groups have no particular number of signs in them, nor do these signs occur in any particular order. De Saussure stated that it is impossible to say in advance how many signs the memory will suggest and in what order. Any given sign may act as the centre of a constellation, from which connected terms radiate *ad finitum*. Such a constellation is best explained with an example of the word as linguistic sign centre (fig. II2-4).[42]

[38] De Saussure, *Course in General Linguistics*, 121.
[39] *Ibid*., 121-122.
[40] *Ibid*., 122-123.
[41] *Ibid*., 122. In fact, this is one of the earliest accounts of connectionism theory: a visual imaging method which is discussed in the next chapter.
[42] *Ibid*., 124.

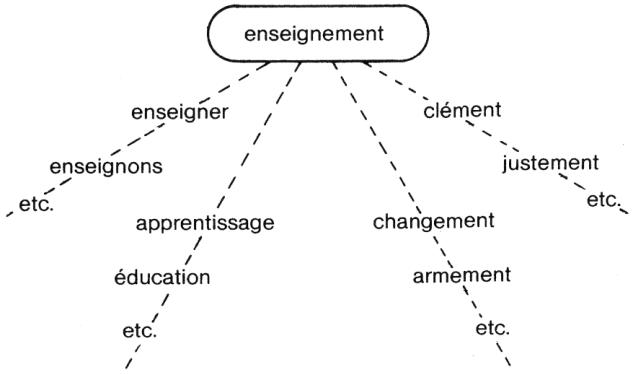

Fig. II2-4 A constellation of associative groups radiating from the sign 'enseignement'. De Saussure, *Course in General Linguistics*, 125.

The associative relations can be of various kinds, based on different sorts of commonalities. For instance, the members of an associative group may all have a certain grammatical element in common, such as the verbal prefix *enseign-* in *enseign*ement, *enseign*ons, *enseign*er, and so on; or the suffix -*ment* in enseigne*ment*, arme*ment*, change*ment*, and so on. The association may also be based on semantic similarity, such as in *enseignement*, *instruction*, *apprentissage*, *éducation*, and so on; or it may be based only on similarity of sound patterns, for instance in the final syllables (here not the suffix) of enseigne*ment*, clé*ment* and juste*ment*. There may also be a double associative link based on form as well as on meaning. Any word, or any other sign, can evoke in the mind whatever is capable of being associated with it in some way or another.

By entering into syntagmatic and associative relations a sign becomes imbued with *value*. De Saussure emphasized that within a syntagma the value of a sign is derived particularly through the principle of negative differentiation: 'concepts … are defined not positively, in terms of their content, but negatively by contrast with other items in the same system. What characterizes each most exactly is being whatever the others are not'.[43] Thus, by its position within a syntagma, a sign acquires value simply in opposition to what precedes, or to what follows, or to both.[44] Chandler provides a clarifying example: if we would attempt to 'teach someone who did not share our language what we mean by the term 'red'', 'we would be unlikely to make our point by simply showing that person a range of different objects which all happened to be red – we would probably do better to single out a red object from a set of objects which were identical in all respects except colour.'[45] The concept of 'red' can then be grasped by deviation of the norm. Within an associative group a sign acquires value by negative differentiation with other members; it is chosen for those characteristics, which the other members have not.[46]

In sum, the value of signs in a sign system is generated as follows: our memory holds in store all the various moulds, or syntagmas, of every kind and length. When a syntagma is brought into use, we call upon associative groups in order to make our choice among signs to fill the syntagma.[47]

[43] De Saussure, *Course in General Linguistics*, 115; Chandler, *Semiotics*, 21.
[44] De Saussure, *Course in General Linguistics*, 121.
[45] Chandler, *Semiotics*, 21.
[46] Another example is provided by De Saussure himself: when someone says 'marchons!', he thinks unconsciously of various associative groups and terms, such as 'marche!', 'marchez!', or 'montons!', 'mangeons!', and so on. One of these terms is sought and selected precisely because of its differentiation to the others. De Saussure, *Course in General Linguistics* (2009), 128. For the activation of associative groups, see chapter 3: semantic network analysis.
[47] De Saussure, *Course in General Linguistics*, 128.

a.4 The meaning of signs

De Saussure's sign model is dual in nature in two respects: 1) it contains a level of the sign (*parole*) and a level of the sign system (*langue*), and 2) each sign within a sign system consists of a signifier and a signified. Consequently, De Saussure's conception of meaning was dual in nature. Meaning arises from 1) the relation between signifier and signified on the level of the sign – *signification*, and 2) the relations between signs on the level of the system – *value*. The meaning of a sign is thus more than the sum of its parts, for the value of this sum is determined only in the context of the system.[48] De Saussure argued that 'To think of a sign as nothing more would be to isolate it from the system to which it belongs', which in his opinion would lead to the supposition that one can induce an entire system from its individual signs (*parole*), while on the contrary, the system (*langue*, or linguistic structure) should be the starting point from which one can deduce its constituent elements.[49]

De Saussure's concept of the relational identity of signs and their relational operation within a sign system is at the heart of his structuralist theory:[50] signs would have no intrinsic meaning as autonomous entities; rather they derive significance from oppositive relations as a system.[51] All meaning, in his opinion, is built upon relations within, but especially between signs (fig. II2-5).

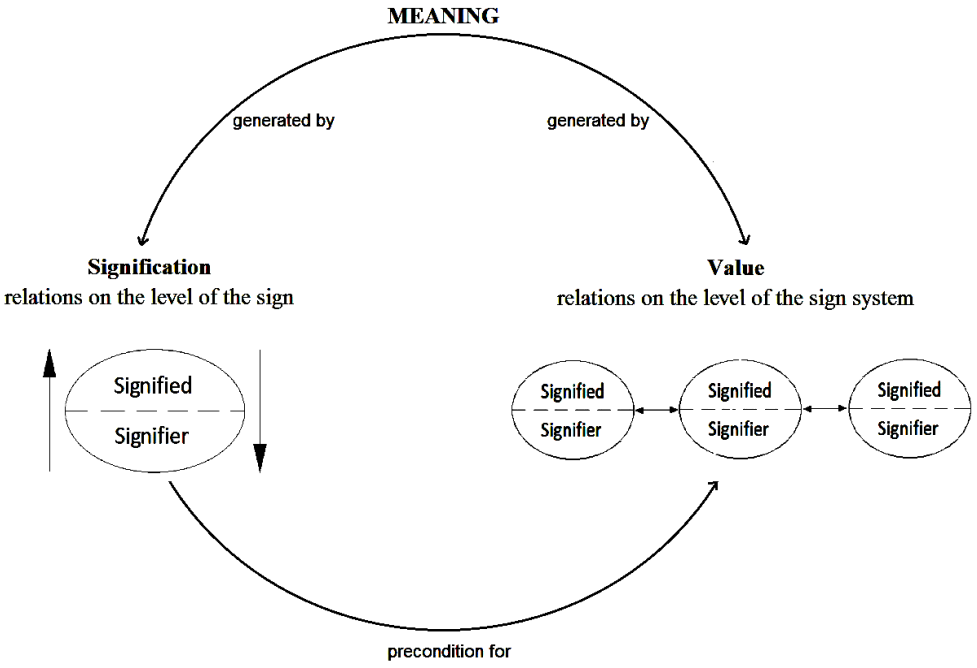

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Fig. II2-5 De Saussure's theory of meaning being generated by signification between signifier and signified on the level of the sign and by the value of a sign in relation to other signs within the system. In order to determine the value of a sign within the system its signification must of course be a precondition.

[48] De Saussure, *Course in General Linguistics*, 110-120.
[49] *Ibid*., 112.
[50] Chandler, *Semiotics*, 21. A scholar who was much influenced by this idea was Lévi-Strauss. In isolating fundamental oppositions he was describing 'sets of categories' (i.e. associative groups) that make useful logical tools for expressing relations. Only through these relations the categories have expressive function. See e.g. Lévi-Strauss, *La pensée sauvage* and *Le totéisme aujourd'hui*. Culler, *The pursuit of signs*, 25-28.
[51] *Ibid*., 29-30.

a.5 Discussion

The structuralist idea that signs and sign systems consist of constituent parts that together generate meaning was revolutionary: it brought clarity into the study of language as a sign system by offering basic methodological tools. A focus on signs and the question of meaning was not new (cf. chapter 1), but De Saussure's primacy granted to relations and systems of relations was a most 'powerful contribution to our understanding of the functioning of signs'.[52] De Saussure did not simply offer a new interpretation; according to Culler, who designated 'interpretations' as 'the enemy', there were already too many of those. Rather, what De Saussure did was to go beyond interpretation and, by constructing an account of rules and conventions concerning methodological structural distinctions that is still essential in many semiological analyses, to search for advancement of our *understanding of the operation* of sign systems.[53] Culler agrees that 'If we are to understand our social and cultural world, we must think not of independent objects but of … systems of relations' which enable the objects to have meaning.[54]

Still De Saussure's theory was criticized in many respects. For instance, the study of language had been focused upon an evolutionary historical and comparative approach during much of the 19th century.[55] De Saussure's focus on structural relations of a linguistics consisting of signs now caused him to draw a radical distinction between diachronic or evolutionary linguistics on the one hand, and synchronic or static linguistics on the other. He gave priority to the latter: 'It is clear that the synchronic point of view takes precedence over the diachronic, since for the community of language users that is the one and only reality. The same is true for the linguist. If he takes a diachronic point of view, he is no longer examining the language, but a series of events which modify it.'[56] In other words, the traditional diachronic point of view represented *parole*, the instantaneous manifestations, while it was *langue* in general to which the semiological linguist primarily had to direct his focus. As a consequence, De Saussure's sign could only be a purely psychological, immaterialized entity. Nothing could exist beyond the signifier and the signified. Referential objects were not considered from the point of view of the functioning of the code;[57] De Saussure's semiology operated completely within the sign system. Signs, that is linguistic signs, had no intrinsic substance or essence for him, precisely because he rejected nomenclaturism: linguistic categories are not simply a consequence of some predefined structure in the world; there are no natural concepts or categories which are simply reflected in language, and for which language has set labels. On the contrary, language plays a crucial role in constructing reality: it does not reflect reality, but rather constructs it.[58] This detachment from social and historical context was rejected. The idea that both signifier and signified were merely existent in the minds of sender and receiver, and that the sign was therefore cut off from the real world in that it lacked something to refer to was unacceptable to many, among whom Ogden & Richards, who criticized De Saussure for 'neglecting entirely the things for which signs stand'.[59]

[52] Culler, *The Pursuit of Signs*, viii-ix, 24-29.
[53] *Ibid*., xx-xxi, chapter 1.
[54] *Ibid*., 25.
[55] De Saussure, *Course in General Linguistics*, x.
[56] *Ibid*., x, 89.
[57] Eco, *A Theory of Semiotics*, 59
[58] Chandler, *Semiotics*, 24-25.
[59] Ogden & Richards, *The Meaning of Meaning*, 8. Cf. Chandler, *Semiotics*, 25, referring to Stam, *Film Theory*, 122.

Applied to ancient Egyptian material, De Saussure's theory does work for Goldwasser, who considers it in her semiotic analysis of ancient Egyptian hieroglyphic script.[60] She argues that, when Egyptian script was invented as a semiotic writing system (the first results of which she sees in the Narmer palette), certain concepts were selected among innumerable visual options available in the cultural repertoire to be permanently fixed as 'mental images' to hieroglyphic signifiers. Not particular instances, but standard idealized mental concepts were henceforward nailed to particular signs. For instance, in the word *s*, 'man', the sign of the seated Egyptian male figure in loincloth represents the 'best example' or prototype of the category 'man'; it was considered the ideal representation to refer to the concept of 'man', and in extension 'human being'. In the word *rmṯ*, an Egyptian seated male in first position followed by an Egyptian seated female were considered the ideal representations to refer to the collective 'people'. These signs were used throughout the history of Egyptian hieroglyphic script, nailed to the concepts of 'man' and 'people'.[61] The selection of preferred concepts out of particular instances means that a sign can only exist as a psychological entity: the words *s* and *rmṯ* do not refer to particular, real-world individual Egyptian males and females, but conceptually represent entire categories. This detachment from the real world is in fact what makes a writing system efficient and generally applicable in different situations.

Yet, Goldwasser found that De Saussure's theory is defective in a different respect; that is, its application to script in general, and picture script such as ancient Egyptian hieroglyphic script in particular. De Saussure focused on spoken language at the expense of written language and therefore dealt only with one signifier and one signified: the sound pattern and the concept it referred to. In alphabetic script, however, one deals with a written signifier (e.g. 'cat') which refers to a phonetic signified (*kæt*), which in turn refers as a phonetic signifier to the signified concept *cat* (fig. II2-6). These are, in fact, two successive processes of signification, in which the phonetic signified/r in mid-way plays a double role, connecting the written signifier to the eventual concept *cat*.

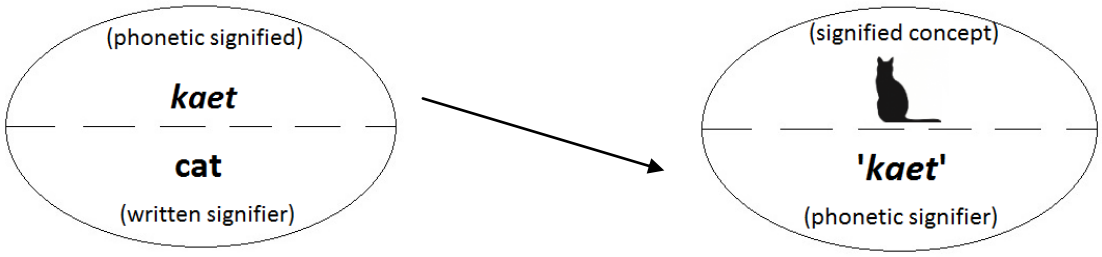


Fig. II2-6 Two successive processes of signification in linguistic writing systems. Departing from the linguistic signifier one needs first to take the mid-way step of the phonetic signified/r before one arrives at the concept that is signified.

In picture script this becomes even more complex: pictorial value becomes a 'built-in' property of the script[62] and thus acts as another 'lifeline' in addition to the phonetic value of a sign. Consider the hieroglyph . It occurs in the words for diverse types of bird and can thus be considered a bird with prototypical status in the ancient Egyptian worldview.[63] In a pictorial reading it is, then, a pictorial

[60] Goldwasser, *From Icon to Metaphor*.
[61] *Ibid*., 8-10, 31.
[62] *Ibid*., 29.
[63] Goldwasser, *Prophets, Lovers and Giraffes*, 19-20.

signifier that signifies the select pictorial concept of *duck*, and in extension *bird*. In a phonetic reading it is a phonetic signifier '*s3*' that signifies the phonetic signified 'duck'. Fig. II2-7 visualizes these pictorial and phonetic readings, which Goldwasser calls pictorial and phonetic trails.

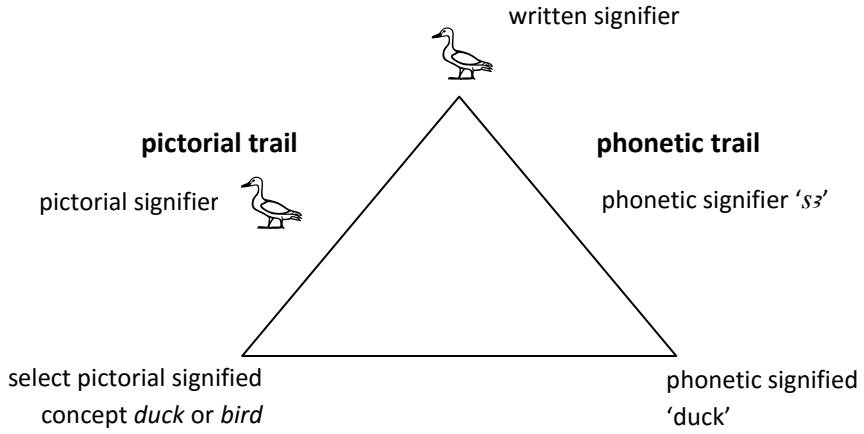


Fig. II2-7 Goldwasser's consideration of the Saussurean sign for ancient Egyptian hieroglyphic writing on the level of the sign: *s3*. Based on Goldwasser, *From Icon to Metaphor*, 40.

Another example is the hieroglyph 𓎛 (fig. II2-8). As a written signifier in the pictorial trail the sign is actually a fusion of two hieroglyphs: 𓏏 and 𓌙. Together they signify the select pictorial signified, the concept *act of bringing a gift*, with 𓏏 signifying the gift and 𓌙 the movement involved. Goldwasser hypothesizes that the signs were first written separately *𓏏𓌙, but soon merged into 𓎛 to enable a person to represent pictorially not only the material gift, but the abstract notion of *bringing* as well. As a written signifier in the phonetic trail, 𓎛 is a phonetic signifier '*jn*(*j*)', which refers to the phonetic signified, the verb 'to bring'. Thus, we end up with 𓎛 as a written signifier that, consisting of a pictorial signifier with a select pictorial signified signifies the *act of bringing* pictorially and, consisting of a phonetic signifier with a phonetic signified signifies the verb 'to bring' phonetically.

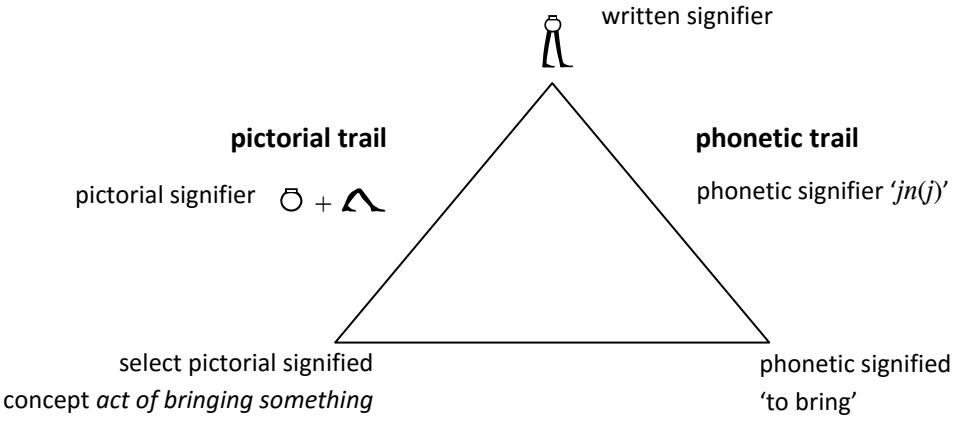


Fig. II2-8 The hieroglyphic sign 𓎛 '*jn*(*j*)' reconsidered as a Saussurean sign.

The pictorial and phonetic reading processes are probably activated simultaneously in the mind of the reader.[64] The horizontal line between the two trails indicates that they can work together: they strengthen each other so that there is no doubt as to what is the signified. The two information avenues coincide at the end of the process in the same pictorial and phonetic signifieds *'duck'*/'duck'.[65] Thus, in the examples of Figs. II2-7 and 8 one could say that each trail contributes with 50% to the generation of meaning by the hieroglyph . However, when this hieroglyph is accompanied by an ideogram stroke or a phonetic complement , then the focus of attention of the reader is diverted either to the pictorial or to the phonetic trail. In other words, on the level of the sign system, in combination with other signs, the reader is guided along one of both trails. In the case of he or she is hinted towards a pictorial understanding of , and in the case of he or she is encouraged to read phonetically (fig. II2-9). In the latter case, the pictorial signification and value of are neutralized.

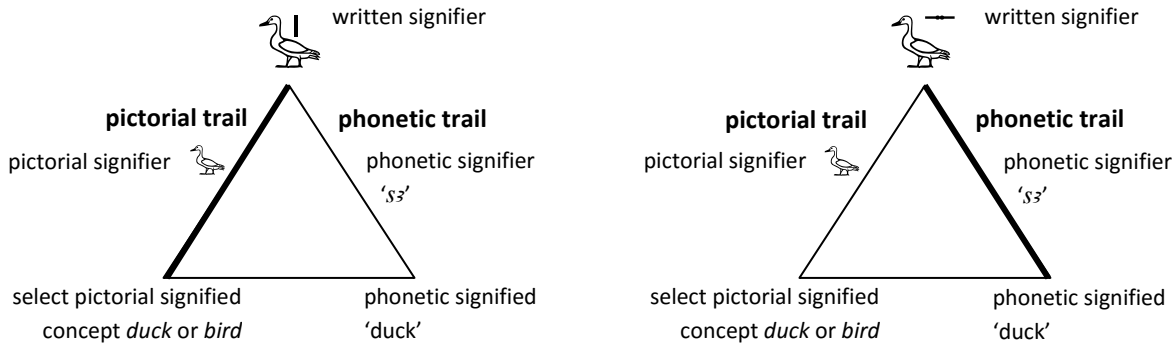


Fig. II2-9 Goldwasser's adaptation of the Saussurean sign model for ancient Egyptian hieroglyphic writing on the level of the system: *s3*.

Thus, instead of dealing simply with a signifier and a signified as in De Saussure's model, the hieroglyphic sign takes into account two processes of signification: a process represented by concrete signification along a pictorial trail, and one represented by abstract signification along a phonetic trail. The trails can work together, but in context the reader may be guided along one of them. A similar restructuring of the Saussurean sign is necessary when we want to apply the theory to the marks from Deir el-Medina. Just like hieroglyphs, the marks are not signifiers in the Saussurean sense; they are not sound patterns, but visual signifiers that may be understood as sound patterns in the phonetic trail, but may just as well be understood as pictorial signifiers in the pictorial trail. In Part I we concluded that a significant number of marks, at least in dynasty 20, is related to hieroglyphic (or hieratic) script. Such marks may, as written signifiers in the phonetic trail, be understood as sound patterns. Thus, consider the mark , which is attested for *Jn(j)-ḥr-ḫʿw* (fig. II2-10):

[64] For simultaneous cognitive processes, see also this Part, chapter 3.
[65] The hieroglyphic written signifier is in this case called an 'ideo-phonograph' by Derrida. See Goldwasser, *From Icon to Metaphor*, 40.

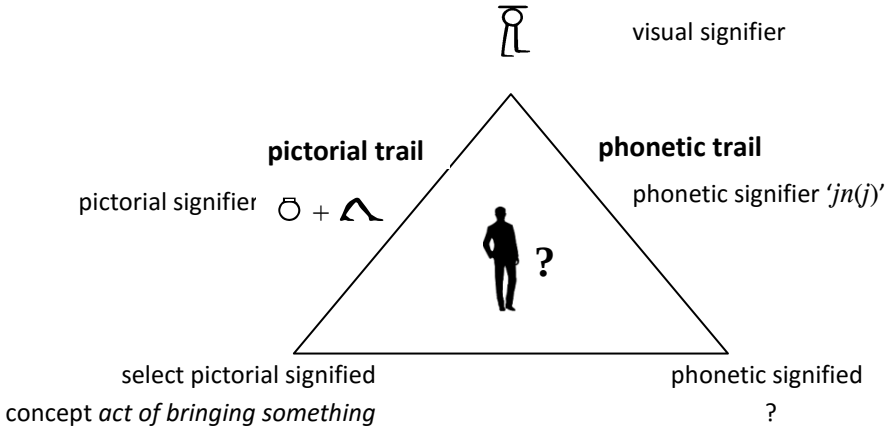


Fig. II2-10 The Saussurean model applied to the mark 𓂝 as visual signifier.

We now have an overview of the possibilities which the mark 𓂝 as a visual signifier has, and by means of which it can signify. But here we encounter a problem. The signifieds of the marks should be the workmen, for it is to the workmen that the marks ultimately refer. But they are neither accommodated in the Saussurean model, nor in an adjusted Saussurean model along the pictorial or phonetic trails. Certainly, when we know that the mark 𓂝 was used by a workman named *Jn(j)-ḥr-ḫʿw*, we may assume that the signification of the mark follows the phonetic trail and as a phonetic signifier is an abbreviation for the name '*Jn(j)-ḥr-ḫʿw*'. But the problem remains: the mark 𓂝 is attested for *Jn(j)-ḥr-ḫʿw* in dynasty 19 in the reign of Ramesses II[66] as well as in dynasty 20 in the reigns of Ramesses III and IV.[67] Considering the timespan, this cannot be the same man. Thus, when we read the mark 𓂝 along the phonetic trail and assume its visual signifier was an abbreviation for the name '*Jn(j)-ḥr-ḫʿw*' (the phonetic signified), we can still not link the mark to its rightful owner (fig. II2-11):

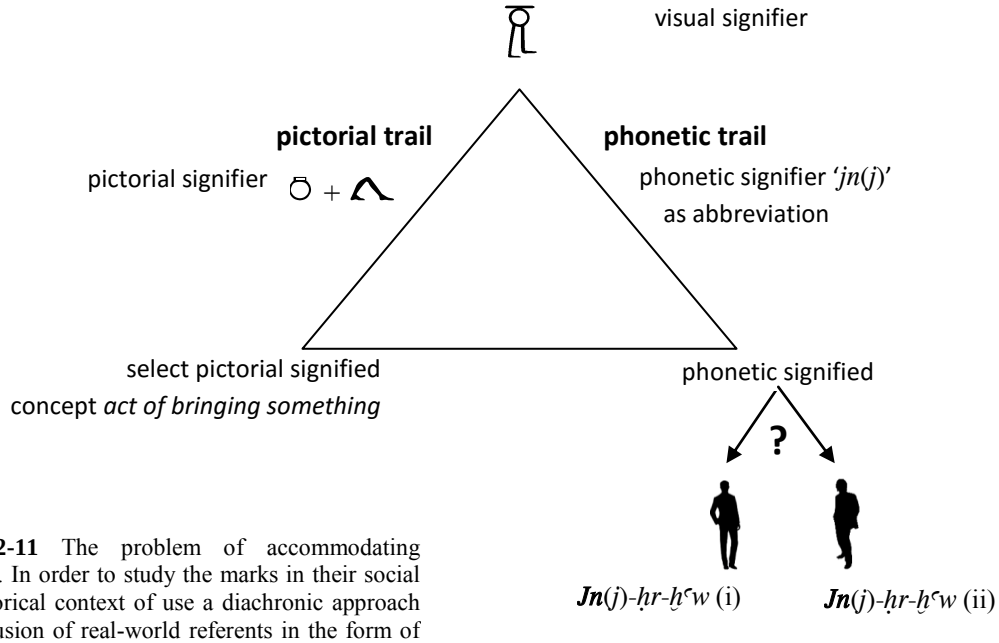


Fig. II2-11 The problem of accommodating referents. In order to study the marks in their social and historical context of use a diachronic approach and inclusion of real-world referents in the form of individual workmen are necessary.

[66] e.g. ostracon Cairo JE 96335.
[67] e.g. the potsherds Nagel, Céramique 046, fig. 29 nr. 247-253 from tomb N 359 of *Jn(j)-ḥr-ḫʿw* (ii), Western Cemetery.

The solution must be to include real-world referents: signs need real-world referents in order to convey specific meaning and function in society. With respect to the identity marks, we need the actual, individual persons to whom the identity marks ultimately refer. In the case of 𓄿 they are *Jn(j)-ḥr-ḫʿw* (i) and *Jn(j)-ḥr-ḫʿw* (ii); only they as real-world referents can make the difference between what are actually two different marks with two different meanings. Fig. II2-11 shows that the mark 𓄿 in the Saussurean sign model cannot distinguish between the two names *Jn(j)-ḥr-ḫʿw*. De Saussure's theory does not accommodate this difference in identity, simply because the actual persons *Jnj-ḥr-ḫʿw* (i) and (ii) do not have a role as the ultimate signifieds. Understanding the marks as abbreviations to refer to the names of the workmen is no solution, for it is an infamous fact that many namesakes lived in Deir el-Medina. Of course, one may argue that on the level of the sign *system* both marks 𓄿 occur in different contexts, each related to other identity marks; that is, *Jn(j)-ḥr-ḫʿw* (i) and *Jn(j)-ḥr-ḫʿw* (ii) each occur in association with different workmen, and therefore they are indirectly present as the referents of the marks on the level of the system. But such generation of meaning merely out of the relations between signs on the level of the system is not enough. We need referents as signifying constituents of the marks themselves. That is, we need the marks to be autonomous entities with intrinsic meaning referring to the real world in order to be able to study the marks in their social and historical context of use. A diachronic approach through the inclusion of real world referents is necessary in order to advance our understanding of the functioning of the marks.

The problems with De Saussure's sign theory do not end here. In the example 𓄿 is a mark from the group of hieroglyphically inspired marks. As such, it can be interpreted as a phonetic signifier '*jn(j)*', and as an abbreviation for the name '*Jn(j)-ḥr-ḫʿw*' in the phonetic trail. But not all the marks from Deir el-Medina are related to script and can be understood as phonetic signifiers in the phonetic trail. How do the marks from Group II refer to their signifieds? Consider, for instance, 𓋴, which is attested as the mark of *Ns-ʾImn* (iii) (fig. II2-12). As far as we know, it has no sound pattern. It has been suggested to have had pictorial value (Grandet suggested a stool, cf. Table I3-1 mark II 001), but it remains unclear how *Ns-ʾImn* (iii) could be pictorially connected to this mark.

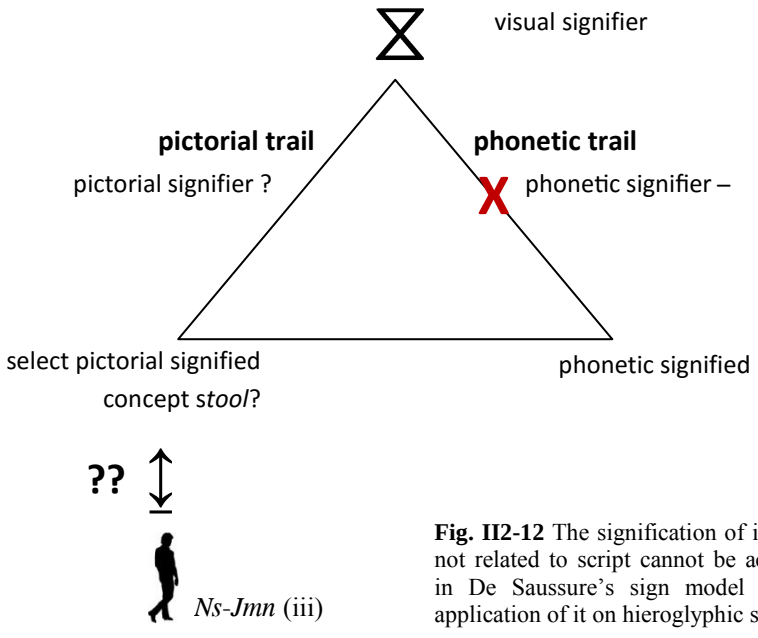


Fig. II2-12 The signification of identity marks that are not related to script cannot be accommodated, neither in De Saussure's sign model nor in Goldwasser's application of it on hieroglyphic script.

If not via linguistic sound pattern, there must be some other naturally, culturally or cognitively defined or agreed connection between the signifiers and the workmen for the marks to be effective and efficient in the administrative communication, but De Saussure's model and theory and Goldwasser's reconsideration do not accommodate this.

In sum, De Saussure's theory was important in that it offered a revolutionary new way of analyzing language: it offered new, structural methodological tools for the foundation of a true science of linguistics that considered language as a coherently organized structure. But this pioneering work in fact contributed little to a general theory concerning the operation and interpretation of signs and sign systems.[68] De Saussure did provide the first steps toward such a theory, but he did not yet solidify a 'central place' for it 'within the humanities and social sciences'.[69] Several aspects of his theory appeared to be inapplicable in the analysis of systems that were not composed of spoken linguistic signs, in particular the purely psychological nature of the sign and the exclusion of real-world referents. In other words, when signs do need to be autonomous entities with intrinsic meaning referring to material, individual referents, the theory is defective. While for written linguistic systems such as ancient Egyptian hieroglyphic script an adaptation of the theory that includes a visual dimension of the linguistic sign might make it useful semiotic analysis, its inadequateness for the accommodation of the marks from Deir el-Medina can be summarized in three points:

- De Saussure's emphasis on relations between signs was an important innovative view, but we cannot let it overshadow the meaning of the marks as autonomous entities with intrinsic meaning and real-world reference;
- In relation to this, we cannot accept a purely synchronic approach to the analysis of the marks, as only a diachronic approach involving marks with intrinsic meaning and real-world reference can advance our understanding of the their functioning in social and historical context;
- Finally, the theory offers no accommodation for marks that have no relation to linguistic script. Goldwasser's reconsideration at least offers room to include pictorial signification and value in addition to phonetic signification and value, but it still offers no accommodation for the referents and marks that seem to have no relation to the pictorial hieroglyphic script.

The problem of the exclusion of real-world referentiality was not solved in the semiological tradition that followed a dyadic interpretation of the sign. Referentiality only became a feature in Peirce's triadic model of the sign (section 2). However, before we skip to his model, we cannot ignore certain developments in the dyadic tradition that are nonetheless important for an investigation into the generation of meaning by the marks. We will see that even without a referent we can go beyond the possibilities for signification that exist within the Saussurean model and therewith approach the workmen a little bit better. We therefore continue in sections 1.b-d with those followers of De Saussure, who successively redefined the theory and made it more generally applicable in the search for an answer to the question of how signs convey meaning: Hjelmsev, Barthes, and Jakobson.

[68] Nöth, *Handbook of Semiotics*, 63; Mounin, *Ferdinand de Saussure*, 33.
[69] The quote is from Culler, *The pursuit of signs*, vii. See also Chandler, *Semiotics*, 212.

b. Semiology according to Hjelmslev[70]

Semioticians after De Saussure struggled with the idea of the sign as a purely psychological entity. They reinterpreted the distinction between psychological sound pattern and abstract concept as a distinction between more broadly any form of any kind of sign as it is seen, heard or otherwise experienced, and its content as that to which the form refers. This, however, led to the idea that form is merely an arbitrary container which is meaningless in itself and from which content – meaning – could be extracted without an active process of interpretation.[71] In the search for a solution and more generally for an answer to the question of how signs generate meaning several steps can be discerned. The first step was taken by the Danish structuralist linguist and semiologist Louis Hjelmslev (1899 – 1966), who was greatly influenced by De Saussure. Hjelmslev's theory is very complicated in that it remains highly abstract and uses an elaborate impenetrable terminology,[72] which are probably reasons that explain why introductory semiological works do not always give full credit to Hjelmslev for ideas that were later incorporated, developed and successfully applied to the analysis of linguistic as well as nonlinguistic sign systems by others. Here, we focus upon one aspect of his theory which is most important to us: the idea of processes of selection and combination which, on the level of the sign, find expression in a stratification of De Saussure's sign-components, and on the level of the sign system in a schematized reconsideration of De Saussure's syntagmas and associative groups. Hjelmslev's account remained a static structuralist theoretical account and it was only in the following steps taken by Barthes and Jakobson that the processes of selection and combination were given an active role in the creation of meaning, even as processes underlying two cognitive patterns that are neurologically inherent to the human brain. This is discussed in sections1.c-d and in chapter 3. The present paragraph is presented to show how Hjelmslev arrived at the processes in the first place.

b.1 Stratification of the Saussurean sign

First, Hjelmslev reorganized the Saussurean sign into an 'expression-plane' (signifier) and a 'content-plane' (signified); expression and content became the sign-constituents of the Hjelmslevian sign.[73] Second, he stratified both planes in order to imbue De Saussure's immaterial psychological forms with substance (fig. II2-13); the sign, in both of its planes, was built up from purport, substance and form:

[70] Two versions of Hjelmslev's *Prolegomena to a Theory of Language*, first published in 1943, were used for this chapter. The version from 1953 is stored in the University Library in Leiden, but appears to be a summary of the complete work. The version from 1969 is complete can be read online against payment: (https://www.scribd.com/doc/130368171/Hjelmslev-1961-Prolegomena-to-a-Theory-of-Language).
[71] Chandler, *Semiotics*, 56.
[72] Cf. Eco's critique on Hjelmslev's theory in 'The Influence of Roman Jakobson on the development in semiotics' in Armstrong & van Schooneveld, *Roman Jakobson*, 41; also cited in Nöth, *Handbook of Semiotics*, 65.
[73] Hjelmslev, *Prolegomena* (1969), 47; Taverniers, 'Hjelmslev's semiotic model of language', *Semiotica* 171 (2008), 368-369.

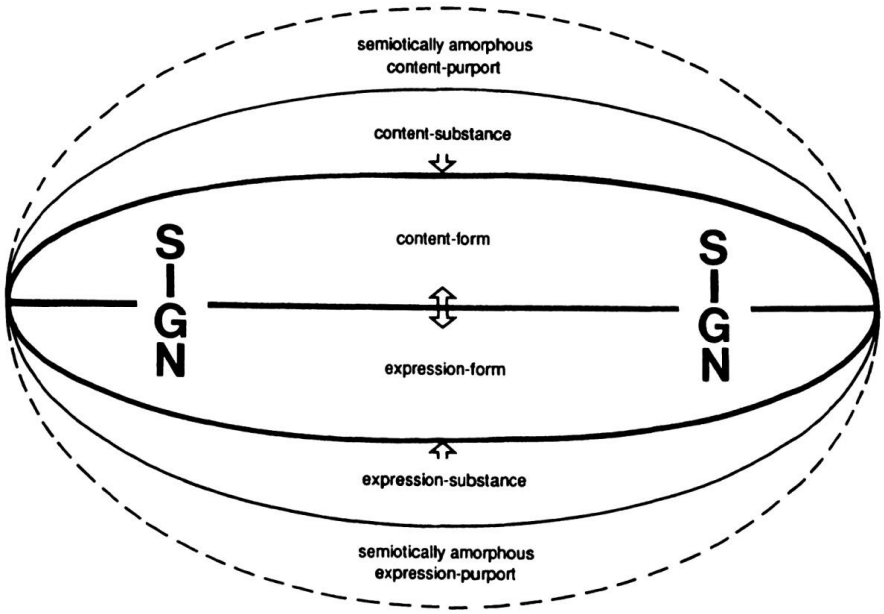


Fig. II2-13 The Hjelmslevian stratified model of the sign in which the form-strata of a sign system shape formed substances out of the purport to act as the content-plane and expression-plane of a sign. Based on Nöth, *Handbook of Semiotics*, 67.

Hjelmslev agreed with De Saussure that semiology was first and foremost a science of forms, not of substances. The strata of form remained for him the core and primary objects of semiological research; hence the restriction of the term 'sign' to these strata. However, he emphasized that the expression and the content of a sign do not simply exist: they are the result of a 'forming process'. The ultimate sign consists of a signifying plane, which is substance given form as expression, and a signified plane, which is substance given form as content.[74] The stratifications of this forming process with regard to the linguistic sign can be described as follows (summarized in fig. II-2-14 below):

Every sign begins with purport. Signs do not simply exist; their constituents, expressions and contents are selected and formed out of a vague, shapeless, indistinct nebula: an amorphous presemiological sphere that lacks any semiological structure in itself.[75] Hjelmslev introduced the term purport to designate this nebula; Eco later spoke of 'matter'.[76] In the content-plane, content-purport is an amorphous thought-mass: a mass of all potential concepts, thoughts, notions and senses that can serve as content. In the expression-plane, expression-purport is mass of all potential phonetic and phonological expressions: a mass of 'amorphous, unanalyzed sequences of sounds', or a 'vocalic continuum'.[77] Purport is common to all languages; that is, all languages draw from this amorphous presemiological mass of potentials.

Each language selects from the purport those concepts and sounds to be given form by content-, respectively expression-forms. Content- and expression-forms are abstract notions of concepts and patterns, or moulds, that differ from language to language. They are defined on the level of the sign system in relation to other concepts and patterns; that is, in oppositive relation or negative

[74] Hjelmslev, *Essais linguistiques*, 34-43, 27.
[75] Hjelmslev (in *Prolegomena* (1953), 31-32 and (1969), 51-52) follows an idea that was already suggested by De Saussure, *Course in General Linguistics*, 110-111: 'In itself, thought is like a swirling cloud, where no shape is intrinsically determinate. No ideas are established in advance, and nothing is distinct, before the introduction of linguistic structure … [to] this nebulous world of thought'. Cf. Nöth, *Handbook of Semiotics*, 61, 66-67; Chandler, *Semiotics*, 18-19. Also compare the concept of purport to the pool of visual communication that is suggested as the source from which marking as well as writing systems developed in Part III, chapter 2.
[76] Eco, referred to in Nöth, *Handbook of Semiotics*, 66-67.
[77] Hjelmslev, *Prolegomena* (1969), 52; Taverniers, 'Hjelmslev's semiotic model of language', *Semiotica* 171 (2008), 378.

differentiation.[78] In fact, they constitute the linguistic structure (*langue*) on the level of the system. On the level of the sign, they are patterns of sounds in the expression-plane: phonological patterns that are particular to a language. In the content-plane of a sign, they are abstract notions of content which are defined in relation to the expression-form with which it constitutes a unit that functions as a sign in a language.[79]

As soon as a language starts drawing from the purport (i.e. applies its forms onto the purport), the purport is formed into substance. In other words, as soon as purport is viewed from the perspective of a particular language, it is given substance by that language.[80] This means that the phonological patterns which exist in the expression-plane and the abstract notions which exist in the content-plane shape from the purport particular expressions and contents:

- in the expression-plane, the pronunciation of a particular sequence of sounds, for instance by an individual or in a specific context. This particular sequence has the potential to become an instant manifestation: a manifestation of a sequence of sounds;
- in the content-plane, a particular content that can apply to a particular situation or context.

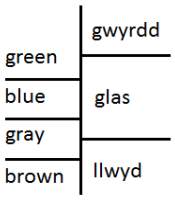
These particular expressions and contents thus have the potential to become instant manifestations, and as such they can become *parole*, which Hjelmslev renamed *usage*. They are in fact the components of signs that really stand for something.[81] The generation of substance on both planes of the sign is necessarily a result from the shaping of the purport by sign-forms. Hjelmslev did not consider purport an actual part of the sign, and consequently did not allocate it an active role in his theory (hence the dotted lines in Fig. II2-13), but at the heart of this theory on the formation of signs lies his emphasis on the idea that it was by imposing the structure of the form-strata (*langue*) onto purport that a sign came to be constituted of an expression and a content that were both formed substances (*parole*).[82]

	Form	Substance	Purport
Content plane	***Content-form:*** Aspects of content defined in relation to other elements of content within one language, and in relation to an expression plane	***Content-substance:*** The 'meaning' of a sign in a particular context (*Semantics*)	***Content-purport:*** Amorphous, unformed thought mass
Expression plane	***Expression-form:*** *Phonology* Phonemes: sound-expressions defined in relation to other sound-expressions within one language, and in relation to a content plane	***Expression-substance:*** *Phonetics* The pronunciation of a sound sequence by a particular person, hic et nunc	***Expression-purport:*** Amorphous, unformed sound sequence

Fig. II2-14 The form-, substance-, and purport-strata within the content- and expression-planes of a linguistic sign. Taverniers, 'Hjelmslev's semiotic model of language', *Semiotica* 171 (2008), 379.

[78] This idea is analogous to De Saussure's relational concept of negative differentiation; the content- and expression-forms of a sign are defined in relational context with other signs. Cf. section a.3 above, and the example of the color-spectrum below.
[79] Hjelmslev, *Prolegomena* (1969), 54; Taverniers, 'Hjelmslev's semiotic model of language', *Semiotica* 171 (2008), 377.
[80] *Ibid*..
[81] Hjelmslev, *Essais linguistiques*, 80-89; Barthes, *Elements of Semiology*, 17-18; Taverniers, 'Hjelmslev's semiotic model of language', *Semiotica* 171 (2008), 384.
[82] Nöth, *Handbook of Semiotics*, 68-69. Hjelmslev was not the first to propose such a forming process. Von Humboldt had already argued that the matter of language consisted partly in sounds, partly in unformed thoughts, the sounds being formed by the 'Lautform', the thoughts by the 'Ideenform' or 'innere Form' of language. Nöth, *Handbook of Semiotics*, 68, referring to Fischer-Jørgensen in *Acta Linguistica Hafniensia*, 2. For further comparison between Hjelmslev and Von Humboldt, see also Trabant, 'Louis Hjelmslev' in Krampen et al., *Classics of Semiotics*, 89.

Every language shapes purport differently into formed substance. Hjelmslev argued that 'Just as the same sand can be put into different moulds', purport is shaped into formed substance by different moulds, i.e. structures or patterns of forms.[83] Therefore, each language consists of different linguistic signs. The forming process can be exemplified with the 'amorphous continuum' of the color spectrum. In the content-plane, every language acknowledges a particular number of colors, because it imposes its own conceptual boundaries upon the purport that is the color spectrum. In the expression-plane every language applies its own phonological patterns onto the spectrum, resulting in particular names for colors. Consider the differences between the linguistic signs that exist in modern English and Welsh to designate the following colors (fig. II2-15):



- 'green' in English is 'gwyrdd' or 'glas' in Welsh;
- 'blue' in English is 'glas' in Welsh;
- 'gray' in English is 'glas' or 'llwyd' in Welsh;
- 'brown' in English is 'llwyd' in Welsh.

Fig. II2- 15 The English and Welsh color spectra. Hjelmslev, *Prolegomena* (1969), 53.

The purport contains all potentials that are in the color spectrum: all potential contents of colors in the content-plane, and all potential expressions for colors in the expression plane. In the content-plane, the conceptualizations of color that exists in English (the content-forms) shape four different content-substances: the particular colors *green*, *blue*, *gray* and *brown*. In the expression-plane, the phonological patterns that exist in English shape four different expression-substances as particular designations: 'green', 'blue', 'gray' and 'brown'. Welsh, however, has different conceptualizations of color, and shapes three content-substances: the particular colors *gwyrdd*, *glas* and *llwydd*. In the expression-plane, it has formed the particular expressions 'gwyrdd', 'glas' and 'llwydd'. Because the content-substance of *green* in English is conceptualized partly by what Welsh perceives as *blue*, Welsh has formed two different signs for *green* with two different expressions. On the other hand, because the content-substance of *glas* in Welsh is conceptualized by what English perceives as *green*, *blue* and *gray*, English has formed three different signs for *glas* with three different expressions. In a similar way languages conceptualize and designate morphological classes in different ways. Some languages, such as modern English or modern Dutch, know only the twofold distinction between *singular* and *plural* in the content-plane (a distinction between 'singular' and 'plural', or 'enkelvoud' and 'meervoud', in the expression-plane). Others, such as Arabic or ancient Egyptian, impose a different notion of plurality on the purport of morphological classes, thereby producing further content-substances such as *duality*.[84]

Although Hjelmslev's account remained an abstract theoretical account which departed only from language as a linguistic sign, his model of the stratified sign can also be applied to a system of visual communication such as photography, in which each stratum adds significant information to the overall photograph:

[83] Hjelmslev, *Prolegomena* (1969), 52; cf. Nöth, *Handbook of Semiotics*, 68-69.
[84] Hjelmslev, *Prolegomena* (1953), 33 and (1969), 53; Nöth, *Handbook of Semiotics*, 69-70.

- The expression-form of a photograph would be the technique and style used in its production, such as realism, pop-art, portrait, sepia, or black and white;
- The expression-substance would be the actual, physical materials and adjustments used in production, such as the make and type of the camera, the sort of photographic paper, the objective used (e.g. fish-eye), or the exposure time used;
- The content-form would be the concept pattern, or genre, in which the photograph is taken, for instance documentary photography, travel photography, or commercial photography;
- The content substance is the actual photograph in a particular news article, for instance, as an actual instance of documentary photography; or at the World Press Photo as an actual instance of documentary photography; or in an advertisement as an actual instance of commercial photography; or in National Geographic Travel as an instance of travel photography;
- The purport would contain all potential photographs, in all potential styles and techniques in the expression-plane, and all potential contents in the content-plane.

Fig. II2-16 shows a photograph from the database Symbolizing Identity. The content-substance is the actual manifestation of the photograph in the research database (codified, in fact, in the URL link).
As a photograph taken for study, it belongs to the content-form of documentary photography. The form of expression had to be as realistic and clear as possible, capturing the details as they occur on the ostracon itself. The expression-substance consists of the actual materials and adjustments that were prescribed by such a realistic and clear style.

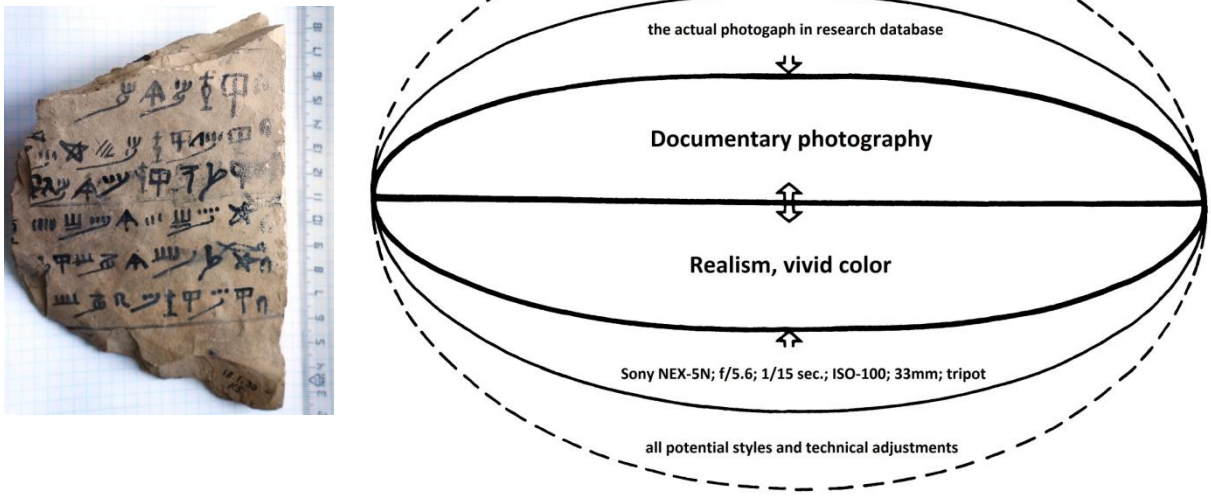


Fig. II2- 16 Study photograph of O.IFAO ONL 6536 and its analysis as a Hjelmslevian sign. Photograph by the author.

The Hjelsmlevian process of creating signs is in fact a process of categorization (by imposing concepts onto purport to create formed substantiated content) and of labeling (by imposing phonological sound patterns onto purport to create formed substantiated expressions). In other words, the form-strata categorize and label purport into substances which are proper to specific sign systems. Such semiological structuring processes can be related to cognitive hypotheses on linguistic relativism, such

as the Sapir-Whorf hypothesis, which argues that different languages encode different categories and that speakers of different languages therefore perceive and think about the world in different ways. Underlying such hypotheses is classification theory, or taxonomy.[85] As a theory belonging to the field of cognitive linguistics, it exposes the conceptual and deep structured system of wor(l)d-classification which is sustained by the members of a certain community or society and underlies their selection of those signs, which are considered suitable for visual communication. Goldwasser has applied the theory in a study on Egyptian determinatives, or classifiers, which add semantic information to an otherwise complete (pictorially and/or phonetically) written word, and therewith hint at the existence of conceptual categories that constitute the cognitive structure underlying ancient Egyptian hieroglyphic script. We explain this with an example (fig. II2-17):

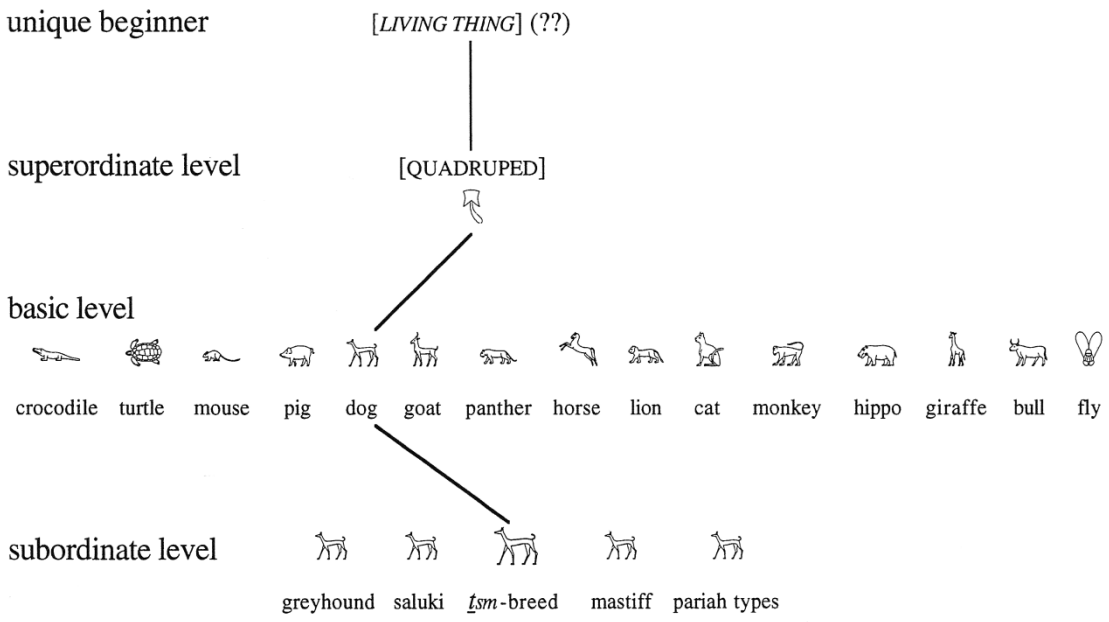


Fig. II2- 17 Levels of taxonomic classification. Goldwasser, *Prophets, Lovers and Giraffes*, 31.

The taxonomic levels that are found in classification theory are constructed hierarchically, from the most abstract term to the individual instance. This phenomenon is called 'hierarchy of categorization'. The levels include:

- a unique beginner, which is the highest, and most inclusive term of categorization, an abstract pattern such as [ANIMAL];
- a superordinate level, which in linguistic systems is often a collective or mass noun. In every taxonomy there is only one superordinate level, for instance [QUADRUPED];
- a basic-member level, the members of which show a high level of occurrence; they are the signs most frequently used in (visual) communication, for instance , '*kꜣ*';

[85] Outlined by Rosch, e.g. in 'Cognitive reference points', *Cognitive Psychology* 7 (1975), 532-574; 'Cognitive representations of semantic categories', *Journal of Experimental Psychology: General* 104 (1975), 192-233; 'Principles of categorization', in Rosch & Lloyd (eds.), *Cognition and Categorization*, 28-49. See also Goldwasser, *Prophets, Lovers and Giraffes*, 27; Nöth, *Handbook of Semiotics*, 69; Harley, *The Psychology of Language*, 89-98; Fromkin, Rodman & Hyams, *An Introduction to Language*, 311.

- a subordinate level with signs that may, but do not necessarily, further specify the signs on basic level, and may refer to their particular instances and manifestations.

Every level in this taxonomic categorization is included in the one above in a 'set-inclusion' relation. This relation can be called an 'IS-A relation' (e.g. 'a bull IS A quadruped', 'a quadruped IS AN animal').[86] The greater the inclusiveness of a category in a given taxonomy, the higher the level of abstraction.[87]

The analogy with the Hjelmslevian process of sign-formation lies here: the unique beginner and superordinate levels are abstract patterns, forms, or abstract concepts on the level of the sign system with which the ancient Egyptians approached the purport, and attempted to make sense of it, i.e. classify it. The purport contained the entire repertoire of representations and contents, which could be used to represent the world, available to the culture. Applying the concepts of [ANIMAL] and [QUADRUPED] onto the purport, the Egyptians *selected* particular contents (e.g. *kꜣ*, *ssmt*, *rrj*, *mjw*, *kyw*, *db* or *mmj*)[88] and particular (hieroglyphic) expressions (e.g. , , , , , ,) to be *combined* as formed substances into a basic-level member *sign*. These basic-level member signs were prototypical signs, the most frequently used hieroglyphs which could act as representatives for a whole group. As such, they can be called 'signs elect' and compared to the determinatives and discussed in the previous section.[89] However, in addition to these prototypical basic-level members, the graphic variation of the hieroglyphic script allowed to now and then strengthen or nuance a message by selecting slightly different formed substances for content and expression, therewith replacing a basic-level member sign with a subordinate-level member sign. In Hjelmslevian terms, both basic-level member signs and subordinate-level member signs are selected formed substances combined into hieroglyphs, given form by the application of the conceptual abstract form-strata onto the purport. Fig. II2-18 visualizes the process: `

[86] In the next paragraph we will see that this is not the only relation that exists between determinatives and the word they classify. Cf. Goldwasser, *Prophets, Lovers and Giraffes*, 33-35.
[87] *Ibid*., 29-31.
[88] WB V, 94.7; WB IV, 276; WB II, 438.7; WB II, 42.1; WB V, 110.4; WB V, 433.14; WB II, 58.14.
[89] See p. 123 above. The term 'sign elect' refers to Goldwasser's 'signifier elect' in *From Icon to Metaphor*, 8-10, 31-34.

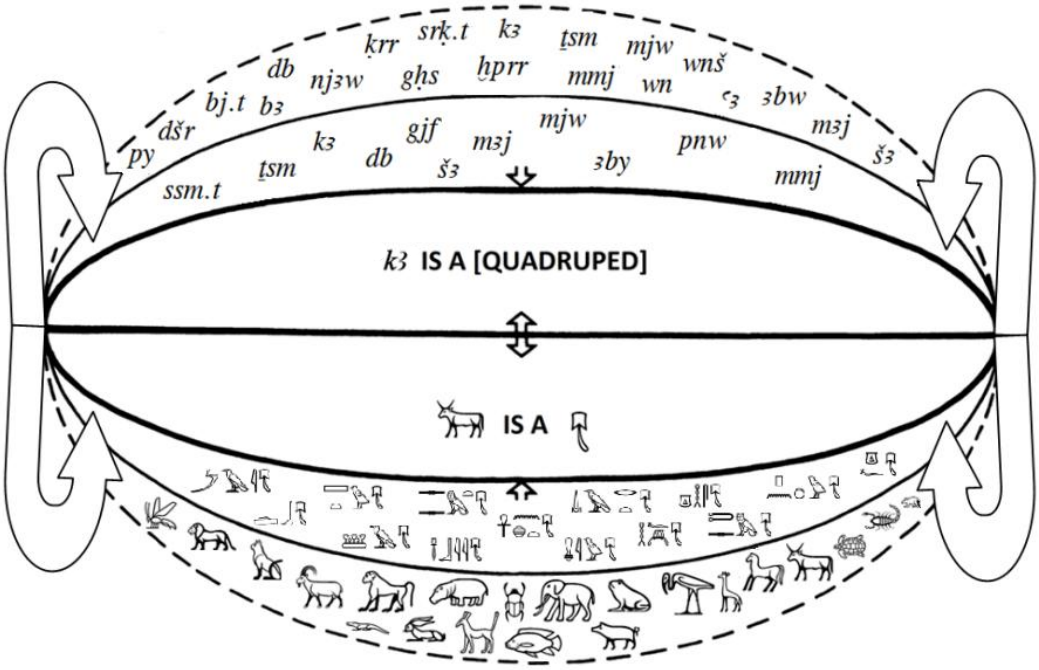


Fig. II2-18 Taxonomic classification of the superordinate category [QUADRUPED] as a Hjelmslevian process of sign formation. The purport contains all possible expressions and representations. The form strata of 𓃀 in the expression-plane and [QUADRUPED] in the content-plane select from it their basic-level members (i.e. particular instances of the form-strata), of which 𓃒, *kꜣ*, has become the formed substance.

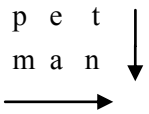
An accommodation of hieroglyphic signs in the model does lead to problems, because we need the phonetic and pictorial trails which Goldwasser introduced. Thus, it is true that ancient Egyptian had neither an expression- nor a content-form for the unique beginner. At least until the appearance of Demotic, it also did not have a content-form for the superordinate level [QUADRUPED], for which it also had no phonetic expression, but it did have a pictorial expression: the classifier 𓃀. All members belonging to this category may take this 𓃀-classifier, by means of which the script thus indicated the existence of a category that did inhabit the conceptual space of the ancient Egyptian world, but which had neither content-form nor phonetic expression. Goldwasser calls such cases 'covert categories', whose existence as a conceptual content can be inferred only from the visual script, while in language they were not labeled.[90]

Nevertheless, fig. II2-18 shows that from Hjelmslev's semiotic perspective on the cognitive process of sign formation it can be inferred that selection and combination are key processes: selection of content and expression in a cognitive categorization process of the purport, and their combination into signs used to represent the world. The processes of selection and combination automatically involve the addition of substance to the sign as shaped, or given form, out of the amorphous nebula of the purport. This was Hjelmslev's most important contribution to semiology on the level of the sign.

[90] Goldwasser, *Prophets, Lovers and Giraffes*, 31, 36-38.

b.2 Reconsideration of the sign system: syntagmatic versus paradigmatic relations

Hjelmslev agreed with De Saussure that it is merely by virtue of relations on the level of the sign system that the full meaning of signs can be analyzed.[91] It has been mentioned above that the form-strata of a sign are defined in relational context on the level of the sign system. This means that the formed substances which ultimately are the content and expression of a sign are also defined and imbued with value in relation to other signs. Thus, the formed substance *green*/'green' is defined in relation to the formed substances *blue*/'blue', *gray*/'gray', and *brown*/'brown'.[92] Among the relations that exist between signs on the level of the sign system Hjelmslev described two that have become particularly influential in later semiological works: the 'both – and' or conjunction relations, and the 'either – or' or disjunction relations.[93] He gave the following example:[94]



In the words 'pet' and 'man', along a horizontal axis, there is conjunction between the letters 'p', 'e' and 't', and between 'm', 'a' and 'n'. These are signs that co-exist in conjunction and are combined in a process of forming bigger signs, that is words. The same process can be imagined for words, which in conjunction are processed into sentences, or for sentences processed into even bigger units. Along a vertical axis there is disjunction between 'p' and 'm', between 'e' and 'a', and between 't' and 'n'. In each set, one of the members is selected: either 'm' or 'p', either 'e' or 'a', either 't' or 'n'. Different selections would result in different words ('mat', 'pen', 'men', 'pat', 'pan', 'met'). Hjelmslev called these sets of members paradigms.

The horizontal axis Hjelmslev designated as relational or syntagmatic axis; the vertical axis as correlational or paradigmatic axis. The axes are now also known as the syntagmatic and the paradigmatic dimensions of a sign system, represented as in fig. II2-19. The relation of conjunction in the syntagmatic dimension is similar to De Saussure's syntagmatic relations; the conjunctions to his syntagmas. The relation of disjunction in the paradigmatic dimension is similar to De Saussure's associative relations; the paradigms to his associative groups. A difference between the theories of Hjelmslev and De Saussure is that, while the latter granted special status to the syntagmatic dimension due to his focus on spoken language which, he argued, can only be uttered in linear syntagmatic sequence,[95] Hjelmslev argued that disjunction in the paradigmatic dimension is a necessary

[91] Hjelmslev, *Prolegomena* (1953), 13-14, 18-19; Hjelmslev, *Essais linguistiques*, 34.
[92] And in Whelsh, the formed substances *gwyrdd*/'gwyrdd', *glas*/'glas', and *llwyd*/'llwyd' are each defined in relation to each other.
[93] Hjelmslev, *Prolegomena* (1953), 22-25 and (1969), 36-41. The conjunction and disjunction relations are in fact specifications of three other relations of dependence between signs, which Hjelmslev calls 'functions'. They are 'determination' (one sign depends on another for its meaning, nature and function within the system), 'interdependence' (two signs depend on each other for their meaning, nature and function within the system), and 'constellation' (two signs do not depend on another for their meaning, nature and function within the system). An example of determination is the color green in a traffic light, which means 'proceed', but in that meaning depends on the color 'red' in the same traffic light; the color red, however, does not necessarily depend on green to mean 'stop' as it occurs in that meaning in many other traffic signs without green. An example of interdependence are the concepts of 'light' and 'dark': 'light' is only defined in relation to darkness and vice versa. An example of constellation are the pictograms and , which are part of the same pictographic system but do not depend on one another in meaning.
[94] Hjelmslev, *Prolegomena* (1953), 22 and (1969), 36.
[95] Linearity of the sign was one of De Saussure's 'principles of the sign'. De Saussure, *Course in General Linguistics*, 69-70.

precondition for conjunction in the syntagmatic dimension. It is the opposition between the members of a paradigm that is a precondition for the selection of one among them as part of a syntagma.[96]

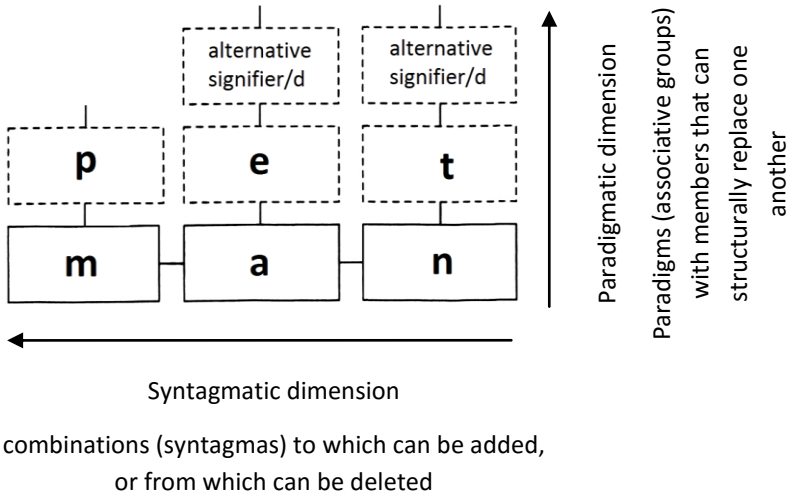
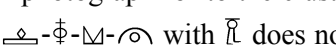


Fig. II2-19 The schema of syntagmatic and paradigmatic dimensions of a sign system. Adapted from Chandler, *Semiotics*, 84 (fig. 3.1).

Since the paradigmatic dimension has such a primary role in defining the value of a sign, it is of importance to provide a narrow definition of paradigms. Whereas De Saussure had argued that it is impossible to say in advance how many and which members an associative group will contain, Hjelmslev advocated that this could be defined by the commutation test. The members of a paradigm are signs which are all members of some defining category. In linguistic systems they are often members of grammatical groups (e.g. nouns, verbs, adjectives) or sets of consonants or vowels.[97] The members can structurally replace one another. Yet, the choice for one, therewith excluding or substituting others, shapes a specific meaning. The commutation test determines whether a change in the sign selected leads to a change in meaning. For instance, a first step is to select from a sign system a sign, which may be a consonant in a word or a noun in a sentence. Then, alternative consonants respectively nouns are considered. The effects of each substitution are evaluated in terms of how this might affect the sense made of the bigger sign thus formed (i.e. the word resp. sentence).[98] In the example of 'pet' and 'man' on the previous page, one might select the consonant 'm' and study how the meaning of the word is changed when 'm' is substituted with 'p' ('pan'), or with 'r' ('ran'), or with Ø ('an'). All three substitutions lead to words that are existent within the system of modern English language, and thus 'p', 'r' and Ø are all members of the paradigm from which 'm' is selected in order to convey the specific meaning of 'man'. In contrast, substitution of 'm' by 'g' (*'gan') results in a non-word; 'g' is therefore not a member of this paradigm. In similar manner, the members of the paradigm to which the signifiers 'a' and 'e' belong may be identified and evaluated; as also the members of the paradigm to which 'n' and 't' belong. The commutation test can also be applied in other systems of visual communication which are not couched in linguistic form, for instance

[96] Hjelmslev, *Prolegomena* (1953), 22-24.
[97] Chandler, *Semiotics*, 85.
[98] *Ibid*., 89.

photography: one may test how a change in the setting, or the light, or the objects or persons photographed changes the meaning of the photograph. When such a change is meaningful, then 'setting', 'light', 'objects' respectively 'persons' is a paradigm in the system of photography.[99] We return to this idea of commutation in photography in the next section on Barthes, where specific examples are given.

