

The ‘Writing of the Birds’

Sorting Iconic Variation through Decipherment in Egyptian Hieroglyphs

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Abstract. The conference’s leading issue — whether the identification of allographs necessarily presupposes the linguistic analysis of a decipherment, or whether an understanding of graphic variation can in fact inform that decipherment — is, we argue, on the basis of Egyptian hieroglyphic writing, best approached by inverting it: the distinction between allograph and distinct sign is not the *precondition* of decipherment but a *categorisation it produces*. Egyptian hieroglyphs offer a revealing case, because they are at once images and signs of writing, so that a visible difference between two signs is very often an iconic difference — more or fewer details, a different posture, an added attribute — whose linguistic pertinence is rarely self-evident.

Our argument proceeds in three steps. We first survey the kinds of variation a figurative script exhibits — partly externally conditioned (a single writing system realised in coexisting norms; further modulated by medium, diachrony, diatopy), partly internal to the system (logo-phonographic economy, open specification of the signified, polygraphy, mutual interferences, and graphic dissimilation). The common thread is that a visible difference does not wear its semiotic status on its face.

We then turn to Champollion’s decipherment. Two apparently contradictory but complementary movements were at work. He demanded an ever more faithful rendering of the sources, which made the variation *visible*. He then identified which differences were *pertinent*, pre-eminently through the hieratic cursive, whose equivalences with the hieroglyphic forms he established on purely formal grounds *before any reading was assigned*. The hieratic case illustrates what we call *de-iconization* (in a strictly formal sense): figurative shape recedes while graphemic value is preserved. Form and function are independent dimensions — the principle that, through Knorozov, became the working maxim of every later decipherment.

What a decipherment produces, finally, is a *categorisation* imposed upon a gradient of iconic variation, and the categories it builds are of two *orthogonal* kinds: a graphemic inventory of classes individuated by linguistic value, identified by commutation, and a grammemic inventory of classes individuated by visuo-spatial values. Any repertoire that would fail to take those two dimensions into account would inevitably misrepresent the script. The Thot Sign List is an attempt to operationalise this distinction and is offered less as a finished product than as a model to follow for the figurative scripts that still await decipherment.

1. Introduction

In the medieval Arabic reception of the hieroglyphs, the script was sometimes called *qalam al-ṭayr*, “the writing of the birds” — one of several names (alongside *al-qalam al-barbawī*, “the script of the temples”, or *qalam kāhinī*, “the priestly script”) under which it was perceived from the outside. This label is explained by the sheer number of birds (Figure 1) discernible in this figurative system (Desclaux 2025; on the Arabic reception more broadly, see Ducène 2020, 2022, and Winand 2022; On the Egyptian origins of this phenomenon: Quirke 2017, Quack 2024).



Figure 1. Abū al-Qāsim al-ʿIrāqī (British Library, ms. 25724, fol. 50v.)

A treatise entitled *Kitāb Shawq al-mustahām fī maʿrifat rumūz al-aqlām*, literally “The Book of the Lovesick Devotee’s Longing to Know the Symbols of Scripts” under the name of Ibn Waḥshiyya (an attribution now widely doubted) describes hieroglyphic writing as made up of instruments, trees, plants, birds and parts of birds, planets and stars: so many figures that, in its telling, the script became as innumerable as those of the Indians and the Chinese (Winand 2022, p. 76).

The designation is more than picturesque. To an eye that cannot read them, the hieroglyphs present themselves first as a teeming aviary — a surface of recognisable figures, among which birds are especially conspicuous — and on that surface nothing looks more like a bird than

another bird: whether two such figures are two shapes of one and the same writing sign, or two distinct signs altogether, is precisely what the untrained eye cannot decide.

The contrast with a script we *can* read is instructive. In a familiar alphabet we settle the question without a second thought: a and *a* are two shapes of a single letter, whereas a lowercase <l> and a capital <L>, however alike they may appear on the page, are not confused in context: *Irreal*. Yet this knowledge is parasitic upon our ability to read: we sort shapes into signs because we already know the values those signs carry. Take that knowledge away — face the aviary once more — and the question becomes genuinely hard.

This is precisely the question that the present meeting addresses. Does distinguishing a graphic variant (an allograph) of a sign from a distinct sign endowed with a different value necessarily presuppose linguistic analysis, and therefore decipherment? Or can a closer, more nuanced understanding of graphic variation in its own right contribute to the work of decipherment? In deciphered writing systems the matter has, for the most part, been settled; in undeciphered ones it remains open. Our wager is that bringing the two situations into dialogue is illuminating in both directions.

We approach here the question from the vantage point of a *figurative* script: Egyptian hieroglyphic writing. Hieroglyphic signs are at once images and signs of writing (Laboury 2022), and their strong iconic dimension is cultivated by the Egyptian cultural environment (Houston & Stauder 2020). Because of this double nature, the problem of variation takes on a particular shape. A visible difference between two signs is, very often, an *iconic* difference: more or fewer details, a different posture, an added attribute, a fuller or sparer rendering of the same creature or object. And it is rarely self-evident whether such a difference is linguistically pertinent or not. Examples of the “bowing man” (𓂏 A16, see <https://thotsignlist.org/mysign?id=234>) collected by Meeks (2013, p. 40) clearly illustrate the problem of where to put the boundaries (Figure 2).

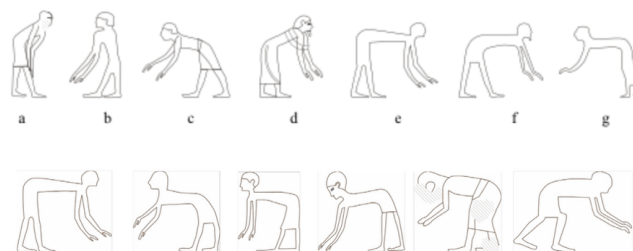


Figure 2. Allographs of 𓂏 A16 (a–g) identified by Meeks (2013) and tokens of the type (e)

Iconicity, in other words, is at once the glory of the system and the source of its principal puzzle. A figurative script is therefore not a marginal case but a revealing one: it stages, with unusual clarity, the very question the conference poses. To address it we will keep technical apparatus to a strict minimum in this first, descriptive part, introducing it only as the argument requires. One plain distinction suffices for the moment, that between a concrete *token* (a single written occurrence), which we will neutrally call a *glyph*, and the *sign* it instantiates.

Our argument proceeds in three steps. We first lay out, as accessibly as we can, a typology of the kinds of variation that a figurative script exhibits, surveying the full range of factors — external and internal — that make Egyptian writing vary, and showing how each kind of variation bears on the question of sign identity. We then turn to a historically attested case in which precisely this sorting was accomplished: Champollion's decipherment. There, two seemingly contradictory but in fact complementary movements were at work — making graphic complexity *visible* through ever more faithful sources, and identifying the *pertinent traits* that separate signs from their variants, notably by way of the hieratic cursive. Finally we generalise. Decipherment is, among other things, an operation of categorisation imposed upon a continuum of graphic variation; and we argue that contemporary digital sign repertoires — the *Thot Sign List* (<https://thotsignlist.org>) among them — must encode and analyse written variation rigorously if they are to serve philology, grapholinguistics, and the semiotics of writing in general.

2. Graphic variation in a figurative script

In Egypt, a single writing system was realised in several coexisting norms, selected according to the medium, the genre of the text and the degree of sacredness attached to it: the monumental hieroglyphic norm, the hieratic cursive and, from the first millennium BCE, the Demotic script. Each of these norms in turn displays a wide range of formal variation, conditioned by factors that are diachronic, diatopic, diaphasic, diathematic, and so on.

Beyond such external causes, however, the very structure of the writing system generates a variation that is inherent to it. Characterised by their strong iconicity, the polyfunctional hieroglyphs form an open repertoire. Compounding the variation produced by other factors, this fluidity makes the strict categorisation of scriptural elements even more complex. While it particularly concerns semograms, it can affect all signs in elaborate, playful, or self-reflexive forms of writing, such as enigmatic writing. Together these characteristics make it difficult to

establish strict criteria for defining or distinguishing one sign from another, or a sign from a variant.

It is convenient to organise the present survey along two axes. The first gathers the factors that condition variation from *outside* the system proper — the dimensions along which the norms of writing vary, and through which the material support prefigures a scribe's choices (§2.1). The second concerns the variation that the system generates *internally*, from its own logo-phonographic economy and the openness of its repertoire (§2.2). We then take stock of what all these cases have in common (§2.3).