The commutation test thus involves the study of transformations in the paradigmatic dimension that result in transformations in the syntagmatic dimension and in overall change of meaning. Chandler mentions four basic transformations that the commutation test may study: substitution and transformation of members in the paradigmatic dimension, and addition or deletion of signs (e.g. selecting Ø in the paradigmatic dimension in the case of 'an') in the syntagmatic dimension. By means of the commutation test, the syntagmas and paradigms that are meaningful in a sign system in that they provide the structural context within which signs make sense can be identified.[100] In the system of identity marks from Deir el-Medina this idea is useful in interpreting clusters or sequences of marks and in identifying contemporaries or even more specific teams of workmen. The individual workmen are members of paradigms, and the clusters or sequences are syntagmas. Consider the clusters of marks on the ostraca represented in fig. II2-20. We can substitute marks from the cluster in photograph 'a', or add marks to it from the repertoire in photograph 'b', and see whether the new cluster is meaningful in the system. For instance, if we add the mark from the ostracon in photograph 'b' to the cluster in photograph 'a', we find that the new cluster  with does not occur in the mark material. The workmen with the mark is not a member of the paradigm of which the workmen with marks and are members. That conclusion supports the dates given to the ostraca: dynasty 18 for the ostracon in photograph 'a', and dynasty 20 for the ostracon in photograph 'b'. If the workman with mark was not a contemporary of the workmen listed on the ostracon in photograph 'a', he cannot have been a member of their paradigm, which is defined as consisting of workmen from dynasty 18.

When we look at two other examples in fig. II2-21, both dated to dynasty 20, we can assume that the workmen represented on both ostraca are all members of the paradigm which consists of workmen from dynasty 20. However, when we substitute the mark in the sequence in photograph 'a' by from the sequence in photograph 'b', and we compare the new sequence to the marks ostraca in general, we see that this sequence is not found. That is, all three marks do occur together once, on ostracon Turin CG 57008, but they are separated from each other and occur in different columns. That they are not found in sequence may be due to the fact that we do not have all records with marks, but it may also be due to the fact that the workman with mark was a member of the left-side-crew, while the workmen with marks and were members of the right-side-crew. In fact, all marks in photograph 'a' represent workmen from the right side, and all marks in photograph 'b' represent workmen from the left side. We then have at least two sub-paradigms for dynasty 20: workmen from the right side and workmen from the left side. Although workmen from both sub-paradigms 'right' and 'left' may occur on the same ostraca, meaningful sequential syntagmas are found especially within the 'right' and 'left' sub-paradigms. This conclusion has been decisive in the interpretation of damaged marks. For instance, the damaged mark in ostracon DeM 10121 (fig. II2-22) shows remains that could be interpreted either as the mark or as the mark . However, since all other marks on the ostracon

[99] Chandler, *Semiotics*, 89.
[100] *Ibid*., 84.

refer to workmen from the left side, and the mark 𓀀𓏏 belonged to the workman *Jmn-nḫt* (xxvi) who worked on the right side, we prefer restoring the remains to 𓀀𓏏, the mark which belonged to *ꜥ3-p3-ṯ3w* (i) from the left side.

a.

b.

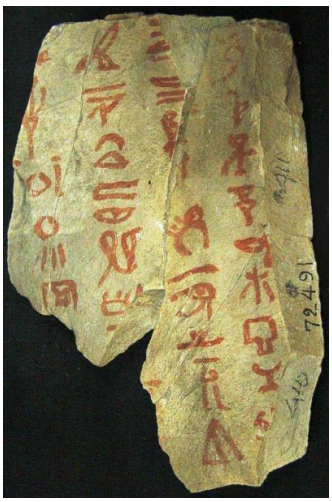
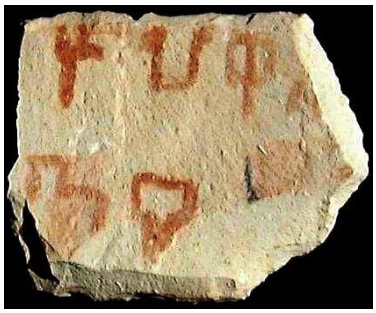


Fig. II2-20a. OWV 05 and **b**. Cairo JE 72491

a.



b.

Fig. 2II-21a. ARTP 99-029 and **b**. IFAO ONL 6217

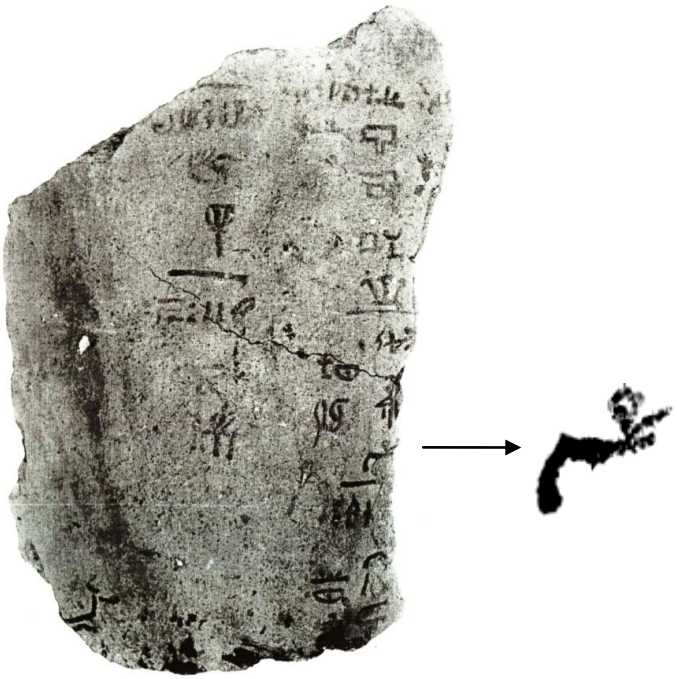


Fig. II2-22 DeM 10121

The ostraca are thus messages, the marks of which are selected form paradigms, which are delimited first of all by temporal boundaries. The members of these paradigms are workmen: we have a paradigm with workmen from dynasty 18, a paradigm with workmen from dynasty 19 and a paradigm with workmen from dynasty 20. These paradigms can be subdivided into sub-paradigms, for instance the sub-paradigms that have as members the workmen working on the 'right' side of the crew and the workmen working on the 'left' side of the crew. It is from these paradigms and sub-paradigms that the messages are composed; the sequences of these messages reflect the organization of the work.

b.3 Summary and discussion

Hjelmslev's theory centers around formal structures and relations in signs and sign systems, in which the processes of selection and combination have key roles. On the level of the sign, he argued for a stratified structure of the sign into three levels that are each separate stages in the process of sign-formation, and for the selection of expressions and contents to be combined into a sign. On the level of the sign system, he argued for a functional structure of sign systems characterized by a paradigmatic and syntagmatic dimension, and for the selection of signs from paradigms and their combination into syntagmas to form bigger signs. His most important contribution to semiology was the attribution of substance to signs, which naturally results on the level of the sign from the creation of signs out of the amorphous presemiological, unstructured purport. Traditionally, a sign was defined as something which stands for something else (*aliquid pro aliquo*); Helmslev had now projected this definition onto the content-plane stating that 'a sign is a sign for something' because 'the content-form of a sign can subsume that something as content-substance'.[101] The content-plane of a sign was now a 'Ding an sich' shaped out of the purport, and the expression plane was a 'sound as such' shaped out of the purport.[102]

Yet, we stumble across problems. Hjelmslev's model and theory still do not provide the possibility to distinguish between workmen who used the same identity mark at different periods, a problem which we saw with in the previous section. We can still not accommodate the referents. Although a sign now had substance, it still had no particular referent in the real world. The Hjelmslevian sign, as a substance, has the potential to refer to particular instances, but *it does not include these particular instances in the generation of its meaning*. This means that *Jn*(*j*)-*ḥr*-*ḫʿw* (i) and *Jn*(*j*)-*ḥr*-*ḫʿw* (ii) are still not part of the meaning of the marks and ; the theory does not perceive these marks as two different marks with different meanings. Furthermore, as we have noted, the theory does not include the pictorial and phonetic trails of signification, which are necessary in the analysis of signs from a pictorial script.

[101] Hjelmslev, *Prolegomena* (1953), 57. This principle became a dogma for the neo-Hjelmslevians, among whom are Greimas and Eco. For *aliquid pro aliquo*, see p. 106 above.
[102] Taverniers, 'Hjelmslev's semiotic model of language', *Semiotica* 171 (2008), 383.

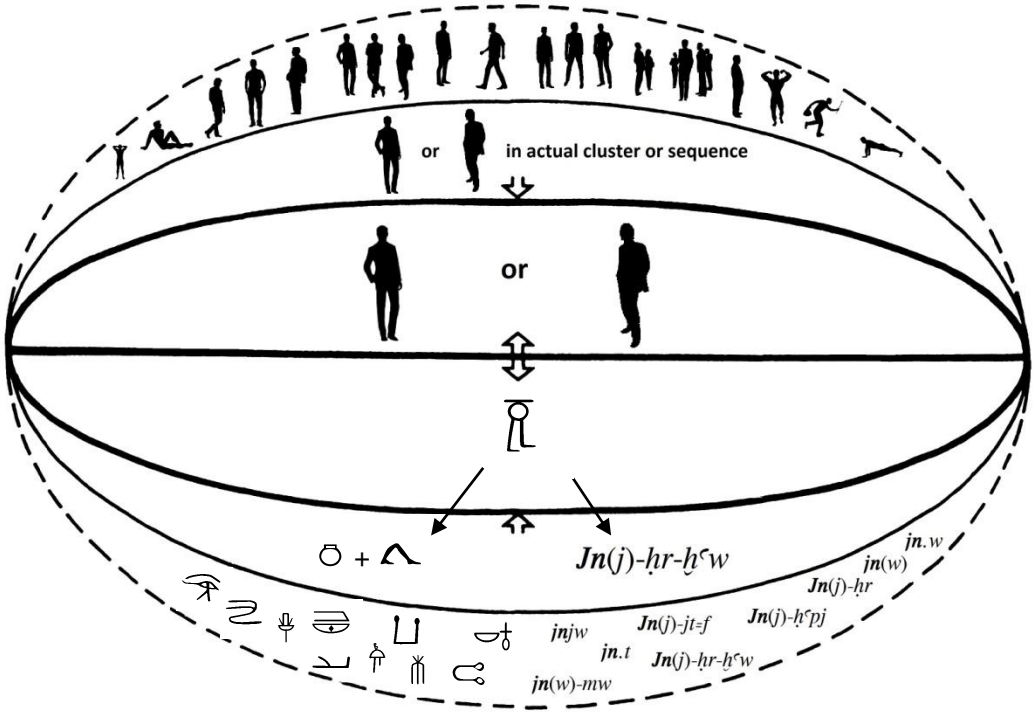


Fig. II2-23 The problem of accommodating referents in Hjelsmslev's sign model.

There are many things wrong with the model in fig. II2-23. First, we cannot distinguish between pictorial and phonetic value of the mark in the expression-plane, which makes the overall meaning of the mark ambiguous and the interpretation of the mark by a receiver a difficult and confusing task. Second, we cannot distinguish between *Jn(j)-ḥr-ḫʿw* (i) and *Jn(j)-ḥr-ḫʿw* (ii) in the content-plane. In the stratum of content-substance a distinction between the two men could be indirectly inferred when on the level of the system the two possibilities are considered on the basis of the particular occurrence of 𓀀 in an actual sequence or cluster of marks; that is, the specific content-substance which is meant (*Jn(j)-ḥr-ḫʿw* (i) or *Jn(j)-ḥr-ḫʿw* (ii)) can be inferred from an analysis of the position of each of these men within a sequence of marks that belong to other workmen, in the syntagmatic dimension. Thus, if these other workmen lived in dynasty 20 during the reign of Ramesses III and worked on the left side of the crew, we may infer that it concerns *Jn(j)-ḥr-ḫʿw* (ii). However, a model does not do a very good job in visualizing a system with the aim to ease its interpretation when it leaves the scholar to make additional analysis for each and every mark to complement it with such crucial information.

Nonetheless, in the first half of the 20th century Hjelmslev's theory was an inspiring reconsideration of the basis De Saussure had laid. It was only too abstract and too theoretical, lacking application to communication systems other than (spoken) language. It has already been mentioned that the processes of selection and combination were developed and given a more concrete role in the creation of meaning by signs and sign systems by Barthes and Jakobson, but on the basis of his stratified sign model Hjelmslev already laid out the abstract foundations for a theory of meaning including denotation and connotation. For reasons of clarity (and to avoid repetition), this topic is discussed in the next section, for it was Barthes who developed this theory and gave it concrete application in linguistic, as well as other systems of visual communication.

c. Semiology according to Barthes

Roland Barthes, a French semiotician and cultural and literary theorist (1915 – 1980), was much influenced by the works of De Saussure and Hjelmslev, but he did not follow them in considering semiology a general science of which linguistics was only one part. Rather, he was of the opinion that every semiological system has linguistic admixture. Nonlinguistic signs are always combined with a linguistic message, for instance films in cinema, images in advertisements, pictures in comic books and photographs in press photography. He argued that 'it is far from certain that in the social life of today there are to be found any extensive systems of signs outside human language'.[103] In the rare case that a nonlinguistic sign would not be accompanied by a linguistic message, linguistic admixture would still be present in its meaning, for Barthes argued that meaning does not exist if not designated by our language. In other words, the only existent concepts are those expressed through language: no sign system can exist independent of it.[104] While this is in fact an extreme version of the Sapir-Whorf hypothesis which states that the form of our language determines the structure of our thought processes, which has proven not to be true but to a very limited extent,[105] Barthes was one of the first to explicitly notice an intimate relation between linguistic and nonlinguistic elements in every sign system; that is, no sign system is purely nonlinguistic.[106]

Barthes thus considered semiology to be part of linguistics. It was from the linguistic model that semiology had to extract its basic analytical concepts, which were subsequently to be applied to all sign systems. He himself was the first to explicitly apply semiology to an analysis of cars, furniture, garments, even architecture and food. In *Image Music Text* (1977) he provided a semiological account of photography and advertisement, while in *The Fashion System* (1967) he made his most detailed and exemplary semiological analysis of the language of fashion.[107]

c.1. Barthes' structural program

The concepts which Barthes extracted from linguistics were heavily influenced by the works of De Saussure and Hjelmslev. He proposed a program for systematic research in semiology, in which he made four selected concepts the core of four succeeding levels of structural analysis. Each level was characterized by one of the following dichotomies:

- *langue* versus *parole*;
- *signifier* versus *signified*, or *expression* versus *content*;[108]
- *denotation* versus *connotation*;
- *syntagmatic* versus *paradigmatic dimension*.

[103] Barthes, *Elements of Semiology*, 9.
[104] *Ibid*., 9-11; Nöth, *Handbook of Semiotics*, 312-313.
[105] Several psycholinguistic experiments have demonstrated that language merely has an indirect influence on cognition and only with regard to a few selected cognitive processes. Moreover, it has been mentioned in the previous paragraph that Goldwasser demonstrated the existence of concepts without representation in ancient Egyptian script ('covert concepts'). Harley, *The Psychology of Language* (2008), 89-98; Goldwasser, *Prophets, Lovers and Giraffes*, 30-31, 36-37.
[106] Cf. the argument by Elkins in the Introduction to this dissertation, pp. xviii-xix.
[107] Barthes, *Image Music Text*; ibid., *The Fashion System*; ibid., *Elements of Semiology*; Nöth, *Handbook of Semiotics*, 312.
[108] In his early work he used the Saussurean terms *signifier* and *signified*, while in *Elements of Semiology*, for instance, he used *expression* and *content*.

In the first two levels he mainly followed Saussure and Hjelmslev. He considered the dichotomy of *langue* versus *parole* an essential feature of linguistic analysis and argued how divergent systems of visual communication could be approached by determining, first, the set of differential rules or conventions which are necessary to communicate effectively and, second, the possibilities for the varied individual applications of those rules.[109] In the individual applications he particularly paid attention to the social usage of signs,[110] which became important in his further analysis of sign systems, especially in his ideas on connotation and ideology (see below). On the second level of *signifier* versus *signified* Barthes adopted the theory that signs consist of form and substance,[111] but he furthermore emphasized that substance was material. Although he agreed with De Saussure that the signified was first and foremost a non-material 'mental image', he acknowledged that the signifier at least needs some kind of matter to provide a necessary support for signification: 'the substance of the signifier is always material (sounds, objects, images)'.[112] He introduced the term 'typical sign' to designate groupings of signs with similar materiality: the verbal sign, the graphic sign, the gestural sign, and so forth.[113] He furthermore reconsidered the Saussurean idea that the link between signifier and signified is arbitrary. Concerning linguistic signs, he argued that the association between signifier and signified is never arbitrary, for no person is free to modify it. Rather, the association is *unmotivated* (although a lack of motivation in linguistic systems is only partial, for there are degrees of motivation in onomatopoeia and derivational signs).[114] Concerning semiological signs in general, he noted that *different degrees of motivation could co-exist in the signs of one single system*. For instance, the movements of honey bees to indicate the location of food ('the waggle dance') consist of a straight line (sign 1), which is highly motivated by analogy with the direction of food nearby, and of a figure-of-eight shape (sign 2), a figure that is less motivated and refers to food in more distant places.[115] This co-existence of various degrees of motivation within a single sign system is exactly the characteristic of systems of visual communication that was noted in Part I. It is explained by the greater or lesser extent to which semiotic systems show admixture with linguistics: the signs located in or near the domains of Writing and geometrical Notation generally show a lesser degree of motivation than signs located in or near the domain of Picture. With this co-existence of various degrees of motivation Barthes shifted de anthropocentric focus on human language to communication systems in broader

[109] Barthes, *Elements of Semiology*, 23-31.
[110] He adopted Hjelmslev's reinterpretation of *parole* as a concept of more social nature under the name 'usage'. *Ibid*., 13-25.
[111] He did not, however, let these strata play a direct fundamental role in his theories. Especially in his theory of connotation, derived from Hjelmslev, Barthes ignored the strata of form and substance. That is, in *Mythologies* (first published in 1957) he still attempted to assign form and substance a place and role, but in his later work, *Elements of Semiology* (first published in 1964) he left the strata out of the discussion. Indeed, it becomes clear that, as deep underlying theoretical structures that derive from pure linguistic analysis, they are not directly relevant to Barthes' simplified version of Hjelmslev's theory, which has much wider semiological application. In order not to complicate matters, to not repeat Hjelmslev, and to keep to the point we will not go into Barthes' earlier remarks on form and substance, but merely mention that the sign was considered to have substance, which should be clear already from the fact that semiology, for Barthes, had so many practical and particular applications. Barthes' theory of denotation and connotation is discussed below. Barthes, *Elements of Semiology*, 38-48; Nöth, *Handbook of Semiotics*, 310.
[112] Barthes, *Elements of Semiology*, 47, 33-34.
[113] *Ibid*., 47.
[114] *Ibid.*, 50-51.
[115] *Ibid.*, 52. Barthes argued that the figure-of-eight shape is unmotivated, but in fact the middle axis of the figure-of-eight refers to distance as well. The whole figure is only less motivated than the direct straight line of sign 1. A lot of literature can be found specifically on the dance of the bees, first and foremost Frisch, *The Dance Language and Orientation of Bees*, for which Karl von Frisch was awarded the Nobel Prize in 1973. See further e.g. Nöth, *Handbook of Semiotics*, 150-151 and Harley, *The Psychology of Language*, 54-55.

context. The nature of the various degrees of motivation was further worked out particularly by Peirce in his famous classification of signs (section 2).

c.2. Deeper structural analysis

Barthes' most important contribution to semiology, and most relevant in the present discussion on the transmission of meaning through signs, concern his third and fourth levels of structural analysis, to which we now turn.

The dichotomy denotation versus connotation

Whereas De Saussure had focused on signs that convey a single layer of meaning,[116] Hjelmslev had theorized that the interaction between the content and expression of a sign could recur at various levels of abstraction. He suggested the possibility that a sign, or in extension a semiotic system, could have multiple layers of meaning, which he called denotative and connotative.[117] However, he was only concerned with forming a theoretical framework for analyzing language and did not investigate the possibilities of such layers in further detail. Barthes took up the theory, developed it, and applied it to semiotic systems beyond language.[118]

He argued for the existence of two different orders in the production of meaning:[119]

- a first order, in which a sign simply consists of a signifier and a signified and produces denotative meaning. This is, in fact, De Saussure's sign model proper. Denotative meaning is understood as a primary, natural, literal, objective, pure, and universal meaning, an 'Edenic state', as Barthes said;[120]
- and a second order, in which connotative meaning is produced. A connotative sign uses a denotative sign as its signifier to which an additional signified is attached. Connotative meaning is a higher order of meaning, which applies to a particular situation and relates to a specific context.[121]

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[116] Although it appears from unpublished works that he did think about the possibility of other signifying processes working beneath or alongside the apparent signs. Goldwasser, *From Icon to Metaphor*, 37.

[117] Hjelmslev, *Prolegomena* (1953), 73, 116-119 and (1969), 114-124; Taverniers, 'Hjelmslev's semiotic model of language', *Semiotica* 171 (2008), 370.

[118] Barthes, *Mythologies*; ibid., *Elements of Semiology*, 89-94; ibid., *Image Music Text*; ibid., *The Fashion System*; Taverniers, 'Hjelmslev's semiotic model of language', *Semiotica* 171 (2008), 372-375; Nöth, *Handbook of Semiotics*, 310-313.

[119] Chandler, *Semiotics*, 138-140; Barthes, *Mythologies*, 110-114; Barthes, *Elements of Semiology*, 89-94. Two notes on terminology must be made. First, Barthes spoke of two staggered semiological *systems*: a primary and a secondary 'system'. I avoid the term 'systems', however, as it may confuse the reader with the term system already in use to distinguish the level of the sign and the level of the sign system. As we will see in the following, the theory of denotation and connotation finds application on both the level of the sign and the level of the sign system. Second, Barthes did not speak of 'meaning' as the product in the connotative order. 'Meaning' is the term reserved particularly for the first-order, denotative meaning. For the second-order connotative meaning Barthes rather used the term 'signification'. Again, I avoid the term 'signification' here in order not to confuse the reader with the Saussurean use of the term. Cf. Taverniers, 'Hjelmslev's semiotic model of language', *Semiotica* 171 (2008), 373; Barthes, *Elements of Semiology*, 89-90; Nöth, *Handbook of Semiotics*, 310-311.

[120] Barthes, 'Rhetoric of the Image' in Barthes, *Image Music Text*, 42.

[121] One of the most important differences between the theories on denotation and connotation as proclaimed by Hjelmslev and Barthes is that the notion of situation-specificity was not relevant in Hjelmslev's definition of the connotative sign. For Hjelmslev, connotation was simply another dimension of the sign. However, we will see in this and the following paragraphs that situation-specificity is in fact important in connotation. Taverniers, 'Hjelmslev's semiotic model of language', *Semiotica* 171 (2008), 375.

The first order with its primary meaning is an element of the more comprehensive connotative meaning in the second order. The denotative sign it produces becomes a mere signifier in 'un système sémiologique second', the product of which is the connotative sign (fig. II2-24).[122] Put differently, connotative meaning is generated in an order of meaning production that is constructed in a semiological chain with a denotative meaning at its base.[123] Barthes renamed the signifier of the connotative sign (i.e. the sign of the denotative order) connotator.

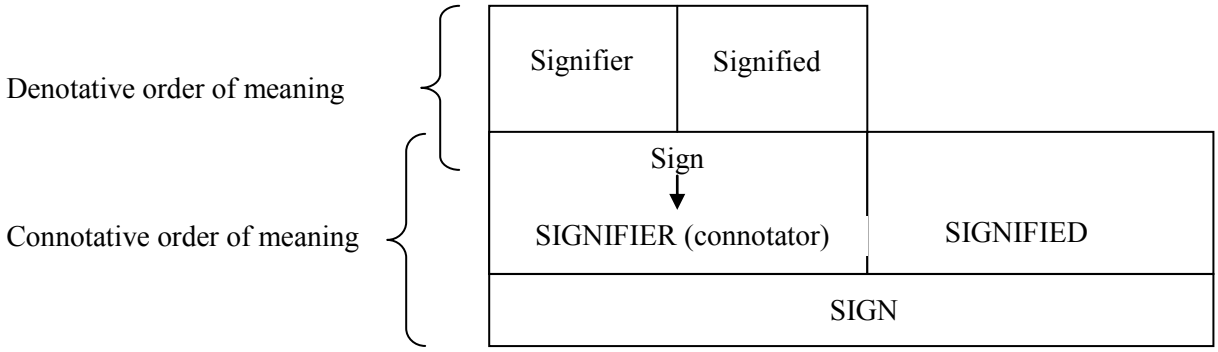

Fig. II12-24 Barthes' scheme of denotation and connotation. Signifier and signified together form a sign in a primary order of meaning production. This sign becomes a signifier ('connotator') in a second order of meaning production. Combined with a new signified it forms a connoted sign. Based on Barthes, *Mythologies*, 113.

In his early work (especially *Mythologies*), Barthes related connotation to what he referred to as myth. Whereas we usually associate myths with 'classical fables about the exploits of gods and heroes',[124] Barthes understood myth as the dominant ideologies of his time. The signified of the connotative sign he viewed more broadly as 'a fragment of ideology',[125] and connotation on the level of an entire system as mythology or ideology, because myths and ideologies contain deeper levels of meaning which presuppose a significant consciousness existing already as a primary meaning.[126] Barthes considered the analysis of signs, and as such the dismantlement of myths and ideologies, a tool in the scientific fight against cultural and social dominance by the bourgeoisie and the mass media: they create and enforce their own ideologies by attempting to give their messages a foundation in a natural, primary underlying meaning. In other words, they attempt to enforce their ideologies by making them seem obvious, and logical on the basis of a primary understanding, therewith concealing but suggesting the 'hidden messages'

Fig. II2- 25 The cover of Paris-Match. From Chandler online (http://visual-memory.co.uk/daniel/Documents/S4B/sem06.html).

[122] Barthes, *Mythologies*, 113.
[123] *Ibid.*; Taverniers, 'Hjelmslev's semiotic model of language', *Semiotica* 171 (2008), 373.
[124] Chandler, *Semiotics*, 143.
[125] Barthes, *Mythologies*, 138; Taverniers, 'Hjelmslev's semiotic model of language', *Semiotica* 171 (2008), 373.
[126] Barthes considered mythology and ideology metasemiotic sign systems of a higher order, in which a mythical or ideological metasign has as its signified (or content-plane) a complete sign system. As a sign, it speaks about a sign; as a sign system it speaks about a sign system. The clearest example of a metasemiotic sign system is linguistics: when we use language to speak or write about a language, the language we use to explain is a metalinguistic system. Mythology or ideology could be considered a metasemiotic system in that it has society as its signified. Barthes, *Mythologies*, 110-114; Barthes, *Elements of Semiology*, 89-90, 92-93; Nöth, *Handbook of Semiology*, 310-311.

they actually want to convey.[127] As an example of these orders of meaning will serve the famous and often cited cover of the French magazine *Paris-Match*, published in the mid-50s (fig. II2-25 above). The boy is the sign. The primary signifier is the photograph of him on the cover of the magazine. It denotes a black African boy in French uniform in the act of salute, 'with his eyes uplifted, probably fixed on a fold of the tricolour'.[128] The denotative meaning consists of the photograph of the boy denoting this signified. But beyond this denotative meaning there is a second, implicit signified of France being a great empire with 'all her sons, without any colour discrimination, faithfully, serving under her flag'.[129] The denotative sign as a whole, the photograph of the African boy in salute, becomes connotator in a second order of signification, forming a connotative sign with this implicit signified of Frenchness and militariness.[130] The full message of the photograph is then analyzed in these two orders of meaning. But the connotative message relates to a specific historical context. It functions as a myth in this context as it represents a fragment of the ideology of French imperialism, which implicitly justifies colonialism. In the words of Barthes, 'there is no better answer to the detractors of an alleged colonialism than the zeal shown by this Negro in serving his so-called oppressors.'[131] Barthes considered it the main task of semiology to offer a method to see through the dominance of such ideologies and put them up for discussion.

The dichotomy syntagmatic versus paradigmatic dimension[132]

Thus, it was important to be able to analyze layers of denotative and connotative meaning and to identify ideology on the level of the sign system as well. Barthes adopted from De Saussure and Hjelmslev the idea that messages are built from a combination of signs which are taken from sets of structurally substitutable variables; that is, they are built in the syntagmatic and paradigmatic dimensions. But he integrated his theory on denotation and connotation with this idea and accommodated it in the scheme of fig. II2-26:

[127] Thirlwell in Barthes, *Writing Degree Zero*, vii-xxii; Nöth, *Handbook of Semiotics*, 311.
[128] Barthes, *Mythologies*, 115.
[129] *Ibid.*, 115.
[130] *Ibid.*; Nöth, *Handbook of Semiotics*, 311.
[131] Barthes, *Mythologies*, 115.
[132] Barthes called this dichotomy 'syntagm versus system', for his term for the paradigmatic dimension was 'systemic' (*Elements of Semiology*, 59). We will, however, retain the terms paradigm and paradigmatic dimension, because these terms have become generally accepted, especially under influence of Jakobson (see section 1.d).

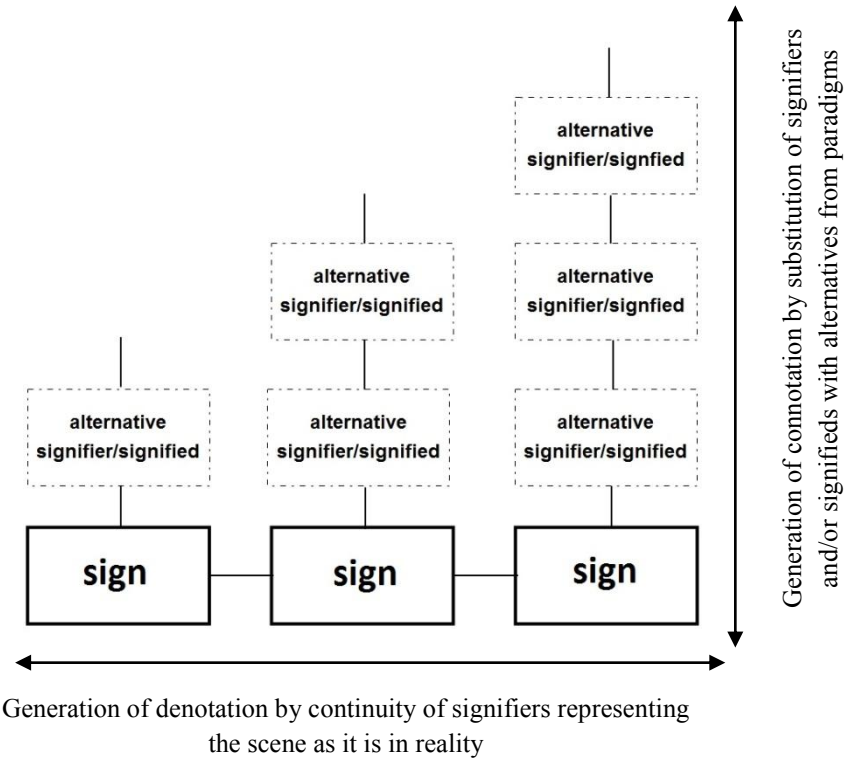

Fig. II2-26 The syntagmatic and paradigmatic axes as the generators of denotation respectively connotation. Adapted from Chandler, *Semiotics*, 84 (fig. 3.1).

Barthes described syntagms as sequences of continuous signs. Their continuity is analogous to reality. The reason that denoted signs have a literal, objective and universal meaning is, according to him, precisely because they represent reality. The continuity of denotative signs in a syntagm is analogous to reality or, rephrased, denotative signs in a syntagm are read continuously analogous to reality. Syntagms are thus denotative signs, and denotation is found in the syntagmatic dimension.[133] Paradigms, in contrast, Barthes described as groups of discontinuous signifiers and signifieds. They offer alternatives that interrupt the representation of reality in the syntagmatic dimension, and they substitute part(s) of it. Barthes argued that substitution from paradigms creates connotation: connotative signs are discontinuous in that they interrupt denotation in order to convey a context specific meaning by drawing upon alternatives. Thus, in this view, the generation of connotation takes place among alternatives which are associated in the paradigmatic dimension.[134]

Barthes explains this most clearly in the system of photography. In his papers 'The Photographic Message' and 'Rhetoric of the Image' (*Image Music Text* (1977)) he argues that a photograph as a collection of signs is one of the best examples of a message with pure denotative meaning. Due to its mechanical instead of human recording (such as is the case in drawing or painting) it transmits pure, literal, objective reality.[135] The photograph *is* not reality, but it is its 'perfect analogon' in that the continuation of the elements in the photograph (i.e. the signs of which it is built) is analogous to the

[133] Barthes, 'The Photographic Image' in Barthes, *Image Music Text*, 18, 20; Barthes, 'Rhetoric of the Image' in *idem*, 34-35.
[134] Barthes, *Elements of Semiology*, 91; Barthes, 'Rhetoric of the Image' in Barthes, *Image Music Text*, 34-35.
[135] Barthes considered 'mechanical' to be a 'guarantee of objectivity'. Barthes, 'Rhetoric of the Image' in Barthes, *Image Music Text*, 43-44.

scene in reality.[136] The combination and continuity of these signs is a pure and literal recording of the real scene. In order to move from reality to the photograph, it is not necessary to decompose the scene and to divide it up into significant units. The scene does not need to be coded, constructed or formed in order to be represented in the photograph; it can simply be captured as it is. This part of the photograph's message consists of continuous denotative signs with reality as their signified in the syntagmatic dimension.

However, this representation of reality is affected in several ways. First, various factors endow the photograph with stylistic values: choices made regarding exposure, angle, color scheme, framing, distance, focus and speed – aspects which give the photograph substance – have immediate effect on its message, as does image processing afterwards. Second, cultural associations are attached to signs such as objects, postures and gestures. Such associations influence the photographer at the moment he presses the shutter button: he may be unconsciously influenced by his own cultural values, or he may intentionally use or accentuate certain association (e.g. through one of the stylistic factors) in order to convey a specific meaning to an intended public. But the associations also influence the people who receive and interpret the photograph according to a traditional stock of signs irrespective of the photographer, possibly years after the photograph was taken when cultural values may have changed. All these stylistic factors and associations on the part of the photographer as well as on the part of the public, at the moment the photograph is produced as well as at the moment it is received and interpreted, generate connotation.

A photograph, then, consists of two messages according to Barthes:

1. a denotative message in which the linear combination of signs represents reality;
2. and a connotative message, which is conveyed by a certain treatment of the photograph: the choice from stylistic paradigms (e.g. exposure, color scheme, framing, distance, and so forth) and from paradigms that contain a variety of alternative objects, postures and gestures which connote certain cultural values and associations.

c.3. Discussion

There are two problems with Barthes' theory of denotation and connotation. First, as mentioned, in his early work Barthes presented denotation as a pure, literal, objective and universal meaning and connotation as a symbolic, ideological meaning that is built upon denotation. Whereas denotative signs and systems generate basic, natural, clear-cut meaning, connotative signs and systems rather generate overall, deeper, global, and diffuse meaning on a higher level, which comes close to culture and society from a macro-historical perspective (ideology). But Barthes later abandoned this hierarchy. He no longer considered denotation as meaning free from ideological aspects. This, he said, is only an illusion, for no sign can be purely denotative. Signs with what we call denotative meaning simply have a broader consensus in that they are less situation-specific than signs with what we call connotative meaning, but they never lack connotation. The usage of 'denotative signs' within society alone endows them with connotation: the ideologies of societies, (sub)cultures, communities. Thus, phrased by Chandler, 'denotation is just another connotation'.[137] It is no longer considered an autonomous state of the sign.

[136] Barthes, 'The Photographic Image' in Barthes, *Image Music Text*, 17.
[137] Chandler, *Semiotics*, 138.

The dichotomy denotation versus connotation is, then, in dubious state. If denotation is 'just another connotation', and there is thus only connotation, the question rises what exactly connotation entails. Are there various kinds and grades of connotation? Consequently, the scheme of fig. II2-24 is also in dubious state, for instead of a strict hierarchy from denotation to connotation, how can a more nuanced interpretation of connotation be visualized? With the disintegration of the dichotomy, the concept of connotation loses its meaning as being oppositive to denotation, and remains rather unspecified.[138]

It is ironic that we can exemplify the problem with exactly the visual medium Barthes used in showing the difference between denotation and connotation. A photograph can never be a perfect analogon of reality, if only because two stylistic paradigms (framing and distance) immediately cut it loose from reality; a photograph is by nature a selection. The framing and size of this selection is determined by the choice of lens and the technical aspects of that lens (zoom, standard focal distance). The cover of the Dutch version of the book *People like us: Misrepresenting the Middle East* (2009) by journalist Luijendijk (fig. II2-27) shows how the mass media can present 'reality' as a myth only by means of a photograph, of which the interpreter has no idea that it is only a selection. The photograph suggests active demonstrations, while in fact Luyendijk describes the situation as rather quiet.[139] In another article he criticizes the news-making media in general, illustrating the problem with the following report:

Fig. II2-27 Cover of the book by Luyendijk. The book offers a perfect insight into how meaning is created and conveyed by the mass media; and of how this meaning may be a distorted picture of reality. It illustrates the need for a semiotic consciousness with the public.

'It was the autumn of 2000 when my newspaper asked me to cover the Palestinian intifada. ... Before taking off from my home in Beirut that morning I turned on CNN and saw the sort of footage everyone associates with the conflict: stone throwing boys. Israeli soldiers taking aim, ambulances rushing off, angry Palestinians shouting slogans, and then a well-groomed reporter saying something like 'hopes for peace seem more distant than ever'.

There are no direct flights from Lebanon to Israel and I had to fly to Jordan and then take a taxi to Ramallah. In all this is an eight-hour trip, enough time to work up some existential anxieties. So there I was, finally, in Ramallah, only to find a city like any other. Children with rucksacks on their backs walked home from school, taxis made their rounds and in the market tomatoes were on sale. People, I asked a pedestrian almost angrily, where are the stone throwers? The man nodded kindly and said: 'Very easy. You follow this street all the way to the crossing, turn left, and then straight on till the City Inn Hotel. There you will find the stone throwers.' He paused for a second and added: 'After two p.m.' And indeed, when the next day I went to City Inn Hotel, around two o'clock both Israeli army vehicles and Palestinian school boys showed up. Soon the stone throwing started, producing exactly the sort of images I had seen on CNN that morning.

News is by definition the exception to the rule. The quiet rest of Ramallah did not make the news, because it obviously wasn't news. The effect of this filter or omission was that the whole city, if not the whole region, seemed on fire. It patently wasn't. ... what happens when you present exception after exception to an audience that has no picture of what 'the rule' in Middle Eastern societies may be? One may blame the constant media stream of negative images and stories from the Middle East on ideology.'[140]

[138] Jakobson, especially, emphasized that signs gain meaning in binary opposition, by being whatever the other is not. See already De Saussure's suggestion on p. 120 with note 46.
[139] Luyendijk, *Het Zijn Net Mensen*, e.g. 23, 42. Translated in English as *People Like Us: Misrepresenting the Middle East*.
[140] Luyendijk, 'Beyond Orientalism' in *International Communication Gazette* 72(1) (2010), 10-11.

The idea of constant active demonstrations is an illusion; the scenes in the media are not analogies of reality, but highly suggestive selections.[141]

There are two further reasons why photography can never be pure denotation, capturing a scene as it is. On the one hand, photographic technique has its limitations. By means of tools such as exposure time, shutter speed, white balance or color temperature we can attempt to artificially reproduce the incidence of light, the range of coloring, hues, tints and shades; professional photographers can come very close. But the camera remains subordinate to what we perceive as reality through the human eye.[142] On the other hand, the choice of objects or persons photographed immediately connotes a photograph. An example is the choice for the African boy in fig. II2-25: skipping an alleged denotative level as 'just any boy', the choice for him immediately connotes the message of the photograph. Consider also another example given by Barthes in 'The Photographic Message' (fig. II2-28):[143]

Fig. II2-28 Press photograph of John F. Kennedy for the 1960 election.

This is a press photograph for the 1960 election, showing Kennedy sitting at a table. Barthes argues that his pose ('half-length profile shot, eyes looking upwards, hands joined together') connotes the photograph. The signs of this pose, selected from a paradigm of signs constituting alternative poses, signify prayer, at least in the tradition and culture of the West. This photograph, Barthes argues, is therewith connoted in that it expresses Kennedy's purity and spirituality.[144] We would add faithfulness and devotion, two qualities which are also associated with prayer and which are certainly fit for a presidential candidate. One can even go further and add more layers of connotation. Thus, connoted meaning is transmitted by:

- the plain background which focuses all attention on Kennedy (a choice from the framing paradigm);

[141] We do not intend to minify the problems in the Middle East, but simply to put them into perspective.
[142] And even that is only a subjective and selective reality in comparison to the reality of physics, for instance.
[143] Barthes, 'The Photographic Message' in Barthes, *Image Music Text*, 22. The photograph is taken from http://sadievislit2014.wordpress.com/2014/02/12/photographic-measures/.
[144] Barthes, 'The Photographic Message' in Barthes, *Image Music Text*, 22.

- the wooden table which, together with prayer, signifies a purity, serenity and simplicity that can be associated with monastic life of pure devotion (a choice from the paradigm of objects);
- the suit worn by Kennedy, which signifies seriousness and importance (a choice from the paradigm of dress);
- the color scheme of the photograph, which is typical for the 1960s and therewith signifies that period (a choice from a color scheme paradigm);
- and, finally, the incidence of light. The photographer chose a soft, diffuse light to shine on Kennedy's front. Certainly, he is the subject, but in this context of prayer the light on his face and hands may also signify approval by God. The photographer, consciously or subconsciously, kept this signification modest. He could have chosen the option of a fixed spotlight and create the effect of revelation and enlightenment as encountered in Western Renaissance painting, and therewith increase the level of connotation (fig. II2-29). In the cultural and religious setting of that period it would have been good promotion. In the politics of the 20th century, however, it would have given the photograph, and Kennedy, an obsolete religious appearance, creating the impression of a European situation before the separation of church and state. That cannot have been the intended meaning of a press photograph in the Americas of the 1960s. The present choice for subtle light may suggest approval and enlightenment, but mainly leaves such an interpretation to the public.

Fig. II2-29 Saint Bridget's Eucharistic Vision, Revelations of Saint Bridget of Sweden. Napels, Italy, last quarter of the 14th century. The Pierpont Morgan Library & Museum, Manuscript MS M. 498.

Thus, we find here different layers and nuances of connotation. But these are not built upon a primary denotative meaning. There is no primary, objective, literal scene of a 'man sitting at a table'. That there would be such a scene, is only an illusion. Before it could gain meaning, it is already reworked upon; the choice of man alone, i.e. Kennedy, who is immediately associated with American politics of the early 1960s, prevents that such a scene can exist. It only gains meaning through values and associations that result from immediate selecting. It is, in fact, the primacy given to the paradigmatic dimension already by Hjelmslev, that prevents the existence of denotation.[145]

There we stumble upon the second problem with the Barthesian theory on denotation and connotation: the idea that the generation of connotation takes place only in the paradigmatic dimension. If denotation cannot exist since it is immediately connoted by selections in the paradigmatic dimension, than connotation must also be present in the syntagmatic dimension. But what kind or grade of connotation is that, and how does it partake in the generation of meaning?

In sum, the Barthesian theory on denotation and connotation was very important for the idea that there are multiple layers of meaning which are generated and conveyed by signs, not only linguistic signs,

[145] Cf. section 1.b above.

but semiological signs in general. These layers are dependent on stylistic choices and associations, which may be intentional or not, may or may not be imposed by the photographer and/or interpreted by the public, and which may be highly culture- and tradition-bound, what makes the full meaning of signs and sign systems accessible only by members of the respective culture and tradition. But the theory needed to be reconsidered with regard to the nature of connotation and its role in both dimensions of sign systems. A solution to the second problem was suggested by Jakobson (section 1.d), while a solution for the first problem we may find in Peircean semiotics (section 2).

d. Semiotics according to Jakobson

Roman Jakobson (1896 – 1982) was a Russian linguist and semiotician. He followed the dyadic sign tradition thus far. Yet, in contrast to Barthes, his focus was again on linguistics, which he considered to be encompassed by semiotics.[146] His work is therefore characterized by a structural analysis of purely linguistic topics such as phonology, morphology and dialectology within a semiotic frame following a top-down approach departing from linguistics as a branch of semiotics. However, from the 1950s onwards, after he moved to New York, Jakobson began to study the semiotic theory of the American philosopher and logician Peirce.[147] He in fact became one of the first European scholars to discover the relevance of Peirce's theory as it did not focus on linguistic or other semiotic signs, but generally on 'signs being signs', and because it offered a solution to the problem of referentiality.[148] While his own theories remained within the dyadic model,[149] which he deemed the 'soundest and safest base' for semiotic research, and while he still considered linguistics the sign system *par excellence*,[150] Jakobson's interests now went well beyond language: his later work is to be placed within a large and interdisciplinary context of studies on communicative behavior involving especially cognitive science, biology, physics, logic and culture within a semiotic frame following a bottom-up approach departing from linguistics as a branch of semiotics.[151] Consequently, his theories and structuralist methodology spread and strongly influenced scholars in divergent fields, among whom

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[146] 'Semiotics, as an inquiry into the communication of all kinds of messages … encompasses linguistics'; 'whereas the subject matter of semiotics is the communication of any messages whatever, the field of linguistics is confined to the communication of verbal messages'. Jakobson, *Main Trends in the Science of Language*, 32; ibid., 'Language in Relation to Other Communication Systems' in Jakobson, *Selected Writings* II, 698; Nöth, *Handbook of Semiotics*, 75-76.

[147] *Ibid.*, 74-75; Chandler, *Semiotics*, 228. It was also by influence of the American writings of Peirce that Jakobson used the term *semiotics* instead of the French *semiology*.

[148] Jakobson, 'A Few Remarks on Peirce, Pathfinder in the Science of Language', *MLN* 92 no. 5 *Comparative Literature* (1977), 1029; Chandler, *Semiotics*, 34-35. In the following §2 we discuss Peirce and add referentiality to the sign model, which Jakobson did not yet do.

[149] *Ibid*. Jakobson did not directly incorporate a referent into his model, which remained formally dyadic, but he did promote the role of context.

[150] Jakobson, 'Language in Relation to Other Communication Systems' in Jakobson, *Selected Writings* II, 699. In this paper, Jakobson attributed the earliest dyadic model to Stoic doctrine, of which he said that it viewed the essence of signs 'in their necessarily twofold structure, namely, an indissoluble unity of an immediately perceptible *signans* and an inferable, apprehensible *signatum'*. Jakobson considered *signans* and *signatum* the only correct translations of the corresponding Greek terms and rejected De Saussure's terms *signifié* and *signifiant*, as well as their English translations *signifier* and *signified*. Ironic, however, is the fact that Stoic doctrine was in fact the predecessor of the triadic sign-model. Nöth, *Handbook of Semiotics*, 75, 90; chapter 1. For reasons of clarity, we refer to Jakobson's own statements on the insignificance of terminology to justify our choice in retaining the terms *signifier* and *signified* instead of *signans* and *signatum*. Jakobson, 'Toward a Linguistic Classification of Aphasic Impairments' in Jakobson, *Selected Writings* II, 293 ('purely conventional nomenclature is harmless as long as we are aware that it is nothing but convention').

[151] See, for instance, Jakobson's chapter 'Interdisciplinary Outlooks' in Jakobson, *Selected Writings* II, 655-722.

dominant figures such as the anthropologist Lévi-Strauss and the psychoanalyst Lacan.[152] Many of Jakobson's theories and methodological principles have proved to be key contributions to further semiotic, as well as conjoint semiotic, linguistic and cognitive research. Examples are his theory on the six social functions of language; the notion of binary oppositions; and the relation of the two fundamental operations that underlie communicative behavior (i.e. selection and combination in the paradigmatic respectively syntagmatic dimension) with the dichotomies of similarity and contiguity, and metaphor and metonymy.[153]

It is the last mentioned contribution which is most important and relevant in the current discussion. It involved a reconsideration and elaboration on Barthes' theory of denotation and connotation, which Jakobson brought into the sphere of cognitive science. By relating the processes of selection and combination with similarity and contiguity, with metaphor and metonymy, and with studies into human cognition he illustrated how different forms of connotative meaning are generated in both dimensions, and how these forms can be related to cognitive patterns for the production and interpretation of communication in the human brain.

The following pages contain some repetition of the theories and ideas already mentioned in previous sections, but this serves to explain how all theories and ideas come together; that is, how they merged into an all-encompassing structure that underlies not only linguistic and other semiotic systems, but *communicative behavior* in general.

d.1 Analysis of communicative behavior: two dimensions, two operations, two rhetoric tropes

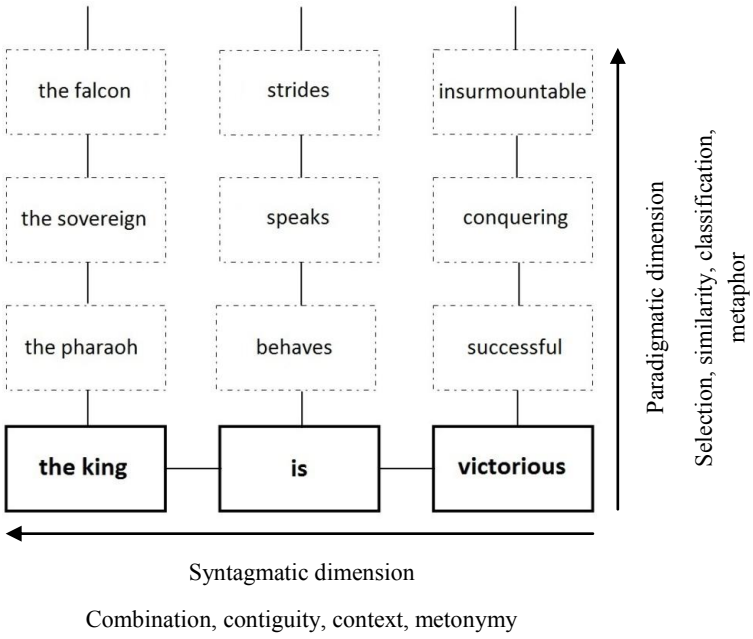


Fig. II2-30 The message 'the king is victorious' in Jakobson's refined schema of the syntagmatic and paradigmatic dimensions of language, displaying selection on the basis of similarity and combination on the basis of contiguity. Based on Chandler, *Semiotics*, 84 (fig. 3.1).

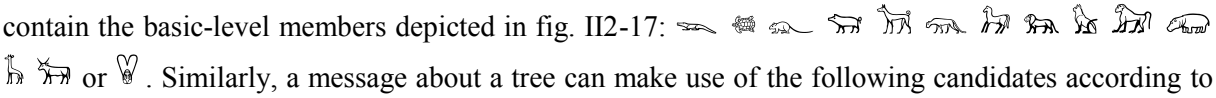
[152] E.g. Lévi-Strauss, *Structural Anthropology*; Lacan, *L'instance de la Lettre dans l'Inconscient ou la Raison depuis Freud*. Chandler, *Semiotics*, 230-231; Nöth, *Handbook of Semiotics*, 75.
[153] *Ibid*., 74-76; Chandler, *Semiotics*, 230.

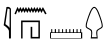
Fig. II2-30 illustrates Jakobson's refinement of the two dimensions of semiotic systems. He emphasized the operation underlying the syntagmatic dimension (i.e. combination) and the operation underlying the paradigmatic dimension (i.e. selection) as two essential operational principles and as two fundamental modes of arrangement that underlie all forms of communication as well as all human behavior in general.[154] He argued that when we express a message we constantly select and combine. For example, when we want to express ourselves about the king, we must choose between terms such as 'king', 'pharaoh', or 'sovereign'. When we want to say something about his status in a war, we choose between terms such as 'victorious', 'successful', 'conquering' or 'insurmountable'. Selection of possibilities is one aspect; the diversity of possibilities in combining units is another.[155] Selection and combination take place on both the level of the sign and the level of the sign system. Jakobson reconsidered these levels as a semantic and a feature level. On the semantic level, a sign system is broken down into its ultimate units endowed with meaning, for instance morphemes and words in linguistic communication. On the feature level, these smallest semantic units are dissolved into minimal meaningless units, which merely serve a function of differentiation, for instance phonemes in linguistic communication.[156] Selection and combination of units always lead to the generation of signs with a higher degree of complexity. Thus, the selection and combination of phonemes in the feature level lead to the generation of morphemes and words in the semantic level (cf. Fig. II2-19 in section 1.b). On the semantic level, selection and combination lead to units with ever higher degree of complexity: the generation of phrases, sentences, utterances, discourse (as in fig. II2-30).[157] Although not denoted as such by Jakobson, these two levels of analysis have become known as the principle of double articulation.[158] A communication system is articulated if it can be broken down at least into units which are themselves significant. Such a system has *first articulation*, the units of which are complete signs endowed with meaning. Traditional examples are pictograms and traffic signs. Only doubly articulated codes have second articulation as well: a further analytical level with minimal functional units. They lack meaning in that they are not signs in themselves; rather, they function to differentiate the signs of first articulation of which they are the building blocks. By means of the minimal functional units /**b**/ and /**p**/, for instance, the meaningful units /**b**in/ and /**p**in/ can be differentiated.[159] Chandler remarks that human language is the only undisputed example of a doubly articulated communication system. At least, double articulation does not seem to occur in the communication systems of other animals. Nöth remarks that, in addition to human language, many data-processing systems such as systematic codes used in libraries are doubly articulated as well. Yet, a key semiotic debate is over whether or not visual systems such as photography, painting and drawing

[154] Jakobson & Halle, *Fundamentals of Language*, 93; Jakobson, 'Linguistic Types of Aphasia' in Jakobson, *Selected Writings* II, 307-308.
[155] *Ibid*., 308.
[156] Jakobson & Halle, *Fundamentals of Language*, 14.
[157] *Ibid*., 72-74. May it be clear that the levels of articulation are not to be thought of in terms of syntactical levels. There are more syntactical levels of analysis than there are levels of articulation (e.g. the syntactical levels of the sentence, proposition, syntagm, word). Each of these syntactical levels is simply a successive combination of the basic signs, and says nothing about their articulation. See the words by Guiraud cited by Chandler: http://visual-memory.co.uk/daniel/Documents/S4B/sem08a.html.
[158] Martinet, *Eléments de linguistique générale*; Chandler, *Semiotics*, 244, 249, 261-262, 264.
[159] Chandler online: http://visual-memory.co.uk/daniel/Documents/S4B/sem08a.html. There are also signs without articulation. These signs bear no direct relation to each other, i.e. do not derive meaning in relation to signs preceding or succeeding them, and thus have no level of second articulation. Neither are they divisible into recurrent compositional element. Chandler argues that the 'language of flowers' is an example, since each type of flower is an independent sign which bears no relation to the other flower-signs. In other words, the combination of several flowers does not lead to a meaningful message.

have double articulation. The philosopher Susanne Langer argues that, while such systems have lines, colors, shapes and so forth, which are 'abstractable and combinatory' and 'are just as capable of articulation … as words', they have *no vocabulary units with independent meanings*. Thus, they have second articulation, but no *vocabulary* of first articulation. In other words, they are open systems and can create new forms at will.[160] Still, it may be convenient on a purely structural level to conceive of visual communication other than human language in terms of double articulation, at least in the case of ancient and obsolete systems, which may be considered closed in that the production of new forms has ceased. The archeologists Sauvet et al. and the archaeologist and semiotician El Hassan Ezziani have analyzed rock art in the Franco-Catabrian region respectively the Atlas mountains in terms of double articulation, which they considered the most objective approach to their material.[161]

Paradigms: selection, similarity, metaphor

Let us take a closer look at the operational principles, starting with selection. Before we express a message, for instance a word or sign of higher complexity, all possible units (representations and concepts) that a culture holds in store for the expression of messages in general are first of all classified (out of the purport, in Hjelmslevian terms). This happens according to classification principles that are culture-bound. Classification theory, which studies the classificatory principles existent in different cultures, was introduced in section 1.b for ancient Egypt. In forming a message, certain units are activated by classification and labeled as probable candidates with a high chance of being selected. For example, when we want to express something about a four-legged animal and we would follow the Egyptian principle of categorization, our remaining units to choose from would contain the basic-level members depicted in fig. II2-17:  or . Similarly, a message about a tree can make use of the following candidates according to ancient Egyptian classification principles:

	ꜣꜥꜥ		*jšd*
	jꜣ.t		*jḳrw*
	jmꜣ		*nrj*
	*jnhmn*		*nh.t*
	jrw.t		

and several other candidates that were conceptualized in the taxonomy TREE.[162] The intended sign can be selected from among these probable candidates. Taxonomical classification can then be considered as a first selection of units, of members to choose from in a *taxonomic paradigm*.[163] This selection and classification prevents that we have to search for an intended unit from among all

[160] Chandler, *Semiotics*, 6-7; Langer, *Philosophy in a New Key* (1951), 86-87. See also the communication between Chandler and Nöth as reported online on possible other double articulated systems: http://visual-memory.co.uk/daniel/Documents/S4B/sem08a.html.

[161] Sauvet, Sauvet & Wlodarczyk, 'Essai de sémiologie préhistorique' in *Bulletin de la Société préhistorique française* 74 (2) (1977), 545-558; El Hassan Ezziani, 'Une application d'un modèle sémiotique à l'art rupestre' in *Sahara* 18 (2007), 127-148.

[162] Listed in Goldwasser, *Prophets, Lovers and Giraffes*, 45-48.

[163] Cf. Fig. II2-18: taxonomic paradigms contain the probable candidates that exist in Hjelmslev's substance-strata.

possibilities; in the examples of and above including also objects, persons, or fish, and so forth. Taxonomic paradigms are therefore first selections that help communication to be effective and fast.

But they are not the only kind of paradigms we may rely on in communicative behavior. Paradigms are ad hoc classifications: they are made anew every time a new sign is to be formed.[164] Their composition may thus vary with every new sign, being adjusted to situation-specific context. That is, their members may vary precisely in order to be able to create *context-specific and multiple layers of meaning*. According to Jakobson, the main principle underlying different categorization procedures that lead to different compositions of paradigms is the binary opposition similarity – dissimilarity. He argued that the members within a paradigm are related to each other by various degrees of similarity; they are members of that same paradigm on the basis of some similarity. By logic, they are then dissimilar to a certain extent as well, which makes them substitutable alternatives. A simple example on the feature level explains this. In the words /**b**in/ and /**p**in/, the phonemes /**b**/ and /**p**/ are similar in that they are both bilabial phonemes and can both fill the initial slot of the sign to be formed. But they are dissimilar in form as well as in pronunciation: /**b**/ is voiced, and /**p**/ is voiceless. Their similarity makes them substitutes; their dissimilarity makes them alternatives. Due to this (dis)similar nature substitution has consequences for the meaning of the message to be conveyed. It is due to degrees of similarity and dissimilarity in the paradigmatic dimension that /**b**/ and /**p**/ function to differentiate the combinations /**b**in/ and /**p**in/ composed in the syntagmatic dimension.[165]

The same opposition is found between the members of paradigms on the semantic level. Jakobson exemplifies this with the phrase 'he did'. In order to produce and interpret this message, the addresser respectively addressee must know the units 'he' and 'did' as well as the relations of similarity and dissimilarity with other units. For instance, they must know that 'did' and 'does' are similar in that they are both derived from the same verb, but that their grammatical form is dissimilar and therefore meaningful in the message.[166] Another example are the units in fig. II2-30. The substitutable alternatives 'king', 'pharaoh' and 'sovereign' are similar in that they can all denote the same person. Yet, they are not identical, and it is precisely their dissimilarity that endows the final selection with meaning. The same is valid for the units 'victorious', 'successful, 'conquering' and 'insurmountable'. Whether we say 'the king is victorious' or 'the pharaoh is conquering' makes a semantic difference for the person who interprets this message in a certain situation and context, the former implying victory in general, the latter gain of territory in particular.[167]

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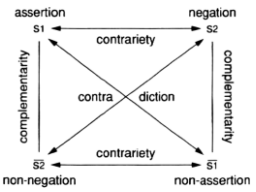
[164] The formation of taxonomic and ad hoc paradigms lies at the basis of connectionism and activation networking; theories that belong to cognitive psycholinguistics and semantic network analysis. We discuss them in more detail in chapter 3.

[165] A similar example is offered by Jakobson with the words 'pig' and 'fig' in Jakobson & Halle, *Fundamentals of Language*, 72-73.

[166] Jakobson, 'Aphasia as a Linguistic Topic' in Jakobson, *Selected Writings*, 232-234. Similarly, they must know the similarity and dissimilarity between units 'he', 'she', 'we', and so forth.

[167] The literary semiotician Greimas was inspired by Jakobson's binary opposition as principle underlying the selection of a certain unit in order to convey a specific message. He elaborated on it in his model called 'The Semiotic Square', which illustrates that selection of units in the paradigmatic dimension entails a careful consideration of the nuances of meaning of these units in relation to the message one wants to convey.



In the opposition 'black – white', for instance, 'black' can be the assertion, 'white' the negation, 'non-black' the non-assertion, and 'non-white' the non-negation. Something that is 'non-black' is not per definition 'white',

A semantic difference becomes even more prominent in the selection of a fourth unit which we allocated to the paradigm from which we selected 'king': 'falcon'. This is a unit from a different taxonomic paradigm, namely BIRDS.[168] How does it end up in the paradigm for 'king', and why are other birds not included (e.g. 'duck' or 'goose'), or even units from other taxonomic paradigms (e.g. 'fish')? How is it possible that this specific member from the taxonomic paradigm BIRDS can become a member in an ad hoc paradigm for 'king'? How is it possible that this goes, but not anything goes?

It is due to the existence of cognitive patterns that differ from culture to culture, are rooted in experience, beliefs and traditions, and that influence the composition of an ad hoc paradigm so that a situation-specific message can be expressed.[169] In ancient Egypt, the king could be conceptualized as a falcon, but he was not conceptualized as a duck or a fish. Certain qualities or aspects of the falcon were extracted and projected onto him: for instance its sharp eyesight or swift attack, or its religious manifestation as Horus, son of Osiris.[170] This projection is a form of rhetoric, namely metaphor, and in particular animalistic metaphor. The essence of metaphor is understanding and experiencing one kind of thing in terms of another to which it is culturally considered similar.[171] In semiotic terms it involves one signified acting as a signifier signifying a different signified (fig. II2-31). Thus, qualities or aspects of the concept to which the expression 'falcon' refers are projected onto a different concept, the original expression of which is 'king'. As a new expression it now signifies a new concept *falcon-king* in which the old concepts *falcon* and *king* are merged. The king has gained qualities and aspects of a falcon. A message such as 'the falcon is victorious' does not only inform that the king has won, but also that he won either by sharp sight, by swift attack, or as divine ruler on earth, Horus, son of Osiris.

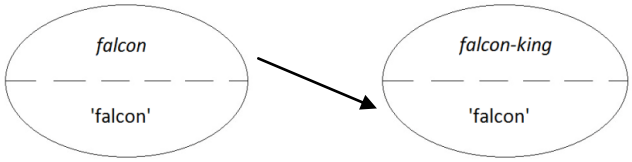


Fig. II2-31 The generation of metaphor as a semiotic process: projection of qualities of one signified onto the signified of another sign, and using the former as expression for the new, merged signified.

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and something that is 'non-white' is not per definition 'black'. The four terms are all related to the initial opposition 'black-white' in different degrees of similarity and dissimilarity. As regards fig. II2-30 we can put all units of the paradigm from which we selected 'victorious' in such a square, which enriches paradigms with further terms from which we can select. For instance, in an opposition 'victorious – defeated' the degrees of similarity and dissimilarity are 'non-victorious' and 'non-defeated', with which we can express that the king neither won nor lost. The same can be done with the oppositions 'successful – unsuccessful' ('non- successful' and 'non-unsuccessful'), 'conquering – conquered' ('non-conquering' and 'non-conquered'), and 'insurmountable – surmountable' ('non-insurmountable' and 'non-surmountable'). Herewith, Greimas in fact created sub-paradigms, enriching the ad hoc paradigms created for the formation of a specific sign with more nuances to select from. Although Greimas' contribution is important in linguistic semantics, its consideration in the context of the marking system has thus far not led to interesting results. Chandler, *Semiotics*, 107 (fig. 3.4).

[168] Goldwasser, *Prophets, Lovers and Giraffes*, 19 (with footnote 54): in four instances, the writing of the word 'falcon' is classified with 𓅃, the duck, in extension the superordinate classifier for BIRD.

[169] See also Goldwasser, *From Icon to Metaphor*, 83, where the same idea is mentioned, i.e. cognitive patterns that consist of concepts which belong to different common taxonomic categories.

[170] *Ibid*., 12-13, 62.

[171] Lakoff & Johnson, *Metaphors We Live By*, 5.

This projection of one concept onto another and the formation of a new sign with a merged concept is only temporary, relating to a particular situation and a specific context. Thus, on the basis of the Egyptian conceptual metaphor 'the king is a falcon', the units 'king' and 'falcon' can temporarily be considered interchangeable alternatives in the formation of a context-specific message. An explicit example is found in the Poetical Stela of Thutmosis III (CGC 34010), eighth stanza line 20: *dj=j mɜ=sn ḥm=k m nb dmɜ.t Ḥr jtj m dgg.t=f r mrr=f*, 'I cause them to see thy majesty as 'Lord of Horus' Wing', taking possession of what he sees as he wishes'.[172] In other stanzas similar animalistic metaphors are created with a bull, a crocodile, a lion and a jackal. Another example from the Egyptian conceptual system is the ad hoc paradigm in which 'enemy' and 'locust' can become interchangeable alternatives. In the 5th dynasty tomb of the nobleman Wernu, the tomb owner is called 'the one who captures the locust'.[173] The locust is a metaphor for 'the enemy': the unit 'enemy' is transferred from its taxonomical paradigm of human beings, and the unit 'locust' is transferred from its taxonomy of dangerous insects. Both are part of an ad hoc paradigm based on the conceptual metaphor 'the enemy is a locust'.[174] Metaphors in our own languages and cultures are not always recognized as they are part of our daily conceptual system, but a well-known animalistic metaphor is, for instance, 'you're a pig!'. Well-known non-animalistic metaphors are 'the world's a stage',[175] where 'world' and 'stage' are temporarily compared in qualities and aspects; or 'my job is a prison', where qualities and aspects of life in prison are compared to one's working places; and finally 'metaphor is an umbrella term',[176] where the comparison of 'metaphor' with 'umbrella' suggests that the former is used as a cover term that incorporates processes of other rhetoric nature as well.

In sum, the operational principle of similarity underlies the grouping of units into taxonomic and ad hoc paradigms according to classification principles and culture-bound conceptual patterns, and the selection of units from them in order to form messages. These messages may gain metaphorical layers of meaning when they are built on degrees of similarity between units that belong to different taxonomic paradigms, which are temporarily made members of the same ad hoc paradigm. The paradigmatic dimension thus generates metaphor.