2.1. Variation conditioned by support and norms

Writing parameters such as the writing medium and the context of inscription as well as diachrony and diatopy of course shape the graphic rendering of signs. Although these variations can be significant, they are nevertheless controlled: the Egyptian writing system remained broadly stable over several millennia, ensuring a degree of continuity in the understanding and transmission of texts. Seen in this light, the “external” factors are so many dimensions along which the norms of the script vary, and through which the support predisposes and orients (Klinkenberg & Polis 2024) what is written upon it.

2.1.1. Medium, technique, and written norms

As with any form of writing, and all the more so with handwriting, the medium employed and the technique of inscription play a definite role in the rendering of the characters (Figure 3). Texts carved in quarries exhibit a more linear ductus than those painted in ink, while monumental reliefs are generally more detailed than texts on papyrus. The choice of medium, and of a more or less iconic style, reflects standards that are more or less sacralised depending on the type of text.



Figure 3. Engraved vs. painted hieroglyphs on stelae (Paris, Musée du Louvre. Engraved: IM 3081, N 421 94, Cat. 53, © 2012 Musée du Louvre / Département des Antiquités égyptiennes. Painted: IM 2854, N 421 296, Cat. 234, S 2090, © 2005 Musée du Louvre, Dist. GrandPalaisRmn / Georges Poncet).

Egyptian writing can take two main forms that are broadly correlated with the medium employed: hieratic, a cursive form prototypically associated with portable media, and hieroglyphs, which share their representational conventions more closely with those of iconography. Between those two norms, several intermediary writing styles, usually gathered under the label “linear hieroglyphs” (Konrad 2022) are attested (Figure 4).



Figure 4. The same spell (BD 23) written in three different norms.

Painted hieroglyphs: tomb of Inherkhawy, TT 359, Cherpion & Corteggiani 2010, vol. 2, pl. 79. Linear hieroglyphs: papyrus of Pinedjem I, Cairo, Egyptian Museum, SR VII 11488, CG 40006, courtesy Dik van Bommel, ushabtis.com. Hieratic: papyrus of Nestytanebetisheru, London, British Museum, EA 10554, 12 © The Trustees of the British Museum.

These norms are, however, instantiations of a single system (Figure 5). This point will prove decisive in Part 2: because the hieratic cursive renders the same signs in a formally reduced, less figurative manner, the equivalences between hieratic and hieroglyphic forms offer a privileged vantage point on which features of a sign are, and which are not, essential to its identity.

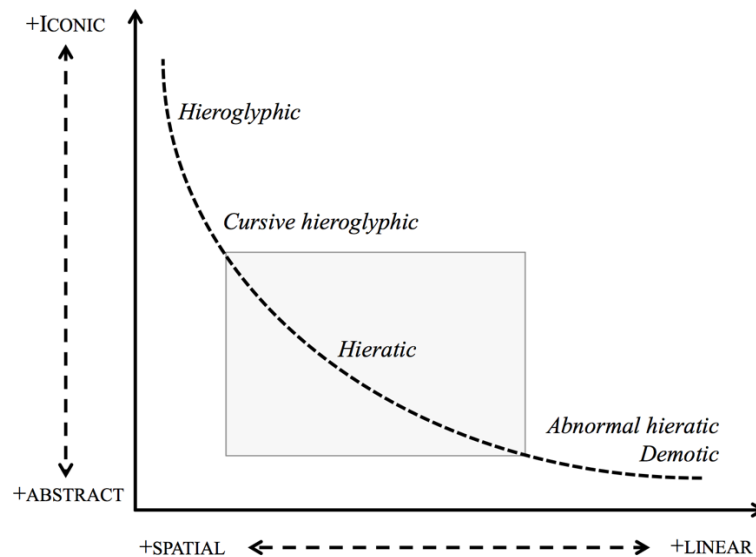


Figure 5. A schematic distribution of the norms of writing in Ancient Egypt (Polis 2020, fig. 1)

The hieroglyphic norm generally allows for the inclusion of more details, yet other signs or variants of signs exist only in hieratic, such as  B37, rendered as the hieroglyph  based on the drawing on an ostracon from the Museo Egizio (Figure 6).



Figure 6. Ramesside figured ostracon (Deir el-Medina; O. Turin Cat. 7052), depicting a dancer in an acrobatic position

The sign-shapes  and , both transcribed with  in hieroglyphs on the Prisse Papyrus (BnF, Manuscrits Égyptiens 183–194) is another example where hieratic distinguishes two different words for “old”, where the hieroglyphic norm does not. The situation became even more complex during the first millennium BCE with the development of new cursive forms

— abnormal hieratic and then demotic — which replaced hieratic in the administrative and subsequently the literary spheres, thereby accentuating its sacred character by emphasising its links with religious texts.

2.1.2. *Diachrony and diatopy*

Used throughout the sphere of Egyptian influence over a broad chronological span (3rd millennium BCE – 4th century CE), Egyptian writing naturally exhibits diachronic and diatopic variation. Owing to the unity of representation between the scriptural and the iconographic systems, this variability partly overlaps with stylistic variation: the treatment of bas-relief, for example, is one of the primary visual characteristics distinguishing the inscriptions of temples in the Ptolemaic and Roman periods. Each corpus is, however, also characterised by peculiarities of sign repertoire and by features of its own — the presence of highly specialised signs in the Pyramid Texts of the Old Kingdom, the combination of generic classifiers at the end of words in the hieratic texts of the New Kingdom, the extensive expansion of the repertoire in Greco-Roman temples, and so on. Diatopic variation is less apparent, particularly during periods of centralised power; nonetheless, regional trends can be identified, notably in the First Intermediate Period (Seyr 2023).



Fig. 7. Late 6th Dynasty (c. -2300) vs. Ptolemaic (c. -250) stela with a comparable offering formula

(Paris, Musée du Louvre. Left: E 3135, C 160, Anastasi n° 35, © GrandPalaisRmn (musée du Louvre) / Franck Raux.
 Right: N 268, AF 35, CC 458, C 117, © 1996 Musée du Louvre, Dist. GrandPalaisRmn / Christian Larrieu).

2.2. Variation internal to the system

Beyond these externally conditioned variations, the functioning of the system generates variation of its own. Two features are decisive: its logo-phonographic economy (§2.2.1) and the openness of its semographic repertoire. The latter is by far the more prolific source, and we examine its workings in turn — the open specification of the signified (§2.2.2), the polygraphy of frequent morphemes (§2.2.3), the interferences between neighbouring signs (§2.2.4), and the graphic dissimilation of generic signs (§2.2.5).

2.2.1. The logo-phonographic economy: “orthographic” variation

Within this logo-phonographic system, Egyptian hieroglyphs can take on or combine semographic and phonographic functions (Table 1).

	+ SEMOGRAPHIC		- SEMOGRAPHIC
AUTONOMOUS	Pictogram	Logogram	Phonogram
NON-AUTONOMOUS	Classifier	Morphogram	Interpretant
	- PHONOGRAPHIC	+ PHONOGRAPHIC	

Table 1. The main semographic and phonographic functions of hieroglyphs (Polis 2018)

As phonograms, they represent one or more consonants or a long vowel; as semograms, they refer to a more or less precise signified, or even to a specific lexeme.

Despite the existence of standard notations (“orthographic” regularities), this system allows for considerable flexibility in the choice of signs used to write a lexeme. A strictly phonetic notation may employ various combinations of single-consonant or multi-consonant signs. Such a phonetic notation is generally followed by a semogram that marks the end of the word and indicates the conceptual category to which the term belongs (𓂀 ABSTRACT TERM, 𓂏 MULTICOLORED / SPOTTED / MAMMAL, 𓂐 GOD...); this sign is then described as a determinative or classifier (Goldwasser 2002).

Some of these semograms, however, can be highly specialised, or even refer to a single lexeme. They can then be used both as a determinative/classifier and as a logogram denoting a specific term on its own. The term *’by* “leopard” can thus be written using only the phonetic notation 𓂏𓂏𓂏; it often appears in the form 𓂏𓂏𓂏𓂏, where the phonetic spelling is followed by the generic classifier 𓂏. The notation 𓂏𓂏𓂏𓂏 is also encountered, where the sign 𓂏 is a specific

classifier for the leopard. But the term can also be written using this sign  alone, as a logogram, without changing the reading 'by "leopard."