Syntagms: combination, contiguity, metonymy

Let us now turn to the operation of combination, for it is not merely the composition of paradigms and the selection of units that contribute to the generation of meaning. Meaning is also derived from the context external to the units themselves. Context is created by combining units in the syntagmatic dimension. In the words of Lakoff 'every word is defined relative to frames'; we think and we understand in frames,[177] which in structural linguistic semiotics are syntagmas, or syntagms. Thus, it is not only the similarity and dissimilarity internal to the units 'king', 'pharaoh', 'sovereign' or 'falcon' which are meaningful in the message 'the king is victorious'; neither is it merely the selection of the units 'the king', 'is' and 'victorious' that conveys the message. Meaning is derived precisely from the

[172] This is in fact simile, here considered a form of metaphor in which the figurative status of the comparison is made explicit through the use of the word 'as' or 'like', here *m*.
[173] Goldwasser, *From Icon to Metaphor*, 22.
[174] *Ibid*., 22-23.
[175] Shakespeare, *As you like it*, Act II Scene VII.
[176] Chandler, *Semiotics*, 126.
[177] Lakoff, Lecture "Why Linguists Are Needed: The Severe Limitations of Big Data Analysis of Linguistic Corpora", March 13, 2015 at Vrije Universiteit Amsterdam.

combination of these units in this exact order. Syntagms are the contexts for their individual units.[178] The underlying organizational principle in syntagms is *contiguity* between the units, as opposed to similarity between units in paradigms. In the combination of signs in the semantic level of the sign system, this contiguity can be sequential or spatial.[179]

In sequential syntagms the relations between units are essentially about 'right' and 'left', or 'before' and 'after'. Such relations we find particularly in linguistic signs and sign systems, in which units are 'presented one after another' in space and time, as in a chain (i.e. temporal sequential relations in auditory sign systems and linear sequential relations in visual sign systems).[180] In spatial syntagms the relations between units include 'above' and 'below'; 'in front' and 'behind'; 'close' and 'distant'; 'interior' and 'exterior'; or 'center' and 'periphery'.[181] Jakobson argued that these relations are found particularly in signs and sign systems other than linguistic communication such as painting.[182] However, it should be mentioned that, although sequential relations tend to be dominant in linguistic systems and spatial relations in other systems, most semiotic systems rely heavily on both kinds of contiguous relations.[183] This is certainly the case with audio-visual media such as television and cinema, which make use of sequential linguistic messages, and of more spatial distribution of signs; but one can think of simpler examples as well, such as the use of a Capital letter in a word: in the word 'Capital' we have not only a sequential relation between the units C-a-p-i-t-a-l which is significant in modern English language, but also a spatial relation between the first and the last six units of this word, which in this same language contributes to meaning by indicating the beginning of a sentence or proper name.

Contiguous relations are not semantically neutral. The cognitive semanticists Lakoff and Johnson have shown how contiguous relations are linked to key concepts in a culture and thus contribute to culture-specific meaning.[184] For instance, 'left' and 'below' are usually associated with the past, closure, something foregone, or dark and negative; and 'right' and 'above' are usually associated with the future, something new, open and unknown, but full of possibilities.[185] Let us take two sign systems as examples. The first is photography (fig. II2-32). Because of the fact that reading and writing in modern Western linguistic systems proceed along a sequential syntagmatic axis from left to right, the interpretation of the meaning of photographs may likely follow the same direction.[186] There is, then, potential sequential significance in the left-hand and right-hand elements of photographs, of which students at the Academy of Photography in the Netherlands are taught the

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[178] This relates to both the feature and semantic levels as explained above on p. 155: a unit finds its context in more complex units of a higher degree of complexity, but at the same time serves itself as a context for units from a lower level. Jakobson, 'Aphasia as a Linguistic Topic' in Jakobson, *Selected Writings* II.

[179] Jakobson, 'On the Relation between Visual and Auditory Signs' in Jakobson, *Selected Writings*, 340-344; Chandler, *Semiotics*, 110-115.

[180] De Saussure, *Course in General Linguistics*, 69-70; Chandler, *Semiotics*, 110.

[181] *Ibid*., 110-111; Lakoff & Johnson, *Metaphors We Live By*, 14.

[182] Jakobson, 'Visual and Auditory signs' in Jakobson, *Selected Writings*, 336.

[183] Chandler, *Semiotics*, 110-111.

[184] Lakoff & Johnson, *Metaphors We Live By*, chapters 4-8; Chandler, *Semiotics*, 111.

[185] *Ibid*., 112; Kress & Van Leeuwen, *Reading Images*, 186-188.

[186] That is, we do not per definition *read* the signs of a picture or photograph from left to right. Our eyes approach a picture or photograph, focusing first of all on the central or main subject, which may be positioned anywhere and may be highlighted by the artist or photographer through size or eye-catching colors. But when the eyes have collected the signs of which the picture or photograph is composed, the brain starts to puzzle to make a message out of it. And this message may likely be interpreted along the same line as linguistic messages. Jakobson argued that some people might not appreciate abstract art precisely because the brain cannot figure out the puzzle when the message does not proceed along familiar lines. We might get frustrated and conclude that it 'is just a mess'. Jakobson, 'On the Relation between Visual and Auditory Signs' in Jakobson, *Selected Writings* II, 341.

importance.[187] Fig. II2-32 presents two examples in which right and left are meaningful in the contiguous sequence of signs.

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a.

b.

Fig. II2-32a. Photograph evoking the idea of a new start; **b** Photograph evoking the idea of nostalgia. Photographs from Sieveking, Reader 'Basisopleiding' of the Academy of Photography Rotterdam, 51.

Photograph 'a' is liable to an interpretation of a new start in a new house coming from a darker past looking toward a brighter future. This interpretation is generated by a syntagm of light: darkness and shadow on the left in contrast to light on the right. The darkness and shadow on the left intensify the connotation of 'left', while the brightness on the right does the same for 'right'. The flower casts a long shadow to the left and itself leans to the right; it is another sequential signifier that strengthens the interpretation. A significant spatial syntagm is similar to the sequential syntagm of light, and also strengthens the interpretation: darkness below, and light in the upper part of the photograph. Photograph 'b' may evoke the idea of nostalgia. The woman is positioned in the left half of the photograph and is faced toward the left, interpreted as the past. However, she leans slightly backwards, and also her hair and shawl show that the wind gently pulls her away from the past, toward the right. The idea of nostalgia is furthermore evoked by the violin she plays, an instrument which is often associated with nostalgia and melancholy.

The relation between the signs in the syntagmatic dimension (their combination in contiguous sequence) is not only a sequential one here; it is also an evaluative one with regard to the signifieds for which they stand. Evaluative syntagmatic relations cooperate with paradigmatic selections and cultural values associated to the selected units: the flower (life) in photograph 'a' and the violin (nostalgia, melancholy) in photograph 'b'. Imagine that instead of the flower a suitcase was selected in photograph 'a': it would change the interpretation to departure. Thus, composition can generate meaning because it is connoted with cultural associations that are linked to sequential and spatial relations.

The second example are the marks ostraca from Deir el-Medina. In Part I we discerned a development in the organization of marks on the ostraca between dynasties 18 and 20. In dynasty 18 several ostraca display an apparently unorganized accumulation of marks; that is, we do not recognize an ordering or sequence in the marks. In contrast, in dynasty 19 and certainly in dynasty 20 the marks are generally well organized in horizontal rows or vertical columns. The lines can be read from left to right (sometimes from right to left), and the columns from top to bottom; that is, *the marks are read in the*

[187] Sieveking, Reader 'Basisopleiding' of the Academy of Photography Rotterdam, 48-51.

same order as hieroglyphic and hieratic script can be read. Is this development related to the absence of written material in dynasty 18 and a presence and growing influence of writing in dynasties 19 and 20? If so, we can argue that sequential thinking and reading which is implied in hieroglyphic and hieratic script influenced the marking system and was adopted by it under its growing influence. At least, increase of sequential thinking is one of the causes for the shift of the marking system discerned in the Venn-diagram toward the domain of Writing, depicted in fig. I1-8. We may furthermore argue that the increase of sequential thinking was not merely a formal change in format, but a meaningful one as well: in the later ostraca we can read from the sequences of marks the organization of the workmen in teams and their relative hierarchical positions. There is meaning in the spatial organization of the marks on the 20th dynasty ostraca, where the top positions were allocated to the foreman, scribe and deputy of the right- and left-side crews. This is the case on ostracon BM EA 50716 (fig. II2-33). It can be dated to the first years of Ramesses V on the basis of its marks. The first mark, , was used by the foreman, who in this period was *Nḫ.w-m-Mw.t* (vi). The second mark, , was used by the *sš n pɜ ḫr*, who in this period was *Jmn-nḫt* (v). The third mark, , belongs to *Ḥr-šrj* (i), who in this period was assistant scribe to his father *Jmn-nḫt* (v).[188] The fourth mark, , belongs to *ɜny-nḫt* (i), who was a deputy. By taking the four top positions, foreman, scribes and deputy are signified as being more prominent.

Fig. II2-33 Ostracon BM EA 50716, with foreman *Nḫ.w-m-mw.t* (vi), *sš n pɜ ḫr Jmn-nḫt* (v), assistent scribe *Ḥr-šrj* (i), and the deputy *ɜny-nḫt* (i) in the top right.

The examples in figs. II2-32 and 33 both display contiguous relations in the combination of signs in the semantic level of the *sign system*. But contiguous relations are also found in the feature of the level of the *sign*, in the combination of signifier with signified. Whereas in a metaphoric sign a signifier refers to its signified on the basis of a relation of similarity in qualities or characteristics, a signifier can also refer to its signified on the basis of a relation of contiguity. The sign is then metonymic. Metonymy is a form of rhetoric trope, the essence of which is to refer to something in terms of

[188] Davies, *Who's Who at Deir el-Medina*, 114-115.

something else to which it has a relation of contiguity; that it, it is directly related or closely associated with it, and evokes meaning by connection.[189] There are various sorts of contiguity relations. For instance, the signifier can refer to the signified as institute for person. Thus, when in ancient Egyptian script the expression *pr-ꜥ3*[190] is not used to signify *palace*, or *great house*, but rather the concept *king*, this combination between signifier and signified has nothing to do with a similarity of some sort between the king and the palace; yet, it has all to do with a direct relation between the king and the institute or estate from where he rules. Other examples of contiguity relations are:[191]

- effect for cause — e.g. the signifier 'red' to signify a sunburn;
- institute for person — e.g. the signifier 'The Times' in '*The Times* has not yet arrived at the press conference', signifying that *the reporter* of The Times has not yet arrived;
- place for person — e.g. the signifier 'Washington' in 'We have *Washington* on the line', signifying that there is a *reporter* or *politician* from Washington on the line; or the Egyptian signifier in *sḫ.tj*, signifying the 'peasant', who lives in the fields;
- place for event — e.g. the signifier 'Chernobyl' in '*Chernobyl* changed the attitudes to nuclear power', signifying that *the events* at Chernobyl in 1986 changed attitudes;
- material for object/ being — e.g. the Egyptian hieroglyph signifying animals which are 'made of' hide and tail, e.g. *bꜣ*, 'leopard';
- object/ tool for user(s) — e.g. the Egyptian signifier in *sš*, signifying the one who uses these tools to write with, that is the 'scribe';
- producer for product — e.g. the expression 'She owns a *Picasso'* signifying that she owns a *painting* made by Picasso;
- container for content — e.g. the signifier 'the milk' in 'Can you hand me *the milk*?', signifying the container the milk is in;
- organ for activity — e.g. the Egyptian signifier *mꜣꜣ* to signify the activity *to see*, which is what is done with the eye.

The rhetoric trope of metonymy comprises synecdoche, which involves a variety of *pars pro toto* relations. For instance, in the English expression 'Get your butt over here', the speaker surely means the addressed in his or her entirety instead of merely the designated body part. Saying area for location is also a synecdoche, for instance saying 'I'm going to the States' when technically it is only possible to go to a specific locality within the States.

Many more metonymic relations are possible. However, the above will suffice to illustrate Jakobson's argument, which can be summarized as follows.

[189] Chandler, *Semiotics*, 129-130.
[190] WB I, 516.1, 6-8.
[191] Chandler, *Semiotics*, 130; Lakoff & Johnson, *Metaphors We Live By*, 35-39; Goldwasser, *Prophets, Lovers and Giraffes*, 34-35.

Table II2-1 The generation of meaning in sign systems

Dimension	Operation	Organizational principle	Meaning
Paradigmatic	Selection	Similarity-dissimilarity	Layers of metaphoric meaning
Syntagmatic	Combination	Contiguity	Layers of metonymic meaning

In the paradigmatic dimension meaning is generated by selection of units from paradigmatic sets. These sets contain units which are similar in that they can structurally replace one another in the formation of a sign, but are dissimilar in that they offer alternatives and can change the meaning of a message. The members that belong to a paradigm are members of the same taxonomic class or are grouped together on the basis of a degree of similarity which the units share as members of a culture-bound conceptual metaphoric pattern. When a signifier is selected to refer to a different signified with which it shares qualities or characteristics, the sign as a whole gains layers of meaning which are metaphoric in nature. In the syntagmatic dimension meaning is generated by combination of units in syntagmatic sets. The syntagms contain units which are connected to each other in a context created by relations of contiguity. On the semantic level of the sign system these are sequential and spatial relations between signs which add multiple layers of meaning to the overall message when linked to cultural associations. On the feature level of the sign these are various relations that link the signifier to a signified with which it is contiguous, creating layers of meaning in connecting both within a conceptual contiguous context. The layers of meaning created as such are metonymic in nature.

d.2 Metaphor and metonymy as cognitive patterns in the human brain

De Saussure had already proposed that syntagms and paradigms (his syntagmas and associative groups) corresponded to two forms of mental activity.[192] However, in a time when semiology and linguistics were both still far apart from psychological studies, he did not elaborate on the idea. In the second half of the 20th century Jakobson, who actively promoted the cooperation between linguistics, psychologists and neurologists, argued to have found support for the generation of metaphor and metonymy in psycholinguistic studies. He suggested that the operations of selection and combination and their correlated rhetoric layers of meaning corresponded to two cognitive patterns in the brain, two processes of thought and conceptualization.[193] He especially focused on aphasia, the medical term for various forms of language disorders which become apparent in speech, writing (agraphia) or in reading (alexia).[194] Analysis of patients with aphasia, so he claimed, would provide insight into the sorts of messages and meanings produced in the syntagmatic and paradigmatic dimensions.[195] Nowadays, roughly four forms of aphasia are distinguished:[196]

1. A patient with Broca's aphasia has difficulty in combining words into larger contexts. He or she speaks in agrammatic, telegraphic style;

[192] De Saussure, *Course in General Linguistics*, 121. See also Barthes, *Elements of Semiology*, 58.
[193] Among others Jakobson & Halle, *Fundamentals of Language*, 67-96; and various papers by Jakobson in *Selected Writings* II, such as 'Aphasia as a Linguistic Topic' (pp. 229-238), 'Toward a Linguistic Classification of Aphasic Impairments' (pp. 289-306) and 'Linguistic Types of Aphasia' (pp. 307-333).
[194] Kolb & Whishaw, *Fundamentals of Human Neuropsychology*, 518.
[195] That is, we learn more about the structure and workings of the norm by studying the deviations.
[196] Wolters & Groenewegen, *Neurologie*, 454-455; Jakobson, 'Aphasia as a Linguistic Topic' in Jakobson, *Selected Writings* II, 234-238. I do not follow Jakobson in 'Toward a Linguistic Classification of Aphasic Impairments' (*Selected Writings* II, 289-306) where he presents 6 types of aphasia, and instead follow more recent medical studies.

2. In Wernicke's aphasia the patient can follow, carry on and complete a context, but has difficulty in finding words. He or she has fluent, but empty speech;
3. A patient with global aphasia displays difficulty with context as well as with word finding and is not able to produce coherent verbal behavior or to understand auditory or visual communication;
4. Amnesic aphasia resembles Wernicke's aphasia, but the symptoms are much lighter. The patient has intact speech and no difficulty with comprehension. Yet, he or she has difficulty finding words and attempts to compensate this through elaborate, little substantive descriptions.

Jakobson recognized in these four forms two underlying disorders: a contiguity or encoding disorder, in which the operation of combining and coding units into context is impaired (i.e. Broca's and global aphasia), and a similarity or decoding disorder, in which the operation of selecting alternative units on the basis of a recognition of degrees of similarity is impaired (i.e. Wernicke's, global and amnesic aphasia).[197] After having examined aphasic patients himself, Jakobson came to the following conclusions:[198]

- Patients with a contiguity disorder have lost the ability to organize simple units into more complex units on the basis of syntactical rules. They have difficulties with phoneme clusters, and the highest unit preserved in their speech is the word; the creation of sentences and longer messages is deficient. Word order is chaotic and there is no grammatical coordination (agrammatism).[199] The patients have less problems finding and selecting the intended words, however. Thus, while contexture disintegrates, the selective operation continues to work. The patients' communication consists of selecting and substituting synonyms and antonyms, that is of units that share a degree of similarity and dissimilarity. When asked to describe an object, they may express what the object is like (simile) or what it resembles in certain aspects. They can transfer aspects and qualities of the object onto another object, the expression of which they use to describe the first. Jakobson provides the examples of patients who described a microscope as a spy-glass, or a gaslight as fire.[200] A patient diagnosed with Broca's aphasia used the words 'cookies' and 'candy' as alternative substitutes.[201] The communicative behavior of these patients is therewith mainly metaphoric, metonymy being 'alien' to the contiguity disorder.[202]
- Patients with a similarity disorder, in contrast, are able to carry on a conversation, but have difficulty in starting one because they can produce and understand communication only in context. They have difficulty with word selection and with substituting one unit for another on the basis of

[197] E.g. Jakobson, 'Linguistic Types of Aphasia' in Jakobson, *Selected Writings* II, 309; Jakobson & Halle, *Fundamentals of Language*, 77-84 (similarity disorder) and 85-89 (contiguity disorder). Jakobson's terms 'encoding' and 'decoding' in fact substitute the traditional neuropsychological terms 'motor' and 'sensory' aphasia. Jakobson argued that 'encoding' and 'decoding' better explained the nature of the aphasic disorders as impairments of the language structure: 'Toward a Linguistic Classification of Aphasic Impairments' in Jakobson, *Selected Writings* II, 292-297.
[198] Here given in brief and simplified form, but see e.g. Jakobson & Halle, *Fundamentals of Language* for a more detailed account of Jakobson's findings.
[199] Jakobson, 'Toward a Linguistic Classification of Aphasic Impairments' in Jakobson, *Selected Writings* II, 294.
[200] Jakobson & Halle, *Fundamentals of Language*, 86.
[201] Obler & Gerlow, *Language and the Brain*, 41, a clear case of loss of context.
[202] Jakobson, 'Toward a Linguistic Classification of Aphasic Impairments' in Jakobson, *Selected Writings* II, 296-297.

aspects of resemblance or contrast. Pin-pointing an object through furnishing synonyms or antonyms is troublesome. Rather, they take refuge to context.[203] When asked to describe an object, they concentrate on building a context, giving a description of the object that is in contiguous relation to it. Thus, a patient of the neuropsychiatrist Goldstein was not able to name a knife unless in context of use or surrounding; he alternately called it a 'pencil-sharpener', 'apple-parer', 'bread-knife', 'knife-and-fork'. Another patient responded to the assignment to name a pencil with the words 'to write'.[204] A patient of the neurologist Head who was asked to name the color black was not able to respond with the word 'black' and instead answered 'what you do for the dead, dead'.[205] The answers of these patients are in metonymic relation to the objects they were asked to describe. Their communicative behavior is mainly metonymic, metaphor being 'alien to the similarity disorder'.[206]

d.3 Discussion

Thus, Jakobson argued that the communicative behavior of patients with a language disorder indicates the existence of two cognitive patterns that are characterized by either one of two fundamental tropes: metaphor or metonymy. With this theory he provided a more nuanced version of Barthes' theory of denotation and connotation. Instead of a sharp distinction between denotation as an objective meaning and connotation as a second meaning of higher order, there were now simply multiple layers of meaning that could be generated in the syntagmatic dimension as metonymic in nature and in the paradigmatic dimension as metaphoric in nature. This is not to say that we do not make use of a difference in literal and rhetoric meaning in our communication, for in fact we do, but it does make one realize that a first meaning is not literal per se and is oftentimes rhetoric from the start. Lakoff and Johnson argue that rhetoric tropes such as metaphor and metonymy are an integral part of our conceptual system. They are not only 'a device of the poetic imagination and the rhetorical flourish'; they are not 'poetic' or 'fanciful'. Rather, they are pervasive in everyday life and thought; it is our ordinary way of thought and expression.[207] This means that the two tropes as patterns and processes inherent in the human brain are not only present in linguistic communication; they must be present in all forms of communication that are produced and interpreted by the human brain. Metaphor and metonymy must therefore be present in semiotic systems of other nature as well.[208]

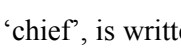
That a first layer of meaning cannot always be considered denotative, objective and literal can be shown with an example from ancient Egyptian hieroglyphic script. We have seen the metaphorical pattern 'the king is a falcon'. In Barthesian terms, when the king is signified as 'falcon', this is meaning on the connotative level. When not referring to the king the expression 'falcon' signifying simply the concept *falcon* is meaning on the denotative level. Hieroglyphic signs, in what Barthes

[203] Jakobson, 'Aphasia as a Linguistic Topic' in Jakobson, *Selected Writings* II, 235; Jakobson & Halle, *Fundamentals of Language*, 78.
[204] *Ibid*., 80.
[205] *Ibid*., 79-84.
[206] Jakobson, 'Toward a Linguistic Classification of Aphasic Impairments' in Jakobson, *Selected Writings* II, 296.
[207] Lakoff & Johnson, *Metaphors We Live By*, 3-6; Lakoff, Lecture "Why Linguists Are Needed: The Severe Limitations of Big Data Analysis of Linguistic Corpora", March 13, 2015 at Vrije Universiteit Amsterdam. Lakoff & Johnson provide the metaphor ARGUMENT IS WAR as an example. We talk about arguments in terms of war in statements such as 'Your clams are *indefensible*'; 'He *attacked* every weak point in my argument'; and 'I've never *won* an argument with him'. Our conventional ways of talking about arguments presuppose this metaphor we are hardly ever conscious of. 'The metaphor is not merely in the words we use – it is in our very concept of argument' (p. 5).
[208] In the next chapter we discuss whether Jakobson's theory can in fact be supported by cognitive and neurological studies of the human brain. Here, we first continue with a discussion of its implication for the marks from Deir el-Medina.

would call the denotative level, are icons with an initial status of 'representatives of the object' or being. This initial status is the most immediately visual level of hieroglyphic reading and produces a primary meaning, culturally considered the most straightforward meaning, which was probably comprehensible even to the uninitiated. Goldwasser argues that this primary meaning was the result of an early process of sign formation in which 'mental images' were fixed as signifieds to hieroglyphic signifiers at the time of script invention.[209] However, the hieroglyph was nailed as a signifier not simply to the signified *falcon*, but to what was in ancient Egyptian culture its most straightforward, direct signified, that is the *Horus falcon (ḥr)*. This initial meaning is already culturally and religiously connoted with metaphoric meaning: a merging of the qualities and characteristics of both the god Horus and the bird falcon. Only in a second layer of metaphoric meaning does the Horus falcon merge with the king. Thus, instead of succeeding layers of denotation and connotation we find multiple layers of meaning that are metaphoric, or metonymic, in nature to greater or lesser extent.

While this aspect of Jakobson's theory was appreciated in the analysis of signs and meaning, the idea that meaning was so clearly separable into a metaphoric product of the paradigmatic dimension and a metonymic product of the syntagmatic dimension was criticized.[210] Metaphorical and metonymical processes are not clearly separable. Although in aphasia, as abnormal communicative behavior, emphasis appears to lie on one functional dimension, in normal communicative behavior the situation is much more complex. Clearly, communication in its various aspects and forms deals with both dimensions. Jakobson knew this,[211] but what several scholars thought of as understated in his theory was the fact that metaphorical and metonymical processes mix and cooperate in the creation and generation of meaning. They contribute simultaneously and interactively to meaning. Only complementary do they produce and convey the full meaning and value of signs and messages. An example of the intimate relation between metaphor and metonymy are the sequential and spatial contiguity relations mentioned above. When in a painting or a photograph there is a meaningful relation between signs below and signs above, these signs are interpreted in a contiguous spatial relation where 'above' and 'below' are key concepts. But it is precisely the connection of these key concepts to associations and values that exist within a culture that makes the contiguous relations metaphoric: 'above' is usually associated with something light, positive, or with control and status, while 'below' is often associated with something dark, negative, or with being controlled and low status. Qualities and aspects of something light, dark, and so forth are projected onto the concepts 'above' and 'below'. Thus, we speak in metaphor when we say 'I am feeling *down/up* today', 'I have control *over* you', or 'he is *under* your control'. Lakoff and Johnson call this *orientational metaphor*.[212] They also exist in the ancient Egyptian conceptual system: *ḥry*, 'who is *upon*', that

[209] Goldwasser, *From Icon to Metaphor*, 1, 20, 33, 56. She notes that iconic reading is not the same as picture reading, since the script system aimed at the representation of linguistic items and with chaining a written signifier with a signified that exists as linguistic concept.
[210] Culler, *The pursuit of signs*, 192-193.
[211] Jakobson, 'Aphasia as a Linguistic Topic' in Jakobson, *Selected Writings* II, 232.
[212] Lakoff & Johnson, *Metaphors We Live By*, 14-19. Their association of 'happy' with 'up' and 'sad' with 'down' is based on the embodiment of emotion. The metaphors appear in our conceptual system based on the characteristic that our body goes up when we are happy, seen specifically in the corners of the mouth when we smile, while we *drop* our head and shoulders when we are feeling down. Expressions such as '*jump* for joy' and '*drop* our head' are expressions in our communicative behavior of *everyday life* based on conceptual metaphoric patterns linked to the embodiment of emotions. Lakoff, Lecture "Why Linguists Are Needed: The Severe Limitations of Big Data Analysis of Linguistic Corpora", March 13, 2015 at Vrije Universiteit Amsterdam.

is 'chief', is written with the sign representing the sky above, and  *ḫry-ʿ* literally expresses 'to be *under* someone's arm' as a word for 'substitute' or 'assistant'. The same connection of spatial relations to these associations and values we have seen in the positioning of foreman, scribes and deputy in top positions related to control or status in the marks ostraca: the spatial contiguity between the marks is metaphoric for the status ascribed to the mark-bearers.

The problem that metaphorical and metonymical processes cannot be clearly separated is in fact a more fundamental one. Oftentimes, metaphor is generated by metonymy.[213] Several scholars therefore speak of metaphoric and metonymic processes, but only of metaphor as fundamental rhetoric trope. Among them is Goldwasser. In her application of the dyadic model to the hieroglyphic sign she explains how metonymic processes support metaphor. Paradigms are, in her terms, not only organized according to taxonomic and metaphoric principles, but also according to 'schematic', that is, contiguity relations.[214] The choice for a specific paradigm-member is therewith influenced by metaphorical as well as metonymical principles. Consider figs. II2-34a and b, an elaboration of the schema introduced in section 1.a.5:

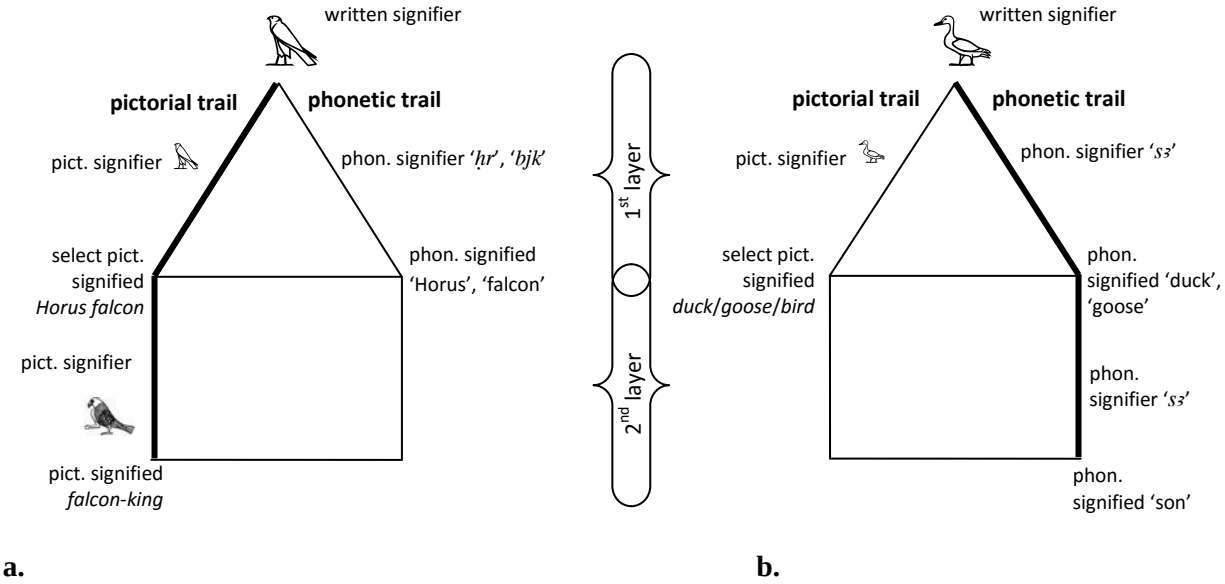


Fig. II2-34a-b Multiple layers of metaphor and metonymy in hieroglyphic signs, resulting in **a.** pictorial metaphor; and **b.** phonetic metaphor. N.B. The model as such is not taken from Goldwasser; the present author is responsible for the elaboration.

The first layers of meaning of both signs are clear by now. In the case of the concept *Horus falcon* is signified in the pictorial trail, while the phonetic signifieds 'Horus' and 'falcon' are signified by the phonetic signifiers '*ḥr*' and '*bjk*' in the phonetic trail. In the case of the concept *'duck'*, *'goose'* or '*bird'* is signified in the pictorial trail, while the phonetic signified 'duck' or 'goose' is signified in the phonetic trail. But both signs can convey a second layer of meaning, which in the case of can be called pictorial metaphor, and in the case of phonetic metaphor. In schema 'a' we may find in the

[213] Culler, *The pursuit of signs*, 193.
[214] Goldwasser, *Prophets, Lovers and Giraffes*, 15-16.

pictorial trail the depiction , a falcon with human arm as seen on the Narmer palette.[215] Based on the metaphoric pattern 'the king is a falcon' it represents a fusion of semantic aspects of with those of a human being. As a newly formed signifier in the pictorial trail, it has as its signified no longer merely the *Horus falcon*, but also a *human*, the king from the metaphor. Pictorial metaphor thus comprises the transposition of aspects of one signifier onto another signifier, the new pictorially metaphoric signifier signifying a new signified that has qualities and characteristics of both original signifieds.[216] In the second case, schema 'b', the phonetic signifier of may become detached from its original signified, and may be transferred onto a new signified on the basis of a similarity in sound pattern. Thus, '*sꜣ*' 'duck' or 'goose' and '*sꜣ*' 'son' share similar sound patterns. The sound pattern *sꜣ* in the sign *sꜣ*, 'duck' or 'goose' may in a second level of meaning become detached from its original pictorial and phonetic signifieds *duck*/'duck' or *goose*/'goose', and be transferred onto the new phonetic signified 'son'. In this case of phonetic metaphor, and in contrast to pictorial metaphor, the signifier remains the same, but refers to a new signified while its original signified is discarded.[217]

Both processes are called metaphoric as they behave conform the Greek compound *meta* 'over' and *pher ein* 'to carry': aspects of one object, whether semantic or phonetic, are carried over or transferred onto another object.[218] But precisely because *specific* qualities and characteristics are *selected* to be carried over, the graphic and phonetic metaphoric signs are metonymic as well.[219] In schema 'a', contains the selected semantic aspect of the human arm, which stands in metonymic relation of synecdoche (*pars pro toto*) to the signified of human being or king. In schema 'b', a metonymical process takes place when the phonetic pattern is extracted and as part of the original sign refers to a new signified. Metonymical processes thus support metaphor.

Other examples of pictorial metaphor are the signs and : both are made up of parts of a human being and parts of a bird, the first referring to the Egyptian notion of the *subject rḫy.t-people*, the second to the notion of the *human soul*.[220] Other examples of phonetic metaphor are, among many others, the application of the sound pattern of the sign '*pr*', 'house' onto the phonetic signified 'surplus' discarding the signified 'house'; or '*ḥr*', 'face' applied onto the phonetic signified 'upon', disregarding the original signified 'face'.[221]

In addition to graphic and phonetic metaphor there are also intermediate forms of metaphor, such as animalistic metaphor. This was the case on the Poetical Stela of Thutmosis III above (p. 159), where the phonetic signifier *ḥr* signified the *king* (fig. II2-35):

[215] Goldwasser, *From Icon to Metaphor*, 11-16. She uses the term 'graphic metaphor'.
[216] *Ibid*., 1, 11-16.
[217] *Ibid*., 17, 40-41, 71-76.
[218] *Ibid*., 71.
[219] *Ibid*., 71, 73.
[220] *Ibid*., 42, 76. Concerning *rḫy.t*: subjectivity is not only indicated by the arms in adoration, but may also be indicated by the pose of the bird, see Griffin, 'A Reinterpretation of the Use and Function of the Rekhyt Rebus in New Kingdom Temples' in Cannata & Adams (eds.), *Current Research in Egyptology 2006*, 67.
[221] *prw*, 'Überschuss': WB I, 526.14-15; *ḥr*, 'auf': WB III, 131.3-4.

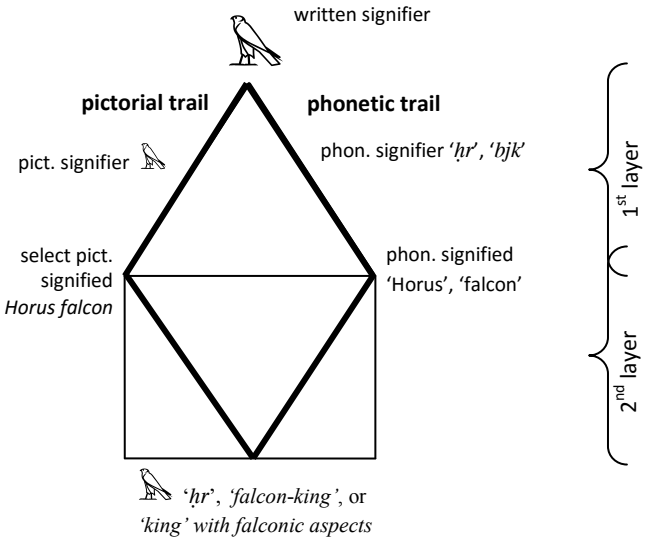


Fig. II2-35 Animalistic metaphor making use of both pictorial and phonetic trails. The pictorial signifier and the phonetic signifier '*ḥr*' are applied onto a new sign, the signified of which is a fusion of the original signified Horus falcon and the new signified king, the latter originally deriving from a sign *ny-sw.t*, 'king'.

In fig. II2-35 there is no pictorial metaphor as the signifier remains the same; it is not merged with semantic qualities or characteristics that belong to a different sign, the end product being a fusion such as .[222] Neither is there phonetic metaphor as there is no similarity in sound pattern between '*ḥr*' ('falcon') and '*ny-sw.t*' ('king'). Phonetic metaphor is furthermore ruled out because in applying the sound pattern *ḥr* onto the new signified *king*, the original signified *Horus falcon* is *not discarded*; qualities and characteristics of this signified are retained. It is rather a case in which both pictorial and phonetic signifiers (and '*ḥr*') are applied in their original form onto a new signified without discarding both their original signifieds. As with graphic and phonetic metaphor, animalistic metaphor takes into account only specific qualities and aspects, which stand in metonymic relation to both signs that take part in the ultimate metaphor.[223]

To summarize, what we learn from Jakobson's theory and the criticism it has received is that signs can convey multiple layers of meaning which are generated by metaphorical and metonymical processes of selection and combination, based on degrees of similarity and contiguity, but also that these processes are intimately related to deepen and enrich the meaning of signs. In normal communicative behavior they may, but oftentimes do not lead to *either* metaphoric *or* metonymic outcomes. Rather, metonymical processes support and generate metaphorical outcomes. Metaphor is therefore often used as umbrella term (a metaphor) to refer to rhetoric communication in general, including metonymy under its wings (an orientational metaphor). Inspired by Goldwasser, we can now incorporate these multiple rhetoric meanings into our analysis of the marks from Deir el-Medina. Thus, the mark can

[222] Which Goldwasser calls surrealistic as it is impossible in the known world, thus pictorially metaphoric; see *From Icon to Metaphor*, 11-12.
[223] Animalistic metaphor is a combination of aspects of phonetic as well as pictorial metaphor. It is neither purely pictorial metaphor, nor purely phonetic metaphor. In other words, animalistic metaphor is not a third class of metaphor, but rather a degree of pictorial and phonetic metaphor. More combinations between pictorial and phonetic metaphor are possible, for instance relating specifically to objects instead of animals (for which, however, no terminology exists in the literature).

be considered a phonetic metaphor for the name *Jn(j)-ḥr-ḫʿw* (fig. II2-36). The phonetic aspect, that is the sound pattern *jn(j)*, is extracted from the first layer of meaning and applied to a new signified on the basis of similarity with the sound pattern *Jn(j)-ḥr-ḫʿw*. The original pictorial and phonetic signifieds are therewith nullified. All the marks that are related to hieroglyphic or hieratic script in form as well as in value follow a similar process: for instance *kɜ* for '*kɜsɜ*'; or *ms* for '*Ms*'; , *ḥr* for '*Ḥr*'; *ḳs* for '*Ḳs*'; *ḫnmw* for '*Ḫnmw-ms*'; *šd* for '*Pɜ-šdw*'; and *jmn.t* for '*Nb-jmn.t*'.

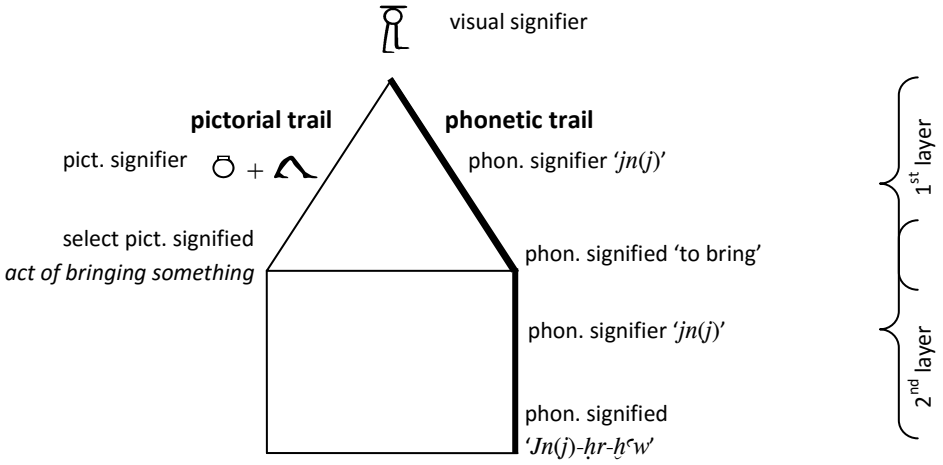


Fig. II2-36 The mark as phonetic metaphor.

Cases of animalistic metaphor can also be discerned. In the example of fig. II2-37 phonetic and animalistic metaphor are combined:

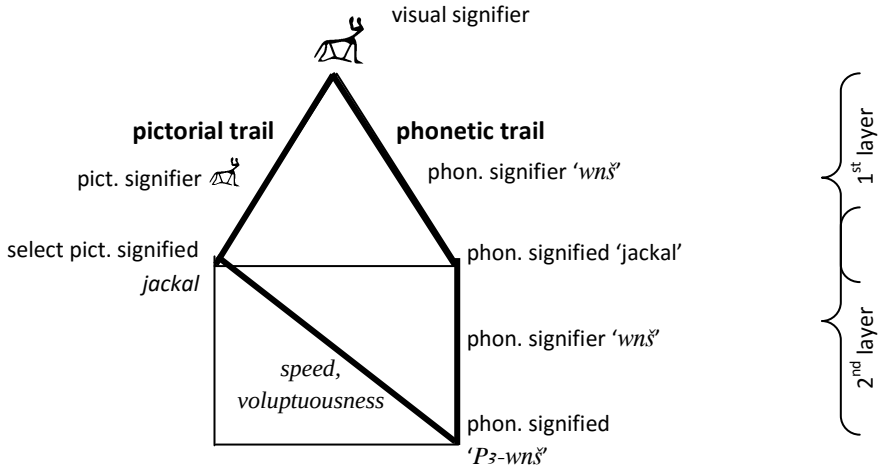


Fig. II2-37 The mark as phonetic animalistic metaphor.

The mark was used by workman *Jmn-nḫt* (xii), son of *Ḥɜy* (vii). *Jmn-nḫt* (xii) was nicknamed *Pɜ-wnš*, presumably because certain qualities or aspects of the jackal were ascribed to him, such as speed or perhaps voluptuousness, a characteristic ascribed to his father who was called *wnš djdj* on ostracon DeM 1038.[224] In this case, the outcome of the animalistic metaphor is represented in the phonetic trail, because in contrast to the example in fig. II2-35 the phonetic signifier '*wnš*' is similar to the nickname '*Pɜ-wnš*'. We can therefore speak of phonetic animalistic metaphor.

[224] Goldwasser, *From Icon to Metaphor*, 62 (speed); Dorn, *Arbeiterhütten im Tal der Könige*. Text- und Katalogband, 190-191, note f (voluptuousness).

The mark can also be said to signify according to animalistic metaphor (fig. II2-38), but it differs from in that a metonymic process is involved. As a hieroglyph, occurs in script as a determinative, but with the phonetic values *jmɜḫ* and *mɜɜ* it is attested already in 19th dynasty Deir el-Medina.[225] These sound patterns seem at first not to signify the referent, that is, the workman *Mnnɜ* (i), and it is therefore uncertain whether the phonetic trail takes part in the signification of . The mark does undergo a metonymic process in the pictorial trail. As selected part of the falcon, it stands in metonymic part-for-whole relation to the falcon, but it also stands in metonymic organ-for-activity relation to the emphasized quality of *sight*. Via animalistic metaphor, this quality may have been projected onto *Mnnɜ* (i): being a draftsman, he was perhaps known to have had a sharp eye, or he wished to emphasize that aspect himself. This signification could, then, have been supported by the phonetic signifier *mɜɜ* in the phonetic trail, which via the phonetic signified 'to see' may have emphasized the same quality.

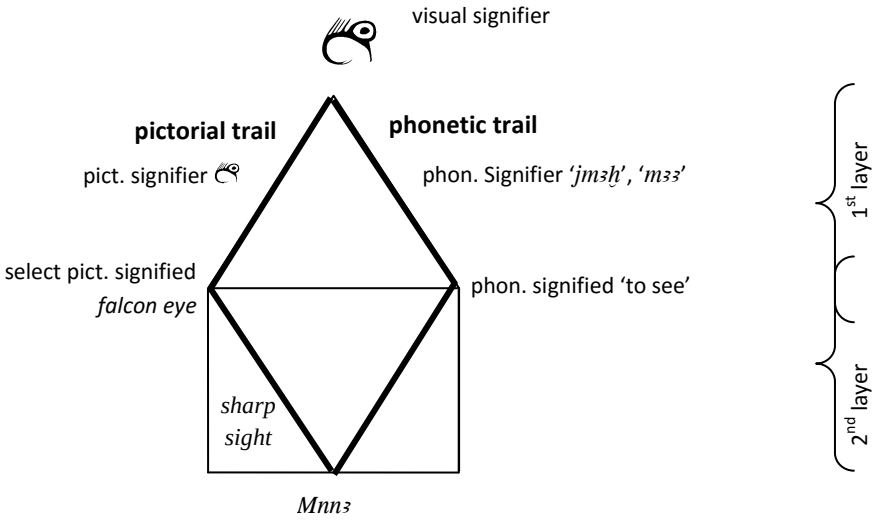
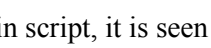
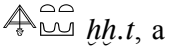


Fig. II2-38 Animalistic metonymic metaphor of the mark , perhaps supported by the phonetic signifier '*mɜɜ*'.

Two further considerations are depicted in figs. II2-39 and 40. Both place larger emphasis on metonymic processes. In fig. II2-39 the mark is equivalent to the hieroglyph . As a pictorial signifier it signifies the select pictorial signified, or concept, *scribe's outfit*. As a pictorial signifier *sš* it signifies the phonetic signified 'scribe'. In fact, the relation between the hieroglyph and the phonetic signified 'scribe' in the first layer of meaning is already a metonymic one, which via the pictorial signified signifies profession via tool. In the second layer of meaning we find the same metonymic relation when the pictorial signifier signifies the man who is *sš n pɜ ḫr*. That is, this specific identity mark is not so much used by one individual in particular, but by every individual who at one time acted as *sš n pɜ ḫr*, for instance *Jmn-nḫt* (v) on BM EA 50716 (fig. II2-33). But we also find another metonymic relation, namely in the phonetic trail when the phonetic signified 'scribe' signifies *Jmn-nḫt* (v) as profession for person. Both metonymic relations build the metaphor in which *Jmn-nḫt* (v) through the mark is identified as having the qualities and characteristics of a scribe.

[225] Haring, Review of J. Moje in *BiOr* 67.1-2 (2010), 27-28.

Fig. II2-40 presents a more complex and less certain suggestion. The mark is thought to represent a level in the pictorial trail.[226] Although it does not occur as a hieroglyph with phonetic value in script, it is seen as determinative in the words  *sbɜ*, 'level', *ḫḫ*, 'to level', and in or  *ḫḫ.t*, a toponym denoting either Aswan, Elephantine, Philae, Sehel or Bigeh.[227] The words *sbɜ* and *ḫḫ* are both attested in the New Kingdom, while the toponym is only attested in the Late and Graeco-Roman periods. A suggestion that concerns the identity of the man who used this mark is based on the frequent occurrence of in TT 360: it may have identified the 19th dynasty foreman *Ḳɜḥɜ* (i).[228] The exact signification remains unclear, but there are at least two possibilities. The first, and most likely one, is the following: via the pictorial trail we might consider the level to refer to the man via a metonymic tool-for-profession relation. A level could well have served as a mark for the office of foreman. The foreman *Sn-nḏm* (i), in fact, was buried with a level,[229] and it may be no coincidence that the mark encountered most often in his tomb (TT1) included the same form: . Via the phonetic trail another possibility might be suggested: even though has no phonetic value, it may as a classifier signify the sound patterns *sbɜ, ḫḫ* and *ḫḫ.t*. There is no phonetic metaphor between these sound patterns and the name of *Ḳɜḥɜ* (i), but could it via phonetic metaphor and the metonymic relation place-for-person signify him as originating from *ḫḫ.t* or another locality with the sound patterns in its name?

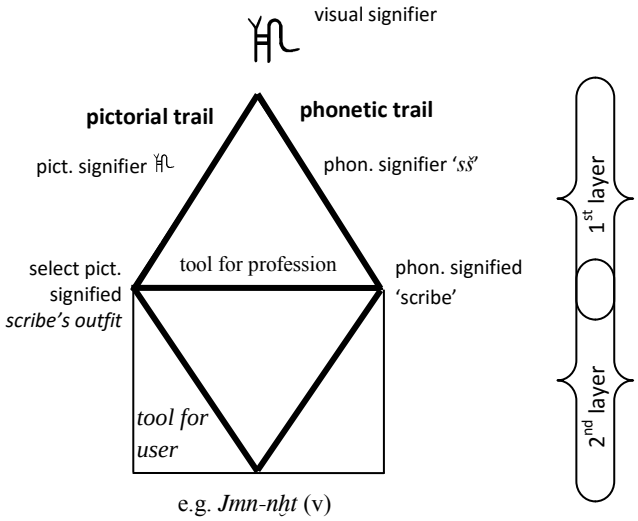


Fig. II2-39 Metonymical processes in the mark .

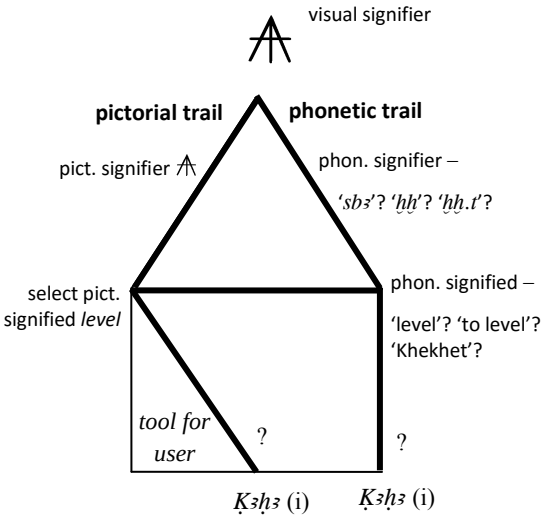


Fig. II2-40 Metonymical processes in the mark .

To conclude, we can clearly recognize processes of metaphor and metonymy in the signification of the marks. Meaning is generated in multiple layers that may specify the nature of the relation between mark and workman. In some cases this relation is motivated by phonetic similarity (phonetic metaphor), in other cases by animalistic qualities and characteristics (animalistic metaphor), in yet

[226] See mark II 042a in Tables I3-1 and I3-2.
[227] WB IV, 86.15; WB III, 331.12-13; Gauthier, *Dictionnaire des Noms Géographique*, 186-187. See also Bresciani, 'Il tempio tolemaico di isi ad assuan' in Bresciani (ed.), *Assuan*, 27-31, who relates the writing of the toponym in Ptolemaic times to the god Khnum of Elephantine.
[228] Cf. Soliman, *Of Man and Marks* (unpublished dissertation), chapter 3.
[229] Cairo JE 27258; Desroches-Noblecourt (ed.), *Ramsès le Grand*, 174-175. For *Sn-nḏm* and the mark see also pp. 199-200 and 270 below.

other cases by both (phonetic animalistic metaphor), and in still other cases by a direct connection or association of a mark with a workman in the course of pictorial and/or phonetic processes of signification. However, there remain major problems, first of all the ubiquitous lack of referents: in figs. II2-36 to 40 the names of workmen have been used as ultimate signifieds, but it will be clear that *the individual workmen must be the ultimate signifieds*. Thus, we can still not differentiate between as phonetic metaphor for *Jn*(*j*)-*ḥr*-*ḫʿw* (i) and *Jn*(*j*)-*ḥr*-*ḫʿw* (ii). The problem becomes worse when we realize that the same mark was at some point also used by a workman named *Ḳnnɜ*; is it still a phonetic metaphor? Another problem is the accommodation of marks that do not seem to be related to script, but that do also not represent anything concrete, i.e. the abstract-geometric marks such as or (cf. fig. II2-12). Do these marks follow the pictorial trail? Do they go through metaphoric and/or metonymic processes? The theories and models thus far have left them rather insignificant.

At this point it is time to involve Peirce's theory, in particular his referentiality and sign typology, as it offers precisely what we need to overcome the remaining problems.

Whereas the dyadic tradition and its concept of meaning had been primarily relational in that meaning was derived from inherent structural relations between signifier and signified on the feature level of the sign and between signs on the semantic level of the system, the triadic tradition was referential:[230] it presented a pragmatic theory in which signs referred to their material environment. The triadic tradition as a school of modern semiotics was founded by the American philosopher and logician Charles Sanders Peirce (1839-1914)[231] around the same time De Saussure was formulating his theory, but the two were not familiar with each others' work. In contrast to the adherents of the dyadic tradition, Peirce was not focused on linguistics; rather, he departed from the axiom that cognition, thought and man are semiotic in their essence.[232] In fact, the entire universe was perfused with signs in Peirce's pansemiotic view.[233] Consequently, his theory was not founded in the structural study of linguistics, but rather in philosophy, mathematics and logic.

Three topics from Peirce's theory are of central concern for the marks from Deir el-Medina: his sign model and the inclusion of referentiality that allows us to see the individual workmen as the ultimate referents of the identity marks (section a); his idea of successive processes of 'semiosis', called 'unlimited semiosis' by Eco, that allows us to accommodate multiple layers of meaning (section b); and his typological study of sign-functions that offers a different perspective on the processes that generate meaning considered metaphoric and metonymic in the dyadic tradition (section c).

a. Semiotics according to Peirce: his model of the sign

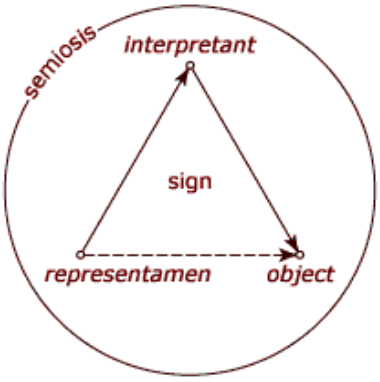


Fig. II2-41 Peirce's model of the sign. http://cseweb.ucsd.edu/~ddahlstr/cse271/peirce.php

[230] Chandler, *Semiotics*, 18.
[231] Earlier triadic models had already been employed by Plato, Aristotle, the Stoics, Leibniz and Husserl, cf. this Part, chapter 1; Chandler, *Semiotics*, 33; Nöth, *Handbook of Semiotics*, 90. As regards Peirce, his writings consist of thousands of papers, but he never wrote a coherent outline of his complete theory of signs. The standard edition of his works from which his writings are usually quoted is *Collected Papers* (Peirce 1931-1958, edited by Hartshorne & Weiss, published by Harvard University Press, Cambridge Massachusetts). When in the following we refer to Peirce and a paragraph number, we refer to this work. Cf. Nöth, *Handbook of Semiotics*, 40.
[232] *Ibid*., 41.
[233] *Ibid*..

Although Peirce did not himself offer a visualization of his concept of the sign, fig. II2-41 shows a representation of the triadic sign as it has now become conventional.[234] The Peircean sign consists of three components:

- The *representamen* is purely the form of the sign as it is perceived or otherwise experienced. Some scholars after Peirce have renamed it *sign vehicle* or *symbol*, but we stick to Peirce's term. He defined it as the first correlate of a sign, 'a vehicle conveying into the mind something from without';[235]
- The *interpretant* is the sense made of the representamen. It is a mental image in the mind of an interpreter, which is evoked by the representamen and by various contextual, situational and cultural factors at the moment of interpretation. For Peirce, it was the ultimate meaning of a sign: meaning is not contained within signs, but arises in their interpretation;[236]
- The *object* is something beyond the representamen and interpretant to which the sign as a whole refers. This is the potentially material referent of the sign.[237] The broken line between the representamen and the object in fig. II2-41 indicates that there is not necessarily any observable or direct relationship between these components; that is, the object may be related to the representamen only via the interpretant.

The interaction between the three components is called *semiosis*, Peirce's term for what was called signification by De Saussure and his followers. The most obvious difference with the dyadic sign model is the addition of the object: it allocates materiality and reality a places within the process of semiosis,[238] and therefore makes the analysis of signs more detailed and more complete than the dyadic model does. But the object is *potentially* material; that is, it is not necessarily confined to things that exist in the real world and may comprise abstract concepts or mental imaginary entities instead.[239] In fact, Eco, although not denying existent objects in an extra-semiotic world, warns for a 'referential fallacy': the erroneous assumption that 'the content' (i.e. the meaning or interpretant) of a sign has anything to do with a corresponding object in the real world. The question whether the object is real is, in his view, not relevant for semiosis; 'the possible states of the world' are not a necessary condition for semiosis, which is only concerned with 'intensional semantics' as opposed to 'extensional semantics'.[240] However, as explained in section 1.a.5 the inclusion of the workmen as real-world individuals in the semiosis of the marks from Deir el-Medina is rather a referential *necessity*, and Peirce's object is the element through which we can tie the marks to their users and to the functional and historical reality in which they were used. Since in the case of the marks the individual workmen take the place of the 'object', we would suggest to henceforth speak of 'referent'.

[234] Cf. Chandler, *Semiotics*, 29-30; Ogden & Richards, *The Meaning of Meaning*, 11.
[235] Nöth, *Handbook of Semiotics*, 42; Chandler, *Semiotics*, 29.
[236] Nöth, *Handbook of Semiotics*, 43; Peirce § 8.179; Ezziani, 'Une application d'un modèle sémiotique à l'art rupestre' in *Sahara* 18 (2007), 131 ; Chandler, *Semiotics*, 29, 32.
[237] Nöth, *Handbook of Semiotics*, 42-43 ; Chandler, *Semiotics*, 29.
[238] *Ibid.*, 33.
[239] Nöth, *Handbook of Semiotics*, 42-43; Peirce §§ 2.330, 1.538.
[240] Eco, *A Theory of Semiotics*, 58-59; Sørensen, 'The Concept of Metaphor according to the Philosophers C.S. Peirce and U. Eco', *Signs* 5 (2011), 161-162.

b. Unlimited semiosis

With the object being the innovation of the triadic model, some theorists have considered the representamen and the interpretant to be analogous to the signifier respectively signified (or expression respectively content) of the dyadic tradition. However, this is an oversimplification of the Peircean model, which implies more than different terms for similar concepts. First, the representamen is not merely a psychological sound pattern; although it is not necessarily material, it can be any form a sign can be perceived or experienced in.[241] Second, the interpretant contains a quality that the signified does not have. This is apparent already in Peirce's description of the process of semiosis:[242]

> *'A sign … [in the form of a representamen] is something which stands to somebody for something in some respect or capacity. It addresses somebody, that is, creates in the mind of that person an equivalent sign, or perhaps a more developed sign. That sign which it creates I call the interpretant of the first sign. The sign stands for something, its object. It stands for that object, not in all respects, but in reference to a sort of idea which I have sometimes called the ground of the representation'.*

Peirce argues that the representamen creates in the mind of an interpreter another *sign*. That sign he calls the interpretant. This is not a case of misuse of the term 'sign' where Peirce would describe the interpretant *an sich* as 'sign'.[243] It rather reveals his idea that a representamen could lead to a series of successive interpretants, potentially *ad infinitum*.[244] Eco describes this as 'unlimited semiosis'.[245] It means that Peirce's interpretant has the potential to become itself a representamen in the mind of the interpreter, starting a whole new process of semiosis and thus creating a new sign. Peirce said that 'the interpretant is nothing but another representation', thus 'The meaning of a representation can be nothing but a representation'.[246] Any initial interpretation of a representamen can be reinterpreted.[247] The processes are depicted in fig. II2-42:

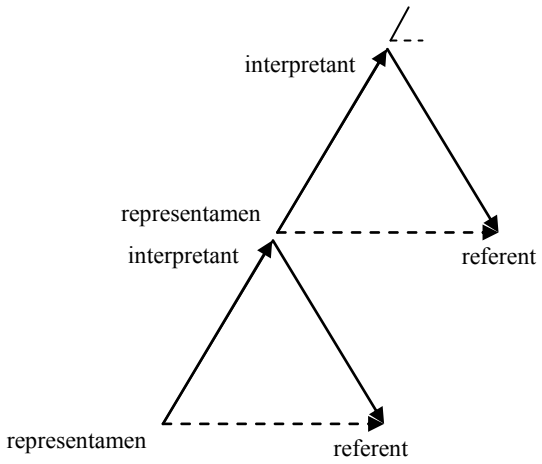


Fig. II2-42 Unlimited semiosis. Based on Chandler, *Semiotics*, 32 (fig. 1.6).

[241] Peirce called the representamen a 'perceptible object' (§ 2.230); Nöth, *Handbook of Semiotics*, 42; Chandler, *Semiotics*, 29 (i.e. I do not agree with Chandler's statement on p. 31 where he says 'The representamen is similar in meaning to De Saussure's signifier').
[242] *Ibid.*, 29; Peirce §2.228.
[243] The term 'sign' is often used loosely in semiotics: Chandler, *Semiotics*, 30.
[244] *Ibid*., 31; Peirce §1.339, 2.300-3.
[245] Eco, *A Theory of Semiotics*, 68-69.
[246] Peirce §1.339; Eco, *A Theory of Semiotics*, 69.
[247] Chandler, *Semiotics*, 31.

While in theory interpretants can infinitely succeed each other to form new processes of semiosis, in practice, Peirce realized, the processes are cut short by the practical constraints of everyday life; some object is always graspable in the end.[248] With regard to the marks from Deir el-Medina the theory of unlimited semiosis allows to accommodate multiple layers of meaning that are significant in that they allow to distinguish between individual workmen via the referent and therefore allow to study the marks in their social and historical context of use. Thus, unlimited semiosis allows a diachronic analysis of the marks and their users. Let us look at the example that is so familiar by now (fig. II2-43):

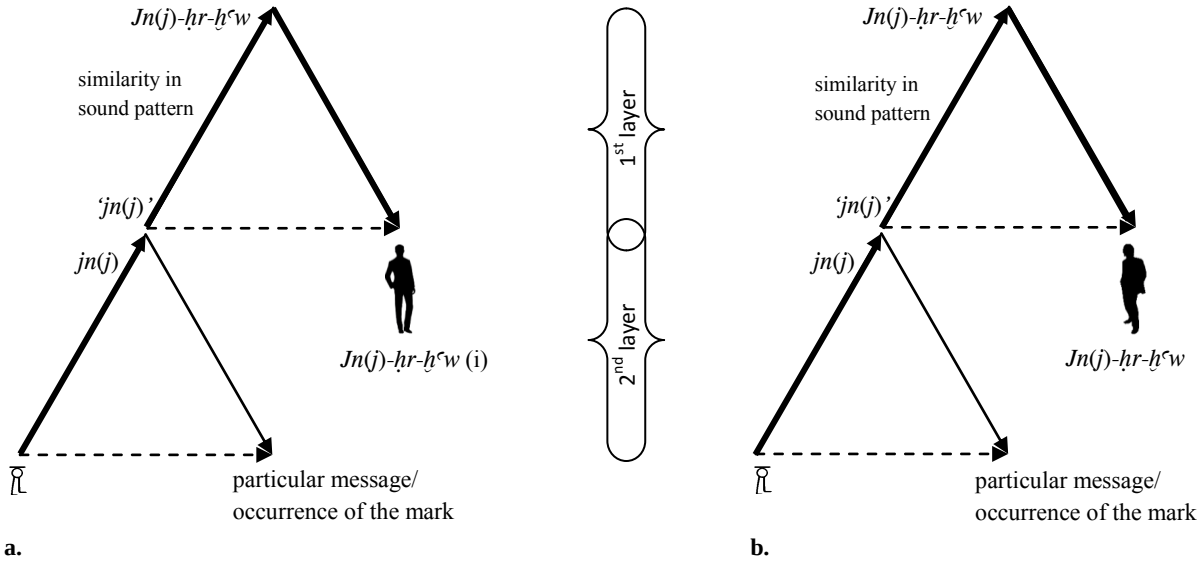


Fig. II2-43a. Successive semiosis of the mark 𓄿𓂋 with *Jn(j)-ḥr-ḫʿw* (i) as referent; **b**. Successive semiosis of the mark 𓄿𓂋 with *Jn(j)-ḥr-ḫʿw* (ii) as referent.

In a first level of meaning and a first process of semiosis, the representamen of the mark is its form as we perceive it: 𓄿𓂋. The interpretant can be said to be the sound pattern that was linked to the hieroglyphic equivalent 𓇋 of the representamen and was thus evoked in the mind; that is *jn(j)*. The referent can be said to be a particular occurrence of the mark. This is the component to which the use of the mark as a whole refers. In a second level of meaning and a successive process of semiosis, the interpretant can become a representamen anew. This is the level where the difference between the two marks 𓄿𓂋 (fig. II2-43a and b) becomes clear. The interpretant *jn(j)* becomes the new form of the sign: in dyadic terms a phonetic signifier, sound pattern or expression '*jn(j)*'. As such, it may lead to a new interpretant on the basis of similarity in sound pattern: the name *Jn(j)-ḥr-ḫʿw*. The referents of the new representamen and interpretant are the individual workmen *Jn(j)-ḥr-ḫʿw* (i) respectively *Jn(j)-ḥr-ḫʿw* (ii), to whom the marks in their entirety refer. The referents in the second level are crucial to the interpretation of the marking system; their inclusion allows to study the 'identity' part in the concept 'identity marks'.

[248] Chandler, *Semiotics*, 80; Gallie, *Peirce and Pragmatism*, 126.

In figs. II2-43a and b both marks 𓂋 are phonetic metaphors because the interpretant-having-become-representamen leads to the second interpretant on the basis of similarity in sound pattern. But at the end of the previous section a third player in the field was introduced: *Ḳnnɜ* (i), who used the mark at least in year 26 of Ramesses III.[249] Phonetic metaphor appears to be ruled out. How do we get from first representamen to ultimate referent?

We may suggest that another process of semiosis is necessary:

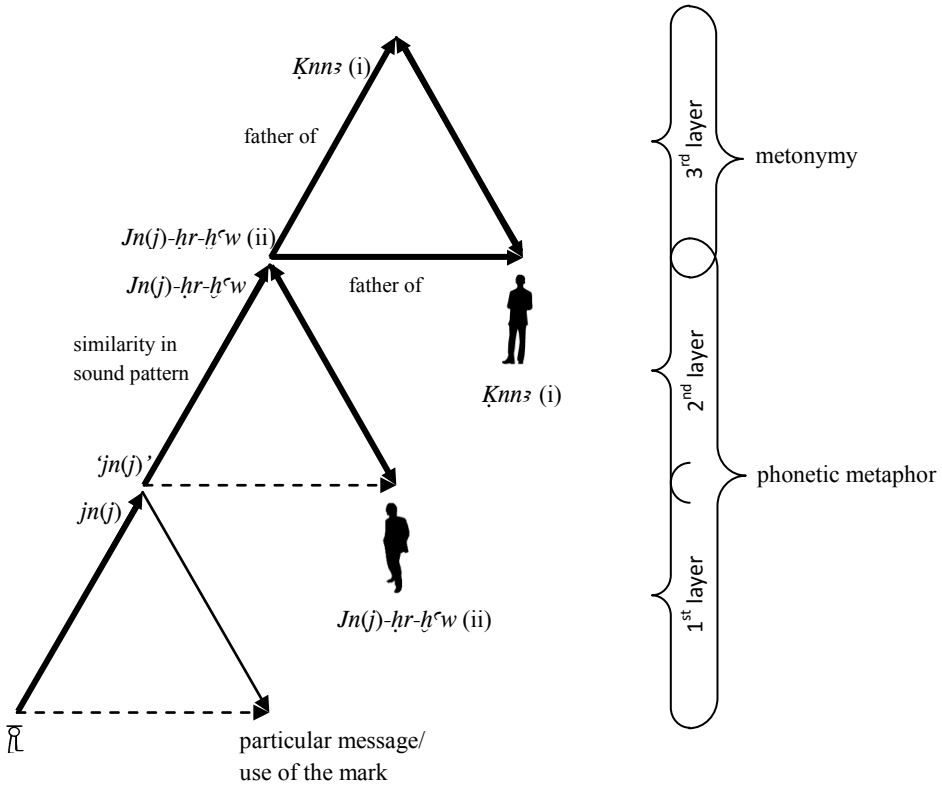


Fig. II2-44. Successive semiosis of the mark 𓂋 with *Ḳnnɜ* (i) as referent.

We know that *Ḳnnɜ* (i) was the son of *Jn(j)-ḥr-ḫʿw* (ii).[250] In the semiosis of the mark 𓂋 from fig. II2-43b, therefore, we may consider the interpretant *Jn(j)-ḥr-ḫʿw referring to Jn(j)-ḥr-ḫʿw (ii) = Jn(j)-ḥr-ḫʿw (ii)* as a new representamen in a successive process of semiosis. As such, *Jn(j)-ḥr-ḫʿw* (ii) may have evoked the idea of his son *Ḳnnɜ* (i) in the mind of an interpreter; the idea of the father evokes the idea of the son. The idea of *Ḳnnɜ* (i) is, then, the new interpretant, and the person of *Ḳnnɜ* (i) is the referent. Representamen refers to interpretant and to referent according to a 'father–son relation'. Thus a new sign is created, the underlying process of which is not one of phonetic metaphor but, as one could suggest, one of metonymy, where the relation between representamen, interpretant and referent is one of contiguity in that *Jn(j)-ḥr-ḫʿw* (ii) and *Ḳnnɜ* (i) are directly connected within the family circle.

[249] On the basis of hieratic parallels the mark 𓂋 must refer to *Ḳnnɜ* (i) on the marks ostraca Ashmolean Museum 1086 and IFAO ONL 0317. The parallel for the Ashmolean ostracon, dating to Ramesses III, year 26 IV *pr.t*, is O.Turin 57153 (*Ḳnnɜ* (i) appears on *sw* 14); the parallels for the IFAO ostracon, dating to Ramesses III, year 26 IV *ɜḫ.t*, are O.Berlin 12629; O.DeM 142 and O.DeM 150.

[250] Davies, *Who's Who at Deir el-Medina*, chart 3.