In addition to this internal flexibility within the hieroglyphic system, certain texts adopt specific orthographic principles known as “enigmatic writing” (Polis & Seyr 2023). The spellings of these texts represent a deliberate departure from standard writing conventions — whether through the restriction of the number of signs that aid reading, through the expansion or, conversely, the restriction of the sign repertoire — thereby broadening the range of possible interpretations. Certain texts, such as the *Book of the Amduat*, present both a standard version and an enigmatic version of the same passages (Figure 8).



Figure 8. Enigmatic writing in the Tomb of Thutmose III

Enigmatic writing may provide signs for certain phonetic value (e.g.  =  for *r*;  =  for *f*;  =  for *s*;  =  for *n*;  =  for *k*;  =  for *p*) or, conversely, considerably reduce the usual graphic variation of Egyptian texts by replacing, for example, all the signs representing birds and bearing distinct readings ( *m*,  *ʾ*,  *w*,  *bʾ*...) with the single generic bird sign  (shoveler).

2.2.2. An open semographic repertoire

Semograms can exhibit virtually unlimited variation in order to convey additional semantic nuances (Collombert 2022a–b; Thiers 2022). Hieroglyphs representing the king may or may not feature different sceptres (, , , ) and crowns (, ), or may show him seated or sitting on a throne, so as to place more or less specific emphasis on different aspects of his power without altering the linguistic interpretation.

The same phenomenon is observed with deities: the name of the god Amun allows for a phonetic spelling  *Jmn*, sometimes supplemented by a generic divine classifier  to give

𓂏𓂐𓂑. A semogram specific to the god may also be used as a classifier, 𓂏𓂐𓂑𓂏, or as a logogram, 𓂏 *Jmn*; this semogram, too, has a large number of variants depending on the attributes the god does or does not hold.

The semographic system is open and, in theory, infinitely expandable, as demonstrated by the creation of certain rare or unique signs. The unusual semogram of the hunter — a man holding a dog on a lead — appears, for example, in a single instance on the Chapel of Metjen (Figure 9), in a version in which the hunter is kneeling (Berlin, ÄM 1105).



Figure 9. Standing vs. kneeling variants of the “hunter” semograms in the Chapel of Metjen (Old Kingdom).

Berlin, ÄM 1105, https://upload.wikimedia.org/wikipedia/commons/0/07/Mastaba_-_tomb_of_Metjen_from_the_Old_Kingdom_04.jpg

The temple of Sety I at Abydos, for its part, features a unique semogram denoting the word “to spread one’s wings” (Figure 10), depicting a man with outstretched wings (A340).



Figure 10. Sign A340, Temple of Sety I at Abydos (TSL_1_550, token TSL_3_26610). © Philipp Seyr

A passage from the stele of Pasherenptah III highlights the openness and fluidity of the semograms used in Egyptian writing (Figure 11).

[*hr wrr*].*y.t=f wnn nsw ds=f s'ḥ' wrry.t=f*

(the king came out of the temple of Isis) [**on**] **his chariot**, then the king himself **stopped his chariot**.

This passage mentions the king's chariot twice. On the first occasion, the king emerges from the temple in his chariot. The word “chariot” (*wrry.t*) is written using a phonetic spelling followed by a semogram, used as a determinative/classifier, representing a chariot drawn by galloping horses. On the second occasion, the text describes the chariot coming to a halt. Since the phonetic reading was established at the beginning of the line, the lexeme is this time written using the semogram alone, without any phonetic notation. In addition to the lexeme, however, the iconic dimension of this logogram encodes additional information about the referent: the sign used in this second instance depicts the horses at a standstill rather than galloping, and thus contrasts in two ways with the previous attestation — logogram vs. classifier/determinative, stationary chariot vs. galloping chariot — raising the question of the level at which such graphic variations should be treated.