The reader familiar with the prosopography of Deir el-Medina will remark that there is also a family relation between *Jn(j)-ḥr-ḫʿw* (i) and *Ḳnnɜ* (i) and the two *Jn(j)-ḥr-ḫʿw*'s themselves: *Jn(j)-ḥr-ḫʿw* (ii) was the grandson of *Jn(j)-ḥr-ḫʿw* (i), and *Ḳnnɜ* (i) was therewith the great grandson of *Jn(j)-ḥr-ḫʿw* (i).[251] We could, then, present the semiosis of the mark 𓋴 in a chain of five successive processes as in fig. II2-45. However, on the basis of Peirce's remark that the endless process is cut short by the practical constraints of everyday life, we suggest that in daily practice the mind of an interpreter would not go back as far as four generations, which in this case is approximately 80 years. The connection between the mark 𓋴 and the referent *Ḳnnɜ* (i) in the daily administration is more likely to have been made on the basis of a 'father–son relation' with 𓋴 in its first two layers of meaning referring to *Jn(j)-ḥr-ḫʿw* (ii) as in fig. II2-43b, than on the basis of a 'great-grandfather–great grandson relation' with 𓋴 in its first two layers referring to *Jn(j)-ḥr-ḫʿw* (i). Analogous to the frequent practice in which family names were repeated every second generation[252] we might suggest that the successive processes of semiosis also went back approximately two generations (cf. the gradations in grey in fig. II2-45). More cognitive effort needed to link a workman to his proper mark would render the system less efficient. In the process of arriving at *Ḳnnɜ* (i) from the phonetic metaphor 𓋴 for *Jn(j)-ḥr-ḫʿw* (i) in fig. II-45 especially the interposition of *Ḥɜy* (iv) disrupts a smooth and fast cognitive process: he is rather attested with a different mark, 𓌙.[253]

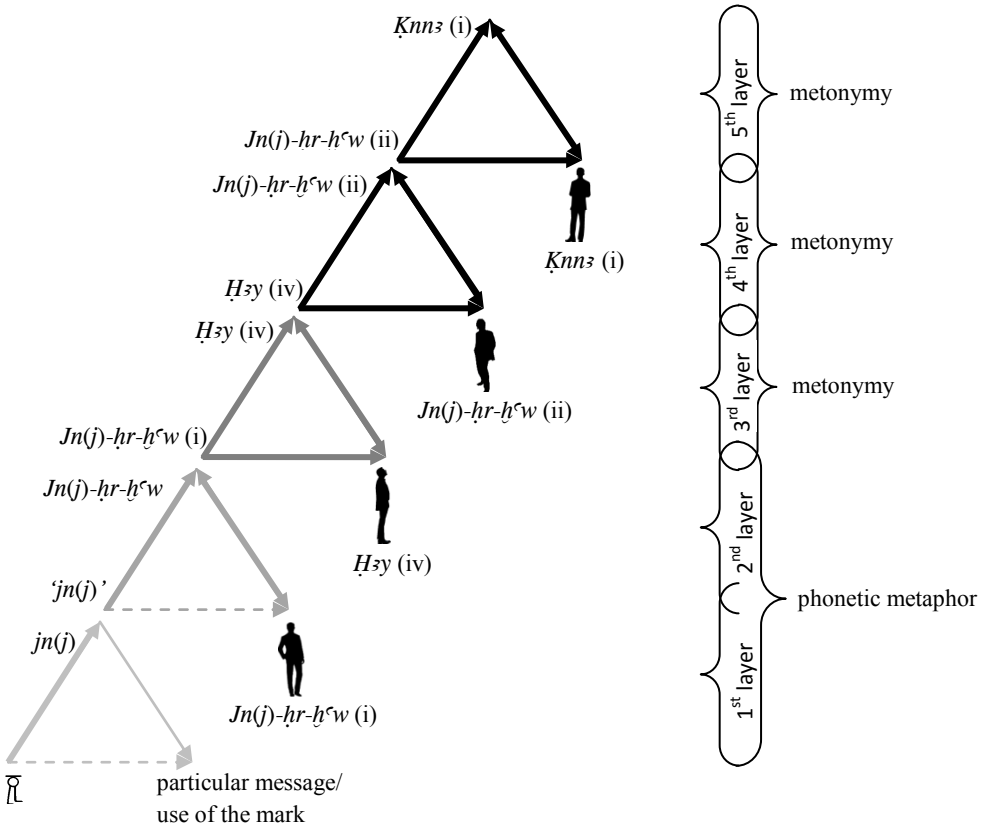


Fig. II2-45 Successive processes of semiosis of the mark 𓋴 going back four generations. It is suggested that in the daily life of Deir el-Medina an interpreter will have made the connection between 𓋴 and *Ḳnnɜ* (i) on the basis of an underlying process of semiosis in which 𓋴 is a phonetic metaphor for *Jn(j)-ḥr-ḫʿw* (ii), rather than that he would have calculated the mark 𓋴 back to *Jn(j)-ḥr-ḫʿw* (i) as forefather of the family.

[251] Davies, *Who's Who at Deir el-Medina*, chart 3.
[252] *Ibid*., xxiii.
[253] Cf. Soliman, *Of Marks and Men* (unpublished dissertation), chapter 4. See also the next chapter, pp. 231-232.

Although the Peircean model and its quality of unlimited semiosis with as a constraint the practicalities of everyday life can be used to analyze the semiosis of the marks from Deir el-Medina and visualize why a certain workman used a specific mark (i.e. visualize the use of the marks in their social and functional context), problems and questions remain. They all center around the fact that the marking system includes marks of different nature. Thus, first, in figs. II2-43 to 45 we used only the example of the phonetic metaphor , but what happens when we want to accommodate marks other than those inspired by hieroglyphic or hieratic script, which have no phonetic value? Consequently, second, how can we accommodate pictorial as well as phonetic interpretations, as Goldwasser did for hieroglyphic script in the dyadic model? How, for instance, can we accommodate a mark such as in fig. II2-37, which generates meaning along both pictorial and phonetic trails? There is only one route to the interpretant that does not allow the for the accommodation and visualization of a cooperation of pictorial and phonetic metaphor. Similarly, the accommodation of and the possibilities suggested for the generation of meaning by are troublesome. Clearly we need to incorporate Goldwasser's pictorial and phonetic trails into Peirce's model. But before we do that in the synthesis of section 3, we must first address a third question: in addition to 'similarity in sound pattern' and the 'father–son relation', what sorts of relations determine the semiosis between the sign-components? What modes of semiosis are there? How do signs behave according to Peirce, and what sorts of sign functions does he therefore acknowledge?

c. Typological study of sign functions

c.1. Peirce's triadic typology

Peirce's typological study of sign-functions is often designated as a 'sign typology' and therewith understood as a classification of distinct 'types of sign'.[254] However, a classification of signs often happens on the basis of form, comparable to what we have done in the Venn-diagram in chapter 1 of the Paleography, and does not take into account the actual semiosis of the signs. It is thus necessary to investigate the relations that exist between the sign-components and to come to a typology of *sign-functions*:[255] of the manners in which signs function and according to which the sign-components interact in order to generate meaning. This is what Peirce did and his 'sign typology' is therefore better understood in terms of a typology of different 'modes' of semiosis according to which signs function.[256] He developed an elaborate typology, in which he first arrived at ten major classes of semiotic modes, and later to ten trichotomies of 66 and even 3^{10} = 59,049 classes of semiotic modes.[257] As the most fundamental, however, he considered the following three modes, to which we will confine ourselves:[258]

The symbolic mode

Signs that function in the symbolic mode are based purely on conventional association between the sign-components. The representamen is related to the interpretant and the referent according to convention: the relation is agreed upon and must be learned. Signs in the symbolic mode are thus also

[254] Chandler, *Semiotics*, 36.
[255] A term borrowed from Eco, *A Theory of Semiotics*, 48-50, who in turn borrowed it from Hjelmslev, *Prolegmena* (1963), 33-41.
[256] Chandler, *Semiotics*, 36.
[257] Nöth, *Handbook of Semiotics*, 44.
[258] *Ibid*.; Peirce §2.275.

interpreted according to learned rules.[259] Examples are found particularly in mathematics and in language.[260] Words, for instance, are linked to their meaning on the basis of agreement. There is no reason behind the designation for a tree being 'tree';[261] this is simply agreed upon by English language-speakers. It is a convention that must be learned by anyone who wants to master the language. De Saussure considered the relation of convention, the symbolic mode, the only relation that exists between signifier and signified. In his focus on linguistics the conventional nature of the linguistic sign was a primary principle of *sémiologie*.[262]

We find the symbolic mode in the first layer of semiosis of 𓐍, in the relation of the representamen with the sound pattern *jn*(*j*) of its hieroglyphic equivalent.

The iconic mode

When a sign functions in the iconic mode, its representamen is experienced as resembling or imitating the referent; it recognizably looks, sounds, feels, tastes or smells like it. It is thus similar to it in that it possesses some of its qualities. The relation between the representamen and interpretant is iconic in that the former 'excites analogous sensations in the mind'.[263] The iconic mode is found particularly in photography and portraiture: a portrait excites in the mind an image that is analogous to it, and resembles the referent (the one portrayed) in several respects. But signs in the iconic mode are not necessarily visual. When running water evokes in the mind the idea of having to go to the bathroom, the referent being the toilet flush, this is iconic semiosis as well.

We find the iconic mode in the second layer of semiosis of 𓐍, in the similarity between the sound pattern *jn*(*j*) and the second interpretant *Jn*(*j*)-*ḥr*-*ḫʿw*.

The indexical mode

When a sign functions in indexical mode, its representamen is directly connected to the interpretant and referent in some physical or causal way. This connection is characterized by a relation of contiguity between representamen on the one hand, and interpretant and referent on the other. The relation can be observed or inferred from the representamen. The representamen *indicates* something, and this something does not depend on 'the interpreting mind', but is necessarily existent in its direct connection to the representamen.[264] Therefore, of the three modes, indexicality is the only one that can serve as evidence of the factual existence of the referent.[265] That makes indices the signs *par excellence* to be used as signs of accountability: images on a security camera *indicate* the thief in a robbery, signatures *indicate* the rights and obligations of individuals, identity marks *indicate* the presence or absence of workmen. On the level of the sign system, all identity marks thus function as indices. Other examples of signs that function in the indexical mode we find in nature: smoke is an indexical representamen for its direct cause fire ('where smoke is, is fire'), or tracks such as broken twigs or footprints are indexical representamina for the physical presence of a living creature. But also medical symptoms being representamina for a condition that causes them, or measuring instruments

[259] Chandler, *Semiotics*, 38-39; Peirce §§1.369, 2.292, 2.297.
[260] Chandler, *Semiotics*, 39.
[261] De Saussure, *Course in General Linguistics*, 67.
[262] *Ibid*., 36-37.
[263] Peirce §§2.279, 2.299; Chandler, *Semiotics*, 40.
[264] *Ibid*., 42; Peirce §§2.285, 2.92, 2.310.
[265] Chandler, *Semiotics*, 43.

being representamina for the weather conditions that cause the measurements are signs functioning in the indexical mode of semiosis.

We find the indexical mode in the third layer of semiosis of , in the contiguity between father *Jn*(*j*)*-ḥr-ḫʿw* (ii) and son *Ḳnnɜ* (i).

The symbolic, iconic and indexical modes of semiosis are three basic modes, but since each of them can be identified in one of the layers of semiosis of the mark for *Ḳnnɜ* (i), they are clearly not mutually exclusive in the overall semiosis of signs. Indeed, instead of three separate and independent modes, we usually deal with signs that function according to any combination of two or three of the modes. Peirce himself already insisted that 'it would be difficult if not impossible to instance an absolutely pure index, or to find any sign absolutely devoid of the indexical quality'.[266] Similarly, semioticians generally maintain that there are no pure icons, for even a portrait is made according to stylistic conventions.[267] Jakobson called the signs functions that combine two or three modes 'transitional varieties' and noted that in each variety one mode is dominant, with dominance being determined by context and the way in which a sign is used.[268] Thus, whether the symbolic, the iconic or the indexical mode is dominant in the semiosis of a sign primarily depends on the particular usage, context and purpose of that sign. The same sign may function in iconic or indexical mode in one context, and in symbolic mode in another. This is precisely the case in Egyptian hieroglyphic script, where the same sign may on one occasion convey meaning primarily along the pictorial trail and on another primarily along the phonetic trail. When, for instance, the sign is used primarily for its sound pattern in the word *prw*, 'surplus', the symbolic mode of semiosis is dominant; it even completely neutralizes its iconic sign function. But when is used in the word *pr* 'house', the iconic mode of semiosis is the one in which the sign most directly functions.[269]

Although transitional varieties may thus combine any two or three of the basic modes of semiosis, and any basic mode can be dominant to greater or lesser degree all depending on usage, purpose and context, there are four domains in which they are logically found:

- In the transition between the symbolic and indexical modes we naturally find sign-varieties that function as *indexical symbol* or as *symbolic index*.[270] Examples of indexical symbols are demonstratives such as 'that', 'this', 'here' or 'there'. They are indexical in that they directly indicate something that is the referent, but as linguistic signs they remain symbols based on convention: we interpret the words according to the learned rule that the sound pattern or written form of 'that', for instance, directly indicates something beyond the representamen and interpretant to which the sign as a whole refers. Examples of symbolic indices are diagrams or registers in a book. They make use of words and numbers that are conventional symbols the meaning of which must be learned, but they are indexical in that their main function is to point to the locations where

[266] Peirce §2.306; Chandler, *Semiotics*, 44.
[267] *Ibid*., 40-41.
[268] Jakobson, 'Language in Relation to Other Communication Systems' in Jakobson, *Selected Writings* II, 700; Jakobson, 'Quest for the Essence of Language' in Waugh & Monville-Burston, *On Language*, 411; Chandler, *Semiotics*, 44.
[269] Cf. previous section (1.d.3). WB I, 511.7 and 526.14-15.
[270] The main mode is indicated by the noun, the mode with which it is combined by the adjective. The meaning of both terms *indexical symbol* and *symbolic index* and the difference in meaning between the two terms is then generated especially in the syntagmatic dimension, in the syntactical combination of the words.

certain topics can be found. Another example of symbolic indices are traffic lights, which make use of the conventional meanings attached to the symbols green, red and yellow, but as indices directly relate to the action to be taken;[271]

- In the transition between the symbolic and iconic modes we find sign-varieties that function as *iconic symbol* or *symbolic icon*. Iconic symbols can be linguistic signs that express a relation of similarity, for instance onomatopoeia such as 'cuckoo' or 'ping pong'. They are iconic in that they refer to an animal or sport via a phonic sound pattern that is similar to this animal or sport in some respect or quality, but they remain conventional in their graphic mode of representation.[272] Examples of symbolic icons are the portraits already mentioned. As a matter of fact, it has been remarked that any picture 'is essentially a symbol, not a duplicate of what it represents'.[273] All artists, photographers and painters alike, employ stylistic conventions and thus, as Peirce stated, 'any material image … is largely conventional in its mode of representation'; 'likeness is aided by conventional rules';[274]

- In the transition between the indexical and iconic modes we find sign-varieties that function as *indexical icon* or *iconic index*. Examples of indexical icons are video-images of a security camera that show a thief at work. They are iconic in that they evoke an analogous idea of the thief in the mind of an observer, but indexical in that they directly point in the direction of the thief as the actual, existent referent who is the cause of the robbery. Examples of iconic indices are laundry labels that make use of iconic pictures such as , , , , , , , , , , or through which they directly point at the actions that must or must not be undertaken;

- In the transition between all three modes we find sign-varieties that function according to any combination in which each of the modes contributes to the generation of meaning. An example provided by Chandler is the map: 'A map is indexical in pointing to the locations of things, iconic in representing the directional relations and distances between landmarks, and symbolic in using conventional symbols (the significance of which must be learned)'.[275] All three modes take part in a correct understanding of the map. Also, when laundry labels include pictures such as , , , or , they switch from functioning in an *iconic indexical* mode to functioning in a *symbolic iconic indexical* mode, simply because they now include letters and numbers which are symbols that function on the basis of convention. Thus, whether a laundry label, or in fact any kind of sign, functions in one or the other (combination of) sign-function(s) depends on its particular instance.

To summarize, on the basis of how a sign is used, for what purpose and in which context, we can analyze its semiosis as taking place in the symbolic, the iconic, or the indexical mode, or in any combination of the modes. Peirce's typology is, then, not a classification of signs in general, but of the

[271] Jakobson, 'Language in Relation to Other Communication Systems' in Jakobson, *Selected Writings* II, 700.
[272] Chandler, *Semiotics*, 41, 44, referring to Jakobson, 'Quest for the Essence of Language' in Waugh & Monville-Burston, *On Language*, 411; and referring to Lyons, *Semantics* I, 105.
[273] Langer, *Philosophy in a New Key*, 67, referred to by Chandler, *Semiotics*, 40.
[274] Peirce §2.276; Chandler, *Semiotics*, 41; Jakobson, 'Visual and Auditory Signs' in Jakobson, *Selected Writings* II, 335.
[275] Chandler, *Semiotics*, 44.

semiotic modes according to which signs in particular instances function. The three basic modes and the transitions between them lead to seven domains in which signs can function:

The symbolic domain
The symbolic indexical or indexical symbolic domain

The indexical domain
The indexical iconic or iconic indexical domain

The iconic domain
The iconic symbolic or symbolic iconic domain

Any combination of the symbolic, indexical and iconic domains

c.2. Metaphor and metonymy in terms of Peirce's typology

The reader may have noted a considerable overlap between the description of the basic modes of semiosis and the description of metaphor and metonymy given in section 1.d.1. Processes of metaphor and metonymy can in fact be discerned in the modes of semiosis. Roughly said:

- Signs or transitional varieties that make use of the indexical mode may be conceived of as metonymic in that the semiosis between the sign components is based on a direct connection of contiguity between representamen and interpretant and referent;

- Signs or transitional varieties that make use of the iconic mode may be conceived of as metaphoric in that the semiosis between the sign components is based on similarity in qualities or characteristics and on the projection of these qualities and characteristics onto an interpretant and referent by an iconic representamen. However, it has been remarked that signs in the iconic mode resemble what they represent *only in some respects*. Chandler states that 'What we tend to recognize in an [iconic] image are analogous relations of parts to a whole'.[276] Metonymic processes therefore support the generation of meaning by metaphoric signs in iconic mode;

- Signs that make use of the symbolic mode may be conceived of as literal in that the representamina of signs in the symbolic mode fulfill their function regardless of any similarity or contiguity with their referent: 'a *symbol* … fulfills its function regardless of any similarity or analogy with its object and equally regardless of any *factual* connection therewith'. 'A genuine symbol is a symbol that has a general meaning'.[277] There is nothing rhetoric about the denotation of a tree by means of the linguistic sign 'tree', in sound or in writing. Certainly, signs in the symbolic mode such as words or phrases can be used rhetorically in a particular context and for a particular purpose. However, they are then no longer pure symbols; they are indexical or iconic symbols instead. Thus, in the transitional varieties of the symbolic mode the metonymic and metaphoric processes come into play again and they undo the literal nature of the purely symbolic sign.

[276] Chandler, *Semiotics*, 40, referring to Langer, *Philosophy in a New Key*, 67-70.
[277] Peirce §§5.73, 2.293; Chandler, *Semiotics*, 39.

When we merge the basic modes of semiosis and their transitions from Peirce's typology with the processes of metaphor and metonymy, we arrive at the following description of the seven domains in which signs may function:

The domains of the three basic modes:

Literal symbolic domain

Metonymic indexical domain

Metonymic metaphoric iconic domain

The domains of the transitional modes

Metonymic indexical symbolic and symbolic indexical domain

Metonymic metaphoric indexical iconic and iconic indexical domain

Metonymic metaphoric iconic symbolic and symbolic iconic domain

Metonymic metaphoric semiosis in any combination of the three modes in an all-integrated domain

Or in tabular form:

Table II2-2 The modes of semiosis merged with the processes of metaphor and metonymy

		Literal (conventional)	Metonymic metaphor (selective similarity)	Metonymy (contiguity)
Symbol		X		
	symbolic index, indexical symbol			X
Index				X
	indexical icon, iconic index		X	
Iconic			X	
	iconic symbol, symbolic icon		X	
	any combination of the 3 modes		X	

c.3. The typology of sign functions incorporated in the Venn-diagram

It is tempting to consider the seven domains characterized by three main modes of semiosis and their transitional forms in terms of the Venn-diagram of visual communication. In incorporating this typology in a Venn-diagram, the latter becomes not a visual classification of signs, but a visual classification of the semiosis of signs. Thus a sign that functions according to a specific mode or combination of modes can be allocated to one of the following domains (fig. II2-46):

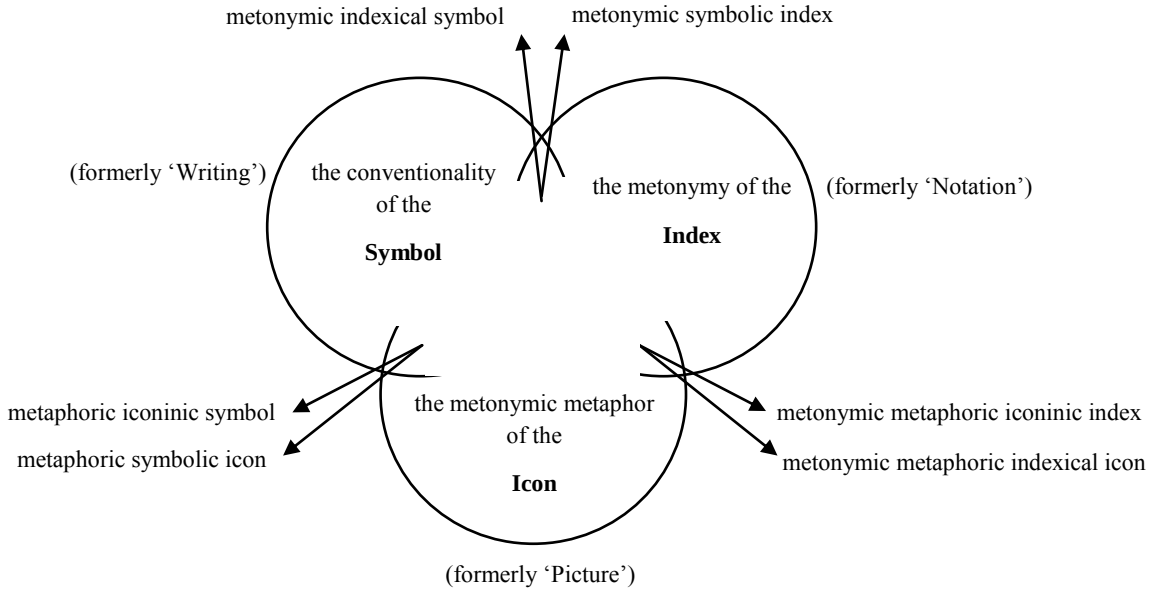


Fig. II2-46 Peirce's typology of sign functions and the processes of metaphor and metonymy integrated in a Venn-diagram. The diagram shows a classification of sign functions according to the fundamental modes of semiosis of signs used for a particular purpose in a particular context. The same sign may be allocated to different domains when used for different purposes in different contexts.

In the upper right, we have replaced 'Writing' with 'Symbol': the signs in this domain convey meaning on the basis of convention. At the bottom we have replaced 'Picture' with 'Icon': the signs in this domain convey meaning on the basis of resemblance or similarity in experience. In the upper left we have replaced 'Notation' with 'Index': signs in this domain convey meaning on the basis of contiguity. To test what this version of the Venn-diagram means for the marks from Deir el-Medina, we may recall the marks that were depicted in Figs. II2-36 to 40 in the previous section 1.d.3: , , , and :

– iconic symbol (fig. II2-36)

We have described this mark referring to *Jn*(*j*)*-ḥr-ḫʿw* (i) and (ii) as a phonetic metaphor, but in the Peircean typology it would function as an iconic symbol. It is primarily conventional in that it makes use of the phonetic sound pattern '*jn*(*j*)', but iconic (therefore metonymic metaphoric), in that it selects this sound pattern and projects it onto the interpretant *Jn*(*j*)*-ḥr-ḫʿw* on the basis of similarity. When the mark refers to *Ḳnnɜ* (i), it becomes an index that is based on the iconic symbol of which *Jn*(*j*)*-ḥr-ḫʿw* (ii) was the referent, but now refers to *Ḳnnɜ* (i) on the basis of the familial contiguity relation of father and son.

– symbolic icon (fig. II2-37)

We have described the mark as a phonetic animalistic metaphor, but in the Peircean typology it would function as a symbolic icon. It is primarily iconic (thus metonymic metaphoric), in that it projects certain selected qualities of the animal onto the workman *Jmn-nḫt* (xii) and also refers to him via the similarity in sound pattern of *wnš*, 'jackal', and *Jmn-nḫt*'s nickname *Pɜ-wnš*. But precisely because it makes use of this phonetic pattern to support and make explicit the animalistic metaphor, the symbolic mode is involved in the ultimate semiosis.

– indexical icon (fig. II2-38)

We have described the mark as an animalistic metaphor, but in the Peircean typology it would function as an indexical icon. It is primarily iconic in that it selects the quality of a falcon's sharp sight and projects this onto the workman *Mnnɜ* (i), but it is indexical in that the representamen emphasizes this quality by representing part for whole and directly connecting organ with activity.

- symbolic index (fig. II2-39)

We have described the mark as generating and conveying meaning according to metonymic and phonetic processes along the pictorial and phonetic trails. In the Peircean typology it would function as a symbolic index. It is symbolic in that its conventional sound pattern *sš* is the word for 'scribe' in ancient Egyptian language, but it is indexical in that the representamen directly indicates this profession via representation of the tools necessary to exercise it, and in that, ultimately, the mark as a symbol is directly connected to the individual who exercised the profession of scribe.

– index and/or iconic symbol? (fig. II2-40)

We have proposed that this mark may generate and convey meaning according to metonymic and/or phonetic processes along the pictorial and phonetic trails. In the Peircean typology this mark could be said to function as an index and/or as an iconic symbol. It functions as an index when it is directly connected to *Ḳɜḥɜ* (i) if he would have used this mark via the metonymy tool-for-profession. When, however, the semiosis rather lies in the fact that an equivalent sign occurs as determinative in words from the Egyptian language and when it uses the phonetic sound patterns of these words to refer to *Ḳɜḥɜ* (i), the sign rather functions in the symbolic mode and via iconicity projects the sound pattern onto the name *Ḳɜḥɜ*.

The sign-functions are tabulated in Table II2-3 and positioned in the Venn-diagram in fig. II2-47:

Table II2-3 Identity marks considered in the integration of the modes of semiosis and the processes of metaphor and metonymy

		Literal (conventional)	Metonymic metaphor (selective similarity)	Metonymy (contiguity)
Symbol				
	symbolic index, indexical symbol			
Index				?
	indexical icon, iconic index			
Icon				
	iconic symbol, symbolic icon	?		
	any combination of the 3 modes			

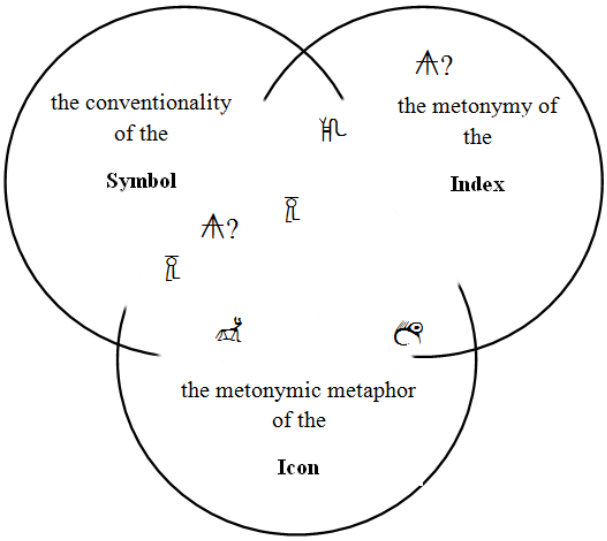


Fig. II2-47 The identity marks from Table II2-3 positioned in a Venn-diagram that integrates the seven domains of semiosis and the processes of metaphor and metonymy.

Thus, by merging the modes of semiosis that result from Peirce's typology of sign functions with the processes of metaphor and metonymy we can refine the analysis of the nature of the modes according to which the marks function and generate meaning.

While Jakobson remarked that one or two modes of semiosis may be dominant, Chandler furthermore remarks that signs may shift in dominant mode(s) over time. His example is the Rolls-Royce, originally an *index* of wealth because one had to be wealthy to own one, but social usage has led to its becoming a conventional *symbol* of wealth.[278] In regard of the marks from Deir el-Medina, it follows that we must reckon with possible changes in modes of semiosis, especially when marks from dynasty 18 also seem to occur in dynasties 19 and 20; their semiosis might have changed. The marks and , for instance, both occur in all periods. The first, equivalent to the hieroglyphic sign *wsr*, is probably a phonetic metaphor, or iconic symbol, in dynasties 19 and 20 when it was used by *Wsr-ḥɜ.t* (i) and *Wsr-ḥɜ.t* (ii) respectively. The second, equivalent to the hieroglyphic sign *ms*, was probably a phonetic metaphor at least in dynasty 20 when it was used by *Ms* (iv). But we do not know whether the extraction of the sound patterns and their application onto the names of workmen was also the dominant mode of semiosis in dynasty 18. Perhaps semiosis rather took place in the iconic mode (e.g. when is similar to the mark in that it is an animalistic metaphor represented by part of the animal), or by means of an indexical relation (e.g. when makes use of the sound pattern *ms* to refer indexically, via the word *ms-ʿɜ.t* 'stoneworker', to a workman on the basis of a metonymy 'profession for person').[279] Another example is the mark . In Part I we have suggested a graphic development of this mark from a rather clumsy form apparently unrelated to script in dynasty 18 to a better equivalent of the hieroglyph *nbw* in dynasty 20. We do not know the identity of the workman who

[278] Chandler, *Semiotics*, 44, referring to Culler, *Structuralist Poetics*, 17.
[279] For *ms-ʿɜ.t*, see WB II, 138.19.

used this mark, but the radical change in form toward the hieroglyph 𓂝 may be reason to reckon with an increase of the symbolic mode in the semiosis of this mark in dynasty 20.

From Chandler's remark on shifting modes, it furthermore follows that the nature of semiosis of an entire sign system may change over time, especially when it concerns an open system, which is liable to the addition of new signs when necessary: such a system may contain signs that generate meaning predominantly in the indexical and iconic modes in an earlier stage, while an increase of signs that make use of the symbolic mode may shift the nature of semiosis of the entire system more toward that particular domain.

One is reminded, of course, of the shift in the Venn-diagram as represented in fig. I1-8**:** in Part I chapter 1 we suggested a shift from Elkins' domains 'Picture' and 'Notation' toward 'Writing' for the marks from Deir el-Medina on the basis of the formal composition of the marking system in dynasty 18 and in dynasties 19 and 20. In this respect, it is interesting to note that Peirce himself speculated about a universal historical development from iconic and indexical modes of semiosis ('Picture' and 'Notation') toward the symbolic mode ('Writing'). Chandler remarks that Peirce did not present this as necessarily a matter of *progress* toward an 'ideal symbolic form', as the theories of evolution presented in the Introduction of this dissertation did, but he nevertheless noted a trend from icon to index to symbol.[280] Iconicity, he argued, was the original default mode of semiosis. He defined it as 'the most primitive, simple and original of the categories'.[281] Signs were 'originally in part iconic, in part indexical'. However, over time, linguistic signs developed a more symbolic and conventional character; symbols came 'into being by development out of other signs, particularly from icons'.[282]

Chandler himself agrees that 'The historical evidence does indicate a tendency of linguistic signs to evolve from' the indexical and iconic modes toward the symbolic mode.[283] In fact, many scholars who study visual communication in cultures all over the world consider a trend from icons and indices to symbolic linguistic writing. Especially signs in the indexical mode they consider direct precursors to linguistic signs in the symbolic mode. They mainly focus on animal tracks and traces as examples: tracks and traces direct one to the creature that created them and are therefore indexical. They were followed by our ancestor hunters and gatherers in search of food, who 'read' them in sequence to restore a past event: the presence of prey and the direction it went. The cultural historian Ginzburg argued that our 'track-reading' ancestors were the first story-tellers 'because only hunters knew how to read a coherent sequence of events from the silent (though not imperceptible) signs left by their prey'.[284] In the words of Perrin tracks were read in a linear sequence that could be mapped conceptually to a sequence in time,[285] leading to a narrative of past reality. Through the millennia, this 'emerging narrative' would have led to the invention of writing as it is currently understood: through the indexical representation of creatures to abstract symbols that refer to these creatures as mental concepts in the early beginnings of mnemonics.[286] A similar idea was expressed by the linguist

[280] Chandler, *Semiotics*, 46; Peirce §2.299.
[281] Chandler, *Semiotics*, 46; Peirce §§2.90, 2.92.
[282] Chandler, *Semiotics*, 46; Peirce §2.302.
[283] Chandler, *Semiotics*, 46-47.
[284] Ginzburg & Davin, 'Morelli, Freud and Sherlock Holmes', *History Workshop* 9 (1980), 13; Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 90.
[285] Perrin is independent researcher who focuses his study on semiotics and brand marketing. 'Marks: A Distinct Subcategory Within Writing as Integrationally Defined', *Elsevier Language Sciences* 33 (2011), 625.
[286] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 90-91.

Landaburu, who considered 'footprints in mud, human and animal scent or broken branches' – all marks that have a direct connection between their form and the event that led to their creation – as marks that 'become signs to those who are able to interpret them'.[287] He argues that such early indexical connections with a function related to identification and territoriality, developed to anchor complex mnemonic uses and subsequently developed into writing. The idea that indices play a prominent role in the origin of writing is furthermore present in the Chinese legend of Cang Jie as the inventor of the Chinese script. The legend records that Cang Jie, official at the court of the Yellow Emperor, 'found inspiration in the marks left behind by birds and animals and the markings on animals themselves, realising that the graphic reproduction of the tracks or marks could be used to represent and keep record' of the Emperor's land.[288]

The idea that indexical tracks and markings were early forms of mnemonic systems that developed into symbolic writing relates to a zoosemiotic frame for the interpretation of mark making in general. By arguing that symbolic writing originates in iconic and indexical signs found in nature the adherents want to emphasize that the term 'writing' thus implies more than merely human linguistic writing, and rather encompasses all forms of visual communication, made intentionally or not, by humans and other species alike. Like Peirce, they do not consider symbolic writing to be the superb and ideal end-product of a linear evolution, but merely remark a general trend. Although we have identified this trend in the formal composition of the marks from Deir el-Medina, from a pictorial and abstract-geometric appearance to forms more conform hieroglyphic and hieratic script, the question is now to what extend we can discern *a semiotic trend* from iconic and indexical modes of semiosis toward more conventional symbolic modes of semiosis. In the next section we merge aspects of the dyadic and triadic semiotic traditions into an integrated model in which we accommodate the semiosis of the identity marks in order to find out whether we can answer that question.

[287] Landaburu, referred to in Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 92.
[288] *Ibid.*, 91; Lewis, *Writing and Authority in Early China*, 197-202, 273.

3 SYNTHESIS

There is clearly not *one* semiotic theory or model that serves the full accommodation and explanation of the identity marks from Deir el-Medina. Each theory and model offers relevant perspectives and methodological tools, but also has its shortcomings. In this synthesis we present a suggestion for the integration of the following aspects from the theories and models that were discussed in sections 1 and 2, which are considered relevant in the analysis of the semiosis of the marks:

- The idea of multiple trails along which signification takes place in Goldwasser's adaptation of the dyadic sign model;
- The inclusion of the referent offered by the triadic sign model;
- The multiple levels of unlimited semiosis in which meaning is generated in successive processes of semiosis in the triadic tradition;
- The processes of metaphor and metonymy in the generation of meaning which the dyadic tradition identified on the basis of the structural functioning of the syntagmatic and paradigmatic dimensions of sign systems;
- The symbolic, iconic and indexical modes of semiosis in which the triadic tradition incorporates the processes of metaphor and metonymy.

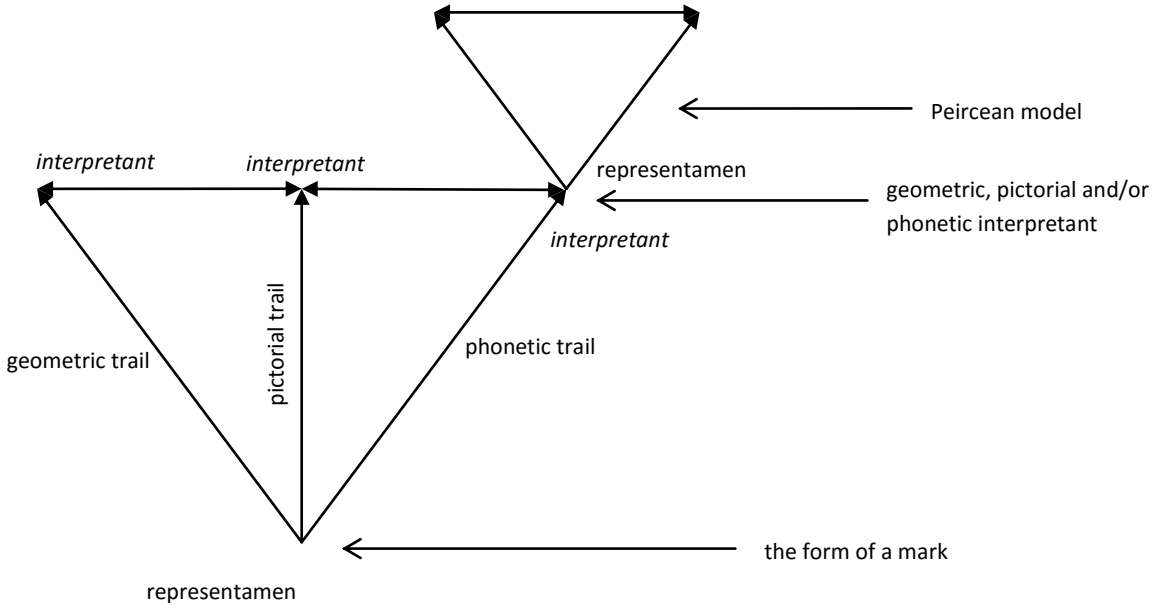


Fig. II2-48 Synthetic model for the accommodation of the marks from Deir el-Medina.

The model that is suggested (fig. II2-48) is built up of successive triangles that represent successive levels of semiosis. In the first level are found the pictorial and phonetic trails, which Goldwasser argued are necessary for the semiotic analysis of the pictorial hieroglyphic script. But we must add a third trail for the marks: a trail that allows the accommodation of abstract geometric forms. This first triangle can be considered semiotically dyadic in that it has a representamen, that is the form of the mark that is our point of departure, and a phonetic and/or pictorial and/or abstract geometric interpretant which it evokes. In a second level we accommodate the Peircean model: the interpretant of the first level becomes representamen in this second level and leads to a new interpretant and to a

referent. The interpretant in the first level can be a full phonetic interpretant, in which case the representamen in the second level is a phonetic representamen, a written or spoken sound pattern. But the interpretant can also be a pictorial or abstract geometric interpretant, or a combination in that the generation of meaning takes place along two or all three of the trails. Depending on the nature of the interpretant, the second level, the Peircean model proper, starts off along or in between the phonetic, pictorial or geometric trails.

a. Examples: dynasties 19-20 and dynasty 18

It is best to look at some examples. The first examples, presented in figs. II2-49 to 56, date to dynasties 19 and 20; the examples in figs. II2-57 to 61 date to dynasty 18. In figs. II2-49 and 50 we find the mark 𓏏, which is well-known by now; a brief explanation will suffice. In fig. II2-49 the mark, referring to the workman *Jn(j)-ḥr-ḫʿw* (i) follows the phonetic trail. It leads to the interpretant *jn(j)*, which in the second level becomes the phonetic representamen '*jn(j)*'. It evokes the interpretant *Jn(j)-ḥr-ḫʿw* on the basis of similarity in sound pattern: the process is one of phonetic metaphor, or one of iconic symbol. The alternative trails in the first level would lead to a pictorial interpretant, which is the *act of bringing something*, or a geometric interpretant, which is evoked by the lines of which the mark consists, but the latter is irrelevant here. Since these interpretants do not play a role in the semiosis of the mark in this particular usage and context, the semiosis along the phonetic trail could be weighed with 100%. In fig. II2-50 the same process takes place in the first two levels for the mark 𓏏 referring to *Jn(j)-ḥr-ḫʿw* (ii). When the mark 𓏏 refers to *Ḳnnɜ* (i), a third level is added. The interpretant-referring-to-the-referent in the second level, i.e. *Jn(j)-ḥr-ḫʿw* (ii), becomes the new representamen which, according to the metonymic relation of family contiguity refers to *Ḳnnɜ* (i) as the interpretant and referent in the third level. The semiosis in the first two levels is phonetic metaphoric, where 𓏏 is an iconic symbol; the semiosis in the third level is metonymic, where 𓏏 is an index for *Ḳnnɜ* (i).

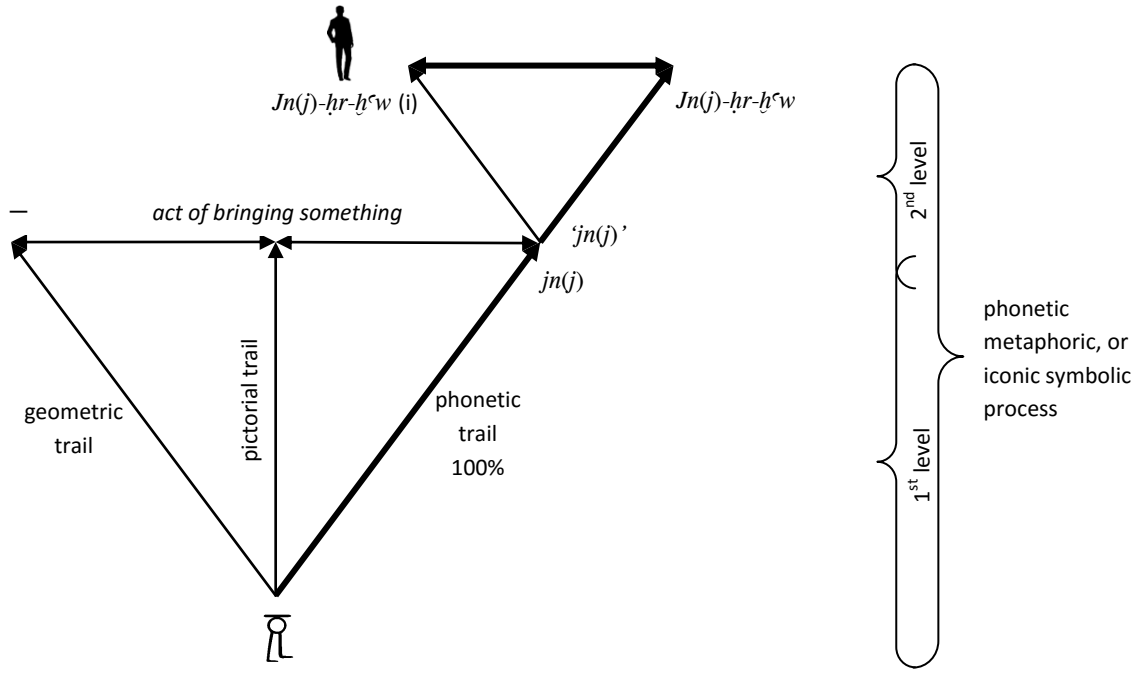


Fig. II2-49 𓏏 referring to *Jn(j)-ḥr-ḫʿw* (i) as a phonetic metaphor, or iconic symbol.

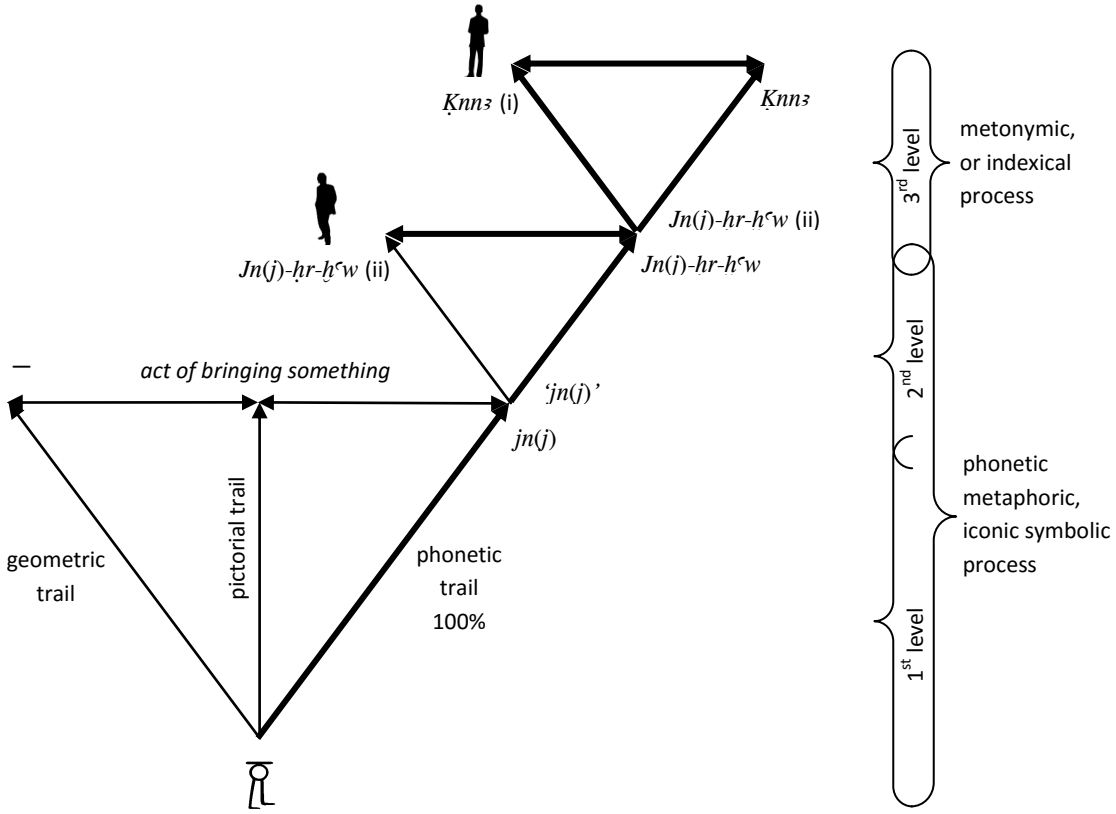


Fig. II2-50 𓇋 referring to *Ḳnnɜ* (i) as a phonetic metaphor, or iconic symbol, in the first two levels of semiosis, and as metonymy, or index, in a third level of semiosis according to the familial contiguity of ‘father – son’.

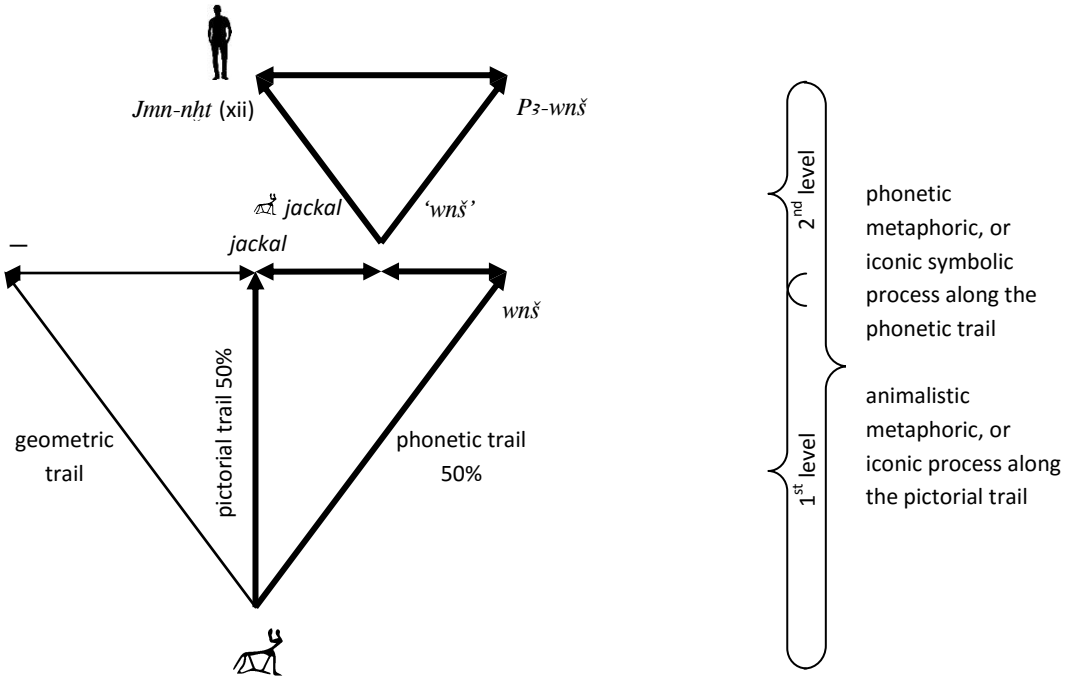


Fig. II2-51 𓃒 referring to *Jmn-nḫt* (xii) as a phonetic metaphor, or symbolic icon along the phonetic trail, and as animalistic metaphor, or icon, along the pictorial trail.

The example of 𓃀 is shown in fig. II2-51. In the first level, the semiosis takes places along both the phonetic and the pictorial trails: both the phonetic sound pattern and the pictorial representation are significant as explained above in section 1.d.3 and fig. II2-37. The sound pattern '*wnš*' contributes in the second level of semiosis by evoking the interpretant *Pꜣ-wnš* on the basis of similarity; that is, as a phonetic metaphor. The pictorial interpretant *jackal* contributes by evoking aspects of the jackal that were projected onto *Jmn-nḫt* (xii), who is the referent because he was nicknamed *Pꜣ-wnš* on the basis of animalistic metaphor. The mark is therefore an icon, and because it makes use of the phonetic trail, it can be called a symbolic icon. Since the pictorial and phonetic trails both contribute to the second level of semiosis, which therefore starts off from their midst, the semiosis along these trails could be weighed each with 50%.

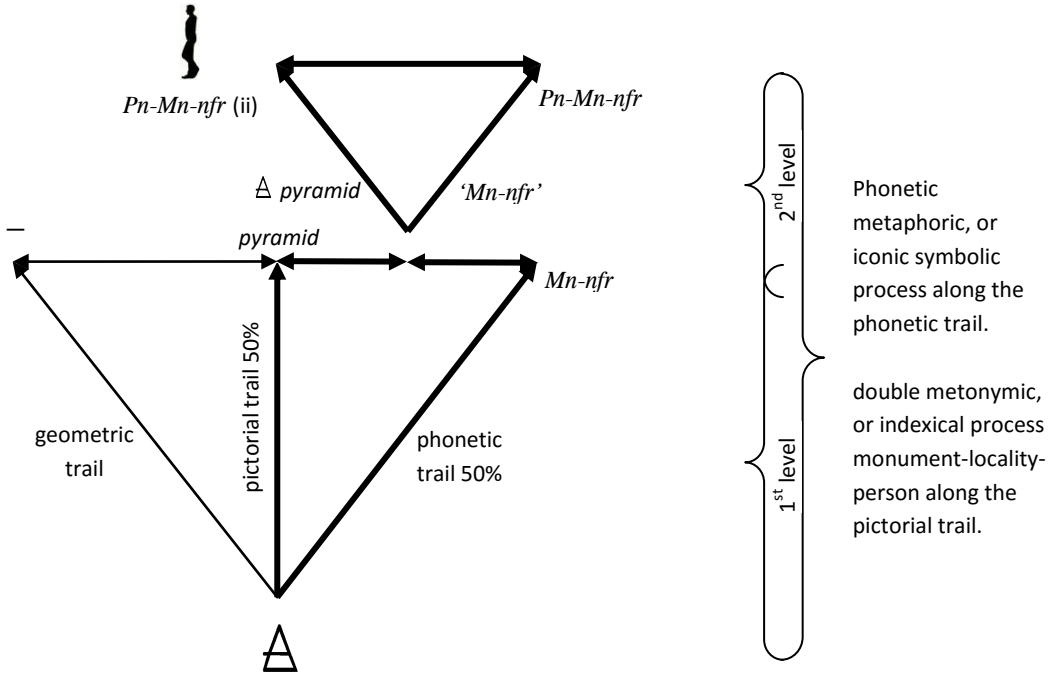


Fig. II2-52 𓉐 referring to *Pn-Mn-nfr* (i) as a symbolic index: along the pictorial trail it indexically connects *Pn-Mn-nfr* (i) with Memphis as 'the one from Memphis', and along the phonetic trail it supports this connection with the sound pattern *Mn-nfr*.

Fig. II2-52 shows the mark 𓉐 that was used by *Pn-Mn-nfr* (ii). This is clear from a match of the marks on ostracon Ashmolean HO 1095 with the hieratic ostracon BTdK 620: the positions of 𓉐 and *Pn-Mn-nfr* (ii) coincide. Moreover, Dorn remarks that on BTdK 620 the remains of paint after the sign 𓏏 in the name *Pn-Mn-nfr* may be interpreted as the pyramid (Gardiner O24).[289] The mark also occurs as 𓏏𓉐, combining the pyramid and a *nfr*-sign. There is clearly a relation between the mark and *Pn-Mn-nfr* (ii), but how can we visualize the semiosis?

Along the pictorial trail 𓉐 represents a pyramid. The form of the mark also occurs in hieroglyphic script, although it does not have a phonetic value; it rather functions as pictorial determinative in the word *Mn-nfr*, 'Memphis'.[290] As a pyramid, the mark may be representative for the capital in a metonymic, or indexical 'monument for locality, or capital' relation. In the first level of

[289] Dorn, *Arbeiterhütten im Tal der Könige*. Text- und Katalogband, 396 note e.
[290] WB II, 63.6.

semiosis we thus have an interpretant which is evoked along the phonetic trail, that is '*Mn-nfr'*, and an interpretant which is evoked along the pictorial trail, that is *pyramid*; the latter is indexically connected to the phonetic interpretant. The representamen in the second level of semiosis then departs from a combined pictorial and phonetic interpretant. This new representamen, '*Mn-nfr'*, refers to *Pn-Mn-nfr* (ii) in the context of the administration of Deir el-Medina in two manners: 1) on the basis of similarity in sound pattern the interpretant *Pn-Mn-nfr*, 'the one from Memphis' is evoked; 2) on the basis of a double metonymic relation 'monument for locality for person' *Pn-Mn-nfr* (ii) is referred to as the ultimate object. We do not know the exact nature of the connection between *Pn-Mn-nfr* (ii) and Memphis; for instance, we do not know whether he in fact came from Memphis to work in Deir el-Medina. But it may be argued that he or his family at least had ties of some nature to the capital for him to be called 'the one from Memphis'. Ultimately, therefore, the mark can be said to be a symbolic index in that it indexically connects *Pn-Mn-nfr* (i) to Memphis, and makes use of phonetic metaphor to support this connection.

In all three examples we find Goldwasser's phonetic metaphor; that is, in all three examples the semiosis is at least partly based on similarity in sound pattern between the value of the mark being equivalent to a hieroglyphic sign and the name of the workman who used the mark. That means that, even though the marks rely heavily on conventional linguistic values, they do not once behave as purely conventional symbols: their meaning is not literal. Similar phonetic metaphors are found in the semiosis of the marks for ***Kɜsɜ*** (v/vi) and his son *Pn-ʿnḫ.t* (iii); for ***Ms*** (iv); for ***Ḥr*** (ii); for ***Mr***.*y-Rʿ* (v) and his son *Nfr-ḥtp* (xii); for *Wsḫ-**nmt.t*** (i); for *Jmn-**nḫt*** (ix); for ***Mɜɜ***-*ny-nḫt.w=f* (iii); for *Pɜ-**šd**.w* (xvi);[291] for *Pɜ-**ḥm-nṯr*** (ii); for ***Ḳs*** (i); for ***Jmn***-*pɜ-ḥpy* (iii).

In the following examples, semiosis also takes place at least along the phonetic trail, but instead of phonetic metaphor we see phonetic metonymy. That is, there is no similarity in sound pattern between the representamen and interpretant in the phonetic trail on the one hand, and the ultimate referent on the other. Rather, the phonetic trail evokes an interpretant in the second level that is directly connected to the ultimate referent on the basis of a relation of metonymy. Consider fig. II2-53 below. It shows that the semiosis of the mark takes place along both the pictorial and phonetic trails. Along the phonetic trail, it evokes the interpretant of its hieroglyphic counterpart , that is *sš*. As a new representamen '*sš*', this sound pattern may, in the context of Deir el-Medina, have evoked the function of *sš n pɜ ḫr*. Thus, along the phonetic trail, the mark does not refer directly to the name of an individual person, but to a function that is carried out by an individual, for instance *Jmn-nḫt* (v) whom we encountered in the previous sections as scribe in first years of Ramesses V. A two-level phonetic symbolic process takes place in which evokes the function *sš n pɜ ḫr* as interpretant, but it takes a metonymic process of 'function for person' to connect this interpretant to the ultimate referent.

In addition, there is another metonymic process of semiosis that takes place along the pictorial trail. The interpretation of as ultimately referring to someone who carried out the function of scribe is confirmed in that the mark represents a *scribe's outfit*. It therefore has a metonymic relation of 'tool

[291] *Pɜ-šdw* is a very common name. Dorn lists three plausible identifications for the match between the mark on O.Ashmolean HO 1095 and *Pɜ-šdw* on O.BTdK 622, of which *Pɜ-šdw* (xvi) might be the most probable one. Dorn, *Arbeiterhütten im Tal der Könige*. Text- und Katalogband, 396.

for user' to the ultimate referent. In the end, the mark is an index that via symbolic and indexical processes along both the pictorial and phonetic trails is connected to the referent. Similar processes take place in other marks that refer to person via function, such as 𓆑 for the scorpion-controller *Jmn-ms* and 𓉔 for a person who remains unnamed, but exercised the function of doorkeeper according to a match of the marks ostracon Cairo 25317 with the hieratic ostracon Berlin P. 14264. The following two marks in figs. II2-54 and 55 are slightly more elaborate examples of marks that relate to function.

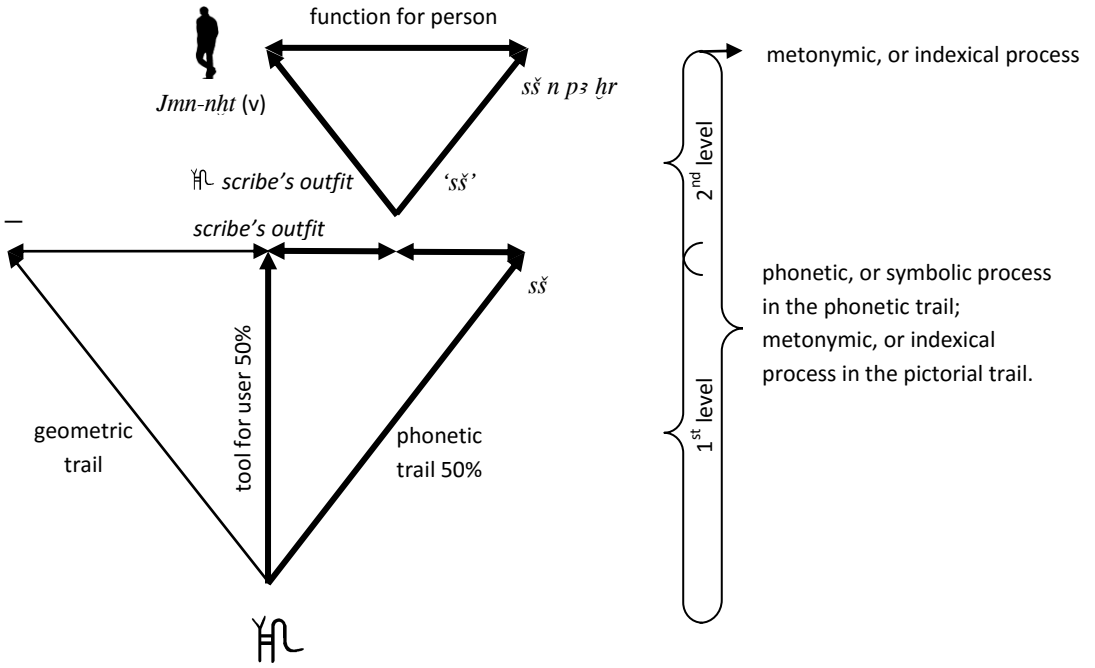


Fig. II2-53 𓌙 referring to *Jmn-nḫt* (v) as a symbolic index: via indexical and symbolic processes along the pictorial and phonetic trails it evokes the profession of scribe, which ultimately refers to *Jmn-nḫt* (v) as exercising this profession.

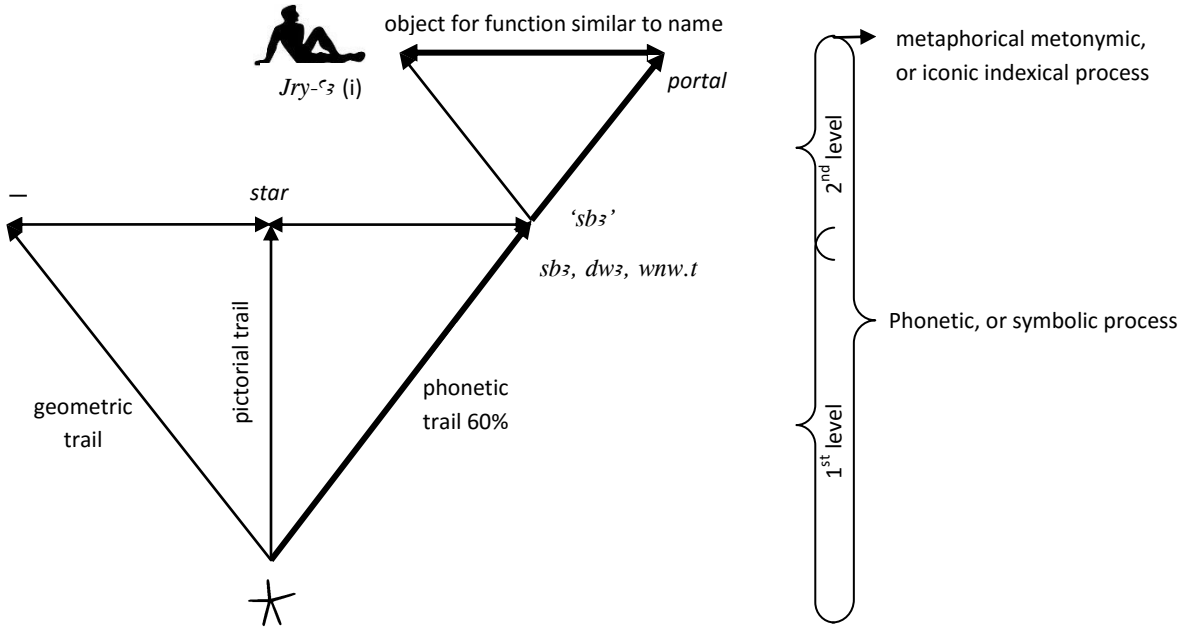


Fig. II2-54 𓀭 referring to *Jry-ꜥꜣ* (i) as a symbolic index: via indexical and symbolic processes along the pictorial and phonetic trails it evokes the function of doorkeeper, which ultimately refers to *Jry-ꜥꜣ* (i) as having exercised this function.

Phonetic metonymy, or the symbolic indexical mode, is found in the mark (fig. II2-54), although its semiosis is uncertain. The mark occurs in all periods, but we only know the identity of its user around the beginning of the reign of Ramesses IV: *Jry-ꜥ3* (i).[292] Along the pictorial trail, may represent a star; as such it has been interpreted by Gardiner.[293] Along the phonetic trail, as equivalent of the hieroglyph , the mark can convey the sound patterns *sb3*, *dw3* or *wnw.t*. It is suggested that the semiosis takes place along this trail, specifically through the sound pattern *sb3*. This phonetic interpretant becomes the representamen '*sb3*' in the second level, which may evoke in the mind the interpretant *portal*, because the hieroglyph was used for its phonetic value in the writing of the ancient Egyptian word *sb3*, 'portal': .[294] A phonetic symbolic process thus takes place in which leads to '*sb3*' and subsequently to the interpretant *portal*. In turn, this *portal* may be directly connected to *Jry-ꜥ3* (i) on the basis of an iconic indexical relation. The Egyptian phrase *jry-ꜥ3* is a title and means 'doorkeeper'. Therefore, the interpretant *portal* may connect the mark and *Jry-ꜥ3* (i) on the basis of an 'object for title' relation, the designation of the title being similar to the name by which the workman was known. Ultimately, the mark is, then, an iconic index for *Jry-ꜥ3* (i), based on a phonetic symbolic process.

Since this path of semiosis is only a suggestion, we chose to weigh the phonetic trail with 60%. As mentioned, also occurs in dynasties 18 and 19. Although we do not know who used the mark in those periods, it is clear that another person named *Jry-ꜥ3* has not been identified. The semiosis of in dynasties 18 and 19 thus seems to have followed a different path that remains unknown to us at present.

In fig. II2-55 we see the mark that was used by *Nḫ.w-m-Mw.t* (vi) from the moment he became foreman of the right side of the crew in the first year of Ramesses IV.[295] The semiosis could be suggested to take place along both the pictorial and phonetic trails as a symbolic index. Along the pictorial trail, the mark represents a *bee*. Along the phonetic trail, it can be considered equivalent to the hieroglyphic sign , which is used in the ancient Egyptian word *bj.t* 'bee', but also in *bj.tj* 'king (of Lower Egypt)'. Considering the many uses of honey in ancient Egypt and the domestication of bees since dynasty 5 we may argue that the ancient Egyptians were familiar with the fact that bees naturally live in colonies and that worker bees are headed by one large specimen.[296] Perhaps the nisbah *bj.tj* meaning 'king', or literally 'he of the bees', semantically relates to this 'head of the hive'. As such, the pictorial and phonetic interpretants of the mark may have worked together to become a new representamen, in which as *king of the worker bees*, or *king of the hive*, metonymically refers to *Nḫ.w-m-Mw.t* (vi) in his position of foreman of his workers. Ultimately, then, the mark is indexical in connecting *Nḫ.w-m-Mw.t* (vi) to his position via a phonetic symbolic process.[297]

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[292] E.g. O.BM EA 41649, O.IFAO ONL 6283, O.IFAO ONL 6730. *Jry-ꜥ3* (i) does not occur in Davies, *Who's Who in Deir el-Medina* (1999), but Collier tentatively identified him as the son of Khaemnun (iii). Collier, 'The Right Side of the Gang' in Haring, Kaper & van Walsem (eds.), *The Workman's Progress* (2014), 14-15.

[293] Gardiner N14. Another interpretation was suggested by Beaux, who compares the hieroglyph to a starfish. Beaux, 'Étoile et étoile du mer', *Revue d'Égyptologie* 39 (1988), 197-204.

[294] WB IV, 83.

[295] Collier, 'The Right Side of the Gang' in Haring, Kaper & van Walsem (eds.), *The Workman's Progress*, 6.

[296] That this chief animal was actually a female with the sole function to serve as reproducer was possibly not yet known. Feierabend, 'Die ägyptische Biene' in Vaelske et al. (eds.), *Ägypten. Ein Tempel der Tiere*, 90-91.

[297] Note that, if this reasoning is correct, the semiosis to refer to a foreman changed in the course of dynasties 19-20. Compare what has been said about the mark above (p. 173).

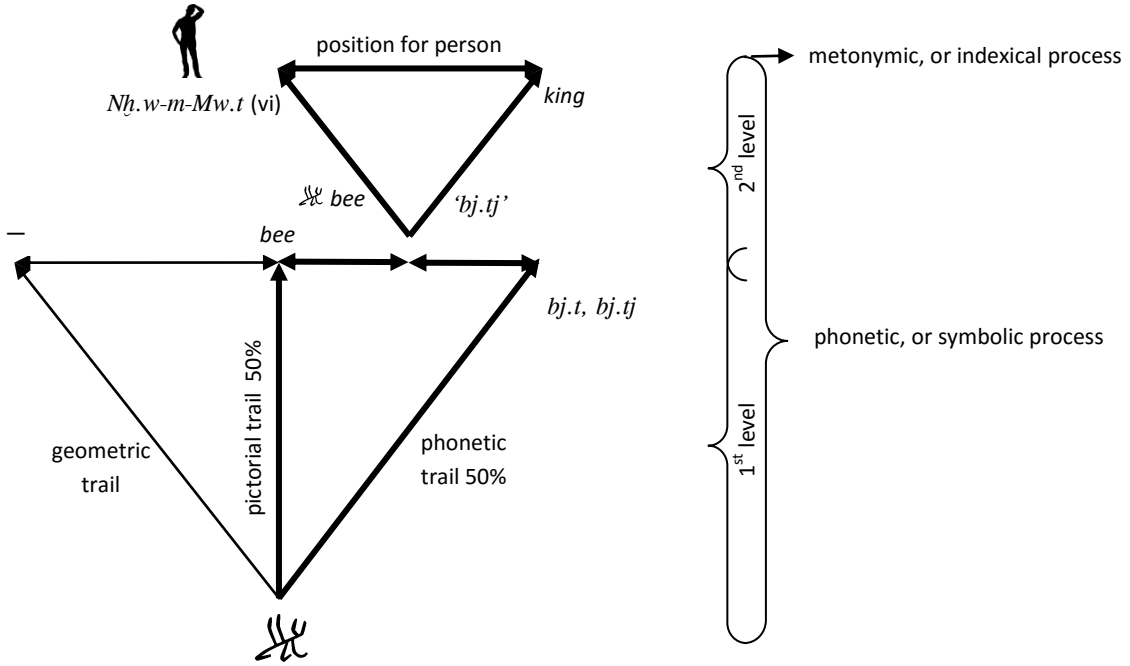


Fig. II2-55 𓆑 referring to *Nḫ.w-m-Mw.t* (vi) as a symbolic index: via indexical and symbolic processes along the pictorial and phonetic trails it evokes idea of the bee as king of the worker bees, or king of the hive, as metonymy for *Nḫ.w-m-Mw.t* (vi) as foreman.

Before *Nḫ.w-m-Mw.t* (vi) became foreman, he used the mark 𓏞 (fig. II2-56). The semiosis of this mark is not entirely clear. We are not certain of what the mark represents. In interpreting the mark as abstract geometric, one is inclined to think that the semiosis took place simply on the basis of agreement; that the notion evoked by the mark was simply the plain form *d4h1* (diagonal 4, horizontal 1), and that this form was used by *Nḫ.w-m-Mw.t*. The mark 𓏞 would then be a purely conventional symbol to which *Nḫ.w-m-Mw.t* was directly and conventionally nailed as its meaning. Such an abstract geometric mark is potentially an *indexical* symbol when it was passed on to its user on the basis of a metonymic 'father-son' relation, as was the case with *Jn(j)-ḥr-ḥʿw* (ii) and *Ḳnnɜ* (i), but we do not know whether that was the case with *Nḫ.w-m-Mw.t*. However, from a comparison of the sequence of the marks on ostracon BM 50716 with marks' ostraca from the same period it appears that the mark 𓏞 could have been equal to the mark 𓏟.[298] This mark, as was mentioned above on p. 173, could have been connected to the office of foreman in dynasty 19 by representing a level. If that connection is correct, it remains the question why *Nḫ.w-m-Mw.t* used it precisely *before* he became foreman, and why he changed his mark, therewith the semiosis between the mark and the office of foreman, after his promotion. Presumably, the connection between 𓏟 and the office of foreman was, in dynasty 20, no longer known or used, which may also explain the more frequent form 𓏞 of which we do not know whether it was also conceived of as level. While an explanation for the use of 𓏞 when indeed it was equal to 𓏟 by *Nḫ.w-m-Mw.t* may have been his relation to *Sn-nḏm* (i), being the latter's great-great-grandson, in whose family the mark 𓏟 appeared in several variations,[299] such a relation does not exist between the mark 𓏞 and its subsequent user after *Nḫ.w-m-Mw.t*: the mark was passed on to the workman *Pɜ-md.w-nḫt* (i), who had no family ties to *Nḫ.w-m-Mw.t*. The only

[298] On O.BM 50716 the form 𓏟 takes the position of 𓏞.
[299] This is further explained and illustrated in Part III, chapter 1, section 3 about mark derivation in Deir el-Medina, p. 270. For the family relation, see Davies, *Who's Who at Deir el-Medina*, chart 7.

reason that 𓀀𓀀 now referred to *Pз-md.w-nḫt* (i) could be suggested to have been that the mark had become available and *Pз-md.w-nḫt*, as newcomer to the crew, needed one. This suggests, first, that a connection between 𓀀𓀀 = 𓀀 and the office of foreman was indeed lost and, second, that the semiosis may have been purely conventional: the agreement that *d4h1* was used by *Pз-md.w-nḫt* (i), without there being any further reason for that. However, we cannot be certain of this and we must not resort to a reasoning in which we assume purely conventional semiosis on the basis of a lack of knowledge and understanding.

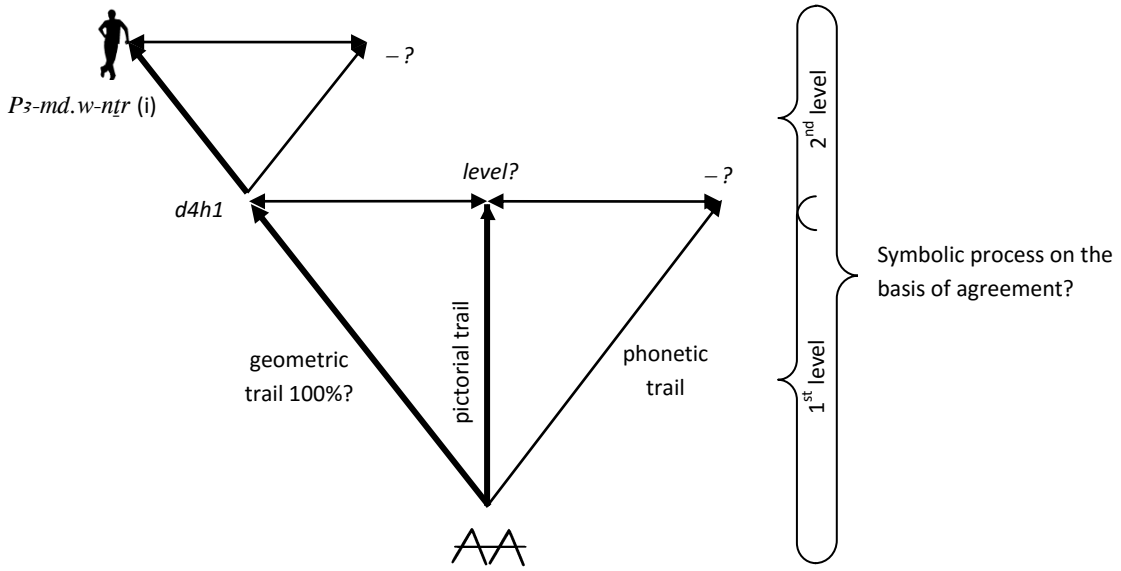


Fig. II2-56 The semiosis of the mark 𓀀𓀀 referring to *Pз-md.w-nḫt* (i): symbolic process on the basis of agreement?

It may be argued that the number of marks that convey meaning on the basis of pure convention was limited in the elaborate marking system we see in dynasty 20. Especially in an open system to which new marks can be added when necessary, a high number of marks the semiosis of which must be *learned* instead of *inferred* renders the system inefficient: more signs to be learned means more cognitive effort. For the same reason it is also to be expected that the passing on of a mark between two unrelated men as in the case of *Nḫ.w-m-Mw.t* (vi) and *Pз-md.w-nḫt* (i) was an exception rather than a rule: when refuge is taken to pictorial and/or phonetic, metaphoric and/or metonymic relations between mark and user in order to reduce the cognitive effort, one expects the mark to remain within the family and to be passed on from father to son with the aim to preserve this pictorial and/or phonetic, metaphoric and/or metonymic connection. The situation may have been different in dynasty 18, when the number of identity marks in general was still fairly small. Even in the case that half of the approximately 40-45 18th dynasty marks was based on pure convention the number would still be less than the 26 letters of our modern Western alphabet; thus, easy to learn and remember.

For dynasty 18 we deal with a lot of cases in which the semiosis, including the ultimate referents, of the marks remains unclear. Many marks appear to be of abstract geometric form and they are therefore especially liable to be interpreted as conventional symbols of geometric nature. But also pictorial or even apparently script-related marks may be based on purely conventional agreement in that there simply was no further semiosis between the mark and its user. We have very few matches between marks and workmen, of which even less are certain. The most certain matches are presented in figs. II2-57 and 58.

Fig. II2-57 shows the mark 𓉐, which was possibly used by *Ḥḳꜣ-nfr*. The mark is encountered in his tomb (N 1350) in the Western Cemetery, on an amphora that also bears the inscription 'Osiris Heqanefer, true of voice'.[300] The form appears to be geometric, but might be a linear representation of an object, or even a being when the four vertical lines are interpreted as legs or paws. We have, however, no suggestions at present and are inclined to consider that the semiosis took place along the geometric trail in which the mark 𓉐, with the geometric notion *v2h1v4*, was simply nailed to *Ḥḳꜣ-nfr* on the basis of agreement. Similar geometric symbolic processes of semiosis might be considered for the marks 𓊃, 𓉔, 𓉗, 𓉘 and 𓉙.

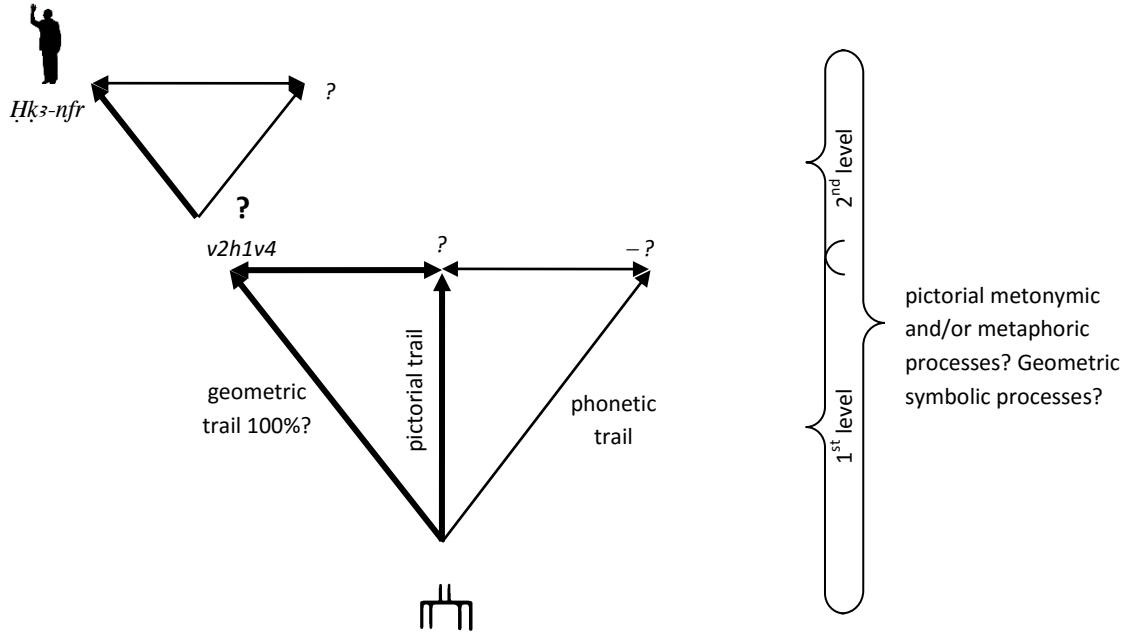


Fig. II2-57 The semiosis of the mark 𓉐 referring to *Ḥḳꜣ-nfr* remains unknown, but presumably follows the pictorial and/or geometric trail.

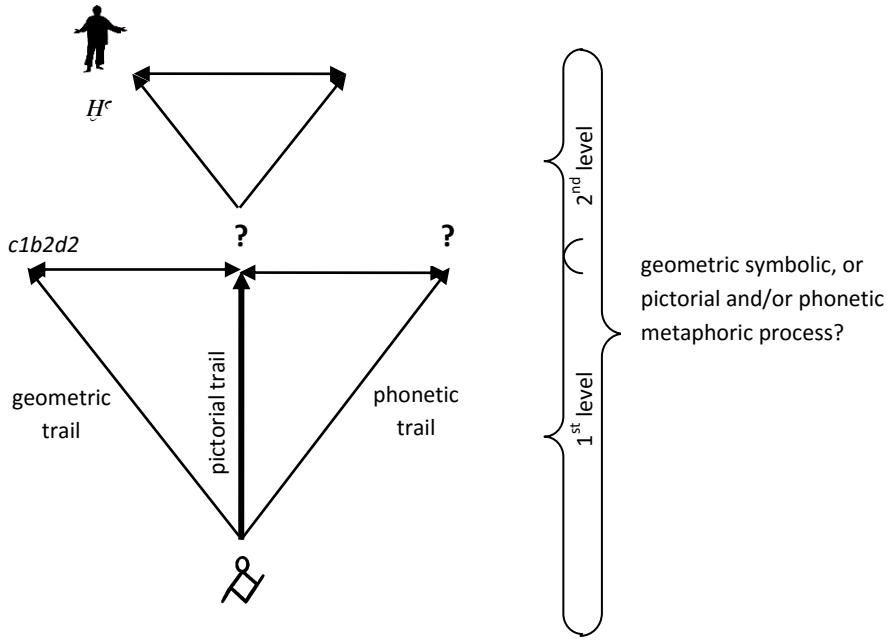


Fig. II2-58 The semiosis of the mark 𓀀 referring to *Ḥˁ* remains unknown.

[300] Bruyère Rap. 33-34 I 112, fig. 48.

Fig. II2-58 shows the mark which belonged to the foreman *Ḥ*ʿ. The mark is frequently encountered in his tomb in the Western Cemetery (TT8), primarily on pottery and linen, but also on a bronze amphora support and a bronze container. Allomorphs of the mark are and . It has been suggested that the forms represent sandals, conform the sometimes crude representation of hieroglyphic signs as identity marks in dynasty 18. However, the sandal occurs as a mark in dynasty 18 in much more recognizable form as , and not once in the tomb of *Ḥ*ʿ. Moreover, both the sandal and the mark of *Ḥ*ʿ occur on the same ostracon IFAO ONL 6298, which suggests that they belonged to two different men. One might also think of an earthenware pot with handles, but pots as well occur in more recognizable forms in dynasty 18: , , . Moreover, the necks and rims of these pots are usually displayed as triangular and rectangular in form, not as a circle as consistently in , or . Although the mark does come across as the representation of a concrete object or being rather than as a plain abstract geometric form, also because the exact same form appears as a builders' mark on the pyramid of Amenemhet II at Dashur,[301] we have thus far no suggestions. Signification might be expected along the pictorial trail, but this and the precise nature of the signification remain unclear.

There are marks from dynasty 18 that most plausibly generate meaning along the phonetic trail, but they are often mono-consonantal signs, which have disappeared in dynasty 20. They give only one isolated sound or letter. Consider the marks and in figs. II2-59 and 60 below. The identities of the workmen who used these marks, or of workmen who used other 18th dynasty marks that appear to be mono-consonantal hieroglyphic signs such as , , , , , and , remain unknown at present. Nevertheless, we can speculate on the process of semiosis: the sound values *m* and *j* may be considered as abbreviations of names. Multi-consontantal abbreviations are frequent in later periods as we have seen above, but mono-consonantal abbreviations seem to be rare. Yet, they are attested already in the first half of the second millennium BC in the geographic section of the Ramesseum Onomasticon, which contains a list of 29 town names, each followed by a sign that abbreviates the town name.[302] For instance, the town numbered 197 by Gardiner in his publication of the Onomasticon is *Ḥfꜣ.t*, which is abbreviated with the mono-consonantal sign *ḥ*; the town numbered 206 is *Jwn.t*, which is abbreviated with the mono-consonantal sign *n*; and the town numbered 190 is *Ḏbꜣ*, which is abbreviated with the mono-consonantal sign *d* or *ḏ*. Conform this practice, we may conceive of the mark as an abbreviation that leaves only the preposition *m* in names such as *Jmn-m-jp.t*; and we may conceive of the mark as an abbreviation that gives only the initial mono-consonantal sound of a name such as *Jmn* or *Jpwy*.[303] Perhaps this idea finds support in the fact that the mark is encountered on ostraca Ashmolean HO 0892 and KV 10004 together with a mark , which may also be seen as an equivalent of the hieroglyph *j*. Although the former ostracon also shows a double occurrence of the mark , which may be reason to interpret both and as a double occurrence of the same mark as

[301] See Part I, chapter 1, p. 31: The possibility that the forms were linear abstractions of a concrete object or being is considered more likely than that they were purely abstract geometric inventions which occurred in exactly in the same form at two sites that were geographically and temporally far removed.

[302] Gardiner, *Ancient Egyptian Onomastica*, 11-13, plate IIA. See also Part I, chapter 2, pp. 80-81. Gardiner in fact remarked that the signs following the town names could be compared to 'certain Theban ostraca which display similar cryptic symbols'. Most signs in the Onomasticon are abbreviations, but we also find metonymy, for instance in when the provincial sign is used to represent the provincial capital *Gbtw*, Coptos, in town number 205.

[303] Compare also the possibilities for abbreviating personal names given in the chapter 'Kurz- und Kosenamen' in Ranke, *Die ägyptischen Personennamen* II, 95-171.

well, KV 10004 contains no double marks. Did the marks and belong to two different workmen, whose names both began with the mono-consontantal sign *j*; and did they vary their mark in order to make the difference between their identities clear?

If indeed the marks in and referred to workmen's names along the phonetic trail, they are phonetic metaphors in that there is similarity in sound pattern. Alternatively, the pictorial trail may be considered: perhaps generated meaning on the basis of an animalistic metaphor, or perhaps was used according to a relation with its user on the basis of a metaphor or metonymy that we do not recognize; or, perhaps, there is no further meaning behind the marks and they were merely used on the basis of plain agreement. At present none of the trails leads to decisive answers as to the identity of the workmen identified through the marks.

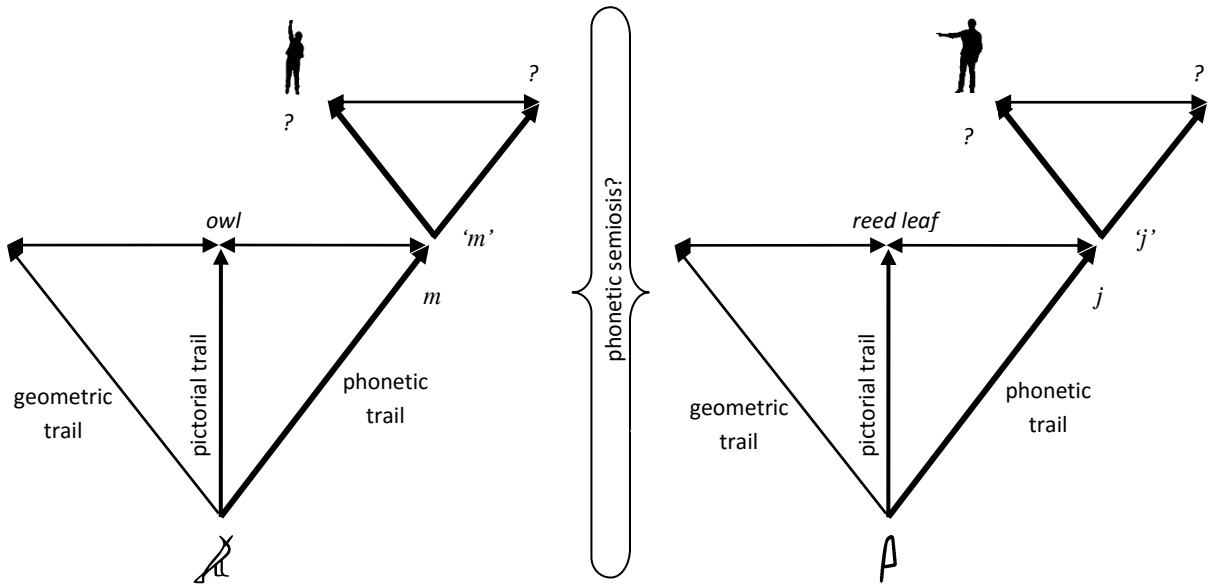


Fig. II2-59 The semiosis of the mark as suggested to take place along the phonetic trail on the basis of a phonetic metaphoric process in which the abbreviation *m* is similar to part of the workman's name.

Fig. II2-60 The semiosis of the mark as suggested to take place along the phonetic trail on the basis of a phonetic metaphoric process in which the abbreviation *j* is similar to part of the workman's name.

As a final example, we find in dynasty 18 marks that are clearly pictures of concrete objects or beings. Fig. II2-62 presents the mark . It was found three times in Tomb N 335, puits 1099 in the Western Cemetery: the tomb of *Nḫ.w-nfr*.[304] This is our only argument to link the mark to *Nḫ.w-nfr* as its user; the identification is thus very uncertain. As regards the semiosis, the first interpretation of the mark is a pictorial one: it represents a mirror. The pictorial trail offers pictorial metonymic or pictorial metaphoric processes of semiosis. Perhaps *Nḫ.w-nfr* was known to care about his appearance, in which case the mirror would be a metonymic index referring to him ('object for user')? Or perhaps the qualities of brightness, reflection and perfect eternal appearance that were associated with the mirror in ancient Egypt were projected onto *Nḫ.w-nfr*, in which case the mirror was a metaphor for him? Or perhaps *Nḫ.w-nfr* had a special relation to the sun-god Re, who was associated with the mirror on the

[304] Bruyère Rap. 27 II, 012, fig. 9 nr. 1; Bruyère Rap. 27 II, 115, fig. 77 nr. 02; Nagel, Céramique, 054, fig. 34 nr. 06c.

basis of the mentioned qualities? In that case the mirror would be a metaphor for Re and subsequently an index for *Nḫ.w-nfr* ('personal god for person'). Or did a similar indexical relation link the mirror to *Nḫ.w-nfr* via the goddess Hathor, who was also frequently associated with the mirror?[305]

Along the phonetic trail we could suggest Egyptian terms for 'mirror', such as *ꜥnḫ* or *mɜ.w-ḥr*, but also descriptions such as *mnḫ.y*, 'the excellent one', or *jmn.t.y*, 'the western one' or 'divine one'.[306] Even if there is no similarity in sound pattern with the name of *Nḫ.w-nfr*, or with the name of one of his forefathers who potentially used the mark before him, at least the last two options may be considered metaphoric on the basis of a projection of the qualities *excellent*, *western* or *divine* onto the mark user.[307]

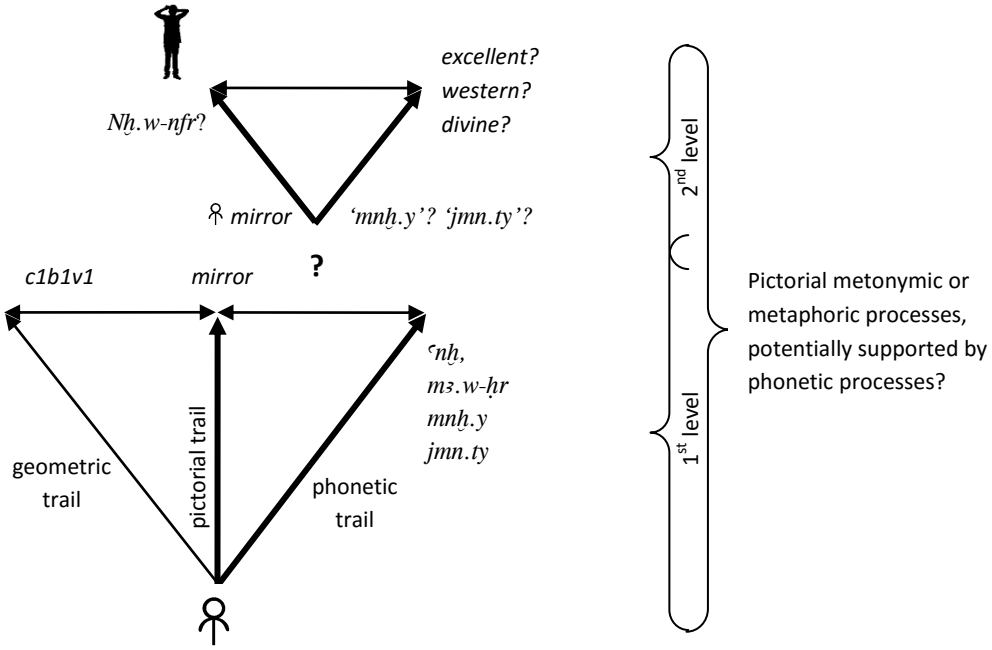


Fig. II2-61 the semiosis of the mark 𓁟 referring to *Nḫ.w-nfr* is suggested to take place along the pictorial or the phonetic trail on the basis of metonymic or metaphoric processes.

Similar pictorial metonymic or metaphoric processes, potentially supported by phonetic processes, in which the user of the mark may be connected to the object or being represented by the mark, or may be compared to its qualities, might be expected for other 18th dynasty pictorial marks such as 𓉔, 𓉐, (soul-house, T-shaped basin, garden pool); 𓋴 (stool?); 𓎛 (sunshade?); or 𓇋 (papyrus plant?).[308] However, especially in cases where the ultimate referent remains unknown, it is easy to get lost in speculation, and with respect to a limited number of marks we must reckon with the possibility that even such pictorial marks may be conventional symbols in that there is no further meaning or semiosis behind their use other than the agreement that 'mark X was used by workman Y'.

[305] O'Neill, *An Overview on Egyptian Mirrors from Prehistory to the New Kingdom*: https://www.academia.edu/1439781/Reflections_of_Eternity; http://www.britishmuseum.org/explore/highlights/highlight_objects/aes/b/bronze_mirror_with_two_falcons.aspx

[306] WB I, 204.11-13; WB II, 10.15; Meeks, AL 79.1235; Meeks, AL 79.0232; O'Neill, *An Overview on Egyptian Mirrors from Prehistory to the New Kingdom* : https://www.academia.edu/1439781/Reflections_of_Eternity.

[307] O'Neill, *ibid*.: 'Other mirrors from Bersheh are named 'the excellent one' and 'the divine one'. Whether this relates to the mirrors or is in reference to the owners is unclear!'

[308] For these pictorial interpretants, see II 001, II 016, II 028, II 029 and II 039 in Table I3-1.

b. Discussion and conclusive remarks

The identity marks from Deir el-Medina convey meaning in at least two or more levels of semiosis that include representamen (form), interpretant (notion) and referent (existent individual workman). Different degrees of symbolic, iconic and indexical motivation are accommodated along one or more of the three trails as well as in processes of metaphor and/or metonymy throughout the two or more levels of semiosis. The ultimate semiosis of a mark is the sum of its degree of symbolic, iconic and/or indexical motivation and the processes of metaphor and/or metonymy it makes use of. When thus analyzed, we see that marks from dynasties 19 and 20 are complex constructs of metaphor and metonymy especially along the pictorial and phonetic trails as phonetic metaphors or phonetic metonymies, or as pictorial metaphors or metonymies backed up or complemented by phonetic symbolic processes. They integrate various processes and trails and simultaneously make use of the iconic, indexical and symbolic domains. They are puzzles that attest semantic creativity, and as such do not merely refer to the identity of the workmen, but also oftentimes reveal details about them such as origin, lineage, function or position.

For dynasty 18 we have much less data, and any substantial comparison between the semiosis of the 18th dynasty marks and marks from the later periods is hindered by a lack of knowledge. We can only attest that there are clearly less script-related marks, and those that are of a form that also occurs in script are not as consistent in form and orientation as one would expect from a sign with linguistic value. Perhaps this suggests that the phonetic trail was not yet used to the extent we see in the later marks? This idea would find support in the overall lack of written material in the early period: it may have been the case that the early members of the community were less literate and less familiar with linguistic script than the members from the end of the 19th dynasty onwards. For the marks from dynasty 18 we have not attested the complex, simultaneous and integrated use of the trails and different pictorial and/or phonetic metaphoric and/or metonymic processes of semiosis, but this may simply be due to a lack of sources and consequently our lack of knowledge. Purely on the basis of speculation we could suggest that the marks from this period did not yet have to be the complex constructs we see in later times, because the community, and therewith the number of marks in the system, were still rather limited. Perhaps there was no need yet to create multiple simultaneous connections between man and mark to serve as *aides-mémoires* in identification.

If so, then we might perceive a development in which the marks from dynasty 18 show processes of semiosis that are less the complex integrations of multiple semiotic processes we see taking place in later marks. If we recall the suggestion put forward in chapter I of Part I, where we concluded on a shift of the marking system in the Venn-diagram of visual communication from a pictorial and geometric nature toward more emphasis on the system of writing, we can now argue that indeed there was a growing emphasis on marks related to script, which presumably resulted in an increased use of the phonetic trail and phonetic processes of semiosis, but this shift did not take place at the expense of the other domains and other modes of semiosis. Thus, fig. II2-62 presents a hypothetical situation in which the marking system draws from all domains and makes use of all modes of semiosis in both periods with the difference being that in dynasty 20 we find one integrated cloud that especially focuses on the transitional domains and the centre where all domains come together.

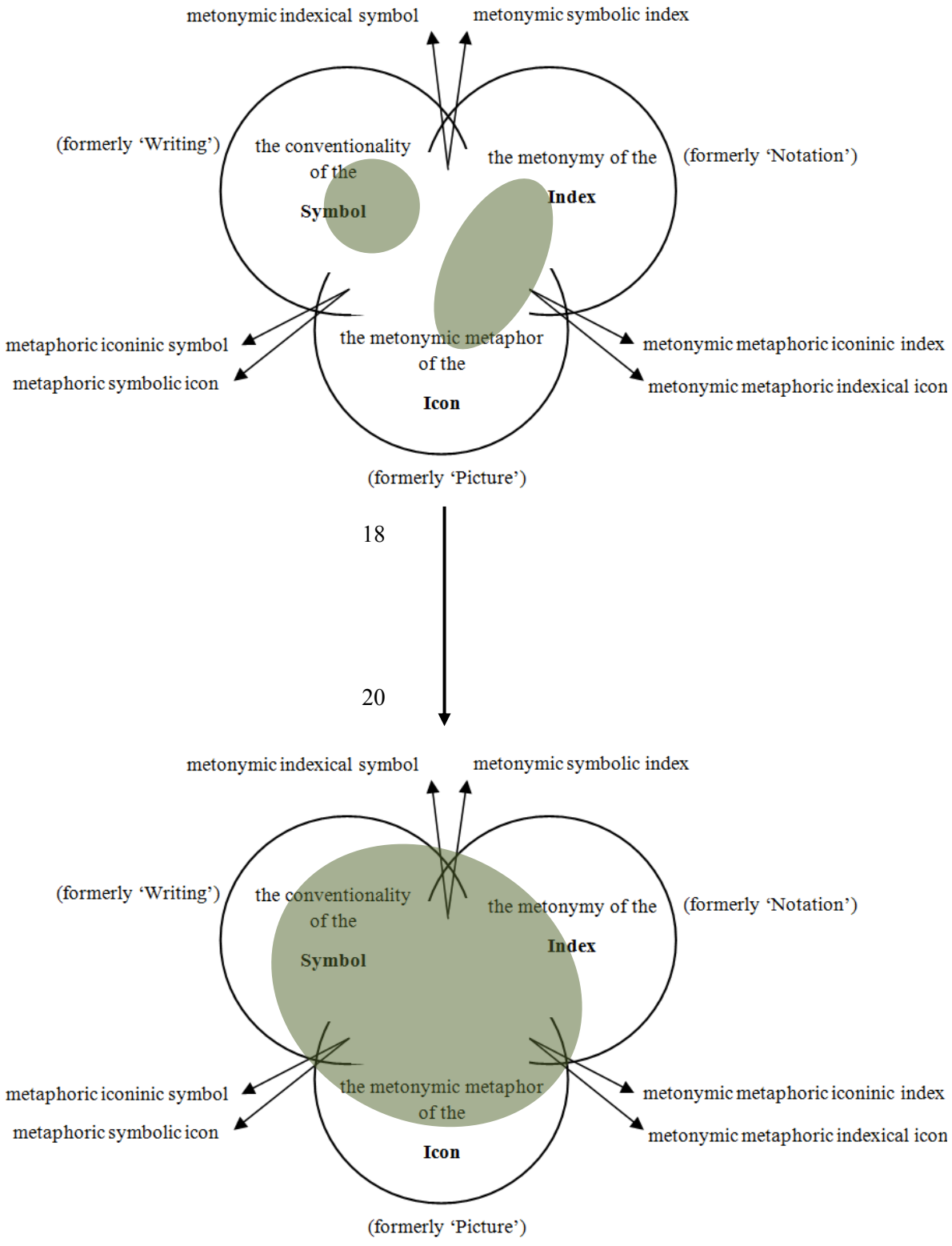


Fig. II2-62 The semiosis of the marks incorporated in the Venn-diagram of sign functions, displaying a development from single processes of semiosis to integrated complex constructs making use of multiple processes of semiosis.

Instead of a shift from one or two domains to another, the identity marks from Deir el-Medina in their development rather show an overall enrichment in all domains and modes of semiosis.

This is, at least, the result of an analysis of the marks in the combined dyadic and triadic semiotic model as it has been suggested here. It is nothing but a theoretical suggestion for the accommodation of the marks and their modes of semiosis, and it is certainly not a perfect suggestion. There remains a considerable subjective aspect in the interpretation of meaning along the trails and in the processes that take place. We must also especially be aware of a modern Western bias when we search for the interpretants which a form being a representamen may evoke. Suggestions for interpretants, and for the trails and processes that are followed, must always find support in contextual linguistic and archaeological research. Thus, archaeological study may support interpretations given to pictorial and abstract geometric marks; and linguistic research is helpful in the identification of forms of metaphor and metonymy. Metaphor and metonymy are rhetoric tropes that are highly culture- and tradition bound; therefore, we must be certain that the suggested metaphoric or metonymic relations in fact existed in ancient Egypt. We must also be aware of the possibility that the Egyptians made use of forms of metaphor and metonymy with which we are not familiar. Several studies now focus on metaphor and metonymy in ancient Egyptian language and script, and such linguistic investigation is helpful to the analysis of the manners in which the marks conveyed meaning.[309]

While there thus remains much work to be done, the value of the model lies in the fact that it allows a visual mapping of the possible values and meanings of the marks, and in that it allows to indicate and weigh the probability of certain trails and processes that may play a part in the ultimate semiosis of the identity marks. As such, the chapter has been offered as an answer to the question 'How do the marks convey meaning?'.

[309] Goldwasser, *From Icon to Metaphor*; Goldwasser, *Prophets, Lovers and Giraffes*; Kammerzell & Lincke, 'Egyptian Classifiers at the Interface of Lexical Semantics and Pragmatics' in Grossman, Polis & Winand (eds.), *Lexical Semantics in Ancient Egyptian*, 55-112; Lincke & Kutscher, 'Motivated sign formation in Hieroglyphic Egyptian and German Sign Language' in *ibid*., 113-140; Lincke, *Die Prinzipien der Klassifizierung im Altägyptischen*.

3

THE ROLE OF THE COGNITIVE SCIENCES

The previous chapter discussed how semiotic theories and models can be useful in analyzing the structure of signs and in mapping the generation of meanings. However, the semiotic approach covers only part of the search for meaning. Since the end of the 19th century it had studied signs as the products of communicative behavior, but it had not related the creation and generation of meaning to its actual origin in the human brain: it is there, where all forms of human communication and expression are produced, processed and interpreted. The patterns, structures and rules that communication systems manifest are 'grounded, indeed, embodied in the brain'.[1] Therefore, anyone who wishes to analyze any system of human communication must take into account the functional organization of the brain. In this chapter we want to investigate whether the cognitive sciences can offer support to the previous semiotic account especially in regard of two questions:

1. Can we find support for the metaphoric and metonymic processes of semiosis as cognitive patterns of thought and conceptualization in the human brain?;
2. How do cognitive models explain and visualize processes of thought, and (how) can they be helpful in explaining and visualizing the semiosis of the identity marks?

To answer these questions we will first briefly familiarize ourselves with the nature and focus of the 'cognitive sciences' (section 1). Thereafter, we look into the organization of communication in the human brain (section 2). Finally, we look at connectionism and activation theory, which are currently popular theories in the cognitive sciences that offer models to analyze and visualize the processing of information in the brain (section 3).

1 COGNITIVE SCIENCES IN A NUTSHELL

'Cognitive sciences' is a collective term by which is meant a relatively recently developed multidisciplinary approach to the study of the human mind and brain.[2] Its beginnings can be traced back to the mid-20th century when psychology and linguistics were both redefining themselves, resulting in their combination into psycholinguistics: the study of language processing in the human mind. This development was much due to the work of the linguist Chomsky. Before the 1960s the dominant trend in psychology had been behaviorism, which concerned itself with the observable natural behavior of humans and other animals, but neglected mental events. Behaviorists argued that events taking place in the mind are unobservable and that the only objective evidence for the study of psychology is therefore behavior. Human communication was examined as natural behavior just like any other sort, without

[1] Obler & Gjerlow, *Language and the Brain*, xv.
[2] The difference between 'mind' and 'brain' will become clear below, but generally comprises a psychological approach (mind) and a neurological approach (brain).

consideration of mental processes.[3] The behavioral approach to psychology reached its acme in the publication of the book *Verbal Behavior* (1957) by the psychologist Skinner. The downfall of behaviorism was brought about by Chomsky's devastating review of it in 1959.[4] Chomsky argued that defining psychology as the science of behavior was like defining physics as the science of meter reading. If scientific psychology were to succeed, mentalistic concepts would have to be integrated to explain the behavioral data.[5] It is impossible to distinguish behavior from mental events since the latter cause and stimulate behavior; behavior must be observed, but analyzed as a result of mental events. Chomsky described a new type of linguistic theory called transformational grammar that provided both an account of the underlying structure of language and of people's knowledge and consciousness of their linguistic behavior. His theory explained the cognitive processes that were responsible for the structural aspects of human language. The idea that grammatical rules which govern phrases and sentences are not behavior but mentalistic hypotheses about the cognitive processes responsible for the verbal behavior we observe was received and tested enthusiastically among psychologists throughout the 1960s and the 1970s: psycholinguistics was born.

The cooperation of psychology and linguistics and their new mental approach inspired developments in other disciplines, such as artificial intelligence studies, which viewed the human mind as a computer and used computer modeling to understand language performance and stimulate mental processes. Neuroscience developed to seek a way to bridge the gap between 'brain' in a biological and neurological sense and 'mind' in a psychological sense. In anthropology scholars began to focus on differences and commonalities in the way people of different cultures perceive the world. They studied how thought works in different cultural settings.[6] The study of cultural differences in metaphor and metonymy as rhetoric tropes through which the world can be expressed is the result of combined cognitive psycholinguistic and anthropological research.[7] In philosophy the necessity was felt to deal with questions such as the relation of mind and body and how people think and behave, or should think and behave.[8] In the late 1970s, six disciplines had included a study of mental processes and each had progressed far enough to recognize that the solution to some of its problems depended on collaboration with the other disciplines. The six disciplines were combined in the hexagon of cognitive sciences, usually presented as in fig. II3-1. The disciplines are linked in that they all contribute theories, methodologies and research tools such as models to study 'the representational and computational capacities of the human mind and their structural and functional realization in the human brain'.[9]

[3] Skinner argued that the standard methods and techniques to study the verbal behavior of animals were 'surprisingly free of species restrictions' and could be 'extended to human behavior without serious modification'. Skinner, *Verbal Behavior*, 3. See also Miller, 'The cognitive revolution: a historical perspective' in *TRENDS in Cognitive Sciences* 7 (3) (2003), 141; Harley, *The Psychology of Language*, 10.
[4] Chomsky, 'A Review of B.F. Skinner's Verbal Behavior' in *Language* 35.1 (1959), 26-58.
[5] Miller, 'The cognitive revolution: a historical perspective' in *TRENDS in Cognitive Sciences* 7 (3) (2003), 142.
[6] Thagard, 'Cognitive Science' in *Standford Encyclopedia of Philosophy* (2014) (http://plato.stanford.edu/entries/cognitive-science/).
[7] See, for instance, the study on metaphor and metonymy by Lakoff & Johnson, *Metaphors We Live By* (2003), referred to already in the previous chapter.
[8] *Ibid*..
[9] Miller, 'The cognitive revolution: a historical perspective' in *TRENDS in Cognitive Sciences* 7 (3) (2003), 143-144.

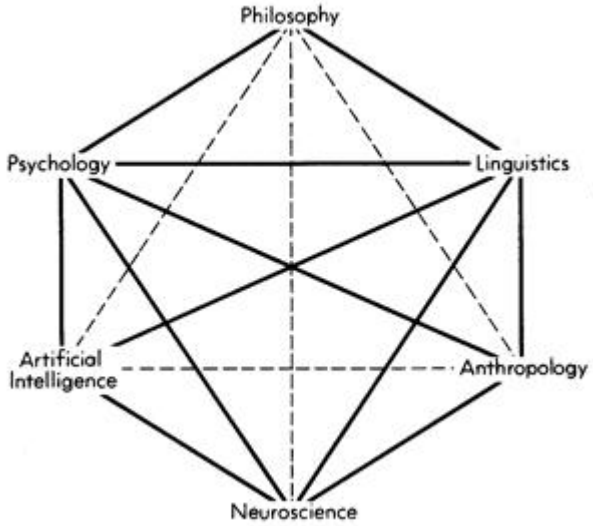


Fig. II3-1 The hexagon of cognitive sciences. Gardner, *The Mind's New Science*, 37.

Semiotics is not universally considered a separate discipline and as such has no position in the hexagon. However, it is indirectly included in the collective of cognitive sciences. The previous chapter showed its close ties with linguistics, but also brought semiotics in connection to psychological and anthropological questions concerning culturally determined patterns of thought.[10] In this chapter we focus more on neuroscience and artificial intelligence in order to link the semiotic processes of meaning-making to the human brain and to represent them in a neurological model. We begin the next section with a neuroscientific account of the organization of communication in the human brain. Neuroscience comprises study of the nature and organization of the brain and nervous system, and of how brain and behavior are related. Neuroscientists who work with human subjects use various techniques such as magnetic and positron scanning to observe what is happening in different parts of the brain while people are doing various mental tasks. As a result, they have been able to identify regions of the brain that are involved in the mental processing and interpretation of visual, auditory and other forms of input.[11] In close cooperation with psycholinguistics neuroscience is referred to as neurolinguistics. As such, it has especially focused on the localization of brain regions involved in linguistic information processing in healthy individuals as well as in patients who have suffered brain damage and therewith loss of cognitive abilities.[12] The focus on linguistic information processing has, however, been biased, both in psycholinguistics and in neurolinguistics: with respect to spoken language it has concentrated on subjects who speak at least one modern Western language (primarily English, German, French or Dutch), and with respect to written language it has concentrated on subjects who are able to read and write the modern Western alphabet.[13] Other languages and scripts are underrepresented; other systems of communication even more so. Thus, questions on how the human brain processes

[10] In particular sections 1.c-d and section 3.
[11] Thagard, 'Cognitive Science' in *Standford Encyclopedia of Philosophy* (2014) (http://plato.stanford.edu/entries/cognitive-science/). See also section 2 below.
[12] Obler & Gjerlow, *Language and the Brain*, 1-2; Harley, *The Psychology of Language*, 14; Wolters & Groenewegen, *Neurologie*, especially chapter 34 on the higher cerebral functions and dysfunctions.
[13] Harley, *The Psychology of Language*, 14. Most information provided by Harley is based on studies done on monolingual English-speaking subjects, with contributions particularly of studies on Dutch-speaking subjects (e.g. by the psycholinguist Levelt). Earlier psycholinguistic and neuroscientific studies were carried out on French and German speaking subjects (e.g. by the physician and anatomist Broca and by the neurologist Wernicke).

information from drawings, paintings, photographs, pictograms or other marking systems, and how it interprets these data as meaningful, have not been given full attention. Consequently, models on human communicative behavior have focused on modern Western linguistic behavior as well, for instance on the lexical, semantic, syntactic and phonological processes of speech production or word recognition. Figs. II3-2 and 3 provide two examples that are well-known in psycholinguistics. Yet, these models make use of an approach that is derived from artificial intelligence and which has the potential to be more generally applicable: it is called connectionism or activation theory and it models mental or behavioral phenomena as processes of interconnected networks of nodes (processing units). We will argue that it can be used to visually explain the processes of semiosis that underlie the identity marks.

Whereas semiotics has lacked in connecting the generation of meaning to the organization of the brain as the origin of all human communication, the cognitive sciences have stayed behind in including a more universal perspective as regards the various natures of *communicative* instead of merely verbal signs by which humans express themselves. It is our goal to find out to what extent the semiotic account from the previous chapter is reconcilable with neuroscientific accounts on the organization of brain functions involved in communicative behavior and to what extent we can accommodate the processes of semiosis in a connectionist modeling of the communicative brain.

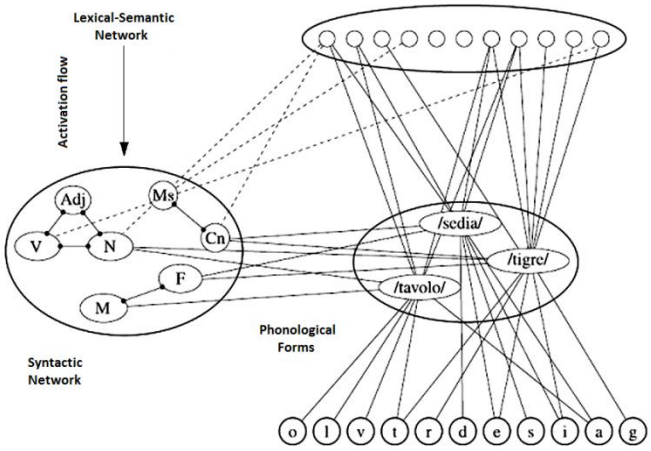


Fig. II3-2 Model of lexicalization by the psycholinguist Caramazza. The flow of information is from semantic to lexeme and syntactic networks. N = Noun; V = Verb; Adj = Adjective; M = Masculine; F = Feminine; Cn = Count noun; Ms = Mass noun. Dotted lines indicate weak activation. Harley, *The Psychology of Language*, 419 (fig. 13.5).

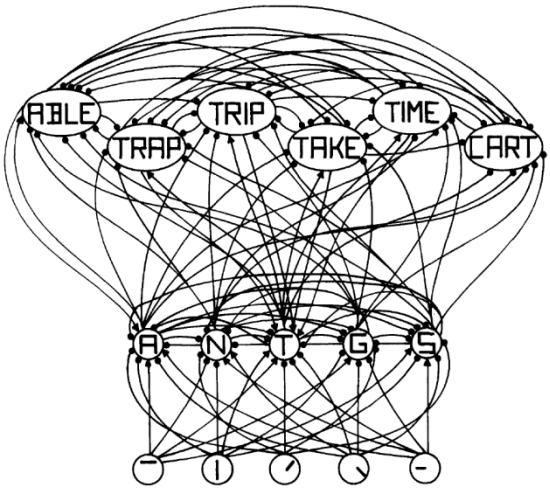


Fig. II3-3 Interactive activation network of letter recognition. It shows how letters are recognized and identified on the basis of visual input features as well as in the context of words. McClelland & Rumelhart in *Psychological Review* 88.5 (1981), p. 380 (fig. 3).

2 THE ORGANIZATION OF COMMUNICATION IN THE HUMAN BRAIN

a. The structure of the brain

Before anything can be said on the operation of communicative functions in the brain it is necessary to identify those parts of the brain that have important roles in complex cognitive processes, in particular communication. Therefore, we begin this section with a basic account on the brain's neuroanatomy.[14]

The human brain, together with the spinal cord, forms the central nervous system. It controls the muscular activity in the human body as well as our conscious thought. The anatomical and functional organization of the brain is extremely difficult to grasp because of the complicated clustering of nuclei (collections of neuron and glial cell bodies, which form the functional units of the nervous system) and the intricate pathways of their axons (long processes extending from the neuron cell bodies to form connections with other neuron cells in the brain).[15] Details of the organization and operation of the brain are therefore not entirely clear; despite anatomical studies and neurological experiments since the 1800s and improvement of scanning and imaging techniques especially in the second half of the 20th century the exact processes of the brain's mediation between thought and expression is still not completely understood, and we have yet to learn how individual cells behave and contribute in the processes of communication.[16]

We are, however, not completely lost. The human brain can be described according to different anatomical and/or functional areas, or according to its phylogenetic development.[17] We will here present a simple functional-anatomic picture of the brain consisting of the cerebellum or the small brains, which serve to coordinate and refine movement; and of the cerebrum, home to the large brains, which form the functional-anatomic basis for our conscious experience of sensory perceptions, including vision and hearing, as well as for the planning and execution of complex motor actions (fig. II3-4).

[14] Two notes must be made. First, I am aware that the following account lacks many details about the neurological organization and operation of the human brain. It is by far not a detailed neurological account, which I cannot provide as I have no scientific background in this field. I have only introduced myself to the cognitive sciences taking classes on Psycholinguistics and Language and Cognition (prof. dr. N. Schiller, Leiden University) and familiarizing myself with relevant scientific literature from these classes, complemented with literature on neurology kindly provided by dr. A.M. van Sijl (Diakonessehuis Utrecht). From these classes and from the literature I extracted those basic, primary structures and operations relevant to the processing of communication. Finer differentiation of cortical and subcortical structures, details about brain architecture (cellular distribution) and the transmission of neural impulses related to complex cognitive processes must be sought in expert literature.

Second, one may ask whether it is justified to study the brain and communicative behavior of modern man and compare it with the communicative behavior of the ancient Egyptians, living approximately 3500 years ago. Yet, 3500 years is only a small time frame compared to the 35.000 years in which man has not changed morphologically. Structures that are concerned with the processing of communication are present in the brain since at least some two million years. Anatomically, the brain of an ancient Egyptian man is therefore comparable to the brain of modern man. Of course, there will have been functional differences, due among others to culture, experience and level of knowledge, but since we can no longer subdue ancient Egyptians to psycho- and neurolinguistic tests, study of the modern brain is the closest we can get to an interpretation of their neuro-communicative behavior. Kolb & Whishaw, *Fundamentals of Human Neuropsychology*, chapter 4; Harley, *The Psychology of Language*, 51-54.

[15] Kolb & Whishaw, *Fundamentals*, 4-5, 8-9; Wolters & Groenewegen, *Neurologie*, 5-8.

[16] Obler & Gjerlov, *Language and the Brain*, 8, 13.

[17] The latter concerns a description according to evolutionary development; see Kolb & Whishaw, *Fundamentals*, 8-10.

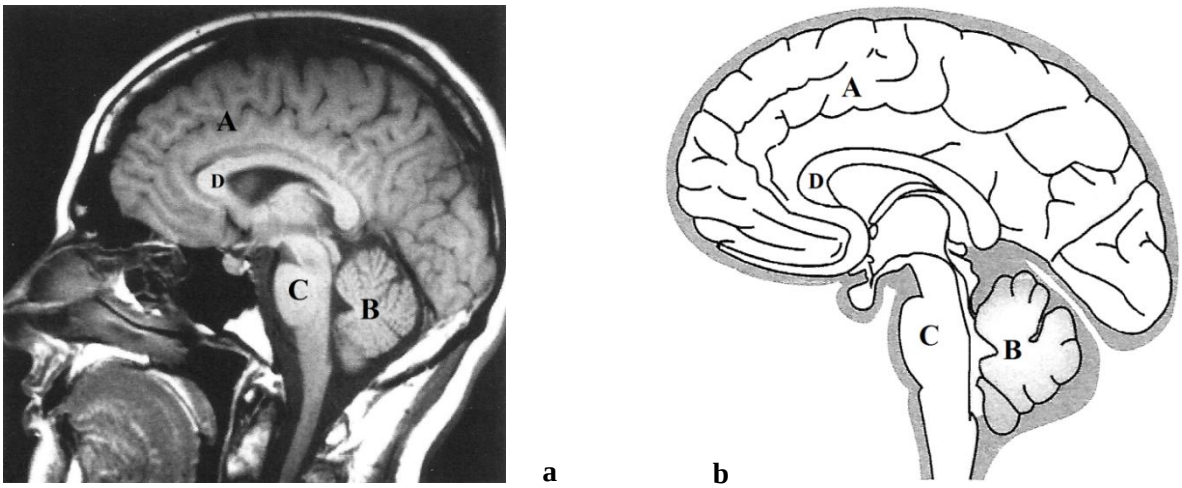


Fig. II3-4 MRI-scan of the human brain (**a**) and drawing (**b**) indicating A: cerebrum, B: cerebellum, C: brain stem, and D: corpus callosum. Wolters & Groenewegen, *Neurologie*, 33, 43.

Since higher cognitive functions including the processing of communication are accommodated in the cerebrum, it is this part of the brain that concerns us further. The cerebrum consists of the neocortex, or (cerebral) cortex, as its largest and dominant area, and of several subcortical areas including the thalamus, basal ganglia and the limbic system.[18] Brain functions that concern communication cannot be directly explained by looking at the functional-anatomic organization of the cerebrum; yet, the structure of this region and the connections between the neocortex with subcortical areas at least provides insight into cognitive function and dysfunction. The cerebrum is divided into a right and left hemisphere by a medial longitudinal fissure (fig. II3-5). These hemispheres are symmetrical to a large extent.[19] Each is subsequently divided into four main areas called lobes: the frontal, parietal, occipital and temporal lobe (fig. II3-6).[20] The lobes are not functional, but anatomical regions. Nevertheless, there are functional differences between them, and their designations are often used in a loose and descriptive way to indicate different functional regions.[21]

[18] Kolb & Whishaw, *Fundamentals*, 11 (Table 1-2), 16-26; Wolters & Groenewegen, *Neurologie*, 415-427.
[19] That is, there are functional differences, for which see below (section 2.b). Anatomically the hemispheres are symmetrical to a large extent, although there are differences. For instance, the area lying deep in the posterior part of the superior temporal lobe, the 'planum temporale', is larger in the left hemisphere for 65% of the human population, while it is larger in the right hemisphere for 10% of the population. In 25% there is symmetry. Because of the fact that this area is often larger in the left hemisphere Obler & Gjerlov consider it important for language, a brain function for which the left hemisphere is dominant in 90-95% of the population; see *Language and the Brain*, 25 and section 2.b below. Wolters & Groenewegen, however, argue that a connection between this feature of anatomical dissimilarity and the function of language is unclear; *Neurologie*, 416, 427.
[20] Deep within a large sulcus that separates the frontal, parietal and temporal lobes (the sulcus lateralis) lies the insular cortex, which is sometimes considered to be a fifth lobe in the cerebrum. Wolters & Groenewegen, *Neurologie*, 415-6. The lobes are separated from each other by convolutions in the form of hills (gyri) or valleys (sulci). Obler & Gjerlov, *Language and the Brain*, 18.
[21] Kolb & Whishaw, *Fundamentals*, 17.

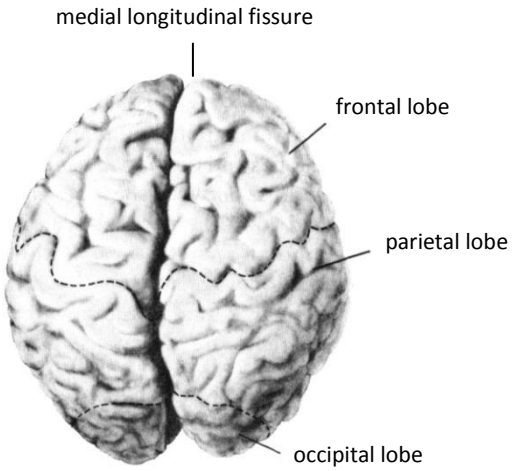


Fig. II3-5 Dorsal view of the brain showing the medial longitudinal fissure. Adapted from Kolb & Whishaw, *Fundamentals*, 18.

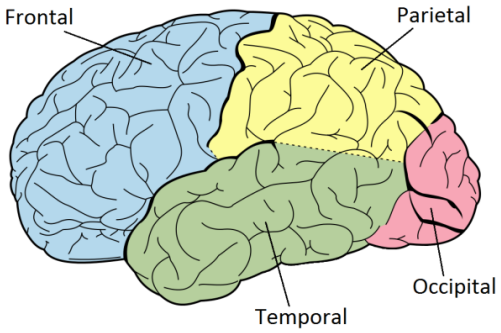


Fig. II3-6 Lateral view of the brain showing the lobes in one hemisphere (here left). Adapted from Gray, *Anatomy of the Human Body*, 728.

The topography of the neocortex and the four lobes can be mapped on the basis of information obtained by the application of various research techniques. Fig. II3-7 shows a projection map based on a tracing of the connections between neuron cells from the sensory systems (vision, audition and the somatosensory system, i.e. touch) and the motor system (movement) to the neocortex and subcortical areas. The dark grey zones in the map are the primary projection areas, which receive input in the case of vision, audition and touch, and send out information in the case of body movements. The map shows that vision primarily projects to the posterior occipital lobe, audition to a superior area in the temporal lobe and touch to the parietal lobe, while movement appears to be processed in the frontal lobe. The zones in light grey and white are secondary respectively tertiary projection areas: adjacent areas that, to lesser extent, are also involved in sensory and motor activities. Certainly, such a map is a much simplified description of the neocortex; it reflects only the main concentrations of activity when we see, hear, feel and move.[22]

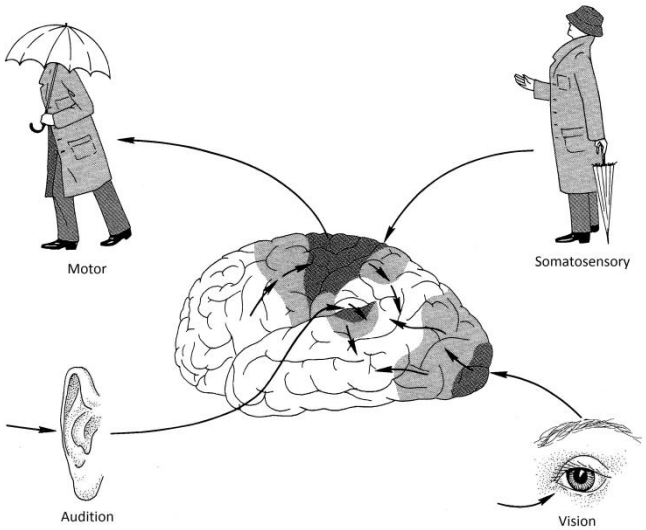
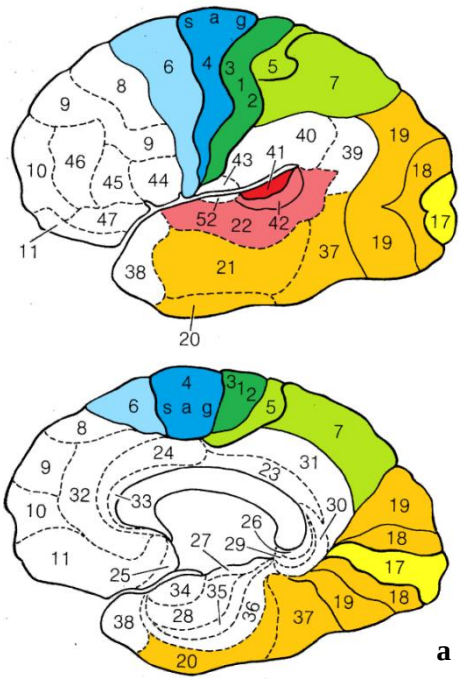


Fig. II3-7 Projection map. The dark areas indicate primary projection zones, which receive input from the sensory systems or project to the motor system. The light grey areas are adjacent secondary projection zones. The white areas are tertiary, or association, projection zones**.** Kolb & Whishaw (1985), 19.

[22] Kolb & Whishaw, *Fundamentals*, 18-19.

A different kind of map, the cytoarchitectonic map, provides more specific information. Cytoarchitectonic maps are based on study of differences in cell distribution and in cell sizes and shapes throughout the cerebrum; in other words, they are based on the different architectonic structures of cells.[23] The most influential cytoarchitectonic map has been Brodmann's map (fig. II3-8a).



a

b

Functional areas and Brodmann cytoarchitectonic areas

Function	Brodmann area
Vision	
primary	17
secondary	18, 19, 20, 21, 37
Auditory	
primary	41
secondary	22, 42
Body senses	
primary	1, 2, 3
secondary	5, 7
Sensory, tertiary	7, 22, 37, 39, 40
Motor	
primary	4
secondary	6
eye movement	8
speech	44
Motor, tertiary	9, 10, 11, 45, 46, 47

Fig. II3-8a Brodmann's anatomically different areas of the cerebrum. The upper picture shows the visible surface of a hemisphere; the lower picture shows the inner part that faces the other hemisphere. Kolb & Whishaw, *Fundamentals*, 21; **b** Table indicating the relations between some of the known areas of brain function and Brodmann's anatomical areas. Adapted from Kolb & Whishaw, *Fundamentals*, 22.

In numbering the areas with cells that differ in structure, the map is solely based on anatomical information. Yet, as it turns out, the relation between anatomical structure and brain function is stunning.[24] Knowledge on the localization of brain function had been based on study of the effects of brain lesions (aphasia) since the 19th century, but in the 20th century more accurate 'human brain imaging'-techniques became possible: EEG, CAT, PET, MRI and particularly fMRI and TMS are techniques that measure and map the brain's activity.[25] The table in fig. II3-8b shows some of the relations between the known locality of *brain functions* and anatomical areas numbered by Brodmann. The primary and secondary areas of brain function are colored in the map. We gain from it a similar, but slightly more accurate picture as from fig. II3-7, with the secondary areas of vision now extending into the temporal lobe (18-21, 37), and specific areas for eye movement and articulated speech localized in the frontal lobe (9 resp. 44).

Certainly, in any act of movement or communication there is not just one lobe or brain area involved. Thus, vision involves not only the processing of visual input in the occipital lobe, but also

[23] Kolb & Whishaw, *Fundamentals*, 8, 20-22.
[24] *Ibid*., 22; Wolters & Groenewegen, *Neurologie*, 418-419.
[25] For these techniques, see Harley, *The Psychology of Language*, 16-19; Wolters & Groenewegen, *Neurology*, 424-425; Obler & Gjerlov, *Language and the Brain*, 9-10.

movement of the eyes regulated in the frontal lobe. The topographical maps simply show that, anatomically as well as functionally, input received visually is processed primarily in the occipital lobe; input received auditorily is processed primarily in the temporal lobe; input received via touch is processed primarily in the parietal lobe; and movement is regulated in the frontal lobe.