Figure 11. Stela BM EA 886 (1026, the “Harris” Stela), l. 10

(© The Trustees of the British Museum)

While it enriches the semantics of the texts without, in most cases, posing any specific reading difficulty, this wealth of variation therefore presents a problem when one tries to present the hieroglyphic repertoire systematically. What criteria should determine whether tokens with different characteristics belong to two different signs, or to two classes of the same sign? Beyond the wish to categorise, these questions are crucial in the context of digital encoding in textual databases: too strict a separation of the different instances of a sign may obscure connections

between terms exhibiting minimal graphic variation, while, conversely, standardisation may obscure significant specificities. We return to this practical stake in Part 3.

2.2.3. *One morpheme, many signs: the suffix pronoun =j “I, my”*

The notation of the first-person suffix pronoun =j “I, my,” an extremely common morpheme, is a striking example of what may be called *polygraphy* — the rendering of a single linguistic unit by a wide and open set of distinct signs. This pronoun likely corresponds to a single vowel, and thus admits a rare phonetic notation $\text{ɰ} = j$. However, since vowels are usually not written in Egyptian, the pronoun is most often indicated solely by the presence of a classifier. The most common and generic of these is the seated man . Depending on the person to whom the pronoun refers, it may be indicated by the sign for a woman , for a god — generic ( or ) or specific (e.g.  or ) — or even for a king, again with virtually unlimited possibilities in the choice of crowns and sceptres (, ,  ...).

The fact that a single morpheme is represented by such a wide range of hieroglyphs might give the impression that all these signs are equivalent, appearing as graphic variants of one another that merely provide semantic precision. Their fluidity and multifunctionality, however, preclude so simple an analysis. In addition to the first-person pronoun, these signs can in fact denote or classify other words, other pronouns, but also more specific lexemes — *s.t* “woman” for the sign , *nsw* “king” for the sign , and so on.

2.2.4. *Overlaps and interferences: conceptual affinities and the fluidity of categories*

While each token possesses unique features, it can be linked to a sign through a combination of specific characteristics that contrast with those of others within a network of signs. Yet defining a sign through contrastive criteria is also problematic, for signs within the network can influence one another and exchange characteristics, creating overlaps between categories.

The performative nature of Egyptian images — and therefore of Egyptian writing — encourages the neutralisation of depictions of malevolent beings. Words denoting enemies thus most often feature a semogram representing an enemy in bonds ( A13). During the Old Kingdom (3rd millennium BCE), they can also be classified by the depiction of a foreigner. Terms denoting death generally employ a semogram depicting a figure from whose head a stream of blood flows ( A14, often reinterpreted as a figure with an axe embedded in the head; see de Spens 2022).

During the 2nd millennium BCE the signs influence one another (Figure 12), and the situation grows more complex: the enemy can be dead or decapitated, while the dead person is sometimes assigned foreign iconic markers, thus matching the image of a neutralised enemy. Although they are usually considered distinct signs for historical reasons, the signs  A13 and  A14 can both feature fairly similar variants depicting a dead and chained figure characterised by foreign iconic markers from the 2nd millennium BCE onward. This kind of example makes it difficult to link tokens to a specific sign.