Communication between the different areas within a lobe, as well as between the lobes and the two hemispheres in general takes place via various connections, or 'pathways', which are bundles of nerve fibers that transport information. There are relatively short connections within a lobe, longer connections between lobes, and interhemispheric connections called commissures.[26] The largest commissure is the corpus callosum, which connects almost all parts of the two hemispheres (the curved area indicated 'D' in fig. II3-4 above).[27] Because of the fact that different brain functions are not only concentrated in different areas within one hemisphere, but the two hemispheres are also, at least in part, specialized in different functions, the commissures are essential for the integration of processes that take place in each hemisphere.[28]

b. Lateralization of brain functions

The functional asymmetry of the right and left hemispheres is called lateralization of brain functions: the two hemispheres are in part specialized for different tasks. For instance, more than 80% of the human population is better skilled with the right rather than the left hand. Because of the fact that the brain is cross wired and each hemisphere responds to, and controls the contralateral side of the body, this means that the motor skills for hand movement are dominant in the left hemisphere.[29] The left hemisphere appears furthermore to be dominant for intellectual, rational, verbal, analytical and time-based processing, while the right hemisphere accommodates especially nonverbal and intuitive processes, for instance musicality, artistry and spatial orientation.[30] The processing of grammar, syntactic structures, and linguistic communication in general appears to take place especially in the left hemisphere with 90-95% of the population.[31] This is apparent from lesion and stimulation studies. Lesion studies are the oldest approach and provided much of the 19th and early 20th century knowledge on the localization of language functions. They examined the effects of brain damage (resulting from head injury, vascular accidents, tumor or brain surgery in circumscribed regions of the brain) on verbal language production and comprehension on the basis of behavioral tests, the results of which were compared to verbal language production and comprehension in normal control subjects.[32] The healthy subjects provided the norm, the patients with brain damage the deviation. On the basis of both norm and deviation, the French physician Bouillard in 1825 was the first to propose an asymmetry of brain functions, suggesting that the left hemisphere had a special role in complex movements such as fencing, writing, and speech. His proposal found a little bit of support from scholars who observed that the left

[26] Kolb & Whishaw, *Fundamentals*, 22-23; Wolters & Groenewegen, *Neurologie*, 422-423.
[27] *Ibid*., 423; Obler & Gjerlov, *Language and the Brain*, 18, 24.
[28] Wolters & Groenewegen, *Neurologie*, 415, 427-428.
[29] *Ibid*., 427. For the cross wired operation of the brain see also Obler & Gjerlov, *Language and the Brain*, 22-25.
[30] Wolters & Groenewegen, *Neurologie*, 427; Harley, *The Psychology of Language*, 68.
[31] Wolters & Groenewegen, *Neurologie*, 427; Obler & Gjerlov, *Language and the Brain*, 28 give a percentage of 97% with left hemispheric dominance for linguistic processing, while in 3% of the population the right hemisphere appears to be dominant; Harley, *The Psychology of Language*, 68.
[32] Kolb & Whishaw, *Fundamentals*, 66-79.

hemisphere appeared to be more crucially linked to language, since damage to the right hemisphere seemed to have very few consequences for the production or comprehension of linguistic communication.[33] More definite proof came in 1836, when both the Scottish physician Abercrombie and the French neurologist Dax published data which demonstrated that disorders of language were consistently associated with lesions of the left hemisphere.[34] Finally, in 1865, the French neurologist Broca provided the decisive anatomical evidence. In his paper he argued that language loss after brain injury was far more common after left-sided injury than after right-sided injury, and he was able to localize one specific area, damage to which resulted in a defect of speech production: Broca's area in front of the primary motor area in the frontal lobe of the left hemisphere (nr. 44 in fig. II3-8a).[35] Ten years later, the German neurologist Wernicke identified another area, also in the left hemisphere, damage to which caused disturbance especially in language comprehension: Wernicke's area in the back of the left temporal lobe (nrs. 41-42, 22 in fig. II3-8a).[36] Various other regions of the brain, all in the left hemisphere, that appeared to be somehow connected to the function of language, were identified in the years thereafter.[37]

The results from the early lesion studies could be supported by stimulation tests that were developed in the second half of the 20th century. In stimulation tests specific parts of the brain are stimulated by chemical or electrical means and the resulting behavior is studied. In a technique called the Wada test, for instance, the anesthetic sodium amytal is injected into the artery leading to one or the other side of the brain. If the drug is delivered to the left side of the brain, a temporary paralysis of verbal language function is experienced. The patient cannot speak at all for several minutes and in the minutes thereafter language sounds aphasic. Of the people who have undergone this test, 95% of those whose left hemisphere is dominant in motor skills have left hemispheric dominance for language processing as well; 70% of those whose right hemisphere is dominant in motor skills appear to have left hemispheric dominance for language processing.[38] This means that in general for the majority of people the left hemisphere is dominant for verbal language production. In another test, tachistoscopic presentation, visual stimuli are briefly presented selectively to one hemisphere or the other in normal individuals with uninjured brains in order to learn about which hemisphere is involved in processing them. When a

[33] *Ibid*., 9; Kolb & Whishaw, *Fundamentals*, 513.
[34] *Ibid*.; Obler & Gjerlov, *Language and the Brain*, 28.
[35] *Ibid*.; Kolb & Whishaw, *Fundamentals*, 514.
[36] *Ibid*.; Obler & Gjerlov, *Language and the Brain*, 9.
[37] *Ibid*.; Kolb & Whishaw, *Fundamentals*, 514ff. A remark must be made here: the early lesion studies all followed a localizationist approach. This was criticized by those who rather followed a holist approach. Holists argued that localizationism was a false compartmentalization of language abilities that in fact are supported by larger parts of the brain. They focused on the questions how areas of the brain are interconnected and how any language is dependent on other cognitive abilities such as memory and thinking. The neuropsychiatrist Goldstein, for instance, to whom Jakobson often referred, argued that our ability to think in abstract terms is lost in any sort of brain damage and will necessarily influence language as a result. Holists thought not in terms of individual syndromes linked to specific areas in the brain; rather, they saw aphasia as a single phenomenon with patients only being more or less severely impaired. Indeed, pure localization of speech and language functions has little meaning. The 19th century neurologist Jackson pointed out that 'to locate the damage which destroys speech and to locate speech are two different things' (quoted by Obler & Gjerlov, *Language and the Brain*, 33). But, even if we ignore the exact localizations of brain functions, at least the localizationist approach in the early lesion studies indicated a clear left hemisphere dominance for linguistic communication functions in general. Obler & Gjerlov, *Language and the Brain*, 10.
[38] Obler & Gjerlov, *Language and the Brain*, 29. The authors note that the Wada test is used primarily as a method of determining which hemisphere is dominant for language in patients who must undergo brain surgery. The brains of these patients, frequently epileptics for whom medications have not worked, while not acutely injured, by definition have some neurological problem. They expect the percentages for left hemispheric dominance in language processing to be even higher in neurologically normal populations.

person looks at a random point in space everything to the right of that point is in the right visual field, and everything to the left of that point is in the left visual field. Due to the crossed wiring of the brain, information about the right visual field is sent by the eyes to our left hemisphere, while information about the left visual field is sent by the eyes to our right hemisphere. In normal individuals the hemispheres communicate through the corpus callosum; that is, information is ultimately processed regardless of the visual field in which it is presented. However, the test of tachistoscopic presentation shows that *linguistic stimuli are initially processed more quickly and more accurately when they are presented to the right visual field, that is to the left hemisphere*.[39] A similar test can be carried out with auditory instead of visual stimuli: the dichotic listening technique relies on the fact that the right ear has stronger connections to the left hemisphere than it does to the right, and the left ear has stronger connections to the right hemisphere than it does to the left. It appears to be the case that verbal or numeral stimuli are better processed when heard with the right ear, i.e. in the left hemisphere, while nonverbal sounds and noises are rather processed better with the left ear, i.e. in the right hemisphere.[40] A third example of stimulation tests is cortical stimulation. In this test, specific regions in the neocortex of the brains are stimulated by electric currents, while the patient remains conscious and carries out various tasks such as reading a sentence, naming objects shown in a picture, or listening and responding to a question or message. The results from this test present the same left hemispheric dominance for processing linguistic communication.[41]

While these tests can all be conducted on healthy subjects as well as on brain damaged patients, similar tests developed specifically for split brain patients are particularly interesting. Split brain patients are former heavy epileptic patients of whom the commissures between the two hemispheres have been cut in order for them to live a life free of epilepsy, and whose hemispheres thus no longer communicate. In one test, the split brain patient sits at a table onto which several objects lie, the view of which is blocked by a screen. When the patient holds an object in his left hand, tactile information about the object is conveyed only to the right hemisphere. The patient has a mental image of the form of the object, but is unable to name it. When the patient holds an object in his right hand, information is conveyed to the left hemisphere and the object is readily named.[42] This strongly suggests that tactile visual-spatial information, or mental images, are processed in the right hemisphere, while verbal processing takes place in the left hemisphere.

c. Metaphor and metonymy in terms of the organization of communication in the brain

On the basis of lesion and stimulation studies and with help of neuroimaging techniques such as EEG, CAT and fMRI a more detailed account and visualization of the organization of communication in the brain can now be presented. The areas of Broca and Wernicke in the left hemisphere appear to have central, albeit not exclusive, roles in the reception, comprehension and expression of information. Broca's area is known to have a motor planning function specific for speech and syntactic structure. It is responsible for verbal language production and expression, and together with other areas in both right and left frontal lobes, in the left parietal lobe, in the basal ganglia and the cerebellum it forms a brain

[39] Obler & Gjerlov, *Language and the Brain*, 29-30.
[40] *Ibid*., 30-31.
[41] *Ibid*., 34; Harley, *The Psychology of Language*, 68.
[42] Obler & Gjerlov, *Language and the Brain*, 31-32.

system called the 'mental grammar'.[43] Wernicke's area is nowadays known to be responsible for the reception and comprehension of incoming auditory and visual information. It makes sense out of auditory and visual stimuli and cooperates with the primary auditory and visual areas to interpret them as meaningful sounds or patterns.[44] Wernicke's area is part of the brain system called the 'mental dictionary' or 'lexicon', based mainly in the temporal lobe, where representations of all known words, objects, beings, and so forth are stored.[45] Basically, the distinction between the brain systems of which Broca's and Wernicke's areas are part is one between conceiving input (mental dictionary) and producing and articulating output (mental grammar); a distinction that is also explained in terms of a declarative function of Wernicke's area as against a procedural function of Broca's area.[46]

Fig. II3-9 shows the activation of Broca's and Wernicke's areas in the left hemisphere when we hear, see, speak or think.

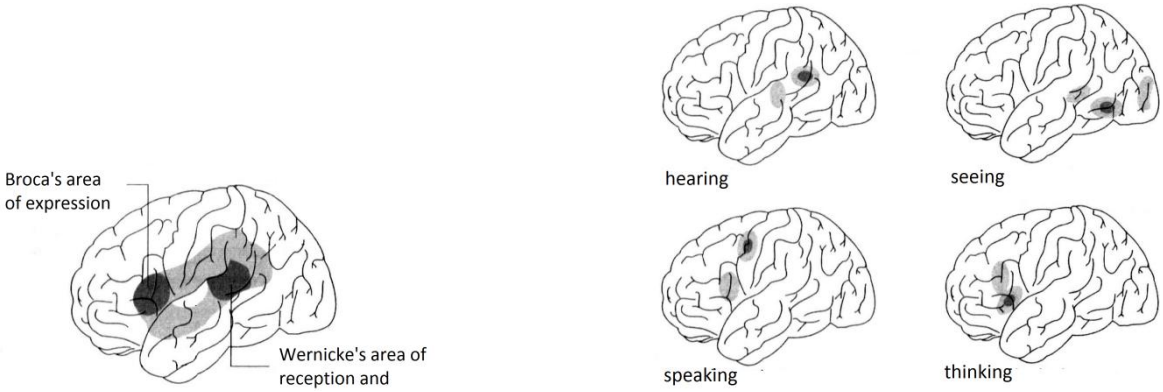


Fig. II3-9 The activation of Broca's and Wernicke's areas when we hear, see, speak or think. Adapted from Wolters & Groenewegen, *Neurologie*, 454.

Fig. II3-10, then, shows what happens when we receive auditory or visual input and translate it into verbal expression.

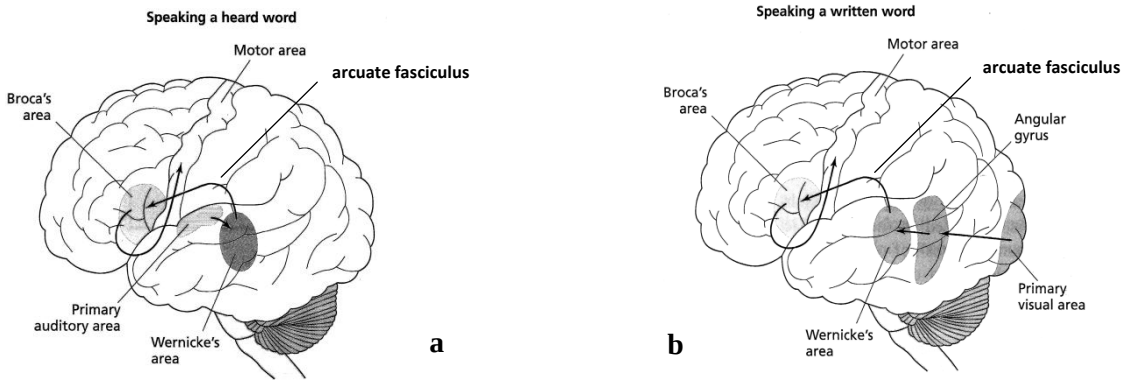


Fig. II3-10 The Wernicke-Geschwind model that shows the sequence of events when a word is presented in auditorily (**a**) or visual form (**b**) to someone who repeats or responds to it in spoken form. Harley, *The Psychology of Language*, 70.

[43] Ullman, referred to in Harley, *The Psychology of Language*, 71.
[44] What is interpreted as meaningful is based on culture, experience and education.
[45] The memory system is also involved. Harley, *The Psychology of Language*, 71. When the identity marks of abstract linear form appear merely geometric to us, the Egyptians may have stored a representation of an object or being for it; they were then able to translate the form into that object or being. As outsiders to their culture, we do not have the same mental dictionary.
[46] Ullman, referred to in Harley, *The Psychology of Language*, 71.

The model of fig. II3-10 is based on an idea put forward already by Wernicke at the end of the 19th century, and elaborated upon by the neurologist Geschwind in 1972. Wernicke had argued that the 'sound images' of words, objects and beings are stored in the mental dictionary of Wernicke's area.[47] The model shows that, when we plan to speak, information from the mental dictionary is sent along a pathway of fibres called the *arcuate fasciculus* to Broca's area, where the sound images are translated into the movements needed for controlled speech and articulation. Thus, when we receive auditorily input (fig. II3-10 a), this information is transmitted from the primary auditory area to Wernicke's area; if we then plan to respond to it verbally, the information flows to Broca's area where articulatory information is activated and passed on the primary motor area responsible for speech. When we receive visual input (fig. II3-10b), this information is transmitted from the primary visual area, via an area called the *angular gyrus*, to Wernicke's area; if we then plan to respond, the information flows further to Broca's area where again the necessary motor functions are activated. The exact function of the angular gyrus is not well understood, but it at least appears to play a central role in mediating between visual and auditory language.[48]

The Wernicke-Geschwind model is a much simplified presentation of how language-processes are organized in the brain. Although more recent theories essentially still follow it, they do present a more complicated picture, involving other brain regions throughout both left and right hemispheres that are believed to contribute in one way or another to the processing of communication. Thus, stimulation tests demonstrate that the inability to use synonyms and antonyms on the basis of relations of (dis)similarity results from stimulation of areas throughout the anterior and posterior regions of the brain.[49] In particular, the whole of the superior temporal gyrus, of which Wernicke's area is just one part, seems to be important; in the left, and to lesser extent in the right hemisphere.[50] The right hemisphere is also active in visual word recognition[51] and the spatial organization of incoming or outgoing messages, both of verbal and of nonverbal nature. Subcortical areas as well play a significant, although poorly understood role (fig. II3-11). Especially specific areas of the thalamus and the hypothalamus, as well as the temporal isthmus are implicated in the processing of communication.[52] Furthermore, tests show that the right cerebellum, the small brains, also become active when we process the meaning of words.[53] Finally, the connections and pathways between all these areas are implicated as well.[54] All these regions were neither considered in the Wernicke-Geschwind model, nor by Jakobson, who linked the patterns of metaphor and metonymy to the areas of Broca and Wernicke.

[47] Harley, *The Psychology of Language*, 69. As we know, De Saussure later used the same term in his semiological description of the psychological signifier.
[48] Harley, *The Psychology of Language*, 69.
[49] Kolb & Whishaw, *Fundamentals*, 515-516. Specific zones include the sensory and motor facial areas and the supplementary motor area, stimulation of which interferes with the muscles necessary for language production.
[50] Harley referring to a study by Hickok & Poppel (2004) in *The Psychology of Language*, 70-71
[51] Harley, *The Psychology of Language*, 69.
[52] Harley, *The Psychology of Language*, 69; Kolb & Whishaw, *Fundamentals*, 517-518, 527; Obler & Gjerlov, *Language and the Brain*, 21.
[53] Harley, *The Psychology of Language*, 70.
[54] Kolb & Whishaw, *Fundamentals*, 22-23.

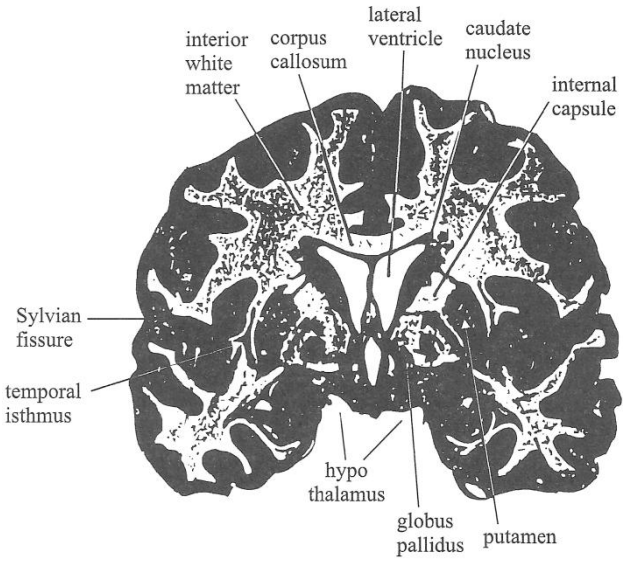


Fig. II3-11 Subcortical areas that also play a significant role in the processing of communication. Obler & Gjerlov, *Language and the Brain*, 21.

In section 1.d of the previous chapter we saw that Jakobson had linked a contiguity disorder and the production of metaphoric speech to Broca's area, and a similarity disorder and the production of metonymic speech to Wernicke's area. Indeed, patients with damage to Broca's area present non-fluent speech characterized by a failure to sequence units of language (agrammatism) and to produce and articulate coherent speech. They usually describe objects or beings in telegraphic manner on the basis of objects or beings to which they have a relation of resemblance.[55] Patients with damage to Wernicke's area have fluent speech characterized by well-formed sentences through which they are able to describe objects or beings in context, but their speech generally makes little sense as the processing of meaning is disrupted. They have difficulties in comprehending language and cannot perceive relations of (dis)similarity.[56] But the distinctions are not that clear-cut. Aphasiologists rarely find these characteristics as a result of damage either to Broca's or to Wernicke's area. Thus, patients with damage to Broca's area may have difficulty with understanding and comprehension as well, and virtually all patients with aphasia have difficulty in finding and selecting words, regardless of the site of damage and the involvement of metaphoric or metonymic processes.[57] The severity of the disorder is also something to take into account: a lesion in Wernicke's area does not straightforwardly lead to difficulty with selection of words, and a lesion in Broca's area does not immediately result in difficulty with syntactic patterns. Stimulation of the anterior region of the brain where Broca's area is located, and of the posterior region of the brain where Wernicke's area is located, has remarkably similar effects on language functions; when the stimulation interrupts language, this interruption is often of the same type in both regions.[58] Fig. II3-12 shows that the same regions of the brain may be affected by both Broca's and Wernicke's types of aphasia. This, as well as the fact that many more brain regions are involved, suggests that we cannot simply link a contiguity disorder resulting in metaphoric style exclusively to Broca's area, and a similarity disorder resulting in descriptive style of metonymic nature to Wernicke's area.

[55] Cf. Part II, chapter 2, section 1.d.2; Harley, *The Psychology of Language*, 435, 437-439, 492; Obler & Gjerlov, *Language and the Brain*, 39-41.
[56] Cf. Part II, chapter 2, section 1.d.2; Harley, *The Psychology of Language*, 68-69, 436, 499; Obler & Gjerlov, *Language and the Brain*, 41-43.
[57] Harley, *The Psychology of Language*, 70-71.
[58] Kolb & Whishaw, *Fundamentals*, 516, 526; Harley, *The Psychology of Language*, 71.

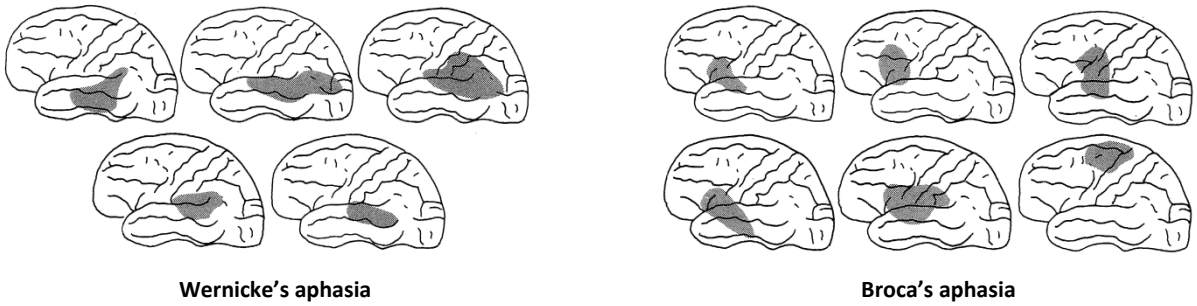


Fig. II3-12 Maps of lesions of individual cases of Wernicke's and Broca's aphasia. Kolb & Whishaw, *Fundamentals*, 526.

Because the symptoms of aphasia cannot be clearly related to either Broca's or Wernicke's area, nowadays a different classification of language disorders is used. Although there is disagreement on the exact number of aphasic disorders, aphasiologists generally distinguish between fluent and non-fluent forms.[59] Fluent forms of aphasia include the traditional Broca's aphasia, but several forms of comprehension disorders as well. They are further divided into 'conduction' and 'transcortical sensory' aphasias, in which the repetition and/or comprehension and/or phonological encoding of language may be impaired. Non-fluent forms of aphasia include the traditional Wernicke's aphasia, but are further divided into 'global' and 'transcortical motor' aphasias, in which the spontaneous use of language, grammar and naming objects is impaired.[60] No classification scheme for neuropsychological language disorders is, however, perfect; there are always exceptions and patients who cut across categories.[61]

To summarize, lesion and stimulation studies demonstrate that much more and larger areas of the brain are involved in the processing of communication than was once thought. Multiple areas and routes are involved, but it is difficult to localize them exactly in combination with specific processes, patterns, behaviors or aphasic symptoms. Although neurologists and aphasiologists can point roughly to specific regions that play important roles in the production and comprehension of verbal language, particularly the left frontal and temporal lobes, the neural systems underlying communication in general are in fact distributed over many cortical and subcortical regions of the brain. Jakobson's proposal, in which he linked the inability to combine units into correct syntactical forms of communication and the ability to select units on the basis of metaphoric relations of resemblance to Broca's area, and the inability to conceive and produce relations of resemblance as against the ability to conceive and produce relations in metonymic context to Wernicke's area is therefore too simplistic. Metaphor and metonymy cannot be that simply localized as cognitive patterns in the processing of communication.

Yet, although metaphor and metonymy cannot be neuro-anatomically linked to the organization of communication in the brain, our communicative behavior can clearly be of metaphoric or metonymic nature. Instead of localizing the generation of the tropes, they are nowadays rather included in a new paradigm used for conceiving how information might be processed and represented in the brain. This new paradigm does not search for language centers *per se*, but rather focuses on the activation of meanings in a network of nodes and relations between them: connectionism theory.

[59] Harley, *The Psychology of Language*, 436-437; Kolb & Whishaw, *Fundamentals*, 520-523.
[60] Kolb & Whishaw, *Fundamentals*, 521-523.
[61] Harley, *The Psychology of Language*, 436-437.

a. The principles of connection and activation

Connectionism is a popular theory in the cognitive sciences that derives from artificial intelligence studies. It is used to explain intellectual abilities and complex cognitive behavior as processes that occur through the interaction of interconnected units, or nodes, in a network. Connectionist networks are based on a metaphor of the brain as a structure made up out of many interconnected neurons that are joined in patterns of synapses (connections). Connectionist networks are therefore also known as neural networks, and they are considered to represent a faithful picture of the nature of cognitive and neurological sensory processing in the human brain.[62] There are many types and forms of connectionist networks, among which are simple tree-structured hierarchies, unstructured mind-maps and so-called 'small-world' graphs,[63] but a very basic example is presented in fig. II3-13:

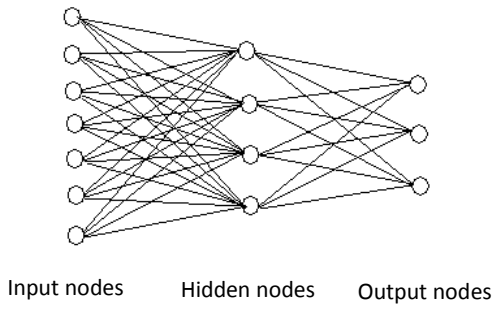


Fig. II3-13 Example of a connectionist network. Input units, or nodes, sent activation along connections to output nodes via intermediate nodes. This principle can be used to explain and visualize the processing of various intellectual abilities, from word recognition and speech production to semantics and classification theory. Adapted from Garson, 'Connectionism' in the *Stanford Encyclopedia of Philosophy* (2015).

The network in fig. II3-13 shows three levels of processing that are represented by input nodes, hidden or intermediate nodes, and output nodes. The input-nodes contain incoming information, which may be visual, auditory or sensory in nature. Via connections they activate the other nodes in the network, which are called 'hidden' in that they represent intermediate levels of processing between input and output. They allow for non-linear and indirect processing. Via the intermediate levels activation is sent to output nodes, which represent the outcome of the information processed. The number of nodes and connections, as well as the number of intermediate levels, depends on the kind and complexity of the cognitive behavior a network is intended to visualize and explain. All connectionist networks, however, depart from three basic concepts that summarize connectionism theory in a nutshell:[64]

- The prime concept that there are many processing nodes that, in analogy to neurons in the brain, are all connected (wired) together;

[62] Harley, *The Psychology of Language*, 23, 481; Garson, 'Connectionism' in the *Stanford Encyclopedia of Philosophy* (2015), introduction and section 1. Consultable online: http://plato.stanford.edu/entries/connectionism/. Harley warns not to get too carried away with the metaphor, but at least it comes closer to the brain than traditional models discussed by him on pp. 10-11. See also Steyvers & Tenenbaum, 'The Large-Scale Structure of Semantic Networks', *Cognitive Science* 29 (2005), 72-73; Burk et al., 'Pattern Discovery Using Semantic Network Analysis', *3rd International Workshop on Cognitive Information Processing* (2012), 1-6. For criticism on connectionism networks as maps of the brain, see Garson, *ibid*., section 4.
[63] Steyvers & Tenenbaum, 'The Large-Scale Structure of Semantic Networks', *Cognitive Science* 29 (2005), 42-43.
[64] Harley, *The Psychology of Language*, 485.

- The concept that activation spreads from node to node throughout the network in a way that is determined by the strengths of the connections between the nodes;
- The concept that high-level, complex intelligent behavior emerges from the interaction and cooperation of the nodes and the strength of their connections.

The concept of activation is central to connectionism theory. Psycholinguist Harley explains it as energy or electricity flowing around a circuit board:[65] it fires quickly in all directions, activating nodes that themselves activate other nodes throughout the network. Activation starts with the input nodes. However, they do not activate all intermediate nodes to equal extent. This is seen in fig. II3-14:

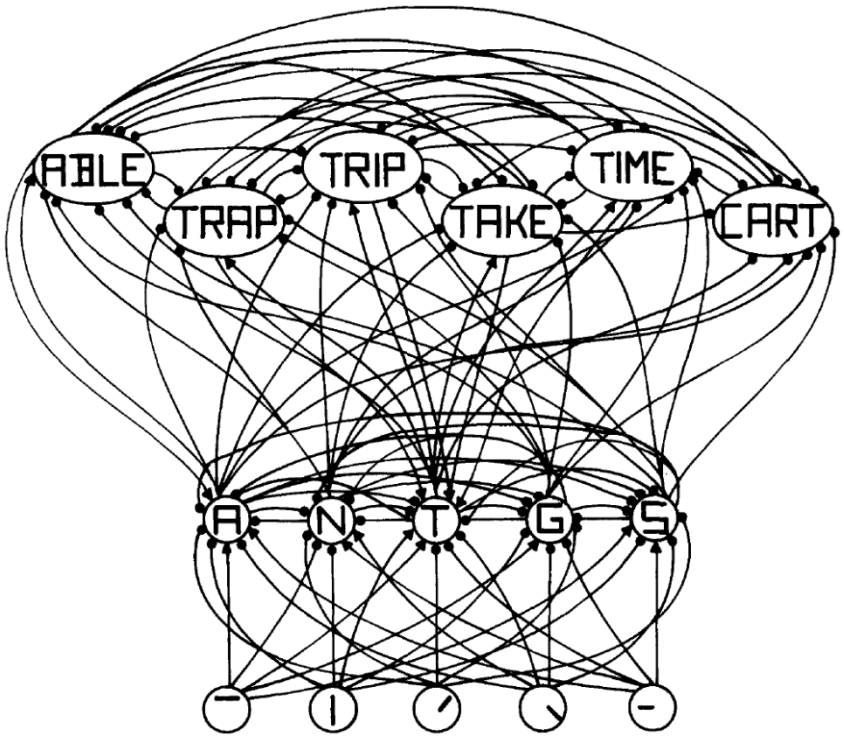


Fig. II3-14 A connectionist network that shows interactive activation between the input, intermediate and output nodes. It was developed to explain visual word recognition and identification: visual input features activate certain letters, which themselves activate certain words as output nodes. McClelland & Rumelhart in *Psychological Review* 88.5 (1981), p. 380 (fig. 3).

Fig. II3-14 shows a connectionist network that was developed by the psychologists McClelland and Rumelhart to account for visual word recognition on the basis of letter identification.[66] The first level at the bottom is the input level. It shows visual feature units; elements that may feature in the composition of the letters of our alphabet.[67] The nodes in the intermediate level correspond to individual letters, and the nodes in the outcome level correspond to words that begin with the intermediate level letters. This is, of course, a simplification of the situation in reality. McClelland and Rumelhart note that in reading

[65] Harley, *The Psychology of Language*, 13.
[66] McClelland & Rumelhart, 'An Interactive Activation Model of Context Effects in Letter Perception', *Psychological Review* 88.5 (1981), 375-407; Harley, *The Psychology of Language*, 197-198, 485-486.
[67] The breaking up of signs into minimal feature units that have in themselves no meaning, and functional units such as words that do carry meaning is precisely what semiotics has called *double articulation*. See the previous chapter, section 1.d. The levels of articulation are here used to show how the brain makes sense out of them: it recognizes words by identifying how they are built up from minimal units that compose meaningful units.

and perception normally many more levels are important. Yet for the sake of comprehension only three levels and a small amount of exemplary nodes are given here.[68]

Starting from the input level, not all of the feature units in fact feature in the letters of the intermediate nodes. That is, although in analogy to neurons in the brain all nodes are in principle connected, for some intermediate nodes this connection is of an *excitatory* (positive) nature and for others it is of *inhibitory* (negative) nature. Thus, when a person NN, who is familiar with the English language and Western alphabet, is presented with a stimulus word a process is initiated in which certain features are extracted from each letter in the stimulus word, and excitatory and inhibitory pressures begin to act upon the intermediate and output-level nodes in order to identify the letters and ultimately the word. Assume that the stimulus word is 'TAKE'. As regards the first letter, the visual feature '|' may be extracted, which has an excitatory connection to the letter 'T', because '|' is a feature of 'T'. The letter 'T' is activated, because it is consistent with the visual input.[69] But the same feature unit '|' establishes an inhibitory connection to the letter 'S', because '|' is not a feature of 'S'. The inhibitory connection makes the letter 'S' inactive in the network.[70] The network indicates activation through excitatory connections by means of an arrow, and deactivation through inhibitory connections by means of a circle.

The excitatory connections that go out from the input level make certain pathways through the network highly active, and therewith certain outputs highly possible, while the inhibitory connections make other pathways end. Thus, all connections from S to the output level are inhibitory; they all end in circles. The conclusion is as follows: it is highly unlikely that person NN, after having been presented with the visual stimulus 'TAKE' and after having extracted the visual feature units of the first letter, will arrive at an output node that starts with the letter 'S'. In contrast, it is very likely that he arrives at an output node that starts with the letter 'T', of which four examples are given in the model: excitatory connections from 'T' arrive at the output nodes 'TRAP', 'TRIP', 'TAKE' and 'TIME'.

The next letter in the stimulus word is processed in similar manner. Thus, the visual feature unit '¯' may be extracted, which establishes excitatory connections with the letters 'A', 'T', 'G', and 'S'; and an inhibitory connection with the letter 'N'. However, although 'A', 'T', 'G', and 'S' are thus all activated, the latter three will receive less activation, since in the context of the previous identification of 'T' the letter 'A' makes most sense in the English language.[71] In activating 'A', the pathway to the output word 'TAKE' (or other words that begin with 'T' and 'A', such as 'TASK' or 'TANK') becomes highly active, while those leading to 'TRAP', 'TRIP' and 'TIME' are inhibited.[72]

Thus, each letter in a stimulus word is identified and visual word recognition is built up from feature-, letter- and word-level processing. But McClelland and Rumelhart warn against considering these processes as taking place stepwise from one level to another. Although their model has the appearance of being built up of three successive stages, McClelland and Rumelhart note that 'processing

[68] McClelland & Rumelhart, 'An Interactive Activation Model of Context Effects in Letter Perception', *Psychological Review* 88.5 (1981), 378-379.
[69] *Ibid*., 376.
[70] Note that the exact position of visual feature units in the circle is significant; the unit '|' does not establish an excitatory connection to N, a letter which contains two long vertical lines, but not at its centre. This means that we recognize and identify letters not only on the basis of formal resemblance with compositional features, but also on the basis of the spatial arrangement of these features.
[71] This effect is called the word superiority effect: the phenomenon that people have better recognition of letters presented within words as compared to isolated letters. Harley, *The Psychology of Language*, 197.
[72] *Ibid*., 198.

at the letter level presumably occurs simultaneously with processing at the word level and with processing at the feature level'.[73] It is through feedback that the levels communicate with each other, and strengthen and affirm activations in the lower and higher levels. McClelland and Rumelhart call this *interactive activation* along two-way connections between nodes: a stimulus at once fires activation throughout the network, but only when the letter 'T' has found affirmation in the lower level of visual feature units and the word 'TAKE' has found affirmation in the lower level activation of 'T' and 'A' do their connections become excitatory or inhibitory.[74] The eventual output word is truly a result of processing and communication taking place at once between the feature-, letter- and word-levels.

To summarize briefly, the connectionist network of visual word recognition shows the pathways that become active when a stimulus in the form of a visually written word is presented. These pathways lead to potential outcomes, or interpretations, of the initial visual input. As such, the network highlights patterns that are created in the brain and visualizes the processes that take place to make sense out of the visual input.

It must be stressed that this is an incomplete and simplified account of McClelland's and Rumelhart's network that we have used to explain the basic idea of connectionism and its central concept of activation. The theory of visual word recognition on which the model is based implies, of course, much more,[75] but we would like to focus merely on one aspect: the *nature of the excitatory connections* that can exist between the nodes of the input, intermediate and output levels. The nature of the excitatory connection between the nodes in fig. II3-14 was of one kind only: visual, formal resemblance between '|' and '¯' as features of 'T' and 'A', and 'T' and 'A' as the first letters in 'TAKE'. Harley mentions that the scope of the network is consequently limited as it gives no account of the various roles semantics and sound can have in establishing excitatory connections.[76] Psycholinguistic studies that made use of picture-word interference tests, in which participants see pictures that they have to name as quickly as possible, have demonstrated that after the presentation of visual input *semantically as well as phonetically related nodes* may receive activation.[77] Thus, one experiment found that the presentation of the picture of a couch activated the word 'sofa' (semantic relation) as well as the word 'soda' (phonetic relation to 'sofa');[78] and the picture of a sheep may activate 'goat' (semantic relation), and also 'sheet' (phonetic relation);[79] and Harley explains that when we hear the word 'ghost', words related in meaning (e.g. 'vampire') can become activated, but words

[73] McClelland & Rumelhart, 'An Interactive Activation Model of Context Effects in Letter Perception', *Psychological Review* 88.5 (1981), 377.
[74] Interactive activation implies that the processing of visual input does not take place bottom-up from feature level to word, but simultaneously top-down. The top-down processing codetermines and affirms the activation of the nodes. Thus, as soon as 'T' is activated, it affirms its own activation by communicating feedback to the input level. While the activation of 'T' is affirmed also in communication with the processing simultaneously taking place at the word-level, the activation of the other nodes in the letter-level is decreased. See pp. 377-378 of their paper in *Psychological Review* 88.5.
[75] For further information, see the papers by McClelland and Rumelhart 'An Interactive Activation Model of Context Effects in Letter Perception', parts I and II, *Psychological Review* 88.5 (1981), 375-407 and 89.1 (1982), pp. 60-94; as well as further and more recent studies on visual word recognition in Harley, *The Psychology of Language*, chapter 6.
[76] *Ibid*., 198.
[77] *Ibid*., 414-415, 421. A debate in psycholinguistic studies has been the question whether semantic nodes are activated first and independently from a secondary activation of phonetic nodes (discrete models), or whether there is overlap in the activation of both semantic and phonetic nodes (cascade models). The evidence supports the latter hypothesis: although the accessing of semantic and phonetic information is generally a two-stage process, the stages overlap in that the presentation of visual input activates nodes that have a semantic relation to the input, while simultaneously nodes with a phonetic relation are activated at least partially (420-425).
[78] Peterson & Savoy (1998), referred to in Harley, *The Psychology of Language*, 421.
[79] Levelt et al. referred to in *ibid*., 421.

related in sound (e.g. 'goal') will also receive an amount of activation.[80] As for the words related in sound, they are precisely what Goldwasser called *phonetic metaphors*: different words that sound similar to the target word depicted in the picture. Phonetic metaphors should thus be reckoned with as possibly activated nodes in a connectionist network. As for the words related in meaning, they may show a variety of semantic relations to the target word.

b. Semantic Network Analysis

A focus on semantics in the question of how the brain processes meaning led to Semantic Network Analysis (SNA) and the development of semantic networks based on connectionism theory and the principle of spreading activation.[81] Semantic connectionist networks are based on the idea that meaning is given by how it is embedded within a network of *semantic features*. It presents these semantic features as nodes in a network structure, within which they are associated on the basis of connections that have themselves meaning.[82] Two of the most common connections between nodes are the 'IS-A' (or 'verification') association and the 'HAS-A' (or 'property inheritance') association. The first kind of association was mentioned in section 1.b of the previous chapter with respect to classification theory. It indicates that a node in the network is a type of another node. The second association describes a node's differentiating features, such as 'a bird HAS wings' whereas 'fish HAVE fins'. Indeed, classification theory makes use of the same idea of spreading activation. Two examples are given below: fig. II3-15 shows a general tree-structured hierarchical classification, while fig. II3-16 shows associations of a classificatory kind between nodes in a spreading activation model.

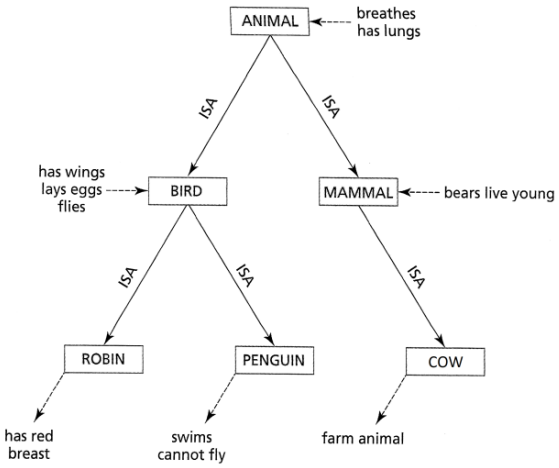


Fig. II3-15 Hierarchical tree-structure based on IS-A connections between semantic nodes. Adapted from Harley, *The Psychology of Language*, 326 (fig. 11.1).

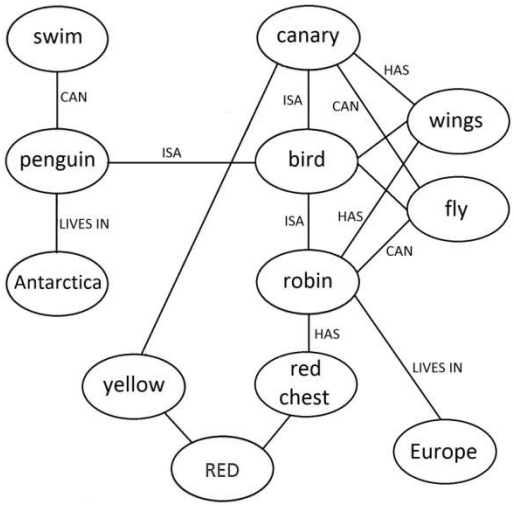


Fig. II3-16 Spreading activation network based on IS-A, HAS-A and other kinds of connections between semantic nodes. Adapted from Harley, *The Psychology of Language*, 328 (fig. 11.2).

[80] Harley, *The Psychology of Language*, 13.
[81] *Ibid*., 325-328.
[82] This feature distinguishes a semantic network from a simpler association network, where there is no structure and no relation between the nodes. *Ibid*.,325.

The disadvantage of the tree-structured model is that the processing of meaning in the brain often does not reflect the hierarchical steps of the categorical structure. For instance, whereas in processing the meaning of 'robin', the node 'bird' ('robin IS-A bird') is indeed activated at an earlier stage than the node 'animal' ('robin IS-AN animal'), in processing the meaning of 'cow' the node 'animal' is rather directly activated, skipping the node 'mammal'.[83] In other words, tree-structured hierarchies present a linear successive process that does not always reflect the manner in which meaning is processed in the brain. Tree-structured hierarchies are furthermore considered limited as models of semantic structure in that they place constraints on the possible extensions of predicates; that is, on the kinds of knowledge and excitatory connections that are possible. They are mainly appropriate for certain taxonomically organized concepts.[84]

In fig. II3-16, which concentrates on the processing of 'robin' only, the thought processes are visualized in a connectionist model in a meaningful, non-hierarchical, structure. The relative lengths of the connections between nodes are significant: short connections indicate quick activations, longer connections indicate later activations and those that take place via multiple intermediate nodes. Thus, the connection between 'robin' and 'bird' is fairly short on the basis of the 'robin IS-A bird' association. The connections with 'wings' and 'red chest' are also fairly short on the basis of the associations 'robin HAS wings' and 'robin HAS-A red chest'. The connection between 'penguin' and 'bird' is longer because, in contrast to 'robin', 'penguin' is considered less of a prototypical example of 'bird';[85] the idea that 'penguin IS-A bird' takes longer to process.

The reader will notice that Fig. II3-16 includes also semantic nodes that are based on other than 'IS-A' and 'HAS-A' associations: there is a functional association that connects the node 'robin' to 'fly' ('a robin CAN fly'), and what has been called an encyclopaedic relation that connects the node 'robin' to 'Europe' ('robins LIVE IN Europe').[86] Other associations on the basis of which nodes may become active in the processing of meaning have been found by the cognitive psychologist Hinton and the neuropsychologist Shallice in a study on a reading disorder, in which the patients cannot retrieve words except on the basis of semantic associations (deep dyslexia).[87] They mention among others association on the basis of:[88]

- size;
- color;
- material, hardness or softness;
- location (indoors, outdoors);
- pars-pro-toto;
- source or derivation;
- a made-of association;
- or a used-for association.

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[83] The conceptualization 'cow IS-AN animal' is encountered more often than the conceptualization 'cow IS-A mammal'. Harley, *The Psychology of Language*, 326-327 (referring to a study by Collins and Quillian (1969)).
[84] Steyvers & Tenenbaum, 'The Large-Scale Structure of Semantic Networks', *Cognitive Science* 29 (2005), 42.
[85] It may be called a fuzzy member of the class of birds. Goldwasser, *Prophets, Lovers and Giraffes*, 19-24; Harley, *The Psychology of Language*, 327-328, 335-337. For prototype theory, see also section 1.b.1 of the previous chapter.
[86] Rogers et al., referred to by Harley, *The Psychology of Language*, 357-358.
[87] Hinton & Shallice, 'Lesioning an Attractor Network', *Psychological Review* 98.1 (1998), 74-95.
[88] Listed in Hinton & Shallice, 'Lesioning an Attractor Network', *Psychological Review* 98.1 (1998), Appendix B. See also Harley, *The Psychology of Language* (2008), 236-239; Steyvers & Tenenbaum, 'The Large-Scale Structure of Semantic Networks', *Cognitive Science* 29 (2005), 51.

If we translate these semantic associations as well as the phonetic and the classificatory associations mentioned before into semiotic terms, we are in fact dealing with a variety of metaphoric and metonymic associations in meaning.[89] Two associated nodes A and B may be metaphors for one another on the basis of similarity in sound (phonetic metaphors), or on the basis of similarity in size, color, material, function, location of usage or occurrence and so forth (semantic metaphors), while these metaphors are framed or supported by connections of metonymic kind; function, habitat, source, material or usage stand for the two concepts that are associated in nodes A and B.

c. The marking system from Deir el-Medina

It now becomes tempting to ask ourselves whether a connectionist activation network can be used to visualize and explain the different processes through which the identity marks generate meaning. But before we attempt to do so, a final aspect of connectionism theory must be explained. In computational cognitive science a connection is not simply excitatory or inhibitory; it is so to a precise calculated degree. Connections have weights, or strengths, that determine how much activation spreads along them, and hence how quickly activation builds up in the node at the other end of the connection.[90] The higher the activation of the connection is, the more likely the node at the other end is to become the output of the network.[91] Meaning is therewith not stored in nodes, or semantic and phonetic features, but precisely in the connections and their weights.[92] The question of meaning and of the motivation for a specific sign is, then, a matter of *degree*;[93] a sign as input node may have several meanings as output nodes that are all motivated to greater or lesser degree.

This is an important point. Although the issue of various degrees of motivation was emphasized in the field of semiotics already by Barthes as well as by Peirce in his sign-varieties (the degree to which a sign is iconic, indexical or symbolic), an essential contribution of the cognitive sciences to the question of the generation of meaning is the provision of algorithms to calculate the degree of motivation. These algorithms, however, require outstanding knowledge of mathematics and we have neither the knowledge, nor the time and space, to include them in our present study.[94] Yet, we can at least consider the visual presentation of a spreading activation network to show how the marks are connected to the workmen and at the same time how the workmen identified through their marks are connected to each other. Let us consider the example of :

[89] See section 1.d.1 of the previous chapter.
[90] Harley, *The Psychology of Language*, 486.
[91] *Ibid*., 13.
[92] Garson, 'Connectionism' in the *Stanford Encyclopedia of Philosophy* (2015), section 5. Consultable online: http://plato.stanford.edu/entries/connectionism/.
[93] *Ibid*., section 6.
[94] Harley, *The Psychology of Language*, 486 offers examples and a brief explanation.

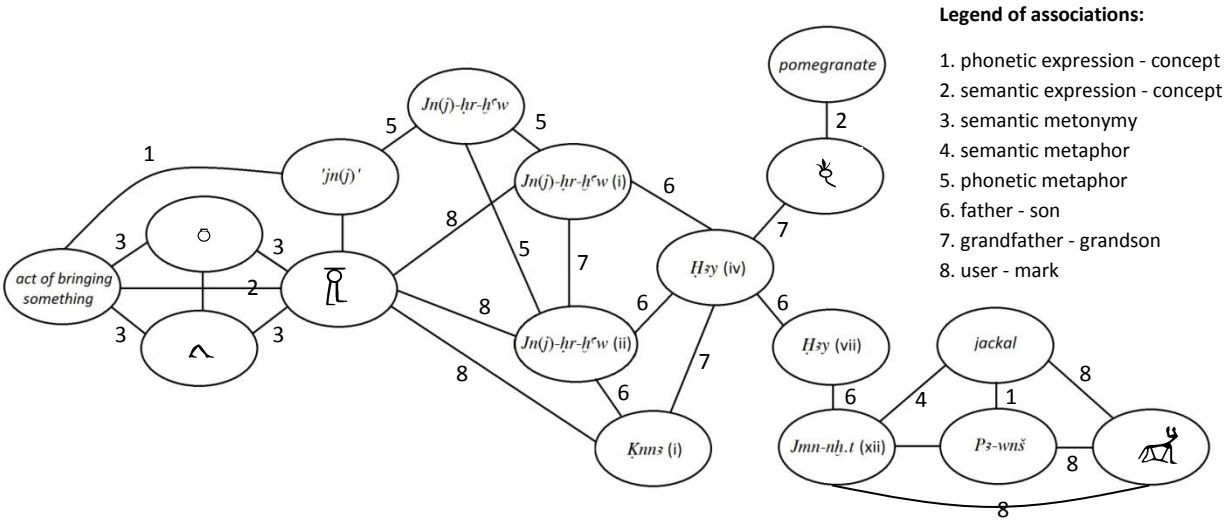

Fig. II3-17 The mark 𓎛 as visual input in a spreading activation network including the meanings along the pictorial and phonetic trails that were suggested in the synthesis of the previous chapter, now as semantic nodes in a non-hierarchical structure spreading toward both *Ḥɜy* (iv) with the mark 𓇋 and *Jmn-nḫt* (xii) with the mark 𓃠. NB: associations on the basis of great-grandfather – great-grandson relations are not indicated as this would not enhance the clarity of the network.

In the previous chapter we saw that the mark 𓎛 consists of 𓎟 and 𓌙 and pictorially depicts *the act of bringing something*. Both 𓎟 and 𓌙 are in metonymic relation to the expression 𓎛 as well as to *the act of bringing something* which is the concept, because they are parts representing the whole. They are semantic nodes that are activated by 𓎛 on the basis of semantic metonymy. In addition, as a phonetic sign, 𓎛 conveys the sound pattern '*jn*(*j*)'. This phonetic node is connected to *the act of bringing something* as the ancient Egyptian expression for this act, but on the basis of phonetic similarity (i.e. metaphor) it is furthermore connected to the name *Jn*(*j*)-*ḥr*-*ḫʿw*. This name is in turn connected on the basis of phonetic metaphor to both names *Jn*(*j*)-*ḥr*-*ḫʿw* (i) and *Jn*(*j*)-*ḥr*-*ḫʿw* (ii) and the persons who were called by these names. As such, *Jn*(*j*)-*ḥr*-*ḫʿw* (i) and *Jn*(*j*)-*ḥr*-*ḫʿw* (ii) are indirectly connected to the mark 𓎛 on the basis of phonetic metaphor through the intermediate nodes of '*jn*(*j*)' and *Jn*(*j*)-*ḥr*-*ḫʿw*, but both also have a direct user-mark connection, as they were both direct users of the mark within the system of Deir el-Medina for a certain period of time. *Ḳnnɜ* (i) is connected to *Jn*(*j*)-*ḥr*-*ḫʿw* (i) and *Jn*(*j*)-*ḥr*-*ḫʿw* (ii) on the basis of family relations, and thus also has an indirect connection with the mark 𓎛 through intermediate nodes (whether via '*jnj*' and the name *Jn*(*j*)-*ḥr*-*ḫʿw*, or via his great-grandfather *Jn*(*j*)-*ḥr*-*ḫʿw* (i) and/or father *Jn*(*j*)-*ḥr*-*ḫʿw* (ii)). Yet, he too has a direct user-mark connection as he was also a direct user of 𓎛 for a certain period of time. *Ḥɜy* (iv), in contrast, does not have a direct connection to 𓎛; he is not attested with this mark. Rather, he used the mark 𓇋, which pictorially represents a *pomegranate*. Still, he is indirectly connected to 𓎛 via family relations. In further spreading its activation, the network comes to include another workman, *Jmn-nḫt* (xii), whom we have encountered in the previous chapter with the mark 𓃠, representing a *jackal*. His connection to this mark, we assumed, was on the basis of his nickname *Pɜ-wnš*, a name that presumably came forth from some aspect of similarity between *Jmn-nḫt* and the animal: a case of semantic animalistic metaphor. *Jmn-nḫt* was the son of *Ḥɜy* (vii), who was in turn a son of *Ḥɜy* (iv). As such, he was a nephew of *Ḳnnɜ* and a great-grandson of *Jn*(*j*)-*ḥr*-*ḫʿw* (i), the first known user of 𓎛.

The big advantage of such a representation in comparison with the model presented in the synthesis of chapter 2 is that it is *not linear*. Therefore, it does not imply that every individual went through the same linear process to get from to, for instance, *Ḳnnɜ* (i). Some, especially contemporaries of *Ḳnnɜ* (i), will have made the connection between and *Ḳnnɜ* directly; others, such as elderly who knew *Ḳnnɜ's* father or lineage, may have made the connection through *Jn*(*j*)-*ḥr*-*ḫʿw* (ii), or perhaps even through *Jn*(*j*)-*ḥr*-*ḫʿw* (i). Furthermore, those with better knowledge of script may have made the connection through '*jn*(*i*)' and the family name *Jn*(*j*)-*ḥr*-*ḫʿw*, while others without knowledge of script may again have followed a direct connection. Inherent to this advantage is another advantage, namely that *Ḥɜy* (iv) does not necessarily have to be included in the process from to *Ḳnnɜ*. In the previous chapter he was included in the linear process as *Ḳnnɜ*'s grandfather, but by not using the mark he in fact represents an interruption. In the network of fig. II3-17 one can quite literally get around him and still follow the process from to *Ḳnnɜ*.

In other words, a representation of the semantic and phonetic knowledge connected to the mark such as in fig. II3-17 shows which nodes have the potential to receive excitatory activation, but it does not imply that one specific path needed to be followed. Although we can never be certain what exactly the ancient Egyptians thought when they saw the mark , or any other of the identity marks, and which semantic and phonetic features may have been activated to greater or lesser degree, we can assume that there were personal differences depending on, among others, age and degree of literacy. The meaning of may have been *conceived differently* by someone who made a phonetic connection through '*jn*(*j*)', *Jn*(*j*)-*ḥr*-*ḫʿw* and the family connections, than by someone who made the connections more directly. As such, the meaning of the mark in fig. II3-17 is indeed found in the connections, and not in the nodes themselves.

In sum, connectionism theory and the principle of spreading activation are important contributions in the search for meaning generated by the signs and markings of visual communication. The strength of connectionism networks lies in the fact that they visualize meaning through a pattern of activation distribution over many potential semantic and phonetic feature nodes in a non-hierarchical structure that approaches the nature of cognitive and neurological sensory processing in the human brain better than traditional models have done.

Unfortunately, we have merely been able to suggest the potential of connectionism theory to the analysis of the Deir el-Medina identity marks. We would have liked to apply the marking system to the theory in more detail, including its computational aspects in calculating the weights of potential connections. The semantic and phonetic nodes to be included in such a connectionist network between the marks as input nodes and the workmen as output nodes, as well as the weights of their connections should be based on a thorough study of ancient Egyptian sources: which semantic and phonetic, metonymic and metaphoric associations do we find in Egyptian sources connected to the marks that were selected to convey the identity of the Deir el-Medina workmen, and how often do these associations occur; that is, how integrated were they? Frequently encountered associations will receive a higher degree of activation as they theoretically have more potential to lead to the output. Such study, however, must be left for a future interdisciplinary undertaking with specialists in the field of (computational) cognitive science.

PART III

COMPARATIVE ANALYSIS

THE UNIVERSALITY OF MARKING SYSTEMS

Marking systems occur in cultures and societies diverse in temporal and geographical space. A variety of terms is used to designate them, among which 'clan marks', 'tribal marks', 'livestock marks', 'border marks', 'masons' marks', 'workmen's marks' or 'trade marks'. Yet, all these terms have in common that they convey identity: identity of a group (e.g. communities, clans, tribes, teams), or identity of individuals (e.g. workmen, sculptors, noblemen, warriors). In many early societies such marking systems acted as a more universal form of visual communication before linguistic writing was widespread, for instance when writing was the privilege of a small literate aristocratic or religious group. In modern societies marking systems are still widely used beside linguistic writing, or even in combination with it: think of brand marks such as , and . From prehistory to the present day, marking systems are universal; but how universal exactly? To what extent are marks and marking systems throughout the world similar in terms of form, function, system, and use and status in society? Linguistic writing systems are universal in their aim to record oral language through the conveyance of phonetic information, but they differ with respect to how their signs relate to the sounds of language. There are formal and systemic differences between logosyllabic scripts, syllabic scripts, and consonantaries such as abjads and alphabets; their signs denote individual morphemes and/or particular syllables, separate consonants and vowels, or separate phonemes in which consonants are accompanied by a specific vowel in different writing systems.[1] Marking systems are universal in their principle of offering methods to record information that are not couched in a specific linguistic form. That is, although they may, but do not necessarily include a linguistic component in that they may use phonetic forms of information processing or other characteristics of linguistic writing such as sequentiality, they offer alternative graphic and graphic rhetoric forms of information processing that may be more pictorial in nature.[2] Can we, however, also discern differences among marking systems such as those that exist among writing systems? Unfortunately, it appeared not to be feasible to provide a comparative analysis of signification processes which underlie different systems, as these processes have in most marking systems hardly been investigated; any such undertaking is often hindered by complete or at least considerable lack of context and knowledge concerning signifieds and referents. Exact details of the semiosis of particular marking systems and of the meaning of particular marks can therefore not be compared. However, through a study of the forms, function, and patterns of derivation and development of marking systems, as well as of their use and status in particular societies in relation to writing, we can at least attempt to approach a phenomenological comparison.

For this chapter, a number of marking systems spread in time and space were closely examined. Four will serve as the main systems of comparison:

[1] For details and explanation of terms, see Daniels & Bright (eds.), *The World's Writing Systems*, 4.
[2] Such as those processes of information processing discussed in Part II.

1. Marking systems from the medieval period that occur in a range of European countries including Belgium, Britain, France, Germany, the Netherlands, Scotland, the Scandinavian Countries and Spain. The marks are often designated as 'lapidary marks' and defined as signs engraved on a block of stone with a specific function during construction processes.[3] They are divided into two general categories: identity marks and function marks. The former identify individuals in relation to the amount and quality of the work accomplished;[4] the function marks are mainly positioning and assembly marks, or marks indicating the height or thickness of blocks of stone. The function marks consist mainly of Roman or Arabic numbering systems or succeeding alphabetic letters that indicate successive courses of stone and will be left out of consideration.[5] We confine ourselves to the identity marks, taking into account that their designation as 'lapidary marks' is in fact inadequate; the same marks used by individuals on stone in the course of a construction process were also used as signatures in official documents, such as building contracts, or as property marks on personal objects. An alternative designation is 'masons' marks', but this misleadingly suggests that only masons made use of them, while carpenters, merchants and in fact craftsmen of almost any guild could identify themselves with a mark. It is therefore best to remain with a more general designation such as medieval European identity marks.
2. A system of identity marks used in small fishing communities in Gallaecia (Galiza and northern Portugal). The marks have been securely attested since the late Middle Ages and share formal similarities with the medieval European marks, but they functioned according to local Portuguese tradition. In the community of A Guarda they are still in use.
3. Systems of identity marks used in south America. The indigenous Wayúu peoples in northern Columbia and northwestern Venezuela and the Kadiwéu peoples in southwestern Brazil used identity marks that were very similar and probably came from a common source in the Amazone. The identity marks used in southeastern and northwestern Brazil used by 'white cattle herders' after the arrival of the Portuguese and Spanish colonizers were influenced both by the indigenous tradition and by European traditions.
4. Identity marks used in southwest Anatolia in the 7th to 6th centuries BCE (Lydia and Lycia) and in the Persian Achaemenid Empire in the 6th to 5th centuries BCE (mainly in Persepolis, Pasargadae and Susa).

Other marking systems will be mentioned in passing, such as identity marks used by the nomadic peoples of ancient Sarmatia,[6] identity marks used by the nomadic herders in medieval to modern

[3] Reveyron, 'Marques lapidaries: the state of the question', *Gesta* 42 no. 2 (2003), 161.
[4] This is, at least, generally believed to be their main purpose. This and other purposes are discussed in chapter 2.
[5] Notwithstanding we would like to mention that interesting examples can be found on the pavement in front of the Abbey of Mont Saint Michel, where a mix of Roman numerals, Arabic numerals and alphabetic letters occur. They therefore also show a mixed composition, and especially the latter are not always clearly distinguishable from identity marks. Personal observation and communication with Prof. Dr. D. de Vries, Leiden University (20-01-2012).
[6] Sarmatia comprises a large geographical area from south Siberia, Central Mongolia, West China (Kansu, western Xinjiang) and northwestern India in the east, across to the boundaries of Iraq, Turkey and southeastern Europe at least as far as Hungary in the west. It is often divided into four main regions of importance: 1) Iran; 2) Transoxiana (western Central Asia) and Afghanistan; 3) Eastern Europe and the northern Caucasus; 4) South Siberia and Mongolia. The Sarmatian nomadic peoples were at the height of their power between the 7th to 3rd century BC, but their marking tradition has been preserved into the modern era – in some

Mongolia, identity marks used by nomadic tribes in northwest Africa up to the present day, and identity marks used by reindeer herders in present-day Norway. The various marks' corpora are plotted on a world map in Plate III1-1 and a map of Europe in Plate III1-2 at the end of this Part III. It should be emphasized that these maps are not meant to equate all the systems: each system is a system in its own right and context. The maps merely serve to familiarize the reader with corpus of each system discussed. One may find it convenient to consult them while reading the Comparative Analysis, in particular chapter 1.

In the first chapter of this Comparative Analysis we explore the question of how universal marking systems are with regard to form and composition, function and purposes, and derivational system and development. In the second chapter we offer a discussion in which we explore the use and status of marking systems in societies in relation to linguistic writing systems. Throughout the Analysis we refer to the marks from Deir el-Medina. We will see that this system shares especially formal and functional characteristics with marking systems in general, but is unique in other respects. By assessing the similarities and dissimilarities, the analysis helps to establish the nature of the marks and the system from Deir el-Medina, embedding them among marks and systems that are all part of a widespread phenomenon that offers methods to visualize information alternative to the mainly phonetic methods of linguistic writing systems.

northern Caucasian villages up to the present day. Yatsenko, 'Problems and Study Methods of the Ancient and Early Medieval Iranian-Speaking Peoples' Nishan-Signs' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 109.

1

UNIVERSALITY IN FORM, FUNCTION AND DERIVATION

1 FORM

a. Formal composition

In this section the commonalities and differences in the formal appearance and composition of marking systems are discussed, and we attempt to explain them. In Part I chapter 1 it was already mentioned that marks generally have a 1) pictorial or 2) linear geometric form. That is, their formal appearance is pictorial or geometric. Pictorial forms involve representations of persons, animals or objects in reality; linear geometric forms are usually called 'abstract' in that they are simple strokes, curves, dots, or combinations of these, which do not seem to represent anything concrete. When a society makes use of (a) linguistic writing system(s), characters borrowed from these scripts may complement the pictorial and geometric forms. The three groups together constitute the formal composition of a marking system (fig. III1-1):

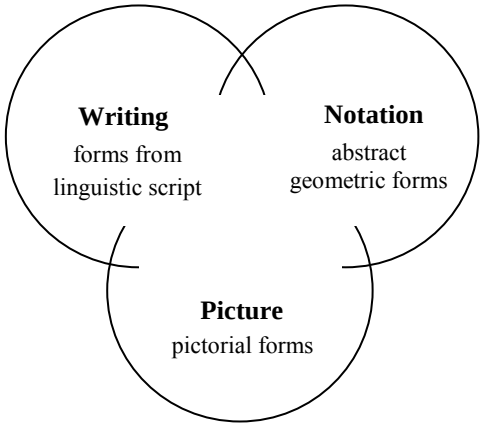

Fig. III1-1 Venn diagram of visual communication, giving a classification of the formal appearances of the marks (i.e. their signifiers). A classification of the actual nature of the marks would depend on their semiosis. Adapted from Elkins, *The Domain of Images*, 85-86.

In Parts I and II we also discussed the problems involved in such a classification and its representation in Elkins' Venn-diagram of visual communication: the diagram presents the domains 'abstract geometric', 'pictorial' and 'forms from linguistic script' merely as modern designations for the formal appearance of the marks, disregarding their signifieds, referents and overall semiosis. In other words, the designations 'abstract geometric', 'pictorial' and 'forms from linguistic script' merely serve to classify the signifiers, or representamen, of the marks as seen through modern western eyes. When we are not dealing with marking systems that belong to our culture, the signifieds and referents, and consequently the processes of signification, often remain unknown to us, especially in the case of ancient and obsolete systems. Questions such as whether 'abstract geometric' marks may in fact be stylized representations of objects or beings, or whether 'pictorial' marks also have phonetic value, and whether marks convey literal meaning

or phonetic or graphic rhetoric meaning as metaphors and metonymies can only be answered after further thorough paleographic and semiotic analysis of each individual marking system has been carried out. In paleographic analysis the scholar must take into account a discrepancy between what his or her eyes consider to be pictorial, geometric, or linguistic forms on the one hand, and what actually may have been the origin and nature of the marks in question on the other; in semiotic analysis (s)he must take into account a discrepancy between what in modern eyes initially appears to be literal or rhetoric icons, indices or symbols on the one hand, and what is ultimately the semiotic nature of marks in the system on the other. For instance, on the basis of its formal appearance, a mark ⧖ may be classified in the domain of 'abstract geometric' notation, while in fact it is a graphic variation of the linguistic sign M in Norway, a metaphorical symbol for manhood in Africa, and a stylized representation of an object such as a stool with assigned conventional or rhetoric meaning in again other systems.[7] The classification and its accommodation in the Venn-diagram is therefore only an initial, hypothetical classification from which one could depart to further investigate the nature and function of the marks and classify them accordingly.

Unfortunately, such thorough paleographic and semiotic research is for many systems usually not obtained due to the fact that any form of speculation or hypothesis on the nature of marks and their semiosis is often hindered by a lack of knowledge and context, but also due to the fact that there has not been a phenomenological framework or model to serve a semiotic analysis of marks and their systems. Therefore, we must in this comparative analysis first of all depart from the formal appearances of marks as described in the literature, and discuss differences and commonalities in the formal composition of marking systems, involving differences and commonalities on a deeper semiotic level only where occasional notes on meaning and referents allow it.

Having said that, we find the combination of pictorial and geometric forms with forms borrowed from linguistic scripts in marking systems throughout the world. In Part I we have seen that ancient Egyptian potmarks, builders' marks and quarry marks display all three groups of forms in all periods of usage. Even characters shared with hieroglyphic script we find from the Early Dynastic period onwards. In 18th dynasty Thebes 55 of the 111 marks in total (= 49.55%) seem to be related to hieroglyphic script at least formally, while 177 of 203 marks from dynasty 20 (= 87.19%) may be related to script in form as well as in value. In 20th dynasty Thebes we even find groups of hieroglyphs, words and phrases in hieroglyphic orthography[8] functioning in addition to pictorial and geometric forms in a nonlinguistic marking system.

Amongst identity marks encountered on Anatolian seals from the pre-Persian period (before 547 BC), of which approximately 75 different motifs are known, 20 (=26 ⅔%) take the form of, or are clearly derived from alphabetic letters. These are mainly Aramaic letters, the language and script used for administration throughout the Persian empire.[9] Further influence from script may be found in the mark 𓍿, which has been interpreted as a pseudo-cartouche. It is peculiar that none of the marks seems to derive from Anatolian scripts, especially since it has been remarked that the same practice of marking and the same forms of marks are not as frequently encountered on Persian and Greek or Cypriotic style seals as

[7] For Norway, see below; for Africa, see Mafundikwa, *Afrikan alphabets*; for the interpretation of a stool, see Part I Table I3-1 code II 001 and Part II, chapter 2.
[8] Haring, 'Introduction' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 2-3. See also Part I.
[9] Some of the letter-marks might pass as Greek according to Boardman, 'Seals and Signs' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 158. On page 160 he rules out Elamite, Hittite and neo-Hittite as sources of inspiration and furthermore specifies Greek influence as 'small' with 'few similarities' to the Anatolian compositions.

they are on Anatolian seals; the marks on the Anatolian seals seem to be part of an Anatolian practice.[10] In addition to Aramaic letters other marks seem to represent objects. Classical art historian and archaeologist Boardman gives the examples , , , and . Although he does not elucidate on which objects exactly these forms would represent, we could suggest a plant-form for and a tool, such as a hammer or ax, for . The remainder of the marks, Boardman says, seems to have been 'deliberately composed from a very narrow repertory of shapes – basically the circle, hook, open and closed arcs, short lines, some at angles or T-shaped, some omegas'.[11] Boardman explicitly notes that the marks as a group do not form any sort of alphabet or syllabary, because they are always isolated. Except for the 20 Aramaic letter-shapes the marks in general have little in common with any of the alphabets in use in southern and western Anatolia or elsewhere in the Persian empire.[12]

Inclusion of pictorial representations of objects and beings, geometric linear configurations and characters from linguistic script has also been mentioned for the marks of the nomadic clans of the Tuareg in northwest Africa (called '*ejwäl*'), as well as for the marks of the nomadic Mongols on the steppes of Mongolia (called '*tamaga*'). Clan marks in nomadic or semi-nomadic pastoral societies are primarily used to mark livestock (their most valuable property) and for that purpose are known as livestock marks.[13] There are various ways to mark livestock, two of which are universal: marking by means of ear notches or brand marking by means of a red-hot iron. The former method offers only limited possibilities given the fact that with a knife only the edge of an animal's ear can be cut in a pattern of straight, curved or angled lines. It is therefore the second method where we usually find the marks that are more generally used as clan marks in other contexts as well. The principal *ejwäl* used by the Tuareg of Mali (the Kel Tamachek), mainly on camels and donkeys, display pictorial or linear shapes that represent animal tracks (e.g. of a bustard, gazelle, or snale), familial objects (e.g. hammers, spoons, drums), or shapes of the night sky (full or crescent moon); others are characters from Tifinagh or Arabic script.[14] The *tamaga* of the Mongols, mainly used on horses and sometimes on camels, are often pictorial or simplified linear depictions of objects, animals or parts of animals. Only objects or animals with positive value qualify for use as a mark. For instance, an Y-shaped mark represents the nasal cleft of a camel, which is 'small in size but great in power since it leads the camel', an animal which is afforded sacred value in Mongol culture. Another mark represents a spindle, 'whose belly grows larger and larger', representing a sign of fertility.[15] These marks seem to attest metonymical and metaphorical thought: the Y-mark as an iconic representation of a part of the animal that conveys meaning through a metonymical relation between its form and function, ascribing the bearer of the mark a leading role or characteristic; and the spindle as iconic representation with a metaphorical aspect of accumulation. Further pictorial tamaga we find in the forms that are derived from religious symbols and which also occur in Buddhist astrology, representing celestial phenomena. In

[10] Boardman, 'Seals and Signs' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 155-157.
[11] *Ibid*., 158.
[12] *Ibid*., 158-159.
[13] This is certainly not the only function of clan marks; they are furthermore used to mark natural phenomena such as rocks, trees, stones or wells; architecture such as door frames, pillars, walls and architraves; and certain objects and utensils. Reasons for this include the assertion of the right as first occupant to use the adjacent grazing land or the water in wells. To avoid dispute on such topics the nomads leave their mark. Landais, 'The Marking of Livestock in Traditional Pastoral Societies' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 100. See also section 2 below.
[14] *Ibid*., 94. For animal tracks as indices considered to be proto-writing see Part II chapter 2, sections 2-3.
[15] *Ibid*., 95.

addition to pictorial and linear forms, the Mongol *tamaga* contain forms derived from Tibetan or classical Mongol alphabetic or ideographic scripts.[16]

In other marking systems we may detect a development from the use of merely two domains (pictorial and abstract geometric) in an earlier phase, to the inclusion of the third domain (forms from linguistic script) in a later stadium, often under outside pressure or due to growing influence and knowledge of script. Among the pre-colonial clan marks of the Kadiwéu Indians of south-west Brazil (Mato Grosso province), for instance, we find designs that have been described as 'asymmetrical yet balanced' patterns containing 'relatively simple motifs such as spirals, S-shapes, crosses, muscles, Greek key-patterns and scrolls'[17] and as 'arbitrary combinations of conventionalized foliage, curvilinear figures, volutes and scrolls, triangles, diamond-shaped and rectilinear figures, ovals joined with V-shaped lines, bands showing bird and fishlike figures and rectilinear frets'.[18] That the designs described as such are not simply interpretations by western scholars is clear from the fact that the Kadiwéu themselves gave their patterns names such as 'diamond', 'spiral', 'circle', 'stair pattern' or 'crossed lines'.[19] Several authors, among whom Lévi-Strauss, have further argued for a distinction between geometric and pictorial design styles segmented on gender lines: women would tend toward a geometrical, formal and abstract style that excluded representation and characterized decorative painting and ornamentation; men would lean toward a figurative style that usually captured wild animals, livestock (especially horses), plants, people and other figures.[20]

The marks of the Kadiwéu people have been linked to Amazonian and Andean marking systems further north.[21] Similarities between the Kadiwéu marks and those of the Wayúu people in northern Colombia and northwest Venezuela have not remained unnoticed.[22] It has been argued that these systems were indigenous and intrinsic parts of the totemic and social structures of the clans.[23] It was only after the arrival of the Spanish and Portuguese that the marking systems began to show characters from linguistic script: the Roman alphabet. The process of alphabetization is especially visible in Brazil. The colonizers brought with them cattle, iron brands and their own marking system, which came to be used by the so-called 'white herders' in the south and northeast.[24] In the 18th century the first regulations and guidelines for mark usage were set up. Official Spanish and Portuguese mark registers were in use in the 19th century to prevent theft, provide grounds for judicial appeal and to regulate and control the movement of cattle.