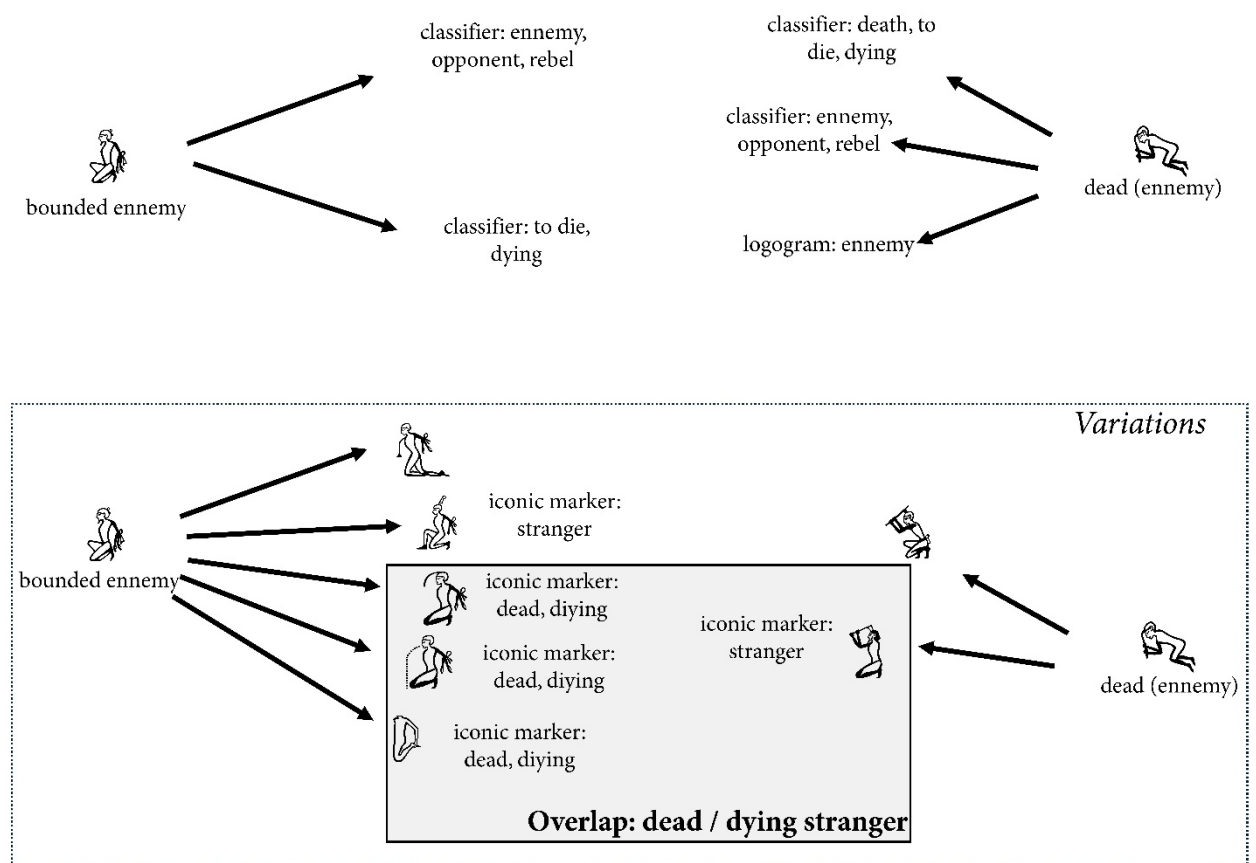


Figure 12. Is a good enemy (only) a dead enemy? Overlaps between  A13 and  A14

2.2.5. Graphic dissimilation

Conversely, certain similar signs, usually regarded as equivalent, may — when combined — reveal contrasting iconicity and be interpreted in different ways. Lists of offerings, for instance, most often refer to cuts of meat and poultry by means of the generic signs  and . Some lists from the Old Kingdom, however, itemise cuts of meat in greater detail, and thus distinguish, for example, between different types of geese and cattle by means of details regarding the beak and the shape of the horns (Figure 13), a process known as “graphic dissimilation” (Posener 1934) or “dissemblance graphémique” (Thuault 2020a).



Figure 13. Graphic dissimulation for cuts of meat and poultry (Junker 1929, pl. 17b)

2.3. Taking stock: at what level does a difference matter?

The cases surveyed above do not all behave alike. Some visible differences are linguistically inert: whether the king holds one sceptre or another leaves the reading untouched. Some carry additional semantic nuance without changing the reading: the galloping and the stationary chariot spell the same word *wrry.t*, yet the second encodes contextual information the first does not. Some become distinctive only in a contrastive setting: the detailed rendering of a goose's beak signifies a particular species only once the offering list sets several birds side by side. And some signal genuinely different signs:  and  may share the value of the suffix pronoun =*j*, but each carries further values the other lacks.

What these cases have in common is that, in a figurative script, a visible — and most often iconic — difference does not wear its semiotic status on its face. The same kind of difference may be irrelevant, may carry meaning of one kind, or may carry meaning of another kind altogether. The descriptive richness surveyed here therefore poses, with unusual sharpness, a single question: at what level is a given graphic difference pertinent? This is precisely the question that the decipherment of the hieroglyphic script had to answer — and it is to that historically attested operation of sorting that we now turn.