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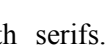
[16] Landais, 'The Marking of Livestock in Traditional Pastoral Societies' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 95.
[17] Lévi-Strauss, *Tristes Trophiques*, 187, referred to in Evans Pim, 'Indigenous and European Marking Systems in Brazil' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 481.
[18] Oberg referred to in Evans Pim, 'Indigenous and European Marking Systems in Brazil' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 481.
[19] *Ibid*..
[20] *Ibid*., 481-2, referring to Ribeiro, *Kadiwéu: ensaios etnológicos sobre o saber, o azar e a beleza*, 264-266. Cf. Lévi-Strauss, *Tristes Trophiques*, 190.
[21] Evans Pim, 'Indigenous and European Marking Systems in Brazil' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 485-6.
[22] Lévi-Strauss & Belmont, 'Marques de propriété dans deux tribus sud-américaines', *L'homme* 3 no. 3 (1963), 102-108; Evans Pim, 'Indigenous and European Marking Systems in Brazil' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 488-490.
[23] *Ibid*., 489, 497-9; Gusinde, 'Totemistische Eigentumsmarken der Guajiro-Indianer', *Anthropos* 56 (3-4) (1961), 531-542.
[24] Evans Pim, 'Indigenous and European Marking Systems in Brazil' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 489-9.

The first marks in these registers were mainly alphabetical monograms.[25] In the northeast it furthermore became common to add an alphabetical 'parish mark' to an owner's mark on cattle, corresponding to the local community where the owner had his or her residence. Interestingly, however, rather than giving the initials of the names of the localities themselves many of these parish marks provided the initials of the saints to whom the localities were devoted. They are therewith symbols with double metonymic semiosis: through saint referring to locality, and through locality to owner.

The tendency to replace older pictorial and geometric designs with alphabetical ones took its most radical turn with a presidential decree (Decree No. 9452, March 20, 1912) that established a new marking system and a period of eight years to replace 'arbitrary marks' with those following the new governmental system. Even though this Decree never became effective due to strong resistance, the use of traditional marks decreased significantly. Most of the original Kadiwéu marks became progressively replaced by owners' initials from the 1930s and 1940s onwards, and marks on livestock were initially simplified and reduced in size, but eventually replaced by smaller alphabetical brands.[26] Although a revival took place in the 1970s promoting the traditional pictorial and geometric designs in various branches of the arts (music, literature, dance, theatre, cinema, architecture, etc.), they are nowadays no longer used as identity marks.[27]

While the Spanish and Portuguese brought to south America their alphabetic marks, contaminating with them the indigenous systems of geometric and pictorial figurative designs, a transition from predominantly geometric and pictorial masons' marks to alphabetic initials can also be followed in Europe. Identity marks have a long history in Europe. Marks were applied onto stones used for construction already during the late Roman Empire. The practice disappeared with the fall of the Empire but returned at the end of the 11th century. Between the 12th and 16th centuries these so-called 'masons'' or 'lapidary' marks, were mainly of forms that represented tools or other objects or beings (e.g. hammers, trowels, striker braids, T-squares, arrows, bows-and-arrows, fish or the Ichtus-symbol), or abstract geometric configurations (e.g. triangles, pentagrams, crosses, and many linear configurations).[28] Some letters do occur, in particular A, M, E and N/Z,[29] but in comparison to later times they are rather marginal in the marks' corpora and one can in fact ask to what extent forms such as and can be considered to be the letters A and M when we do not know the names of the persons who used the marks.[30] Only from the 16th century onwards do we see two indications of a transition toward alphabetic marks. First, from approximately 1525 onwards and influenced by the introduction of Roman capital letters the marks began to be provided with serifs. Examples are  ;[31] although not alphabetic letters themselves, the marks do show influence of a trend in linguistic script. Second, more nonlinguistic marks in the 16th and 17th centuries were accompanied by initials. Professor in building history De Vries calls

[25] Evans Pim, 'Indigenous and European Marking Systems in Brazil' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 491, 495.
[26] *Ibid*., 484-5 referring to Siqueira, *Arte e téchnicas Kadiwéu*.
[27] *Ibid*., 485, 495-6.
[28] Janse & De Vries, *Werk en Merk*, 50-53, 97.
[29] *Ibid*., 51 and figs. 32, 34-35.
[30] Compare the mark II 043 from Deir el-Medina, which is certainly not the letter M (Tables I3-1, I3-2). De Vries suggested that the marks in the form of letters were perhaps applied by the commissioning chief or master, as most workers in the 11th to 13th centuries presumably could not write. Personal communication Haring and De Vries (23-12-2011).
[31] Janse & De Vries, *Werk en Merk*, 56-57.

such marks encountered on buildings in the Low Countries 'typical transitional form(s)'.[32] For marks on buildings in Belgium and France professor in history Van Belle also finds letters only from the 17th century onwards.[33] Both De Vries and Van Belle attribute the changes to a better and more widespread knowledge of the alphabet.[34]

A similar transition, but much more recent, we can discern in the formal appearance and composition of familial and personal identity marks used since medieval times in small Portuguese fishermen's communities.[35] The Roman alphabet was already in use in many fields of the Portuguese society since the 19th century, but it only gradually began to influence the fishermen's marks from the 1930s onwards.[36] Whilst before this period most marks from, for instance, the communities of A Guarda and Póvoa de Varzim were mainly pictorial and geometric in form, including the cross, triangle, star or asterisk, the bird's foot, hour glass, the harpoon, and various geometric configurations that resulted from a practice in which each new generation added one line to the basic family mark,[37] anthropologist Evans Pim concludes from ethno-archaeological research that the increase of alphabetic characters took place in two stages: initially alphabetic letters were added to the original pictorial or geometric basic mark, but eventually they completely supplanted the original mark.[38] Explanations for the fact that the fishing communities switched to alphabetic marks at such a late period compared to the European masons' marks in general are twofold. First, Evans Pim suggests it should be seen in the light of resistance by the communities against 'State individual identity standardization procedures' set in place in the 19th century mainly for enhanced control regarding taxes and military conscription. Civil registers were initiated at this period, imposing standards on how people should be named and how they should sign.[39] Resistance against these standardization procedures might have come forth from a wish to preserve community tradition and identity. Second, the ultimate transition in A Guarda and Póvoa de Varzim has been linked to changes in the available and used materials and tools (e.g. from wood and cork to plastic and other synthetic materials), which led to changes in the technique of applying marks; curved marks such as many letters from the Roman alphabet became easier to execute as they could now be drawn, and no longer needed to be incised.[40]

The transition to characters from the Roman alphabet not only changed the formal appearance and composition of the originally pictorial and geometric marking systems in south America and Europe; also, the increase and eventual take-over of alphabetic initials changed their entire structure and derivational systems, which eventually led to a cease in age-old traditions of inheritance and mark derivation (see

[32] De Vries, 'Signs and Symbols' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 213, fig. 14.
[33] Van Belle, *Dictionnaire des Signes Lapidaires*, XIII.
[34] *Ibid*.; De Vries, 'Signs and Symbols' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 213.
[35] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 107-115 On page 112 Evans Pim explains that the marks, until recently found in Póvoa de Varzim and A Guarda, are nowadays only seen in the latter community. Graça had argued in 1942 that the same kind of identity marks had also been used in the fishing communities of Bouças, Baiona, Cangas and Vigo, while locals from A Guarda, questioned by Evans Pim recalled that the marks had furthermore been used in the fishing communities of Moanha, Ogrobe, Bueu and Marin, as well as in the rural areas of Goião and Portela.
[36] Starting in the community of Buarcos. Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 107, 115.
[37] For this derivational system, see section 3 below (fig. III1-15).
[38] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 114.
[39] *Ibid*., 107.
[40] *Ibid*., 114.

section 3 below). These examples may be seen in the light of a development that Harris has called 'The Tyranny of the Alphabet'.[41]

Thus, it could be said that there are two trends discerned in the formal composition of marking systems. On the one hand there are systems that draw from all three domains of visual communication – pictorial representation, geometric configuration, and forms from linguistic writing. They may place emphasis within one domain or shift emphasis from one domain to include others to a larger extent during the course of their lifetime as we have seen happening in the marking system from Deir el-Medina, but all three domains simultaneously serve as sources of inspiration. On the other hand there are marking systems that undergo a transformation to the extent that one domain gradually begins to exclude the others (fig. III1-2) and therewith affects the entire structure and system. Both the shift in the system from Deir el-Medina and the transformations of the systems in Brazil and Europe including Portugal, are a matter of increasing influence from linguistic writing on nonlinguistic visual communication. What such an increase could mean and why it could take places are questions we will return to in chapter 2.

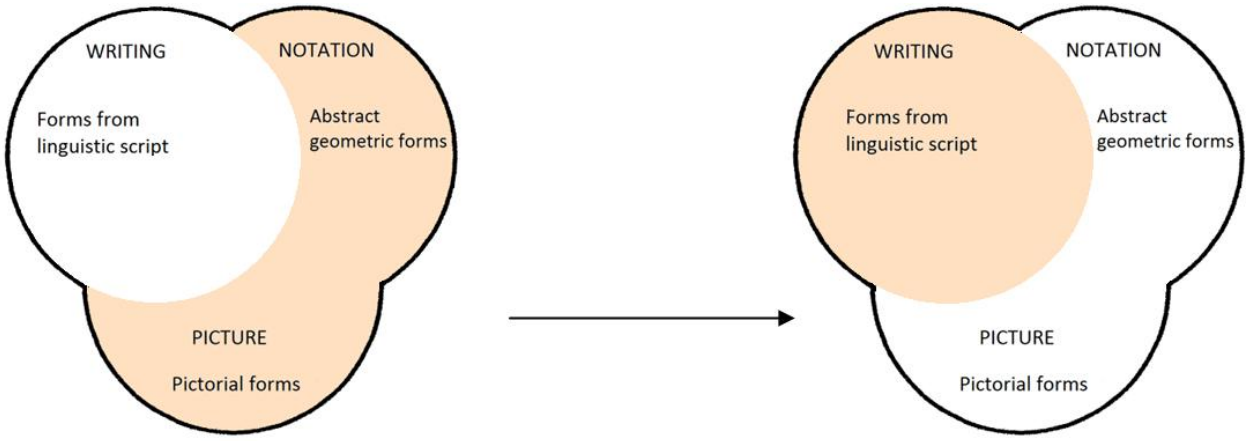


Fig. III1-2 The transformation toward the Roman alphabet in marking systems from European communities and societies (Portugal, medieval Europe) or non-European communities and societies under European influence (Brazil). The transformation is a more radical form of the shift in emphasis that was discerned in the marks from 20th dynasty Thebes (Part I chapter 1, Part II chapter 2). The figure on the right includes part of the Notational domain as monograms can become rather abstract geometric in appearance and the marks in general, although mainly characters from linguistic writing, do not behave according to linguistic rules. An example is given below (Norwegian livestock marks).

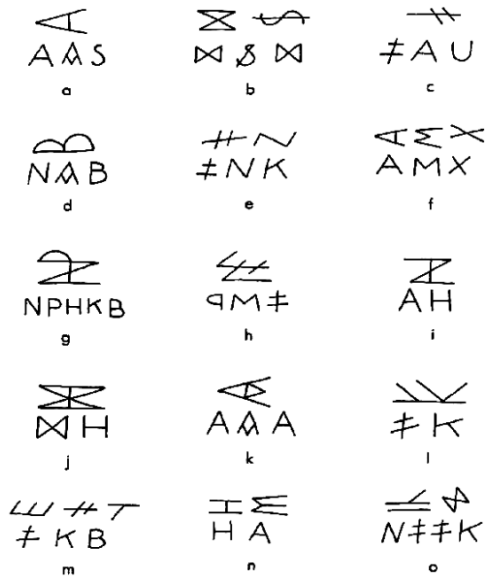
It appears that, when a nonlinguistic system of visual communication (increasingly) makes use of the domain of Writing, the marks from this domain usually retain their phonetic value to render the initials or the first syllables of the names of their owners. Examples from France and Belgium, all dated to the 17th century and later, are the following (Table III1-1):[42]

[41] Harris, *Rethinking Writing*, vii.
[42] Van Belle, *Dictionnaire des Signes Lapidaires*, 5, 6, 13, 15, 17, 20, 25-27, 47; Van Belle, 'The Study of Lapidary Signs', *Re:marks* 1 (2013), 63. See also Esquieu, 'Sur les traces des tailleurs' in De la Roncière et al. (eds.), *Histoire et Société*, 121, 123. The latter mentions that the letter A is most frequent, and may have been used by the 'chef de chantier qui signe par le A, première letter de l'alphabet'.

Table III1-1 Alphabetic identity marks conveying the phonetic sounds of the owners' names

Mark	Date	Owner
B	1688	Fm. **B**audry
D	17th century	**P**. **D**erideau
Đ	17th century	J. **Del**alieux
BC	17th century	J.**B**. **C**apitte
PW	17th century	**P**. **W**incqz
AW	17th century	**A**. **W**incqz
BD	18th century	**R**. **D**erideau
MD	18th century	Fm. **Mond**ron
NL	18th century	**N**. **L**isse
MP/MP	18th century	**M**. **P**aternotte
PCT	18th century	**P**.**C**. **T**rigalet

We see that single letters were used as well as two or more letters following one another, but also that two letters could be fused into a monogram. While the examples of monograms in the Table still remain fairly simple, more complicated monograms are found among the identity marks used by the Lapps of present-day Kautokeino (Norway), applied onto their reindeer. Each mark conveys the initial(s) of its owner, adding to it the initial(s) of the owner's father and of the family name (in some cases the grandfather's name instead). An initial of the owner's wife could be added as well.[43] The marks are interesting, because the graphic variations of alphabetic letters as well as the monograms are very geometric in appearance. They show how subjective a classification of marks into classes of 'geometric forms' and 'linguistic writing' can be as modern western eyes, used to reading alphabetic script on a daily basis, may at first not even be able to recognize alphabetic letters in these seemingly geometric configurations. Consider fig. III1-3.[44] The marks consist of several initials that were usually applied to one side of the reindeer and a monogram that was applied to the animal's other side:



(a) Anders, fils de Aslak Sara
(b) Mikkel-Isak, fils de Mikkel Sara
(c) Johan-Anders, fils de Mathis Utsi
(d) Nils-Peder, fils de Aslak Bol
(e) Johan, fils de Nils Gaup
(f) Anders, fils de Mathis Oskal
(g) Nils-Per-Hendrik, fils de Klemet Buljo
(h) Johan-Mathis, fils de Per Sara (marque inversée, l'éleveur étant gaucher)
(i) Anders, fils de Hendrik Buljo
(j) Mikkel, fils de Hendrik Buljo
(k) Anders-Aslak, fils de Anders Bongo
(l) Johan, fils de Klemet Buljo
(m) Johan, fils de Klemet Buljo; épouse : Ellen, fille de Johan Tornensis
(n) Henrik, fils de Anders Bongo; épouse : Marit, fille de Aslak Mienna
(o) Nils-Johan, fils de Johan Gaup; épouse : Inga, fille de Iver fils de Mikkel Sara

Fig. III1- 3 Livestock marks used by the Lapps of Kautokeino giving initials of names and surnames. Delaporte in *Journal d'agriculture traditionnelle et de botanique appliquée*, 34 (1987), 22.

[43] Delaporte, 'Le marquage du bétail chez des pasteurs lapons', *Journal d'agriculture traditionnelle et de botanique appliquée* 34 (1987), 19-23.
[44] Cf. *Ibid*., 22 (fig. 2); Landais, 'The Marking of Livestock in Traditional Pastoral Societies' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 83 (Fig. 1).

Six examples will be highlighted:

Mark a contains the letters **A**, **A** with graphic variation and **S**, which stand for '**A**nders, son of **A**slak **S**ara'. The graphic variation between the two A's serves to distinguish the two different names Anders and Aslak. On the other side of the reindeer (depicted above the initials in fig. III1-3) the letter A was applied, but turned 90º against the clock in nonlinguistic manner.

Mark b belongs to '**M**ikkel-Isak, son of **M**ikkel **S**ara'. The initials present twice the mark ⋈, which is a graphic variation of the letter M to distinguish the initial from others referring to names beginning with M (compare ᛖ for Mathis and ᛗ for Marit in other examples). Between the two marks for Mikkel is the letter S crossed by a diagonal line for the family name **S**ara, which may be a different family than the Sara-family in mark 'a' considering the graphic variation here. In nonlinguistic fashion, turned 90º against the clock, both M and S accompany the initials on the other side of the reindeer;

Mark c belongs to '**J**ohan **A**nders, son of Mathis **U**si'. Johan Anders is a compound name. In case of compound names, the owner was free to choose whether he would include both initials or only one. From comparison with other identity marks where the position of ᛇ in front of the letters A and U coincides with the name Johan it appears that this mark is in fact a graphic variation of the letter J. Both initials of the name Johan Anders are thus included, followed by the initial of the family name Usi. The letter J in its variation ᛇ turned 90º against the clock accompanies the initials on the other side of the animal.

Mark g shows the initials that refer to the name **N**ils-**P**er-**H**endrik, son of **K**lemet **B**ujo. The monogram consists of N, P (missing a small part on top), and H all turned 90º against the clock and fused together into a monogram; a configuration with the initials of the son;

Mark i belongs to '**A**nders, son of **H**endrik Buljo'. The monogram is a fusion of the initials A and H turned 90º against the clock.

Mark j contains the initial M which we have already seen for the name Mikkel. Here it concerns '**M**ikkel son of **H**endrik Buljo', the brother of Anders who carried mark i. The monogram is a configuration of M and H both turned 90º (whether clockwise or against the clock makes no difference as both these marks are vertically as well as horizontally symmetrical).

One may be tempted to consider marks that render initials not as nonlinguistic identity marks, but rather as abbreviations in a linguistic writing system, especially since the graphic variations refer to names and not to different individuals bearing those names. Yet, such an assumption would be incorrect. First, the graphic variations we encounter are not a part of any conventional alphabet. Second, the orientation of the marks, in contrast to alphabetic letters that function in a linguistic writing system, is not fixed. In the Norwegian monograms alphabetic letters are only graphically used to form nonlinguistic compositions that, turned 90º, do not behave according to linguistic rules.[45] Third, the full meaning of each mark, giving identity and genealogy, is contained within the composition itself, and does not depend on other surrounding marks. The marks are derived from linguistic writing, but the system as a whole remains nonlinguistic in nature.

[45] See also the letter 'P' in mark h, which is reversed.

In addition to the European marks from the 17th century onwards and the present-day Norwegian marks, the 20th century Portuguese fishermen marks that consist of letters of the Roman alphabet also convey the names of their owners. However, instead of first and surnames they render the initials of, or entire *nicknames*. Families and individuals in the Portuguese communities were traditionally referred to by means of nicknames, and having the marks refer to the former is, according to Evans Pim, a remnant of the resistance against the 'State individual identity standardization procedures' explained above.[46] The people might have lost against the invasion of the alphabet, but they would not give up their nicknames which traditionally expressed their identity. An example is the mark TITO. It belongs to a man known in the community of A Guarda as 'Tito'. He was the first of his grandfather's descendants to adopt an alphabetic mark, and therewith leaving the family mark (fig. III1-4). However, instead of using his initials (JBRG) he rendered his nickname. 'Tito' is nowadays in his sixties, which shows how recent an affair the transition to alphabetic marks in the community of A Guarda is.[47]

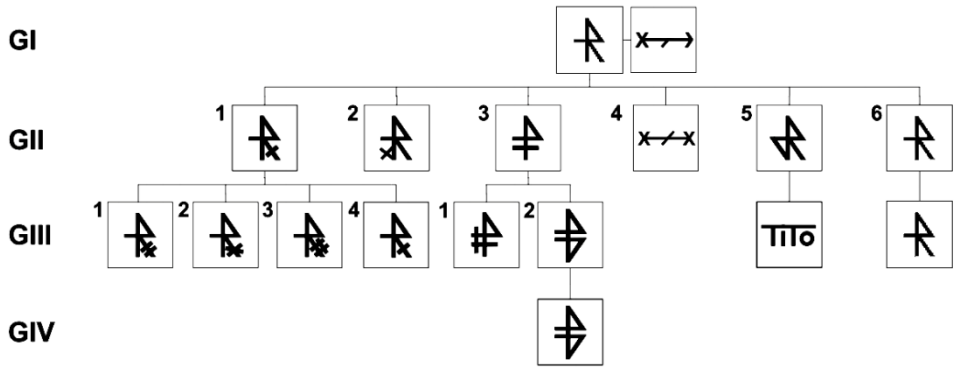


Fig. III1- 4 Geometrical family mark followed for four generations. 'Tito' in Generation III was the first to adopt an alphabetical mark. Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 113 (fig. 9).

In 20th dynasty Deir el-Medina we see a greater variety in the use of marks with phonetic value than in medieval and modern Europe. Whilst we do encounter initial sounds of names and nicknames (including those of forefathers), we saw in Part II that in addition marks from the domain of Writing can give descriptions of function or place of origin, for instance in the cases of for a scribe, for a scorpion controller, for a doorkeeper, for a foreman, or presumably for someone from *Mn-nfr* ((nick?)named *Pз-Mn-nfr*). These metonymic and metaphoric descriptions provide the system from Deir el-Medina with its semantic creativity, which is not seen in Europe.

b. Formal analogies

Disregarding for a moment the marks derived from the Roman alphabet, it may be observed in Plate III1-1 that marks with apparently pictorial and abstract geometric forms display a surprisingly large degree of similarity, not only at regional levels but notably also on a universal scale. Some forms and features of marks are encountered on all continents, for instance , , , , and . At a regional level, logical explanations for this phenomenon are cultural continuity and practices of borrowing and adoption

[46] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 107.
[47] *Ibid*., 114, cf .113 fig. 9.

of marks and entire systems from those of neighboring groups, clans, communities or societies. Looking at Plate III1-1 we see roughly four groups of systems with marks of similar formal appearance: they concentrate in 1) Europe, 2) Eurasia, 3) Africa, and 4) south America. In each of these regions borrowing and adoption (conscious or unconscious) is usually due to a shared cultural environment, for instance adherence to the same religion, remembrance of the same historical events, or usage of similar linguistic writing systems, but also to a shared geographical environment: older marks and marks of other groups, clans or communities can be seen applied onto rocks, trees, animals, objects, houses, temples or other constructions, and as such can form a source of inspiration. In Part I chapter 2 we already saw how a core set of marks appears to return again and again in various ancient Egyptian marking systems from different periods. It concerns especially , , , , , , , and . They are in each case different marks in that their meaning and reference was determined in specific temporal and geographical frames (identical *forms* are not identical *marks*), but while the referents stayed behind the forms could be easily adopted from one locality, period, or context to another. Whether seen on pottery or blocks of stone scattered around constructions already in ruin, or whether known as cultural or religious symbols or characters from writing, the historical, cultural and linguistic continuum that existed throughout Egyptian history was a source of inspiration and an explanation for the recurrent selection of forms. Especially the strong symbolism of , or , or the positive meaning of in Egyptian culture and religion may have caused such forms to be selected time and again; they were part of the collective memory.

A cultural continuum is also suggested with regard to the marks on early Anatolian seals and later masons' marks elsewhere in the Persian Empire.[48] The Anatolian seals display 'linear devices' which in fact are pictorial, geometric and Aramaic looking identity marks that occur in combination with Lydian inscriptions (6th to 4th centuries BC). It was explained above that Boardman considers them not to be part of a Persian Achaemenid practice, but rather a phenomenon of southwest Anatolian origin.[49] Similar mark designs from the pre- or early-Persian period have also been found principally in that region, for instance in the Belevi quarries that supplied Ephesus, on Lydian pottery from Gordion, engraved on Lycian tombs 'cut below the inscriptions as though indicating mason or scribe', and on coins from the 5th to 4th centuries BC relating to local satraps.[50] Boardman sees immediate forerunners of the designs in masons' marks encountered on blocks from Lydian constructions at Sardis dated to the 7th and 6th centuries BC, before the Persian invasion.[51] While the marks would thus be of Lycian and Lydian origin they soon spread to regions further east under Persian rule. Lydian masons were employed by Darius at Susa, and at Pasargadae there is archaeological evidence for their influence and possible presence already under Cyrus. Many masons' marks have been recorded especially from the latter site, and several of them resemble the Anatolian marks.[52] Compare, for instance, the forms vs. ; vs. ; vs. ; vs. ; vs. ; vs. ; vs. in Plate III1-1. After the Achaemenid Persians the concept to use marks for identification would have continued strongly throughout the Empire: Boardman records

[48] Boardman, 'Seals and Signs' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 153-170.
[49] *Ibid*., 153-155, 158. Cf. Yatsenko, 'Marks of the Ancient and Early Medieval Iranian-Speaking Peoples of Iran, Eastern Europe, Transoxiana and South Siberia' in *ibid.*, 131-132, who mentions that 'The seals of the Achaemenid Empire … more often appear not in Persi[d]a, but in western satrapies'.
[50] *Ibid*., 132; Boardman, 'Seals and Signs' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 159.
[51] *Ibid*., 159, 161. See also Plate III1-1. Differences between the marks from Sardis on the one hand and the early Persian seal marks on the other are assigned by Boardman to the technique of execution: the former notably show less circular forms, which are more difficult to manage with a chisel on ashlar than with a drill on a gem (p. 163).
[52] *Ibid*., 164.

that the marks are seen on buildings, coins and livestock from the Parthian and Sassanian Empires. Yet, while it is easy to speculate on cultural contact and practices of borrowing and adoption of marks that were put to use in various contexts, it is extremely difficult to follow any development or transmission in the culturally and politically widespread eclectic region of Sarmatia.

At a universal level formal analogies are more interesting because they are less easily explained by cultural continuity and forms of contact. A number of five explanations may be suggested. First, many marks are constructed out of the elementary forms , , , , , and in various orientations and combinations. These are the most simple forms perhaps universal to the human mind.[53] It is conspicuous that these forms are less often encountered in pure form – that is, as semantic units, or marks, *an sich* – than as constructing features in more complex forms – that is, as functional units in bigger meaningful compositions. Perhaps this says something about the feeling or need to actually *create an identity mark* for oneself or one's group. The basic forms are a set of tools by which to create a specific and proper conveyor of identity; instead of simply or , the combinations and are, although simple, already combinations *specifically created* for a purpose.

A second explanation for universal formal analogies may be the origin of forms in natural and celestial phenomena or the domestic environment in which groups and communities live. Celestial phenomena such as the sun, moon and stars, and forms from nature inspired by plants, trees or flowers, but also animals, domestic and wild, and objects used daily such as pots or tools are universal sources of inspiration. The recurrence of forms such as , ,[54] , , , , , [55] and might be explained as such, as well as perhaps the form of the neck support seen in Egypt as well as throughout Sarmatia and Mongolia.

Third, forms that represent concrete objects or beings may coincidentally be simplified to similar simple and linear forms. The clearest example is , which is seen throughout the world either as a geometric form, or as a variant of M, or as a representation of a standing man as a symbol for manhood, or as a simplified representation of some object, perhaps a stool. The form is universally called an 'hourglass' which it may have represented, although this is unlikely for Deir el-Medina or earlier Egyptian marking systems as no hourglasses are known to have been used.[56] Another example may be , of which has been mentioned above that it represented the nasal cleft of a camel in Mongol culture, but which also occurs elsewhere in the world, among others as a potmark in Early Dynastic Egypt and as workman's mark in Deir el-Medina: the camel, or dromedary, was not encountered regularly in Egypt before the Graeco-Roman period.[57] The form in hieroglyphic script was described as a supporting pole

[53] Dehaene discusses the idea that 'cultural diversity hides a restricted array of universal mental structures' (an idea put forward by Lévi-Strauss) and what the origin of these fundamental cultural features could be. One hypothesis is that they come forth from the brain circuits of the human mind in which minimal arrangements of shapes (an inventory of learnable mental forms) are triggering stimuli for more complicated constructs. Dehaene is speaking among others of religion, music, art and facial expressions, and we might now add our corpora of nonlinguistic marks. Dehaene, *Reading in the Brain*, 304-312.

[54] When interpreted as the sun.

[55] The last three as tools: arrows and hammer or ax(?).

[56] 'Absence of evidence is not evidence of absence' (Carl Sagan), but the absence of evidence among so many objects and documents known from the Theban necropolis, and the fact that we do not know a word for 'hourglass' makes it at least unlikely.

[57] That is, the dromedary was sporadically attested already in the Early Dynastic Period, but was not regularly used or domesticated until much later. It was only by the hands of foreign conquerors from the north and northeast (Assyrians, Persians, Alexander the Great) that the one-humped camel was introduced in Egypt on a greater scale, and was used as the main transport animal in the desert. See http://www.ucl.ac.uk/museums-static/digitalegypt/foodproduction/camel.html; Ripinsky, 'The Camel in Dynastic Egypt', *The Journal of Egyptian Archaeology* 71 (1985), 134-141.

by Alan Gardiner as it occurs as a classifier after the word *sḫn.t*, 'support', although in reversed representation was described as a 'pitchfork'.[58] A third example of what may possibly be analogy on the basis of similar simplification may be seen in a remark made by professor in history and theory of culture Yatsenko. He argued that the identity marks of the Sarmatian nomadic peoples are formally analogous to those of later Turkic and Siberian peoples as well as to those of medieval German, Dacian and Caucasian peoples in the west. The forms he describes on the one hand as depictions of animals and elements of everyday reality, such as garden vegetables, trees and ladders (that is, objects and beings from the natural and domestic environment), and on the other as schematic and highly stylized depictions of animals such as goats and birds and animal bodies in profile. Cultural contact, similar sources of origin, but also stylization may all be causes for formal analogy.[59]

A fourth explanation for formal analogy may be the manner of production. Marking systems from medieval Europe, Portugal and Africa, and marking systems from south America, the Eurasian continent and southern Europe in general have similar appearance, defined mainly by a curved or straight execution of marks. In Europe, a change in the use of tools can be linked to a change in the style of the marks. It has been remarked that those marks from the High Middle Ages (11th to 13th centuries), for instance in Germany, the Czech Republic or Switzerland, were generally curved in form as they were executed by means of a pointed chisel that could easily be used to make circular and curved lines.[60] In later times, especially in northern Europe, another kind of short chisels was used as a result of which the marks became composed mainly of straight lines. Curved lines after the 14th century were extremely rare in northern Europe, while they remained common in southern European marks, which were also more often drawn or scratched than chiseled.[61] As such, different manners of production cause differences in the formal appearance of marking systems, and the variations that remain for straight marks mainly consist of the addition of a number of straight lines in different orientations, lengths and combinations.

The fifth explanation that could account for similar appearance of marking systems that are removed in time and space concerns precisely the addition of lines or other elements. This is the system or pattern of derivation, the manner in which marks were given slight variations when passed on to younger generations. There are certain aspects in these systems of derivation that appear to be universal. We will discuss them in more detail in section 3 below.

To summarize, although the formal analogies of marks in systems throughout the world may at first seem baffling, there are a number of logical explanations for them. Cultural continuity and contact mainly play a role at regional level, although contact also explains the use of Roman alphabetic marks in Brazil. At a universal scale, the human mind and the natural and domestic environment may have formed universal pools of inspiration from which forms or formal features were drawn. Stylization and manner of production contributed further to similar appearance. But there is one important difference between formal analogies at regional level and on a universal scale that must be kept in mind: whereas forms borrowed or adopted at regional level due to continuity or contact may share the same origin, tradition, and cultural, religious and linguistic frame, and could therefore at least in theory share similarities in

[58] Gardiner, *Egyptian Grammar*, 496, 517.
[59] Yatsenko, 'Problems and Study Methods of the Ancient and Early Medieval Iranian-Speaking Peoples' Nishan-signs', Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 109-110, 117, 119-120.
[60] Janse & de Vries, *Werk en Merk*, 49.
[61] *Ibid*., 53-55.

meaning and reference as well, formal analogy on a universal scale is more often the result of coincidence, without there being a deeper meaning or relation in reference. Forms may be universal, but marks in the semiotic sense are not.

2 FUNCTION

a. Multi-purpose systems

Nonlinguistic marking systems generally serve the function of conveying identity: each mark is a concise, separate entity that refers to the person or persons who used it. Beyond this main function, however, they are *multi-purpose systems*; that is, just like linguistic writing systems can be put to use for different ends, marking systems are found in different contexts, for different aims and on different surfaces.[62] Scholars often use a variety of terms such as 'masons' marks', 'livestock marks' or 'border' or 'territorial marks' in order to emphasize the specific purpose of the marks they study; while all are expressions of identity, they convey identity respectively in relation to work-related production, property and territory. The differences between various purposes may be very small, and oftentimes two or more purposes overlap; yet, it is important to distinguish among the diverse purposes as they are the only distinctions that prevent us from equating marks on cattle with marks on chapel doors and temple walls, to name just some examples.

In this section we first briefly exemplify six important purposes for which marking systems are used. Thereafter we discuss the multi-purpose nature of marking systems represented in the scheme as in fig. III1-5, giving the main function of identity marks, the contexts in which they are found, and some of the main purposes for which they are encountered.

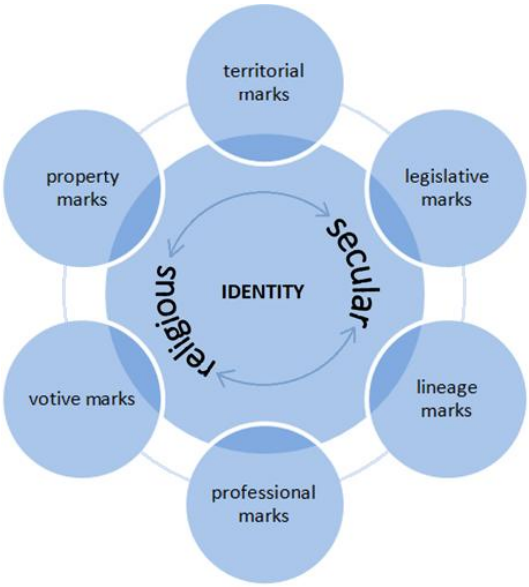


Fig. III1-5 Radial Venn-diagram accommodating the main function of marking systems (conveying identity), their contexts of use (religious and secular) and the purposes for which they are put to use.

[62] We specifically do not use the term 'multifunctional systems' as has been done previously, as we believe that the universal function of identity marks is the conveyance of identity and that this main function serves different purposes in different contexts and on different surfaces.

a.1 Property marks

The most ubiquitous purpose of identity marks is the conveyance of identity in relation to ownership. Marks can be applied onto objects of various kinds, often with special value to the owner(s). In the region of Sarmatia marks were applied onto valuable items such as musical instruments, vessels and warrior's accessories; marks on Anatolian seals, in some cases accompanied by the message 'this is the mark of *NN*', indicated ownership of the seal and of everything onto which the seal was applied; in Gallaecia identity marks were used on a range of domestic objects such as plates, pots and chairs, as well as on tools and fishing equipment such as nets, oars, compasses and sails, and even on houses marking them as the property of those who lived there.[63]

Especially intensive was the application of marks onto a wide range of objects in Deir el-Medina. Marks occur on a large variety of pots, bowls, jars, dishes, cups and ringstands, on bronze amphora supports, tags, jar stoppers, flints and tools, and on domestic objects such as linen, wooden combs, stools and seats, footstands and dishes of lamps, wooden neck supports and small altars.[64] Aston suggested that the marks found mainly on dishes, ringstands and storage jars in the area of the workmen's huts and the Valley of the Kings could reflect that the workmen took their own water supply with them: a storage jar with water, a ringstand on which to place the jar, and a cup to drink from. In such a communal, regimented working environment, individuals 'might have felt the need' to mark their own set.[65] This means that the use of identity marks to indicate property was first of all linked to the work in the Valley rather than to the community in the village of Deir el-Medina. However, that the marks were also intensively applied in private context from dynasty 18 onwards is apparent from the finds of marked objects in the houses inside the village as well as in tombs on grave goods.

In addition to objects, animals could be marked as property as well. Many nomadic societies from antiquity down to the present day use marks on livestock which is, after all, their most valuable property. The Tuareg mark their camels and donkeys, and in Eurasia a clan mark on cattle indicates property of the clan, while additional ear-notches indicate the care by individual families.[66] Marking the ownership of cattle by means of brand marks was practiced in ancient Egypt possibly as early as the Old Kingdom,[67] but there is secure evidence only for dynasty 18 onwards.[68]An iron brand from Thebes dated to dynasty 18 or later, now in the British Museum (EA 57321), shows a lioness head, which suggests that it was used to mark cattle that belonged to a temple of the goddess Sekhmet (fig. III1-6).[69] Two further brands come from Amarna (München ÄS 5520, BM EA 58817): the first displays the hieroglyphs *nfr* and *ꜥnḫ*,

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[63] V.N. Yurgevitch referred to by Yatsenko, 'Problems and Study Methods of the Ancient and Early Medieval Iranian-Speaking Peoples' Nishan-signs' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 110, 112 (footnote 2), 116, 123; Samashev, 'Kazakh Tamgas' in *ibid*., 329; Boardman, 'Seals and Signs' in *ibid*., 153; Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 104.

[64] See the Database *Symbolizing Identity*. Many examples can be found under 'Objects' and filtertypes 'Domestic Objects' and 'pottery'. It is conspicuous that most of the mark-specimens on pots and domestic objects date to dynasty 18 (78,79%). This is mainly due to a large find of linen from the tomb of Kha (TT8) bearing his mark. The largest variety of objects with marks we find in dynasties 19 and 20.

[65] Aston (David), 'Theban Potmarks' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 54, 58. See also Part I chapter 2.

[66] Landais, 'The Marking of Livestock in Traditional Pastoral Societies' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 90; Yatsenko, 'Problems and Study Methods of the Ancient and Early Medieval Iranian-Speaking Peoples' Nishan-signs' in *ibid*., 112 (footnote 2).

[67] Müller, *Der Waffenfund von Balâṭa-Sichem und Die Sichelschwerter*, 76 and footnote 14; Klebs, *Die Reliefs und Malereien des neuen Reiches* I, 69.

[68] Stead, *Egyptian Life*, 32 (fig. 43); Vandier, *Manuel* V, 280; Müller, *Der Waffenfund von Balâṭa-Sichem und Die Sichelschwerter*, 72-77; Klebs, *Die Reliefs und Malereien des neuen Reiches* I, 69-70.

[69] http://www.britishmuseum.org/explore/highlights/highlight_objects/aes/b/bronze_branding_iron.aspx; Stead, *Egyptian Life* (1986), 32 (fig. 43).

according to Müller for 'junges, lebendes (Vieh)', and the second shows cow-horns.[70] The marking of cattle is also depicted in several New Kingdom tombs, for instance in the tomb of Paheri in Elkab and the tombs of Nebamun, Weserhat and Kenamun in the Theban Necropolis. Although Vandier remarks that in the case of Paheri 'il est possible que ce soit son propre bétail qu'il ait fait marquer au fer rouge' the branding usually concerned herds belonging to the king or to a temple, 'in Pacht gegeben' to officials.[71] Vandier suggests that the animals depicted in the tomb of Nebamun bear 'la marque de propriété d'Amon' as Nebamun says to his scribe Djehutynefer 'Do not turn the back on the cattle of Amun, our lord'.[72] It is conspicuous that the workmen from Deir el-Medina did not use their identity marks on animals, especially on donkeys. That they could in fact possess one or more donkeys which they rented to members of the *smd.t*-personnel, who used the animals to bring water from the Nile Valley up to the village, is clear from ostraca that record 'contracts' with details such as when, how long and for what price donkeys were rented out. These records themselves lack many details, such as information on the exact animal that was rented.[73] Usually the only mention of the donkey is the phrase *pꜣ ꜥꜣ* ('the donkey') without further specification. It would be conceivable that a donkey owner marked his animal(s) with his personal mark on the basis of which he could identify the donkey(s) as his property in the theoretically possible case that the animal(s) would be lost, stolen or resold to a third party. Such marks would ideally also be recorded in the contract to serve an anti-theft purpose (see *a.3 Legislative marks* below). In this context, it is interesting to mention that the Baxtyâri nomads of Iran make use of livestock marks that do not convey the identity of the owner, but are rather a kind of summary of the features of each individual animal in the flock. These marks function within a system for tracking lost or stolen animals that calls upon networks of solidarity based on clan alliances and customary rules for settling disputes. In the case that a lost or stolen animal is found with another herd, the original owner is expected to give a comprehensive description of the animal, which can be checked against the mark.[74] A such, the marks do not directly refer to the owner, but they still function to identify property. In Deir el-Medina, however, there is no textual or archaeological evidence to support the practice of marking donkeys, and the only brand marks known seem to refer to the property of higher instances rather than to individual ownership (fig. III1-7).

Fig. III1-6 Bronze branding iron for marking cattle. Perhaps from Thebes, dynasty 18 or later. BM EA 57321.[75]

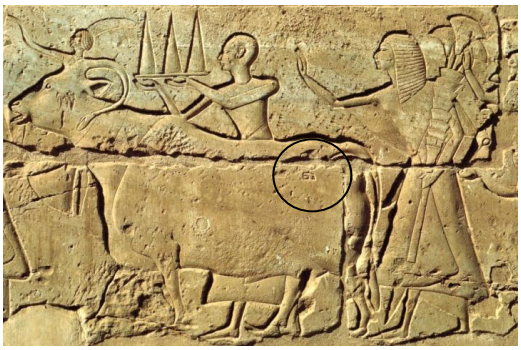

Fig. III1-7 Sacrificial bull procession in the Great Court of Ramesses II, Temple of Luxor. Photograph: Dirk Huyge (KMKG-MRAH).

[70] Müller, *Der Waffenfund von Balâṭa-Sichem und Die Sichelschwerter*, 74-75.
[71] Vandier, *Manuel* V, 280-281; Klebs, *Die Reliefs und Malereien des neuen Reiches* I, 69.
[72] Vandier, *Manuel* V, 281; Davies, *The Tombs of Two Officials* (TTS 3), 32.
[73] Van der Moezel, 'Donkey-Transactions' in Haring, Kaper & van Walsem (eds.), *The Workman's Progress*, 157-174.
[74] Landais, 'The Marking of Livestock in Traditional Pastoral Societies' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 102-103.
[75] http://www.britishmuseum.org/explore/highlights/highlight_objects/aes/b/bronze_branding_iron.aspx.

a.2 Territorial, or border marks

Closely related to the purpose of marking property is the purpose of marking the borders of one's territory, or marking one's presence in a certain territory. As such, identity marks can be seen on trees, wooden posts, sticks, stones, wells or other natural and man-made phenomena.[76] On the one hand, they may be an expression to note that 'X was here', as in the numerous graffiti people in the past and present have left behind. An example are the numerous marks in graffiti throughout the Theban Mountains dating mainly to the 19th and 20th dynasties. By leaving such marks, one makes the territory part of his personal experience. On the other hand, territorial marks have as their specific purpose the demarcation of territory belonging to families, clans, tribes, communities or societies. In nomadic societies, such demarcation provides the right of first usage, for instance to use the water in a well, to let the cattle pasture, or to harvest crops. But demarcation also implies the responsibility to manage the resources, not only for the first occupants, but also for those who will subsequently use the land. Demarcation, then, serves to avoid disputes in a form of society that is mainly oral in nature and makes no use of written contracts. The system is accepted by all tribes and creates a hierarchy that gives the first tribe to mark a territory *legitimacy* over it.[77] With legitimacy we arrive at a third purpose of identity marks: legislative marks.

a.3 Legislative marks

Identity marks can have legislative and binding value in judicial and administrative matters. They can be a legislative measure that, with the potential to be used in court, can ensure accountability. The marks imply certain rights and obligations upon which the users of the system have agreed; their acknowledgement makes the marks valid evidence. Thus, they can serve as anti-theft devices. This is often the prime purpose of marking livestock. The marks turn theft into a far more risky process and are the only means to justifiably get lost or stolen animals back. In Mongol culture, where marks protect herds from raiding and theft, it is therefore forbidden to freely change a mark or to randomly choose a new one; this is only allowed when approved and registered by a local chieftain. To falsify a mark is considered a crime.[78] In south America administrative registers with records of all the marks used by herders were initiated in the 19th century 'to prevent theft and to provide grounds for judicial appeal'.[79] Similarly, marks used by the Norwegian reindeer herders are officially recorded by the administration of Norway and can be used as evidence in court.[80] Valuable objects as well could be marked specifically with the aim of providing them with a measure against theft. Van Belle notes that the marks on stones meant for construction in 18th century Belgium provided the stone-suppliers of quarries with such a security measure.[81]

Marks could also be used as legal and binding evidence in contracts, treaties, alliances, pacts and bonds. Such agreements may be oral and the contracts and treaties unwritten, being symbolized only by

[76] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 101, 104. Marks that occur on trees in communal forests do not necessarily serve to demarcate territory in a literal sense. Rather, they can simply mark specific trees as the property of an individual or a family.
[77] Landais, 'The Marking of Livestock in Traditional Pastoral Societies' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 100-101.
[78] *Ibid*., 101-105.
[79] Evans Pim, 'Indigenous and European Marking Systems in Brazil', in *ibid*., 491.
[80] Landais, 'The Marking of Livestock in Traditional Pastoral Societies' in *ibid*., 105; Delaporte, 'Le Marquage du Bétail chez des Pasteurs Lapons', *Journal d'agriculture traditionnelle et de botanique appliquée* 34 (1987), 19. Note, however, that Delaporte speaks only of the incised earmarks having been endowed with juridical value; apparently, the brand marks 'n'ont que peu d'existence aux yeux des lois norvégiennes'.
[81] Van Belle, 'The Study of Lapidary Signs', *Re:marks* 1 (2013), 63.

the recording of two or three marks which represent different parties. Such accumulations of marks can be encountered especially on objects such as (ritual) vessels, rocks or buildings, and monuments of important or religious nature. They may concern war treaties, contracts on territory (in which case the marks can simultaneously serve as border marks), marriage bonds, collective oaths or unifications. Sworn brotherhood between two (or more) groups is often implicit. Amongst the Arab nomads in western Chad (Kanem region) marks are used in a pact known as *sirr*: an alliance between two parties to keep each other informed on the state of the wells and pastures in the region, as well as of the movements of neighboring peoples. Mutual assistance is compulsory in times of trouble. The parties of a *sirr* exchange their marks and make communal use of them. As such, they signify themselves as one.[82] The pact connects rights and obligations to this new collective identity.

Marks can also have legislative value in linguistically written documents. As such, they function as nonlinguistic equivalents to linguistically written names or signatures. In the light of the traditional western focus on the alphabet as the superior system of visual communication it is interesting to see this combination in documents with legal status. We clearly see the use of personal identity marks in written contracts in late medieval Europe. According to Van Belle marks could accompany a stonecutter's name or completely replace it.[83] The latter we see in a document dated to January 14, 1538, which contracts the Flemish building master Simon Pinet for Our Lady's Tower lantern in Zwolle (the Low Countries). Pinet signed with his mark because 'he could not write very well'.[84] Six months later Simon Pinet, however, disappeared, leaving the work only half finished. The remaining workmen signed a new contract with the church wardens (fig. III1-8), three of whom signed with their name, while thirteen others signed with their mark because they were 'not able to write'.[85] Another example, dated two years earlier, is a bargain for purchase of stone from England, which has three masons' marks on it (fig. III1-9).[86] Also interesting is the mark of the master mason Thomas Crump on a seal, which was attached to a contract dated to 1381, related to the construction of a gatehouse at Cooling Castle, Kent (fig. III1-10).

Fig. III1-8 Building account of Our Lady's Church Zwolle, 1538. De Vries, 'Signs and Symbols' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?,* 217 (fig. 13).

[82] Landais, 'The Marking of Livestock in Traditional Pastoral Societies' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 92.
[83] Van Belle, 'The Study of Lapidary Signs', *Re:marks* 1 (2013), 63-64.
[84] De Vries, 'Signs and Symbols' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 212-213.
[85] 'een deel hoer marck die niet scriven conden'. *Ibid*., 213.
[86] Saltzman, *Building in England Down to 1540*, Plate II.

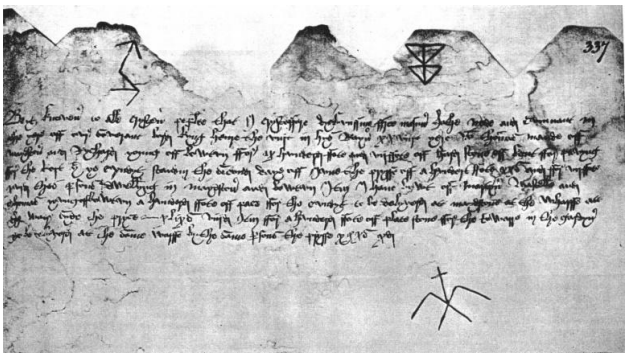

Fig. III1-9 Bargain for a purchase of stone, 1536, signed with marks. Salzman, *Building in England Down to 1540*, Plate II.

Fig. III1-10 Seal of the master mason Thomas Crump. Hislop, *Medieval Masons*, 13 (fig. 2).

Also included in written documentation are the livestock marks on cattle passes from south America. These passes allowed the movement of cattle through national and international borders in 19th century Brazil (fig. III1-11). Without such a legislative document the movement of the animals was illegal and prosecutable.[87]

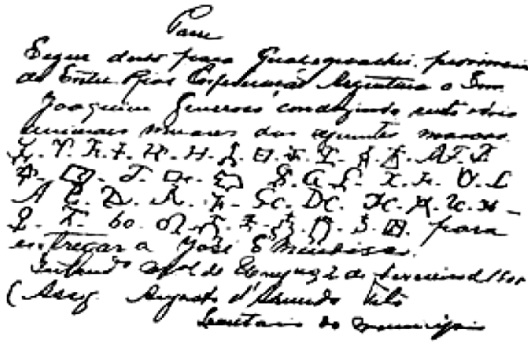

Fig. III1-11 Cattle pass for the crossing of 102 mules through the Argentinean-Brazilian border featuring their respective marks. 19th Century, south Brazil. Evans Pim, 'Indigenous and European Marking Systems in Brazil' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 492, fig. 10.

While in Spanish Brazil marks were thus included in written documentation, Evans Pim was not able to account for the same in contemporaneous Gallaecia. When the emerging State bureaucracy made its way into the communities in the 19th century, it apparently wanted to rule out the marking practice entirely. In recent field study Evans Pim attempted to find the marks of families and individuals in the registers of A Guarda, among others in birth and marriage records that required the signatures of the deponents. Although such marks had always been the principle form of identification, not one was encountered in the registers.[88]

[87] Evans Pim, 'Indigenous and European Marking Systems in Brazil' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 492 fig. 12.

[88] It was mentioned above that this strict policy paradoxically resulted in the survival of the marks up to this day, as resistance and avoidance of State bureaucracy led to continued use of marks on the community level. Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 107.

The use of marks in a system of administrative control is seen in Egypt since Early Dynastic Times. The use of potmarks in a regional network of (re)distribution in dynasties 0-1, and the use of builders' marks in the administration of construction projects in the Old and Middle Kingdoms were mentioned in Part I, chapter 2. The latter were also included in hieratic records concerning the work and the workmen on papyri, found in archives such as at Kahun. In Deir el-Medina we see the identity marks, especially in dynasties 18 and 19, accompanied by dots and strokes, which may reflect a system of control, although not combined with any form of linguistic script. In dynasty 20, however, we find marks ostraca that are similar in structure to documents written in hieratic, usually to be interpreted in entries from right to left, conform hieratic writing. These ostraca record (partially) the same information as the hieratic rosters that record the daily duty of the workmen. They functioned in addition to writing, but the marks also merged with elements of writing. In Part I, chapter 1, examples were given of 20th dynasty ostraca which show the hands of scribes who were familiar with hieratic script, as their marks show a clear hieratic ductus. The exact extent to which the documents with marks were equal to hieratic documents as 'official administration', that is, their value in relation to hieratic documentation to the government in Thebes, remains, however, not satisfactorily known.

a.4 Professional marks

Identity marks can be used specifically in relation to work and work production. As such, they are often designated as 'builders', 'masons', 'quarry, or 'sculptors' marks', '*marques de tâcheron*' (relating to the profession), or as '*marques de carrière*' or '*marques d'appareillage*' (relating to the place of work respectively the use of the marks). Yet, all designations are defective, or 'falsely generic, because they designate a broad phenomenon by a single one of its categories.'[89] In many cases, details on the functioning of the marks in the practice of daily life at the building sites are obscure. Thus, it is often unclear whether the marks refer to individuals or to teams, to which phase of the construction they relate, or to what extent we may discern different socio-professional groups of workers being referred to, such as quarrymen, masons, unskilled laborers and more specialized craftsmen.[90]

Several hypotheses about the users and user context of identity marks as relating to work and production have followed from elaborate research conducted in the field of medieval Europe.[91] These hypotheses are not mutually exclusive as the medieval European marks did not form one marking system, but rather various marking systems valid in the context of specific building projects. Whether they referred to individuals or groups and to which phase of the construction they were related may have varied from country to country, region to region, even from city to city. Thus, the following users and user contexts are all possible. First, the marks on blocks of stone and in written documentation can refer to individual masons and are thought to identify them in relation to the amount and quality of their work. This information would have been used for control on quality, and potentially also for payment, although not necessarily: the documentation on the construction of the cathedral of Utrecht (the Low Countries) shows that the masons, who applied their mark on almost every block of stone, were paid by the day, and not by piece.[92] Second, there are marks that appear to be related to certain specific masters and which

[89] Reveyron, '*Marques lapidaires*: the state of the question', *Gesta* 42 no. 2 (2003), 161-162.
[90] For uncertainties in this respect with regard to masons' and sculptors' marks in Anatolia and the Persian Empire, see Boardman, 'Seals and Signs' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 161-165.
[91] Based on the classification by Van Belle, *Dictionnaire des Signes Lapidaires*, xi-xii. See also Reveyron, '*Marques lapidaires*: the state of the question', *Gesta* 42 no. 2 (2003), 161-170.
[92] Janse & De Vries, *Werk en Merk*, 49-50l; Salzman, *Building in England down to 1540*, 127.

were used by them as well as by their apprentices. In their book *English medieval industries* (1991), professor of medieval history and archaeology Blair and medievalist Ramsay remark that 'Only a master craftsman would have a mark: it would be applied to all the products of his ship, whether made by him or his apprentices…'.[93] This may have been the practice in other fields outside masonry and construction as well; Janse and De Vries mention that many guilds were organized according to a control system based on the master masons' marks.[94] Third, there are the so-called 'quarry marks'. In Part I, chapter 2, we have referred to the ambiguity of this term: it refers merely to the place where the stone was cut, while the marks may have had different aims and potentially referred to different (groups of) people. Some quarry marks should indeed be categorized as identity marks of individual quarrymen, or teams of quarrymen, but others functioned rather in relation to the height of a bedding in the quarry,[95] or the quality of a block or layer of stone. The medievalist Salzman has studied the relation between quarries and building projects in England down to 1540, but details about the actual work done inside the quarry remain obscure. The preliminary extraction of the blocks (effected with heavy malls and iron wedges) was regarded as unskilled or the lowest type of skilled labor, as is apparent from the rates of pay. The next step was to reduce the blocks further by splitting and sawing them to the required dimensions. The final tooling might be performed at the quarry, or in the masons' lodge on the building site. It has been argued that the blocks were marked *before* they left the quarry.[96] Different groups or ranks of quarrymen could have been responsible for that. A document related to the building of Vale Royal Abbey in 1278 mentions at least three groups of masons: one consisting of *cementarii*, who cut, prepared and worked the blocks of stone; one consisting of *quariatores*, 'ordinary quarriers and strikers with great hammers and men serving the masters'; and 'labourers with spades and hoes clearing (the earth) in various quarries'.[97] The difference between *cementarii* and *quariatores* is not entirely clear, but it appears that the *cementarii* were temporarily contracted workers, who were paid by contract, while the *quariatores* were more permanent employees and were paid by the day. Salzman mentioned that marks on medieval construction sites usually appear on quite a small proportion of merely the plain stones of a building. This, he argued, could suggest that the marks related only to the temporary men who were on piece work, or possibly to the casual laborers who were not known to the master and whose work it was therefore more desirable to check.[98]

A fourth hypothesis on the interpretation of marks is based on a text cited by Salzmann, dated to 1442 and relating to Gloucester Castle. The text suggests that a mason (or a master mason?) could go to the quarries to check the quality of the stone, marking the ones he approved of: '*Wages of John Hobbys, riding to the quarry of Upton and the quarry of Freme to pick out and prove good stones from the bad stones … and marking (signand) and scappling and proving the stones so picked out…'*.[99] A similar text is known from Zwolle (the Low Countries), which recounts that the mason(?) Willem Coertsz marked, and therewith reserved certain blocks of stone from a seller.[100] In both cases, the marks were applied in

[93] Blair & Ramsay (eds.), *English medieval industries*, xxvi. See also the remark by Janse & De Vries about the time when a mason would receive or at least start using his own mark: at the moment he had become a companion. Janse & De Vries, *Werk en Merk*, 49.
[94] *Ibid*., 50. Cf. the remark on merchants' marks in Ward et al., *The Ring from Antiquity to the Twentieth Century*, 57.
[95] Reveyron, '*Marques lapidaires*: the state of the question', *Gesta* 42 no. 2 (2003), 164.
[96] *Ibid*..
[97] Salzman, *Building in England down to 1540*, 126.
[98] *Ibid*., 127.
[99] *Ibid*., 126.
[100] Janse & De Vries, *Werk en Merk*, 51.

the quarry or at least before they reached the construction site, and they related to the quality of the stone. But instead of conveying the identity of the quarrymen, they conveyed the identity of the mason who came by for selection. A fifth and final hypothesis also concerns the quality of blocks that came from the quarry. Salzman notes that quarrying in England was a regular trade, and in certain districts there must have been a fairly continuous demand for stone. [101] The marks, applied at the quarry, served to identify certain lots of stones that had arrived from certain quarries.[102] The building master on site could check the quality of the lots, and if he was satisfied with the quality of one specific lot, the marks would tell him from which quarry it came or which quarryman or quarrymen were responsible for it; he could order more. Such control implies traceability, and the marks therewith served a purpose of advertisement on the building site. As such, they could become trademarks, as apparently also happened in other guilds: De Vries shows the proud display of a house brand for beer and honey in the form of an identity mark.[103]

On the level of the individual, a similar development led to the use of identity marks as artists' signatures, used specifically to link an aesthetically pleasurable or high quality work to the specialized craftsman who produced it. Among the masons' and quarry marks, however, such a purpose seems to have been rare. Janse & De Vries mention that a feeling of professional pride may have led some masons to apply a mark to their work, but it is conspicuous that marks generally seldom appear on tracery or carved stones, most of which would be worked by masters. Perhaps the responsible masters would have been easily identified on the basis of style alone.[104] In the merchants' guild we do see a gradual development of the marks toward a trademark or signature that reassured buyers the goods had come from a reputable source: the merchants' marks came to link a merchant as an accountable person to the goods he sold. During the 15th and 16th centuries some merchants became so proud of their marks that they started using them as coats of arms, representing them on their merchants' rings and other belongings.[105] With this growing importance of marks as trademarks in the economy and society came a growing practice of forgery, and laws needed to be installed concerning the selection and use of marks. Guilds ordained that new marks had to be approved, and were assigned to an individual by his craft. Alternations in one's mark were not allowed unless approved by the whole craft.[106]

In Part I, chapter 2, the function of artists' marks was dismissed with regard to potmarks from Egypt and Nubia; there are too few distinctions among them and the pattern of marking vessels is irregular. Moreover, the marks were used over long periods of time, longer than the lifetime of an artist. In Deir el-Medina, however, we may find the conveyance of artists' identities by means of marks on the so-called furniture ostraca (fig. III1-12).

[101] Salzman, *Building in England down to 1540*, 121.
[102] See also Reveyron, 'Marques lapidaries: the state of the question', *Gesta* 42 no. 2 (2003), 164.
[103] De Vries, 'Signs and Symbols' in Haring & Kaper (eds.), *Pictograms or Pseudo Script?*, 212, 217 (fig. 12).
[104] Salzman, *Building in England down to 1540* (1967), 127; Janse & De Vries, *Werk en Merk*, 51, 57, 97. Also personal communication with De Vries, and personal communication between Haring and De Vries (23-12-2011).
[105] Blair & Ramsay, *English medieval industries*, xxv-xxvi; Ward et al., *The Ring from Antiquity to the Twentieth Century*, 57, 71, 77-70.
[106] Salzman, *Building in England down to 1540*, 127. See also Van Belle, *Dictionnaire des Signes Lapidaires*, XV.

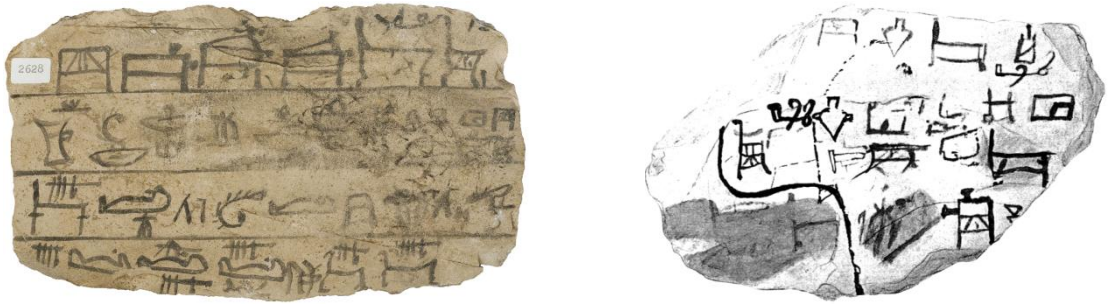

Fig. III1-12 O.Florence 2628 (left) and O.München 398 (right) showing pieces of furniture accompanied by marks.

The identity marks accompany pieces of furniture such as beds, chairs, and chests, and presumably indicate craftsmanship or at least a relation of some sort between the furniture and the workmen indicated through the marks.[107] That they are not ownership marks may be assumed from the fact that one piece of furniture can be accompanied by up to three marks, which may indicate piecework or cooperation of specialists. We do not suggest to interpret the marks on the furniture ostraca in the same context as the marking of the workmen's presence and *wrš*-duties on the marks ostraca in general, as the former concern special work on demand for which the skills of the workmen may have been specifically required. It could have been a way of making an extra income not as workmen of the crew, but as craftsmen in their own right.[108]

a.5 Lineage marks

Identity marks often contain information that connects an individual to particular family lines. As such, they are encountered on tombstones in different societies throughout history. In both medieval Europe and Sarmatia personal or family marks could be used on tombstones as replacement for the image or name of the deceased.[109] In Gallaecia as well, identity marks are encountered in great numbers on tombstones. Among the more than 500 examples at the Santa-Maria à Noia cemetery in Noia are what Evans Pim calls 'heraldic marks', which indicate descent from a specific family. Some tombstones even seem to have been reused by subsequent generations.[110]

In the world of the living identity marks have an important status related to lineage as well. For the Kazakhs they are primary distinguishing signs for external presentation of different clans and tribes. A Kazakh legend tells of a man of the Jalayir tribe, named Birmanak, who was captured by another Kazakh tribe in the course of a conflict. While he lived among his captors he married a woman from their tribe, who bore him two sons. He instructed his sons to look for his original tribe after he would die, and told them that they would recognized it by its mark in the shape of a comb. The sons did as they were told. They left after Birmanak had died and after long wandering came across horses bearing the sign he had described. After listening to their story, the elders of the Jalayir tribe approved the rights of the sons and adopted them as their own children.[111] The legend is illustrative of the important role played by marks in matters concerning paternal lineage.

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[107] For the furniture ostraca, see also Killen & Weiss, 'Markings on Objects of Daily Use' in Andrássy, Budka & Kammerzell (eds.), *Non-Textual Marking Systems*, 137-158.
[108] Lesko, *Pharaoh's Workers*, 12.
[109] Yatsenko, 'Problems and Study Methods of the Ancient and Early Medieval Iranian-Speaking Peoples' Nishan-Signs' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 113; Janse & De Vries, *Werk en Merk*, 48.
[110] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 102.
[111] Samashev, 'Kazakh Tamgas' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 329.

Nomadic societies generally embed the use of marks into a complicated system of stratification. These societies are usually segmented according to lineage structures including various clans, tribes, nuclear families and several sub-units and lineage segments for which English has no nomenclature. The political function of these societies is based on a dynamic equilibrium between structurally equivalent units, which prevents the emergence of chieftainships with broader powers. This structure favors the dispersion of lineage segments, which is a means of both optimizing the exploitation of pastoral land and of minimizing food, health, and political risks. Identity marks represent the different clans, tribes and other segments. A person's social and political status in such a society, which is important among others in relation to first usage of land or resources, is reflected in his mark, the meaning of which depends on rules governing inter-generational and inter-group transmission. The core of the marks used by all segments of society is usually a clan mark. Those marks are transmitted unaltered from generation to generation. Segments within a clan are further distinguished by minor details or features added to the clan mark. This system is seen, for instance, among the clans of Mongolia. Mongol marks present detailed information about an individual: the clan to which he belongs is indicated by a primary mark, while his paternal line, his position in the eldest or youngest branch of the family, his status as nobleman, commoner or slave and his religious or lay status is expressed by means of a series of complementary marks that are combined with the primary clan mark. These complementary marks have both syntagmatic and paradigmatic semantic properties. For example, the selection of the mark that represents a 'throne' ( ) indicates that the owner descends from the eldest branch of his lineage, 'since this line is the one that inherits the images of the spirits of the ancestors that sit on the throne.' When it is in syntagmatic relation with the main mark positioned to the latter's right it furthermore denotes primogeniture, as opposed to a relation in which it would be located to the main mark's left side.[112]

The reason behind expressing one's lineage is usually related to expressing one's status within society, which is of most interest to those of royal or noble descent. In southern Brazil marks are clearly related to the highest ranks in society. After the Spanish and Portuguese conquests, the Kadiwéu Indian society was stratified into three ranks: captains (*capitães*), warriors (*soldados*) and captives from other ethnic groups (*cativos*). These ranks did not have great impact in the relatively egalitarian social relations, but symbolically they are reflected in the use of identity marks especially during ceremonies and feasts: marks were the exclusive right of the captains and their families, who used them on their personal belongings but also tattooed them on their bodies. Warriors were entitled to adopt special names and use a special artificial language (formed by the addition of a suffix to each word), but it is unclear whether they were allowed to bear their own mark. Captives did not have marks. They were, however, most numerous in society, which turned mark usage into a privilege and distinctive lineage affirmation of only a small group of 'true' Kadiwéu. They were marks of nobility and social hierarchy, even more than names: it has been remarked that at the death of a relative the family members, particularly close descendants, would change their names while the family mark was retained. This turned the mark into the element of continuation that identifies and positions an individual within the collective regardless of name changes throughout his lifetime.[113]

[112] For mark derivation in more detail, see section 3.
[113] Evans Pim, 'Indigenous and European Marking Systems in Brazil' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 477-478, 480, 482, 484. This practice was still observed in 1948.

a.6 Religious marks

The last purpose of identity marks to be mentioned here is their usage in the context of religion, as votive, pilgrims', or prophylactic marks. On the pavement of the Hathor temple from the reign of Ramesses II in Deir el-Medina we find at least 17 different workmen's identity marks along with names in hieroglyphic writing (fig. III1-13). Both the names and the marks are presumably votive inscriptions, which were made with the aim of acquainting a deity with the identity of the dedicator who appeals, for instance, protection or fertility.[114]

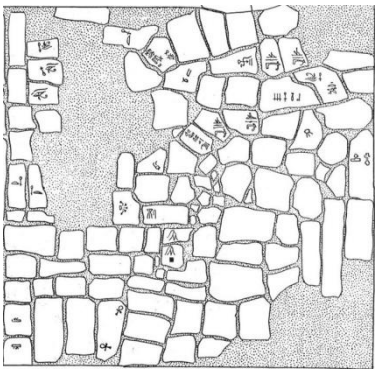


Fig. III1-13 Votive marks on the pavement of the Hathor temple at Deir el-Medina. Bruyère, *Rap. 35-40*, fasc. II pl. IX

Gallaecian marks were also used in religious context. They were left on church or chapel doors after votive processions or pilgrimages. The doors of the chapel at Santa Tegra, A Guarda, are covered with marks, as are those of the chapel of Senhora da Bonança at Póvoa de Varzim (figs. III1-14 and 15). They were also made on church alms boxes and played an important role in weddings when the mark of the newly wedded man would be made in the church vestry.[115]

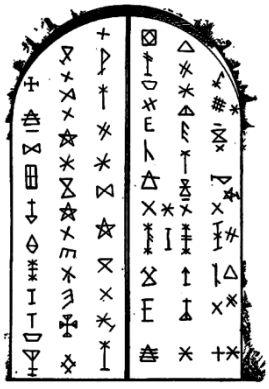


Fig. III1-14 Votive and pilgrims' marks on the chapel at Santa Tegra, A Guarda. Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 110 (fig. 9).

Fig. III1-15 Votive and pilgrims' marks at the doors of the Senhora da Bonança chapel at Póvoa de Varzim.[116]

In constructions from medieval Europe masons' marks are sometimes encountered on prominent places, very highly placed or very visible even after the walls were finished with stucco and paint. It has been suggested that these marks were placed with a votive purpose showing, for instance, participation of a mason on the construction of a church to God and the people on earth. Especially signs in the forms of

[114] Cf. Luiselli, 'Personal Piety in Ancient Egypt', *Religion Compass* 8 (2014), 105-116.
[115] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 110-111.
[116] Photo from: http://www.geocaching.com/geocache/GC11CP6_siglas-poveiras-senhora-da-bonanca?guid=593fd538-784a-4c4e-af94-c7686a6e37ee.

alpha and omega, a fusion of P and X (the monogram chi-rho for 'Christus' sometimes comined with P and A for 'pax') and crosses may be considered votive references.[117] Votive purposes of marks may also be seen on accumulations of several marks on one block of stone; Janse & De Vries provide two examples from the St. Johanneskirche in Neumarkt and the Our Lady's Church in Kampen (the Low Countries) in which the mark of a master mason is surrounded by marks of companions. Since these accumulations deviate from normal practice they may concern a special purpose of relating the team of workers and their master mason to the religious institution.[118]

In the region of Sarmatia marks gradually accumulated in sanctuaries over the course of several centuries, which may indicate pilgrimage and religious rituals. One of the largest series of marks was found on pottery dating to the 5th and early 8th centuries at the site of Sidak in the south of Kazakhstan. This was an interregional sacred temple complex dedicated to the worship of dead ancestors of clans from near and afar.[119] The majority of the marks found in the complex are known from vessels which were used as ossuaries containing the remains of deceased clan members, but many were also applied onto vessels filled with food or wine, which were customary gifts brought by worshippers. The marks, of which at least 60 different types have been distinguished, have exact or very close parallels in clan marks known from monuments in neighboring regions and on objects, most notably coins. Several of them belong to foreign rulers. This suggests interregional stability in population and active participation by different clans in the life of this cult centre through pilgrimage.

b. The universality of multi-purpose systems

The main function and aim of identity marks is certainly to convey identity, but this takes place in different contexts and for different purposes. The contexts are twofold: secular and religious. In secular context marking systems generally serve the purpose of conveying identity in relation to property, agreements, legal issues and accountability. In religious context they generally serve the purpose of conveying identity in relation to votive matters. However, the contexts and purposes cannot clearly be distinguished. If we resort to Saussurean terminology, one can say that on the level of *langue* (i.e. the system) marking systems can be put to use for one or several purposes in secular and religious contexts. Yet, on the level of *parole* (i.e. of the particular manifestations of marking systems, their actual usage as property, border, legislative, professional, lineage or religious marks) one manifestation may simultaneously serve multiple purposes in secular as well as religious contexts. Marks frequently serve more than one purpose *at the same time*. Thus, marks encountered as territorial or border marks do not merely serve the purpose of identifying the owners of territory; they may simultaneously identify these owners as being of royal or high descent and provide them with certain rights of usage or passage, or they may indicate the existence of an agreement, an oral contract or treaty with the division of territory as a result. Professional marks encountered on construction sites may not merely serve a purpose of control and/or payment during the construction process, but may also be an expression of pride and artistry or votive feelings, or they may be a trademark, or identifiers of the mark user in relation to his genealogy.

[117] Personal communication between Haring and De Vries (23-12-2011). Morel, Le bâtisseur et le commanditaire Outils et perspectives d'une étude des signes lapidaires dans l'ancien diocèse de Clermont (fin XIe – début XIIIe siècle), online: http://medieval-europe-paris-2007.univ-paris1.fr/D.Morel.pdf, especially figure 5.
[118] Ibid.; Janse & De Vries, *Werk en Merk*, 62-63.
[119] Yatsenko, 'Marks of the Ancient and Early Medieval Iranian-Speaking Peoples of Iran, Eastern Europe, Transoxiana and South Siberia' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 134-136; http://www.transoxiana.org/13/smagulov_yatsenko-sidak_sanctuary.php.

Marking systems are multi-purpose systems on the level of *langue* or system as well as on the level of *parole* or usage. In this they are equal to other systems of visual communication. Linguistic writing systems, for instance, are designed specifically to be used in different contexts and for different purposes. Also, the photograph of president Kennedy in Part II, chapter 2 (section 1.c) is an example of a manifestation of the *langue* of photography that serves mixed secular and religious purposes in its layers of meaning: promoting Kennedy as a presidential candidate and suggesting divine approval.

Similar to all marking systems discussed, the system from Deir el-Medina was a multi-purpose system in that it was first of all used to convey the identity of the workmen in relation to the work in the Theban Necropolis and their membership of the crew, but in addition was used to indicate property – not only in the context of work on pottery taken to the Valley of the Kings, but also in private context on domestic objects and grave-goods – as well as to convey identity for votive purposes or express lineage relations.[120] In addition to what appears to have been their main purpose, the workmen intensively made use of the marks in different contexts and for different purposes in daily life. In this sense, the system was a system of visual communication alternative to linguistic writing, as it could be drawn from to convey a message that was not limited to the administrative marks ostraca.

3 DERIVATION

Thus far, we have looked at the forms and purposes of marking systems and discovered certain universalities in composition and function. We now turn to a comparison of the development of marking systems over longer periods of time: how were marks transmitted in the systems, passed on from generation to generation? Several systems show clear derivational patterns that were fixed on the basis of more or less strict rules. However, before we start comparing the derivational patterns and the formal development of marking systems over various generations, we have to stop a moment to think about the concept of 'individuality'. In the modern western world the social and political trend of individualism focuses on the individual who strives for independence and self-reliance and advocates his own goals and desires over the interests of the group. In many other societies elsewhere in the world, however, collectivism rather emphasizes the interdependence of members of the group and stresses the priority of group goals over individual goals. This difference implies a difference in the conception of identity: individual vs. collective identity. This was already seen in the previous section, especially in the sub-section on property marks: individual property and ownership are especially important in modern Western culture, while in traditional societies property, such as land and live-stock, is first of all collective property, the care of which can be farmed out to individuals. That a herd, for instance, is not individually owned becomes clear from the fact that, if necessary, the animals can be redistributed after a drought or epizootic that caused several losses.[121] It is, then, no surprise to see, that the marks of nonlinguistic systems often do not refer exclusively to individual identity. Even in a system where each member of the group or society carries his or her own distinctive mark, the importance of collective identity appears

[120] For instance in the Theban Graffiti 0181 (*Jn)j*)-*ḥr-ḫɜw* (i) and his son *Ḥɜy* (iv)); 1077 (the marks of three generations: *Ḥɜy* (iv), *Ḥɜy* (vii), *Jmn-nḫt* (vi/xii)); or 1465 (*Ḥɜy* (vii) *sɜ Jmn-nḫt* (x) with the mark of his son *Jmn-nḫt* (vi/xii).

[121] Landais, 'The Marking of Livestock in Traditional Pastoral Societies' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 101.

from its derivation from an original family, tribe or clan mark, and from the purposes when the marks are put to use, for example, to indicate membership of a certain rank or hierarchy.

The prevailing concept of identity that lives in a society is reflected in the marks and in their systems of derivation. In this section we look at several well-studied systems of derivation, on the basis of which we argue, first, that these systems reflect the existence of a mixed concept of collective and individual identity: they relate to kin- or family-groups in which every individual member is marked. Yet, we also argue that a trend away from collectivity toward individualism can be discerned in the development of the marks and the derivational systems. Often, this trend means the end of traditional marks and derivational practices.

a. Derivation through the addition of individualizing elements

A system in which marks are basically family, kin or clan marks that are individualized by means of the addition of strokes or other geometric or pictorial elements appears to be universal. Such marks are used by individual persons, but they refer to them as being members of a larger group. Derivation on the basis of a family, kin or clan mark is seen in many nomadic societies from antiquity down to the present day, for instance in Sarmatia, Mongolia, and among the Bedouin of Arabia,[122] but it is also seen in three well-studied systems: those from Gallaecia, Brazil and medieval Europe.

a.1 Gallaecia

The marks from Póvoa de Varzim and A Guarda form a system that followed fixed rules of hereditary mark composition.[123] A limited set of basic mark shapes, that is approximately 17 to 22, has been identified in these communities. They are kin marks. According to long-established rules every individual would add a stroke (called *pique*) to the main mark according to his position within the kin, so that everyone in the community would know exactly to whom a particular mark referred. The first born of the head of the kin, for instance, would add one *pique*, followed by two *piques* and three *piques* by the second respectively third born, and so on until the youngest, who usually inherited the original mark of the father together with most of his belongings. This is in contrast with the more universal practice in which the eldest son is given the patrimony. Evans Pim explains that this difference is due to the tradition that in Portuguese fishing communities the youngest son is usually the one who remains in the family home and takes care of his parents, therefore being awarded the best portion of the inheritance.[124]

Evans Pim remarks that 'women would count equally in the sequence of differentiating marks between brothers and sisters – if a man was the third born after two sisters his mark would feature three *piques*.[125] The usual task of women in the community was to repair the nets that belonged to their fathers, brothers or husband, and to preserve and sell the fish caught by them. However, they could also themselves inherit their father's equipment, and, according to Evans Pim, it has even been attested that in

[122] For Mongolia and Arabia, see *ibid*., 92, 98-100; for Sarmatia, see Yatsenko, 'Problems and Study Methods of the Ancient and Early Medieval Iranian-Speaking Peoples' Nishan-Signs' in *ibid.,* 112 (footnote 2), 117, 121; for Arabia, Van Gennep, 'Les <<wasm>> ou marques de propriété des Arabes', *International Archives of Ethnography* 15 (1902), 87.
[123] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 108-109.
[124] *Ibid*., 108. Interestingly, a similar tradition existed in early medieval Turkic marks used in south Siberia, the only difference being that not the youngest son, but a daughter would keep the sign in its original form. For a son, a small detail most often in the upper part of the mark was changed. Yatsenko, 'Some Problems Related to Early Medieval Turkic Tamga-Sign Studies', *Re:marks* 1 (2013), 10.
[125] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 113.

such cases 'the husband after marriage would take over the mark of his father-in-law, adding the variation' that corresponded to his wife's position in the genealogy.[126] He therewith abandoned the mark of his own kin.

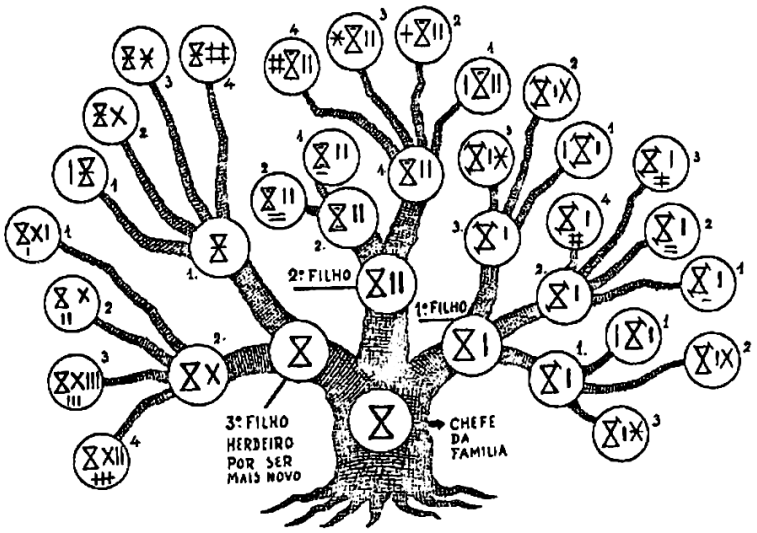


Fig. III1-16 Genealogical tree of the kin group ᛝ from Póvoa de Varzim.
Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 109 (fig. 8).

Fig. III1-16 exemplifies mark derivation on the basis of the kin group with the mark ᛝ from Póvoa de Varzim. The mark ᛝ is carried by the head of the kin. His first two sons create new family marks by adding one respectively two *piques*: ᛝᛁ and ᛝᛁᛁ. The third son kept the original mark ᛝ. On the right it can be seen that the three sons of ᛝᛁ each added a diagonal *pique* to one of the corners of their father's mark: ᛝᛁ, ᛝᛁ and ᛝᛁ. The two sons of ᛝᛁᛁ each added one respectively two horizontal *piques* to the inner triangles of their father's mark: ᛝᛁᛁ, and ᛝᛁᛁ. The firstborn of the son who inherited the original family mark ᛝ added a horizontal *pique* that crossed the mark: ᛝ. His younger brother added a second *pique*, but combined both *piques* into a cross accompanying the mark: ᛝᚷ. The number of *piques* accumulated with each new child, but as this number grew, new compilations were created. This is particularly clear in case of the mark ᛝᛁᛁ, which belonged to the firstborn of the second son of the head of the family. The firstborn of ᛝᛁᛁ, in turn, added a *pique* to the left of the mark (ᛁᛝᛁᛁ); the second son added another *pique* and formed it into a cross with the *pique* of his older brother (+ᛝᛁᛁ); the third son added a third *pique* turning the cross into an asterisk (*ᛝᛁᛁ); and the fourth son added a fourth *pique* and therewith created a square to accompany the father's mark (#ᛝᛁᛁ).

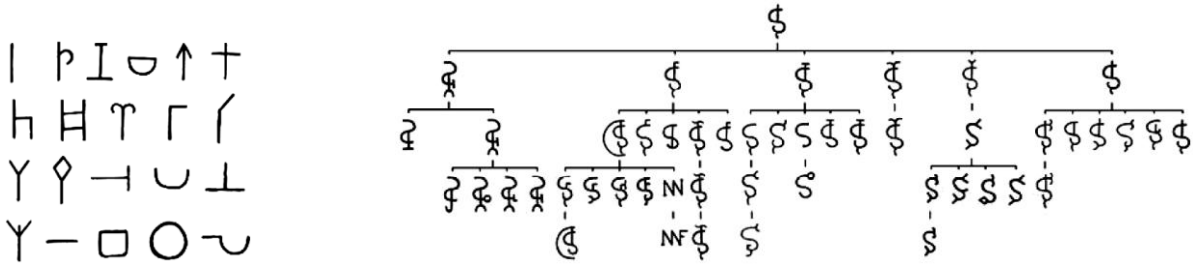
The rules for creating individualized family marks were so strict and systematic that Evans Pim paralleled them to linguistic rules. He describes the basic kin marks as the radical or root element which is modified by a series of prefixes, suffixes or affixes creating lexemes. The basic radical or root acted as a semantic element referring to a specific kin group within the community. The individual marks are equal to lexemes that transfer crucial knowledge on ancestry or descent, genealogical distance or fraternal position. As such, the system allowed to 'trace existing relations' among individuals within the community, 'defining hierarchical positions within a generation and referencing those preceding and

[126] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 113.

coming after them.'[127] The same rules of hereditary mark composition have successfully been applied to tombstone marks dating from a 15th century cemetery in Corunha's San Fransico, further north along the Atlantic coast in modern Spain. This suggests a long-established and continuing tradition of hereditary mark composition throughout Gallaecia.[128]

a.2 Brazil

In Brazil the livestock marks of the white herders made use of similar consistent derivation techniques as encountered in Gallaecia. The basic mark was called the *matriz*, to which a series of elements called *differenças* could be added in accordance with the position of a son or daughter in the family (fig. III1-17). It could be argued that this system of hereditary mark composition came to Brazil with the European colonizers: not only were the techniques of derivation similar, fig. III1-16 also shows the Portuguese tradition in which the youngest son inherited the original mark of his father, while his elder brothers used modified versions. However, the forms of the marks and the *differenças* closely resemble the indigenous Brazilian Kadiwéu marks. It has been suggested that the Kadiwéu marks worked according to a similar system of derivation and inheritance: they show certain base-forms and repetitive elements that can be interpreted as a nonlinguistic code. Although there are no accounts on how the Kadiwéu marks were transmitted and modified generation after generation, they may at least have inspired the forms of the marks and *differenças* used by the white herders.[129] Put differently, similar systems of hereditary mark composition may have existed among the Europeans and the indigenous Brazilian peoples, both of which were inspirational sources for the marks of the white herders: specific traditions from the European system, and specific forms and *differenças* from the indigenous systems.[130] Nowadays, unfortunately, the specifics of the system of the white herders as regards the order of inheritance and the allotment of *differenças* have been mostly forgotten and cannot be compared to an even poorer known Kadiwéu system of inheritance. Where family marks are still preserved, they either show arbitrary combinations of marks with *differenças*, or simply numbers placed underneath the original family mark.[131]



a. **b.**

Fig. III1-17a. *Differenças* that were added to the *matriz*, the base mark, in the system of hereditary mark composition among the white herders. The elements received denominations to describe their specific shapes ('flower', 'fork', 'ear', 'cross', 'hammer'). **b.** Genealogical tree based on the modern description of the marks belonging to the family of Virgílio Maia (2004).Virgilio Maia,

[127] *Ibid*., 108.
[128] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 102, 108-109, referring to Martinéz & Goméz, 'As laudas sepulcrais de San Francisco da Coruña (I)', *Anuario Brigantine* 17 (1994), 241-266.
[129] Indeed, Evans Pim remarks a strong tradition both in northeastern and in southern Brazil of identifying non-alphabetical marks with an older heritage, foreign to the newcomers. Evans Pim, 'Indigenous and European Marking Systems in Brazil' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 495.
[130] One may be reminded of the fact that cattle as well as branding irons were foreign to the indigenous peoples of Brazil. Therewith, the whole practice of branding cattle and the main aim of herders' marks was already derived from the European system.
[131] The numbering system was mainly used by women. Evans Pim, 'Indigenous and European Marking Systems in Brazil' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 479, 492-493.

referred to in Evans Pim 'Indigenous and European Marking Systems in Brazil' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 493-494 (figs. 15, 17).

a.3 Medieval Europe

The systems of derivation encountered in Gallaecia and Brazil are comparable to a system that has been suggested for medieval Europe, but there is an important difference as well. In medieval Europe the allocation and use of a mark appears first of all to have been related to work; that is, although the marks could be used for different purposes, the prime reason for having a mark was work-related, which meant that the masons' and quarry marks were not used by women and were not passed on within the private context of the family. Marks could be passed on from father to son, but primarily when the son took over his father's position and profession. There are examples in which the mark received an additional stroke when used by another family member. Thus, on the basis of documents concerning the construction of the cathedral of Utrecht (the Low Countries) the mark could be connected to Willem van Boelre, while the mark may have belonged to his son Gijsbert van Boelre.[132] The same could perhaps be argued for similar marks such as , and ; or 'or ; or for a range of marks similar to those encountered in Póvoa de Varzim: , , , , , , , , , , and .[133] It was argued in section 1 above that the existence of similar systems of hereditary mark composition is one of the explanations for the fact that many marks display similar forms and shapes, especially seen when comparing the medieval European and Gallaecian marks. It is apparent, however, that in comparison to the European marks the fishermen marks have remained fairly simple. Evans Pim mentions the suggestion that after the third generation the original grandfather's mark, if unused, would be retaken or combined with the mark of the maternal grandparents. Unfortunately, such practices could not be demonstrated from field study in A Guarda.[134]

In addition to the complementary strokes, however, other methods of passing on or adopting marks are known from medieval Europe as well. An ordinance from Germany, the Rochlitzer Ordnung dated to 1462, states that an apprentice received the mark of his master, without alteration.[135] Also, it has been argued that a mark was not in all cases the personal or permanent belonging of a mason or craftsman; marks could be assigned temporarily, and be valid only during the course of a construction project.[136] Thirdly, it has been mentioned that a mason or craftsman could decide to create a mark for himself, therewith not adopting the mark of a predecessor.[137] There thus seem to have existed various practices of transmission and adoption of marks which suggests that there was not one system of medieval European identity marks; there was rather a general practice of using marks, from which several systems were developed first and foremost with local relevance to construction projects and the work conducted in guilds.

An important change in all three regions – Gallaecia, Brazil and medieval Europe – came with the growing influence of the Roman alphabet. This alphabet eventually caused the traditional systems of

[132] Janse & De Vries, *Werk en Merk*, 55-56.
[133] Van Belle, *Dictionnaire des Signes Lapidaires*, e.g. 68, 70, 636-639.
[134] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 109 and note 14.
[135] Esquieu, 'Sur les traces des tailleurs' in De la Roncière et al. (eds.), *Histoire et Société*, 121; Deuchler, *Belser Stilgeschichte*, 228.
[136] Reveyron, '''Marques lapidaires''', *Gesta* 42.2 (2003), 165. See also Aubert, referred to in Esquieu, 'Sur les traces des tailleurs' in De la Roncière et al. (eds.), *Histoire et Société*, 121.
[137] Reveyron, '''Marques lapidaires''', *Gesta* 42.2 (2003), 165.

hereditary mark composition to cease. It has been mentioned that the usage of alphabetic letters changed mark designs: in a transitory phase the initials of a person's name could accompany the family or base mark or replace the additional strokes and elements of derivation, but ultimately initials and entire names substituted the original marks altogether. The addition of strokes and elements of derivation no longer made sense as all the information needed to distinguish the marks and the persons to whom they referred was already phonetically contained in the letters. This development made the marks more personal and individual, as collective family marks disappeared.

b. Derivation in Deir el-Medina

With regard to the material from Deir el-Medina we are not able to argue for a system in which family marks acted as base marks to be modified by individual persons. There may be one example of what could be considered a family mark, although details on the exact transmission remain obscure: the form appears to be a recurrent element in identity marks related to the family of *Sn-nḏm* (i). Thus, the mark was found on building blocks on the north and south walls of the court of TT1, the tomb of *Sn-nḏm*.[138] This strongly suggests that the building blocks had been marked specifically for his tomb, and was therefore his mark. A different combination of with a second element is or , also dated exclusively to dynasty 19. It was found several times on pottery in the tomb of *Sn-nḏm*, as well as in tomb TT 2, which belonged to *Ḥ^{c}-bḥn.t* (i).[139] The fact that *Ḥ^{c}-bḥn.t* (i) was a son of *Sn-nḏm* (i) supports the allocation of or to him. One of *Sn-nḏm*'s other sons was *Bw-nḫt=f*.[140] A statue of him was found in Puits N 1182, in which we also encounter pottery with the marks , and . Unfortunately, these forms are only known from drawings by Bruyère and it is impossible to ascribe a mark to *Bw-nḫt=f*, let alone a specific modified variant. On the basis of ostracon BM 50716 it was argued above (p. 199 with note 298) that the mark alone being equal to at least on that particular ostracon was in later times still used by a great-great grandson of *Sn-nḏm*, the workman *Nḫ.w-m-Mw.t* (vi) before he became foreman (after which he started using). Although we cannot follow the use of or identity behind either or during the many generations that separated *Sn-nḏm* and *Nḫ.w-m-Mw.t*, we could suggest that *Nḫ.w-m.-Mw.t* may have adopted the mark because of the prominence of his forefather *Sn-nḏm* and his family in dynasty 19 and, related to that, the prominence of the mark in general being possibly related to the office of foreman (p. 173). All in all, while details remain unclear, the mark may have specifically related to the office of foreman in dynasty 19, while it could have been more generally used and passed on within the family of *Sn-nḏm*, having become a mark to identify this foreman as well as his descendants including *Nḫ.w-m-Mw.t*.

Indications of what may perhaps be elements of hereditary mark composition we see in the marks and , and in , and : the horizontal lines added underneath, or crossing the marks and . They were discussed in Part I, chapter 1. If indeed these lines indicate a derivational practice, they are seen predominantly in dynasty 18, the period when the marking system shows least influence of script. But in

[138] See the building blocks 'Bruyère, Sen-nedjem 5.1-5.6' (Database *Symbolizing Identity*); Bruyère, *La tombe no. 1 de Sen-Medjem*, 10.
[139] The provenance is recorded as 'Tomb 2b', or TT 2B of *Nḫ.w-m-mw.t* (vi) in dynasty 20. *Nḫ.w-m-mw.t* was a great-great grandson of *Sn-nḏm*. Davies, *Who's Who at Deir el-Medina*, 26, 51, 73, 172, chart 7.
[140] *Bn-nḫtw=f*; cf. *ibid*., 44.

fact, the occurrences of the variants with added lines are too few to be able to recognize a system or strict rules of derivation.

What kinds of transmission are, then, seen in the marks from Deir el-Medina? Certainly, we see the adoption of marks from fathers by sons without modification. Well-known examples are and used by *Mry-Rᶜ* and *Kɜsɜ*, adopted by their sons *Nfr-ḥtp* respectively *Pn-ᶜnḫ.t* in the exact forms and . Another well-known example is the mark used by three generations in the family of *Jn(j)-ḥr-ḫᶜw* (i). It will be obvious that these marks convey meaning on the basis of phonetic value. As such, they could refer to a workman's father's name, and were used by the sons as a sort of family mark, although without the addition of an element that referred specifically to them. The marks could also refer to a workman's grandfather's name. Because of the fact that a family name was often repeated every second generation, there is in such cases simultaneously a phonetic link to the grandson's name. Instead of adopting an older family mark, a workman could also start using a new mark that was adapted to his own name, to his nickname, or to his function in the crew. Examples are *wnš*, which appears in dynasty 20 as a mark used by *Jmn-nḫt* (xii) nicknamed *Pɜ-wnš*; the change of used by *Nḫt-mnw* (vi) to as a new manner to refer to his newly obtained position as foreman of the crew; or used by the scorpion controller *Jmn-ms* (i); and used by the scribes in dynasty 20. In the case of *Nḫ.w-m-Mw.t* (vi), his former mark was taken up by *Pɜ-mdw.nḫt* (i), who was not related to him. We do not know why he adopted the mark ; perhaps it was simply because it was related to the position in the duty rosters which was filled by *Pɜ-mdw-nḫt* when *Nḫ.w-m-Mw.t* left. We have, then, roughly three kinds of mark transmission or adoption in addition to the suggested examples of individualized family marks: adoption of a mark related to the father's or grandfather's name without modification; adoption of a new mark related to name, nickname or function; and adoption of a new mark related to position in the duty rosters. We do not know to what extent these forms of transmission and adoption were personal choices: were the workmen free to make their own choice, did this choice have to be approved of, or were the marks allocated? By whom would the marks have to be approved or allocated? At least it can be said that with respect to mark derivation and adoption of marks there does not seem to have existed one strict system of rules. There were no fixed elements of hereditary mark composition as seen in Portugal and Brazil; instead, the best connections between mark and workman were sought by means of phonetics, genealogy and semantic creativity that made use of names, nicknames, functions and administrative positions. It may not have been a matter of 'anything goes', but within the limits of the possibilities mentioned there was certainly variation in the reuse of older marks and the adoption of new marks.

In not displaying a strict system of derivation but rather variable manners of adopting a mark, the marks from Deir el-Medina are particularly comparable to the marks from medieval Europe. Another comparison with those marks is seen in the lack of women carrying their own mark, or taking part in the transmission of marks from parents to offspring. In Deir el-Medina, the possession and use of a mark seems first of all to have been related to the work in the Theban Necropolis and the membership of the crew, just as the purpose of professional marks was considered the prime reason for the existence of the marks in medieval Europe. In both cases, the marks could be used for other purposes, also in private context and potentially referring through the workman to his family as well (for instance on domestic or funerary objects), but the marks were first of all carried by the men in relation to their work.

2

THE STATUS AND DEVELOPMENT OF MARKING SYSTEMS IN RELATION TO LINGUISTIC WRITING

Most of the marking systems that were described in the previous chapter predate the widespread use of linguistic writing. The general trend toward an increased linguistic component in marking systems on the one hand, and an overall dominance of linguistic writing in modern society on the other has led western scholars to formulate two general statements about the status of marking systems in relation to linguistic writing:

1. Marking systems are a form of visual communication older than linguistic writing;
2. Marking systems are used by and for illiterate people as an alternative to writing.

In this chapter we comment upon the extent to which these hypotheses are (in)valid.

1 MARKS AND THEIR RELATION TO THE DEVELOPMENT OF LINGUISTIC WRITING

In the Introduction to this dissertation we already objected to the idea that marks would be 'proto-writing', or 'forerunners of writing', because such traditional designations devalue marking systems as underdeveloped and imperfect systems that have yet to reach the status of writing. That is, they do not appreciate marking systems as independent fully-fledged systems of visual communication with their own structures, forms of signification, formal compositions and purposes, and they imply that marking systems are no longer relevant after linguistic writing is introduced. We hope to have shown by now that this idea is incorrect. Yet, then, how do marking systems relate to linguistic writing and the development and increasing presence of writing in society? Departing from the marking systems under study we can extract three hypotheses:

a. Marking systems influence the formal development of a linguistic writing system;
b. Marking systems and writing systems are not related and develop independently. Linguistic writing is rather an alien system that invades a marking system and imbues it with linguistic features;
c. Marking and writing systems draw from the same pool of representations that belong to the cultural repertoire and are available for use as the visual signs of a system of communication.

a. Marking systems influence the formal development of linguistic writing

Although this option has traditionally been considered true as it fits the evolutionary idea of a development from primitive pictures to the ultimate system of alphabetic writing, there is in fact little evidence to support the hypothesis with actual examples from the marking systems under study. The hypothesis departs from the idea that marks are a pool of available signifiers from which a newly developing writing system could either draw inspiration, or select actual signifiers that were given a new phonetic signified and a new functional context within a linguistic system. The only tentative suggestions

that have been made are extremely speculative. Boardman, for instance, remarked that the identity marks from Anatolia and the Persian Achaemenid empire formally resemble the later Brahmi and South Arabian writing systems: 'there are suggestive similarities in the composition of many of the characters and in their overall [lapidary] appearance.'[1] Brahmi and South Arabian scripts would have developed out of the identity marks. Yet, any link between the marks and the scripts is extremely uncertain as the marks' development cannot be clearly followed after the Achaemenid Empire and the earliest development of the scripts is equally unknown.[2]

The hypothesis is also tentatively suggested by Evans Pim for the identity marks from Gallaecia. He places it within the broader theory that relates marks to early tallying and other mnemonic devices, from which a linguistic script would eventually evolve.[3] In his thesis he connects Ogham script, an alphabetical script used by the Celts, to the Gallaecian marks. The majority of Ogham inscriptions has been found in Ireland, Scotland and Wales, carved in stone and dating primarily between the 3rd and the 6th centuries CE. Ogham has thus not been found in Gallaecia. However, the inhabitants of Gallaecia were Celtic people, and Evans Pim does not take the lack of inscriptions in the region as evidence against the idea that a Gallaic form of Ogham was ever developed or in use. He argues that Ogham in its earliest phases could have been recorded on wood of which no examples have survived due to the environmental conditions of the Atlantic region.[4] Multiple theories exist on the origins of Ogham script. Some argue that the origins lie in a tallying system, for instance to record cattle. This view has received support among others from the structural order of Ogham characters in groups of five, which could relate to a numerical system. Others argue that the origins of Ogham rather lie in a more general mnemonic system to record information of various kinds. Early Ogham, in the opinion of Evans Pim, was nonlinguistic and would have served 'as an identity and property mark'.[5] He relates the origins of Ogham to the origins of the Gallaecian identity marks as mnemonic devices that must have been in use already in late Neolithic times. The collections of these mnemonic devices he calls *Corpus Signum Gallaecia*.[6] It would have contained tallying units and devices to record territorial and genealogical information in nonlinguistic manner. It was only later in the northern regions, at least from the 3rd century onwards, that this corpus could have served as a source of inspiration in the formation of an alphabetic script that was developed for the recording of the northern Celtic languages. Although the Gallaecian marks, at least those before the invasion of the Roman alphabet, contain forms that could indeed be said to resemble characters from Ogham script, any relation between the marks and Ogham remains highly speculative. In sum, both the Anatolian-Persian and the Gallaecian corpora cannot support the process of a linguistic writing system that developed out of an earlier system of identity marks.

The idea that marks would lead to the development of linguistic writing is contradicted by the relation between the medieval European marks and the Roman alphabet. The latter predated the use of the medieval marks from the 11th century onwards. It was rather this alphabetic system that gradually began to influence the formal development of the marks, especially from the 17th century onwards.

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[1] Boardman, 'Seals and Signs' in Evans Pim, Yatsenko & Perrin (eds.), *Traditional Marking Systems*, 165, 167.
[2] Although Al-Jallad & Al-Manaser argue to have found an inscription in South Arabian script that dates already to the mid-sixth century and mentions the Babylonian king Nabonidus. This would imply that South Arabian script and the Anatolian marks are contemporaneous, a case that would support our hypothesis 'c' for which see below. Al-Jallad & Al-Manaser, 'A Thamudic B Abecedary in the South Semitic Letter Order' in Butts (eds.), *The Semitic Languages in Contact* (forthcoming).
[3] Cf. Part II, chapter 2, §2.
[4] Evans Pim, 'From Marks to Ogham', *Re:marks* 1 (2013), 115-120.
[5] *Ibid*., 118. He also sees evidence in the use of Ogham as recorded in myths (117-118).
[6] *Ibid*., 96.

b. Marking systems and linguistic writing develop independently

A situation in which a marking system and a linguistic writing system developed independently from different sources, but in which the latter invades the former and increasingly imbues it with linguistic features can be seen in Brazil. The indigenous south American marks have been described as representing mainly pictorial and geometric patterns. The Roman alphabetic letters came from overseas and began to influence and replace the indigenous marks in the towns and villages under European control. Yet, although eventually the indigenous marks disappeared in favor of Roman letters, this was a long process in which the marks used by the white herders were similarly influenced by indigenous traditions: we have mentioned the forms of the *differenças* as possibly having been inspired by the Kadiwéu marks. Most of the original Kadiwéu marks only became replaced by Roman initials from the 1930s and 1940s onwards.

A little more force seems to have been behind the contact between the marking system and the Roman alphabet in Gallaecia. The indigenous pictorial and geometric fishermen marks, whether or not having been a source for characters from the Ogham alphabet, had developed independently from the Roman alphabet in Europe. It was only with the introduction of the alphabet by the state bureaucracy that the latter began to influence the former. Despite strong resistance, the indigenous marks have nowadays disappeared in almost all communities. Whereas Brazil temporarily shows some mutual influence and what appears to be peaceful co-existence of the indigenous marks and the Roman alphabet, in Gallaecia we can rather speak of a more aggressive and enforced invasion of the alphabet.

c. Marking and linguistic writing systems draw from the same pool of inspiration

The situation in which marking systems and linguistic writing systems develop or are used around the same time and in their formal composition draw from the same cultural repertoire of representations is most clearly seen in Egypt. We argue that the earliest marks and linguistic writing developed contemporaneously in the Early Dynastic period from the same repertoire of forms available to the culture. In Part I, chapter 2, we have described the use of potmarks from this period onwards. These potmarks included forms that also gradually developed into signs of linguistic writing, most notably , , , , and . Contemporaneous to the potmarks we find the first dockets and seal impressions with *serekhs* and the first occurrences of linguistic writing. The potmarks on the one hand, and the dockets and impressions on the other represent two different systems of visual communications: whereas the latter developed into hieroglyphic, and subsequently into hieratic script, potmarks never developed into a linguistic system, neither in hieroglyphic nor in hieratic form. They remained in use as marks in nonlinguistic context. While drawing from the same repertoire of forms (forms inspired by natural and celestial phenomena as well as the domestic environment and the religious conceptual world) both systems followed their own developments and transformations from their beginnings onwards. In the potmarks and the dockets and seal impressions we see precisely what Mignolo, who was cited in the Introduction to this dissertation, described as 'co-evolutionary processes':[7] different systems of visual communication following their own courses. This does not mean that both systems remained isolated. There was certainly interaction, to the extent that marks could include signs of writing, and writing systems could embed marks in linguistic context. This interaction explains the observed phenomenon of a

[7] Mignolo in Boone & Mignolo, *Writing Without Words*, 13. See also the Introduction, pp. xiii-xiv.

growing influence of script on marking systems. Such influence is seen in the marks from medieval Europe, which became more heavily influenced by the Roman alphabet in the Early Modern period, as well as in the identity marks from Deir el-Medina. It is precisely the fact that there exists interaction between a tradition of marks and a parallel tradition of writing, both from a common pool of visual communication, that explains changes taking place in the marks; the interaction explains the shift of emphasis toward the domain of Writing as seen in the marks from Deir el-Medina represented in figs. I1-8 and II2-62. The shift of emphasis takes place within the pool of visual communication which is common to both marking and linguistic writing systems. This pool is in fact analogous to Elkins' Venn-diagram of visual communication as it contains forms from all three domains: Writing, Picture and Notation. It is also similar to what Hjelmslev considered purport: the presemiotic, vague, shapeless and indistinct nebula that contains all possible forms and expressions.[8] Marking and linguistic writing systems, once developed from the pool, may grow closer together in form and composition. However, the Deir el-Medina marking system clearly shows that a difference between them remained in structure and system. Despite the development out of a shared cultural repertoire of visual representations, and the formal resemblances of single marks and signs of writing, the marks remained nonlinguistic in their structure and context of use, while hieroglyphic and hieratic writing remained linguistic in structure and context of use.

2 CONCLUDING REMARKS

The three hypotheses can be summarized in three schematic models. Hypothesis 'a' is represented in fig. III2-18a. It shows a development from marks serving as a source of inspiration to writing systems. Although the use of the marks does not necessarily cease, the development of writing is considered to come forth from marks that served a more primitive purpose of tallying systems and mnemonic devices. Hypothesis 'b' is represented in fig. III2-18b, which shows marking systems and linguistic writing as two isolated developments from separate sources. Linguistic writing, however, invades the marking systems from outside influence or pressure, and imbues them with linguistic signs until eventually the original marking system in its own right ceases to exist. Hypothesis 'c' represented in fig. III2-18c appears to be the most natural development of linguistic writing and marking systems. Inspired by the natural and domestic environment, by the actual and conceptual world one lives in, several forms of visual communication may develop as parallel systems. These parallel systems follow their own courses and transformations, but may interact and mingle to various extents. In both Deir el-Medina and medieval Europe we see that the interaction became more intensive over the centuries due to a growing presence and knowledge of linguistic script.

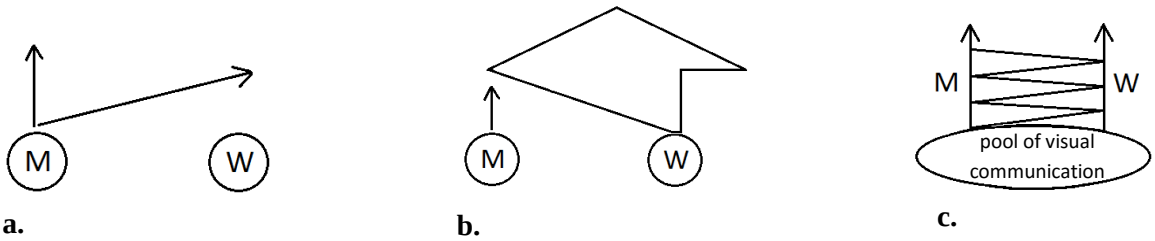


Fig. III2-18a. Marking systems influence the formal development of linguistic writing; **b.** Marking systems and linguistic writing develop independently, but the latter invades the former; **c.** Marking and linguistic writing are two parallel, interacting systems that draw from the same pool of inspiration.

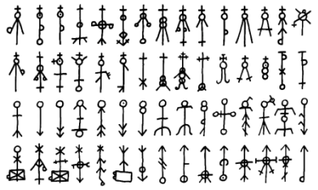
[8] Cf. Part II, chapter 2, p. 130.

One could ask the question why two different systems of visual communication that follow their own courses and transformations would have to develop. Why was it, that one of them, having developed and being available, was not considered sufficient? Several explanations may be suggested at least for the existence and usage of marking systems. First of all, during the course of Egyptian history in general and among the earliest inhabitants of Deir el-Medina in particular, knowledge of linguistic writing was not widespread. That is, the forms of linguistic signs may have been known, as ideograms or symbols (e.g. , ,), but their linguistic structure was known only to the initiated few. Marking systems that do not make use of this linguistic structure, but rather of other semantic connections between form, interpretation and referent, were more universal in that they were available to all degrees of literacy in society. Second, the marking system in Deir el-Medina was an independent system in its own right that could be universally used also in a time when linguistic writing was still absent. It was an alternative system available in the absence of writing. Third, the use of marks may be more efficient than linguistic writing in that they convey several aspects of identity (potentially including origin, profession, lineage, and so forth) compressed into one mark for which only a small surface is needed. As such, one can comprehend their use on small surfaces and in daily administrative tasks. Even those who knew how to write resorted to using the marks as they were available, they were efficient, and they were understood by all. The marking system seems to have been an accepted system of visual communication in the workmen's community and the local administration of the Theban Necropolis. As such, it was truly a system parallel to, yet not isolated from linguistic writing.

In sum, to come back to the two traditional statements on the status of marking systems in relation to writing, the first statement which argued that marking systems are a form of visual communication older than linguistic writing has no overall validity. In several cases it became clear that linguistic writing was already present or just developing at the moment marks were in use. The second statement, which argued that marking systems are used by and for illiterate people as an alternative to writing, does have validity, at least with regard to Deir el-Medina and medieval Europe. Yet, this must not be considered the only reason to use marks: also the literate could resort to marking systems as an efficient and universal alternative to linguistic writing.

PLATE III1-1

WORLD MAP WITH REGIONAL MARKING SYSTEMS



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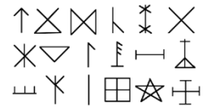

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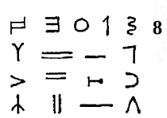

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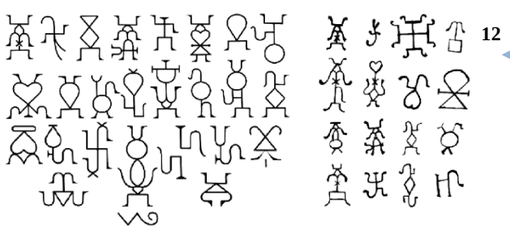

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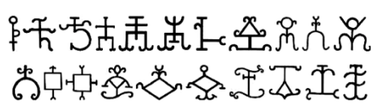

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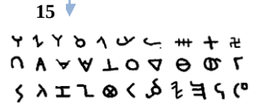

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11.a

11.b

1. Persian masons' marks from Pasargadae, post 547 BC; **2**. Masons' marks from Persepolis, post 547 BC; **3**. Masons' marks from Susa, post 547 BC; **4**. Identity marks on seals and coins from southern and western Anatolia, 6th century; **5**. Tombstone marks Santa Maria a Nova cemetery, Noia; **6**. Votive and pilgrims' marks on chapel doors, Santa Tegra (A Guarda); **7**. Livestock marks of the Lapps, Kautokeino (Norway); **8**. Tuareg livestock marks from the Ahaggar mountains; **9**. Tuareg camel marks and derivations of 4 different tribes; **10**. Sarmatian identity marks, occurring from the Crimea Peninsula to the southern Ural and from the Bosporus to Kazachstan from the Late Bronze Age onwards; **11**. Mongol clan and livestock marks (a) and complementary marks (b); **12**. Clan marks of the Kadiwéu Indians of Mato Grosso (Brazil); **13**. Clan marks of the Wayúu Indians of north Colombia and north-west Venezuela; **14**. Non-alphabetic cattle marks of 'white' herders after colonization in Rio Grande do Sul (southern Brazil); **15**. Masons' marks from Sardis, 7th-6th centuries; **16**. Fishermen's marks from Póvoa de Varzim; **17**. Kazakh clan marks from Sidak sanctuary.

PLATE III1-2 MAP WITH MEDIEVAL EUROPEAN IDENTITY MARKS

1. Cathedral of Geneva, ca. 1170-1240; **2**. Cistercian monastery in Velehrad, Czech Republic, 1210-1240; **3**. Monastery in Visegrád, Hungary, 1484; **4**. Burg Lahr, Schwarzwald, 1220-1240; **5**. Freiburger Münster, first half 14th century; **6**. On stairs of office building in Gerolzhofen, 1614; **7**.Crypt of Cathedral of Trier, 1160-1170; **8**. Ulmer Münster, 15th-16th century. Janse & De Vries, *Werk en Merk*, 49-57.

CONCLUSION

SUMMARY AND CONCLUSION

IN THE FOREGOING thesis we have studied the marking system from Deir el-Medina from three different perspectives. This has provided us with knowledge on the form and nature of the marks and the structure and workings of the system, not only as it functioned in Deir el-Medina, but also as a manifestation of the practice of marking as a universal phenomenon. Here follow a summary and conclusive remarks that provide an answer to the three main questions that were introduced in the Foreword to this thesis.

What is the form and graphic nature of the marking system?

In Part I we analyzed the formal composition of the marking system. We found that it contained marks of various natures, with various degrees of iconicity, or various degrees of concreteness or abstractness all being part of the same system. We proposed that the composition of the marking system could be explained in terms of the three domains that were put forward by Elkins in a Venn-diagram of visual communication, including signs of writing, pictures, and abstract geometric notation. These domains were introduced as supplying any form of visual communication. Every system is a mixed system; when all systems of visual communication are considered to contain elements from the three domains to greater or lesser extent, from some domains more than from others, then divergent forms of visual communication can be relatively defined and compared irrespective of traditional evolutionary notions. Among the Deir el-Medina identity marks we indeed found signs from hieroglyphic or hieratic writing, pictures of concrete objects or beings, and apparently geometric forms. Yet, we also found how fluently the domains run into each other, as signs of Writing in Egyptian script are also Pictures, and especially the geometric notations often appeared to be schematic Pictures or simplified linear signs of Writing (, ,). Purely on the basis of an interpretation of forms in terms of the three domains we discerned a development, or a shift of emphasis in the composition of the marking system from the domains of Picture and Notation toward the domain of Writing taking place between dynasties 18 and 20. In the early workmen's community the system already contained marks from each of the three domains, but only 50% could be considered to have a graphic relation to script, while the other 50% was rather pictorial or geometric in appearance. In general, the marks display a large degree of variation in size, forms and orientation; that is, we see a large range of specimens that relate to one particular mark, or font-type. Among the specimens of one single mark we find, for instance, birds resembling ducks or geese in all kinds and measures, or lotus flowers of all sorts, differing in the form of the flower, the number of leaves and the length and orientation of the stem. A large degree of graphic variation in marks that are of a form which also occurs in hieroglyphic script may indicate that perhaps the sign from script was a source of inspiration, for instance as it was encountered on temple or tomb walls or when it was known as a cultural or religious symbol, but this inspiration was unlikely to be anything more than graphic. That is, whereas in the system of writing consistency and details are important to follow, because the addition or deletion of details makes different signs, the less standardized collection of forms among the 18th dynasty identity marks suggests that it was rather important to convey the *notion* of the object or being represented in the picture, instead of a standard sign with phonetic value. In dynasties 19 and 20 we see the number of marks with forms that also

occur in script increase. In dynasty 20, approximately 80% could be related to the domain of Writing, while approximately 20% could rather be located closer to the domains of Picture and Notation. Not only did marks of a form with an equivalent in hieroglyphic or hieratic script now dominate, they were also more uniform in size, form and orientation. The specimens show more graphic consistency and uniformity in details conform the hieroglyphic or hieratic characters which now appear to act as true *models* onto which the marks were formed. This may indicate that in addition to form they also lent the marks phonetic value. Although data for dynasty 18 are scarce in that we have no hieratic sources and hardly any matches between marks and workmen, it is at least clear that many more marks in dynasty 20 were related to linguistic script and also had a phonetic link to the name of their owners. This phonetic link is also clear in a kind of variation that we only see appearing among the specimens in dynasties 19 and 20: the addition of phonetic complements or group-writings which conveyed part of a workman's name or a word or phrase related to, for instance, his function or provenance. A phonetic link between mark and man was initially the key to the first decipherments of the marks dated to the reigns of Ramesses III and IV. That not all 20th dynasty marks of a hieroglyphic or hieratic form made use of phonetic value became clear from the examples of the pots and jars, and the scorpions. The specimens of these marks show again a large array of graphic variations in the addition or deletion of all sorts of details (one or two handles, spouting water, legs), which may indicate that the precise forms of their hieroglyphic equivalents were insignificant because the marks rather concerned the notion 'pot' and the notion 'scorpion'. This idea, suggested already by Haring in 2009, found support by the knowledge that the mark of the scorpion referred pictorially to the function of scorpion-controller rather than phonetically to the name or function of an individual workman. The degree of graphic variation may, then, serve as a measure that indicates the nature of the relation of a mark to linguistic script: the more uniform its specimens in size, form and orientation, the more likely it was graphically *as well as* phonetically inspired by, or modeled on script.

The shift from the domains of Picture and Notation toward the domain of Writing was not only seen in the forms of marks and specimens, but also in aspects such as the ordering of the marks on the ostraca: whereas in dynasty 18 we still saw apparently unorganized clusters of marks, they were increasingly ordered into lines or columns from left to right or top to bottom similar to hieroglyphic and hieratic script. Also in the addition of contextual information we see an increasing influence of script and a closer cooperation between the marking system and linguistic writing.

In Part I we also studied the origin of the marking system and the question how the marks were created or selected. It was clear from the onset that the marks from Deir el-Medina differed from earlier marking practices in that they were personal marks; that is, they were significant in referring to the individual whereas the earlier potmarks and builders' marks had been significant precisely in the opposite way, in referring to collective identity. While individuality in Egypt was expressed already since the Old Kingdom onwards, we have suggested that this particular expression of individual identity may have been part of a more general focus on the individual, starting according to Assmann already in the transition from the Middle to the New Kingdom in literature, but finding expression in religion, personal piety and art especially from the reigns of Thutmosis III and Amenhotep II onwards. The personal marks from Qurna and the individual masons' marks from Amarna could have been part of the same trend. In other words, the personal nature of the Deir el-Medina identity marks in contrast

to the collective marks from earlier times may have originated only in the New Kingdom. Yet, the *idea* of using marks in general was already as old as the Early Dynastic period, and the Early Dynastic potmarks as well as the potmarks and the builders' marks from the Old, Middle and New Kingdoms may at least have formed a source of *graphic* inspiration. From the earliest potmarks onwards, the ancient Egyptian marking systems can all be compared in form and graphic nature in that they were all composed of marks drawn from the three domains. That is, the Early Dynastic potmarks, the potmarks from later times, the builders' marks from the Old, Middle and New Kingdoms, and the quarry and masons' marks from the New Kingdom onwards were all composed of forms from linguistic script, pictures of objects or beings, and geometric configurations. In particular the builders' marks from the Old and Middle Kingdoms show similarities to the corpus from Deir el-Medina. We have seen a recurrent sign repertoire that appears to have been used at sites from different times and places, yet each time in a particular context embedded within the geographic and temporal limits of a specific marking system. Several signs from this repertoire still appeared as builders' marks in the New Kingdom in the Asasif and at Deir el-Bahri. We considered it plausible that this sign repertoire inspired the earliest marks used in Deir el-Medina of which many are indeed similar. The workmen in the early community might have seen the builders' marks, or worked with them in other projects before the long-term construction works in the Valley of the Kings and the Valley of the Queens were initiated; the age-old and recurrent use of the builders' marks may have inspired their selection as identity marks in the early workmen's community. A clear change, however, was seen with the start of the Amarna period. The marks known from Amarna show few similarities to the marks used in pre-Amarna Deir el-Medina, in form as well as in manner and intensity of use. We concluded that, if indeed the workmen from Deir el-Medina moved to Amarna in the reign of Akhenaton, they apparently did not make use of the same marking system that had been current in Deir el-Medina. They would have continued the practice of using marks, but seemingly less intensively and on a smaller array of objects. After the Amarna period we see the number of different marks used in Deir el-Medina grow rapidly. Some forms might have been inspired by marks known from Amarna, as some new additions show graphic similarities to the marks on talatat blocks. They are, however, so few in number that we cannot draw conclusions from this. Henceforth, it rather seems that the marking system at Deir el-Medina began to lead its own life: increasingly more marks were needed to provide every workman with an identity mark, and these new creations seem to have had their origin purely within the Theban Necropolis, having been specifically created within the frame of the local system. A growing number of marks is increasingly difficult to remember: the most efficient way to achieve this is to create marks on the basis of a mnemonic aid such as a phonetic link between mark and the name of a workman. As such, we may perhaps explain the shift from pictorial and geometric marks to a growing influence of signs of writing. This idea is supported by the increasing presence and use of linguistic script in general from the second half of the 19th dynasty onwards, also in other private and administrative issues. Haring argued that people apparently found out how writing could offer advantages; why not make use of these advantages as *aide-mémoires* in the system of identity marks? The increasing presence and use of linguistic writing explain the greater affinity of the marking system to script.

In sum, to answer the question on the form and graphic nature of the marking system from Deir el-Medina, we can say that from the onset it contained marks of various forms and natures all accommodated within the same system of visual communication. The system was a composition of signs of writing, pictures and abstract geometric forms including schematic linear representations of objects or beings, or signs of writing. With the development of the system over the centuries the nature of this composition changed, placing emphasis more and more in the domain of Writing. This was possibly due to the growing number of marks the system came to collect over the centuries for which a mnemonic aid in the form of phonetic connections between mark and man may have been necessary in order for the system to remain an efficient form of communication.

What is the meaning of the marks and how do they convey meaning?

In Part II we took a closer look at the semiotic nature of the marking system and we studied the manners in which the marks conveyed meaning, for if we were indeed dealing with signs from writing, pictures and abstract geometric configurations, to what extent did they also convey meaning as such? To what extent was the semiosis between mark and workman phonetically or pictorially motivated, or was the connection unmotivated in that the marks were selected or assigned purely on the basis of convention? It was necessary to go through a number of selected semiotic theories to collect the tools we needed to develop a synthetic model that visualized how the marks convey meaning. From the dyadic theories of the sign we learned that the signifier and signified as sign-components, between which semiosis would take place and meaning is generated, are insufficient in any analysis and explanation of meaning. They do not take into account real-world referents to which signs, and in particular the marks from Deir el-Medina, ultimately refer. In order to analyze the marks in their social and historical context of use, and to study the actual 'identity' part in the identity marking system, we needed the workmen to actively take part as referents in the processes of semiosis. We thus soon realized that the basis of our model had to be triadic and the marks had to be analyzed as consisting of Peirce's representamen (form), interpretant (the sense made of the form), and referent (the workman in question). Nevertheless, we extracted useful aspects from the dyadic tradition, among which the idea of multiple layers or levels of meaning and the realization that the relation between the three sign-components can be characterized by the concepts of similarity and contiguity. The concept of similarity leads to metaphoric meaning because metaphor is based on similarity, its essence being understanding and experiencing one thing in terms of another to which it is considered similar. The concept of contiguity leads to metonymic meaning because metonymy is based on contiguity, its essence being to refer to something in terms of something else to which it is directly related or with which it is associated on the basis of a direct physical or causal connection. How the components of a sign relate to each other, and how they thus form a sign together depends on their degree of similarity and/or contiguity. We learned that signs as such can convey multiple layers of meaning which are generated by metaphorical and/or metonymical processes.

In the section on the triadic sign tradition we compared the processes of metaphor and metonymy with Peirce's three main sign functions: the symbolic, iconic and indexical modes of semiosis. These modes appeared to incorporate the processes of metaphor and metonymy. We argued that metonymic conveyance of meaning is based on the indexical sign function in that the representamen of a sign indicates the referent on the basis of a direct connection. Metaphoric

conveyance of meaning is based on the iconic sign function in that the representamen projects certain qualities and characteristics onto the referent because it is considered similar to it on the basis of a metaphoric pattern. We found that in the symbolic sign function the components of a sign are only related to each other on the basis of a convention that is agreed upon. A sign in this mode of semiosis may be conceived of as conveying literal meaning, because its representamen fulfills its function regardless of any similarity or contiguity with the referent. But when such a symbolic sign is used rhetorically in a particular context or for a particular purpose, it is no longer a pure symbol: it is, then, rather an indexical symbol or an iconic symbol in which the metaphoric and metonymic processes come into play again.

These tools – that is, the three sign components of representamen, interpretant and referent; the two tropes of metaphor and metonymy; and the three modes of symbolic, iconic and indexical semiosis – we included in a synthetic model in which we could visualize and explain the semiotic functioning of the Deir el-Medina identity marks along three trails that represented the domains of Writing (the phonetic trail), Picture (the pictorial trail) and Notation (the abstract geometric trail). This model accommodated different degrees of symbolic, iconic and indexical motivation precisely along its three trails as also in its multiple levels of semiosis. Once again in visual form, this was the model as proposed:

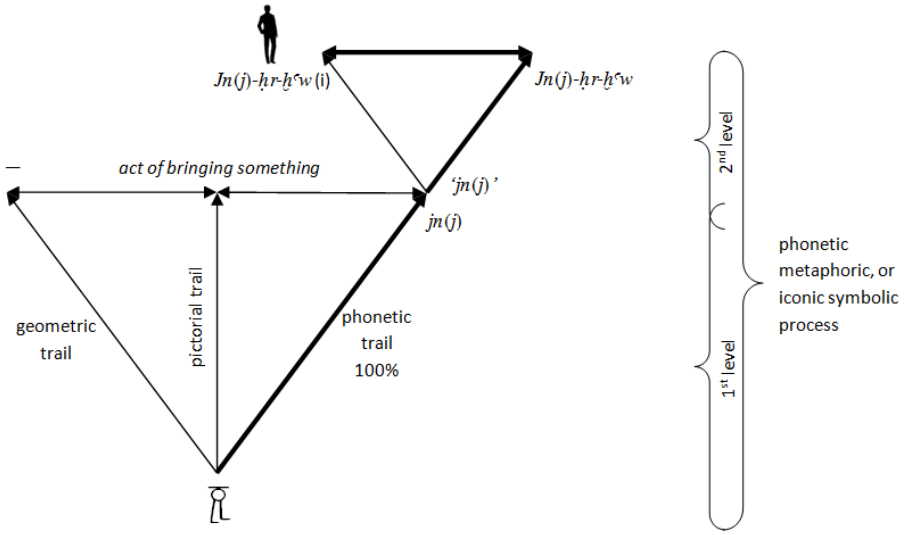

Fig. II2-49 (RPT) The synthetic model with *jn(j)* as example.

The ultimate semiosis of a mark analyzed in this model was the sum of its degree of symbolic, iconic and/or indexical motivation and the processes of metaphor and/or metonymy it made use of. After subjection of several marks to the model we found that they display a wealth of semantic creativity. Many marks, especially those from dynasty 20, the time from which we have most contextual information and matches with workmen, showed the conveyance of meaning simultaneously via multiple trails evoking more than one metaphoric and/or metonymic processes that connected mark to man. The metaphoric and/or metonymic processes were intimately related to deepen and enrich the meaning of the marks. Among the manners in which meaning was conveyed we found:

- Iconic symbols, which conveyed meaning as phonetic metaphors (, pp. 185, 191-192);

- Symbolic icons, which conveyed meaning as phonetic animalistic metaphors (, pp. 185, 192-193);
- Indexical icons, which conveyed meaning as animalistic metaphors supported by a metonymic relation (, p. 186);
- Symbolic indices, which conveyed meaning as pictorial and phonetic metaphors supported by various metonymic relations (, , , , pp. 193-194, 196-197, 186);
- Iconic indices, which conveyed meaning as a metonymy based on phonetic metaphor (suggested for , pp. 195-196).

The marks thus appeared to be complex constructs of metaphor and metonymy especially along the pictorial and phonetic trails in simultaneously iconic, indexical and symbolic modes of semiosis. They are puzzles that attest semantic creativity, and as such they did not merely refer to the identity of the workmen, but also oftentimes revealed details about them such as origin, lineage, function and position.

A disadvantage of the model was that the multiple levels of meaning and their processes of semiosis were represented in a successive, linear, hierarchical manner, while a cognitive study on the organization and functioning of the human brain revealed that this brain does not work in a linear way. The linear representation does not reflect the manner in which meaning is processed in the brain. The brain is rather to be understood as a large, complex network in which many nodes are neurologically connected. They send information to other nodes which fire activation to again other nodes. We found that psycholinguistic studies had revealed that this activation of nodes takes place on the basis of metaphoric and metonymic associations that appeared to be similar to the modes of semiosis. This gave us sufficient reason to make use of a connectionist semantic network in which to accommodate the multilevel modes of semiosis. As such, we visualized them as less linear and hierarchical, and more realistic from a cognitive point of view. The representation of the semantic and phonetic knowledge connected to a workman's identity mark in the semantic network showed which nodes have potential to become activated, but it does not imply that one specific path needed to be followed to get from mark to man. The strength of connectionism networks lies in the fact that they visualize meaning through a pattern of activation distribution over many potential semantic and phonetic feature nodes in an non-hierarchical structure that approaches the nature of cognitive and neurological sensory processing in the human brain in that several processes can and do take place simultaneously.

The simultaneous relevance of different semiotic modes is precisely what explains the mixed nature of marking system. Barthes had already suggested this, explaining the presence of different degrees of motivation in sign systems by means of the 'waggle dance' of bees (pp. 142-143.), but it can now in fact be semiotically as well as cognitively evidenced. We argue that the simultaneous relevance of different semiotic modes, that is different degrees of motivation, is not a special feature of the Deir el-Medina marking system, but a feature of any system of signs in general. Even in a written text this mixture is found. But different systems may place emphasis on different modes, which makes every system a unique composition. As such, different systems of visual communication can be compared as full-fledged systems in their own right.

This does not entail that changes do not take place. We have seen the marking system from Deir el-Medina developing from a system in which the emphasis was spread over the domain of Writing and the domains of Picture and Notation with a ratio of 50:50, toward an integrated whole covering all domains with an emphasis in the domain of Writing. How this change could be interpreted with respect to the relation between the marking system and the contemporaneous system of linguistic writing was part of the third main question which received an answer in Part III.

How can the relation between marks and writing be defined?

In Part I we saw that the earliest use of marks was simultaneous to the earliest use of proto-hieroglyphic script on dockets and seal impressions in the Early Dynastic period. We have argued that both the marks and proto-hieroglyphic script presented two different co-evolutionary processes from their beginning onwards, following their own courses and developments. They were used for different purposes, and where the dockets and seal impressions turned to hieroglyphic and hieratic writing, the potmarks never adopted a linguistic structure and always retained marks of various natures in their graphic composition. In Part III we took a closer look at marking systems from other times and places and found that there were certain universal principles in formal composition, their multi-purpose nature, as well as in their manner of formal development throughout the generations. As regards the status of marking systems in relation to linguistic writing it appeared that most marking systems include from their beginning onwards marks that can be related to each of the domains of Writing, Picture and Notation. Where a system of linguistic writing develops as well, or comes to be deployed under cultural contact or administrative pressure, it influences the marking system and may, as we have seen, gain a large share in it. We suggested three hypotheses on the relation of marking systems to linguistic writing and the development and increasing presence of writing in society. The first, which entailed the traditional idea that marks are a primitive form of writing in that marking systems influence the formal development of a linguistic system appeared to be untenable. On the basis of the marking systems under study we have in fact no evidence of a marking system clearly predating a writing system and being the catalyst to its development. The second hypothesis, which claimed that marking systems and writing systems are not related and rather develop independently until contact between both is established or enforced, and the latter invades the former imbuing it with linguistic features, could be argued for the cases of Brazil and Portugal. The third hypothesis, however, which claimed that marking and writing systems draw from the same pool of representations that belong to the cultural repertoire and are available for use as the signs of systems of visual communication, appears to represent the most natural situation in which marking and writing systems develop. It is precisely what is seen in Egypt in the simultaneous appearance of potmarks and proto-writing. The pool of representations includes pictures of objects or beings that were inspired by the natural and domestic environment of a people, by celestial phenomena and the cultural and religious conceptual world, as well as by a range of universal geometric elementary forms from which more complicated compositions could be constructed. From this pool, marking systems and writing systems could equally draw, but from the moment they do so the marks and signs of writing are used in different structures, nonlinguistic respectively linguistic. Within these structures they follow their own courses. Marking and writing systems that develop as such are never in complete isolation: there is interaction which may cause a greater or lesser influence of linguistic writing onto the marking system. In Deir el-

Medina we saw that the interaction became stronger in the course of dynasties 18 to 20. Yet, no matter how strong the similarities between marks and writing are in the size, form and orientation of specimens, or the ordering of marks in lines or columns conform script, or the combination with phonetic complements and other linguistic contextual information, the marking system remained nonlinguistic in its formal composition and semiotic functioning – that is in its graphic and semiotic nature. Hieroglyphic and hieratic writing, on the other hand, remained linguistic in their formal composition and functioning.

In sum, we argue that the relation between marking systems and linguistic writing can be defined in terms of co-evolutionary processes that draw from the same pool of representations, but from the beginning onwards follow their own courses and developments, being used within their own particular contexts. In an answer to the question why, then, different systems of visual communication would have to develop and why one, being present and available for use, was not considered sufficient, we may argue that at least the marking system offered particular advantages in being more universally understood and in being universally applicable also in the absence of linguistic writing. Marking systems are furthermore more efficient in conveying several aspects of identity (including potentially information on origin, lineage, or profession) in a single form to be easily and quickly used on small surfaces and in daily administration. In other words, marks are efficient to use in time and space, they convey complex semantic concepts and messages in one single form, are understood by all members of a community, and are universally applicable as systems in their own right, existing independently also when linguistic writing is absent. As such, the marks function as necessary tools in society. It is therefore that we may credit Gottfried Wilhelm Leibniz, who was quoted at the beginning of this dissertation, as he already recognized that 'in the process of reasoning, signs fulfill the function of useful and necessary tools since they serve as an 'abbreviation' of the more complex semantic concepts which they represent'.[1]

[1] Gottfried Wilhelm Leibniz, paraphrased by Nöth, *Handbook of Semiotics*, 22.

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