3. Champollion, or how a forest becomes a script

Before such sorting could begin, the script had first to be freed from a tradition of reading that made the very question of sameness and difference between signs ill-posed. From Late Antiquity to the eighteenth century, the dominant interpretive frame for the hieroglyphs was symbolic. Its headwater was Horapollon's *Hieroglyphica* (Figure 14), recovered around 1420, which fed the Renaissance encyclopaedias of symbols (Valeriano, Ripa) and culminated in Athanase Kircher (Winand 2022b), who could expound a royal cartouche “at a single glance” (*uno intuitu*) as a mystical proposition — where it in fact merely spells the name Apries (David 1965, pp. 47–48). What ran through these sign variants was a single assumption: that the sense of a hieroglyph could be read directly off its figure, and that the script therefore had

little or nothing to do with an actual language. And what made the hieroglyphs so resistant was precisely their figurative form, which generated two opposite verdicts — for some a “mysterious symbolism”, for others an “unelaborated notation” of things — both of which detached from a language (David 1965, pp. 12–13, see also Kim 2013).



Fig. 14. Horapollon, *Hieroglyphica* (Kerver edition, 1545, p. 111a)

The problem thus had two entangled dimensions, one *formal* and one *functional*: the figurative shape of the signs on the one hand, and the value attributed to them — symbol, idea, or sound — on the other. The symbolic tradition inferred the second directly from the first (figure → symbol), and so excluded phonography, and more broadly a direct relation with a specific language, in principle. Even the most acute critics of the eighteenth century kept the two planes entangled: Barthélemy for instance clearly connects the two dimensions when he states (David 1965, p. 107): “Les hiéroglyphes, étant des signes représentatifs des idées, différent essentiellement des lettres [i.e., the hieratic norm] qui ne sont que des signes représentatifs des sons”.

Champollion’s decisive move was to dissociate these two planes. Once he could show that a figurative sign could be connected to words of the spoken language, and that the system was

“figurative, symbolic and phonetic at once”, the figurative dimension ceased to be regarded as a defect. He thereby refuted two symmetrical errors — a purely symbolic notation of ideas that excludes all reading, and a purely representational one — both of which presuppose a “synthetic” procedure, whereas writing proper rests on the analytic linkage of signs to the sounds and words of a language (David 1965, pp. 130–133; Polis 2022a–b). It is telling that Champollion himself described in his *Précis* (1824, pp. 255–256) a hieroglyphic inscription as “un véritable chaos” in which the most opposite objects are brought into immediate contact and produce “monstrous alliances”, and yet whose “caractères tellement diversifiés dans leurs formes [...] constituent ainsi une véritable écriture”. The forest is real; so is its order. The decisive step was not to see *more* in it, but to learn which differences and variations were pertinent — and to which level each of them belonged.

This is where Champollion’s achievement bears most directly on the question posed by this conference, for he produced the sorting of variants and distinct signs that the decipherment is so often assumed merely to presuppose. He did so, moreover, through two movements that look, at first sight, contradictory. On the one hand, he depended on — and demanded — an ever more faithful rendering of the ancient sources, in all their iconic details, which made the full extent of the variation *visible*. On the other, he learned to recognise which of those visible differences were *pertinent* to the identity of a sign and which were not — a discrimination for which the hieratic cursive proved to be the essential instrument. The two movements are in fact complementary: one cannot identify what is pertinent without first having the whole of the variation in view.

3.1. Making complexity visible: the faithful rendering of sources

The first movement can be stated as a condition of any decipherment. Comparative scripturology recognises a small set of “pillars” on which all successful decipherments have rested — knowledge of the script type, of the language, and of the cultural context; the availability of a bilingual or some equivalent constraint; and, underpinning them all, a sufficient *corpus* (Zender 2017, synthesising the Friedrich–Coe tradition).

The corpus condition is itself twofold: the number of texts must be large enough to allow effective comparison — a few longer texts, in a diversity of genres — and it must be “accurately recorded and accessible”, failing which no quantity of material will serve (Zender 2017). It is this second, qualitative requirement that bears most directly on graphic variation, for there is no harder task than to distinguish characters from their variants in a script one cannot yet read:

to an untrained eye, nothing looks more like a bird than another bird in a hieroglyphic inscription, all the more so when the original is of poor quality or the copy mediocre. The fidelity of the sources (Figure 15) is what makes the variation *describable*, and with it the very question of whether two shapes are one sign or two. For Egyptian, the condition was met historically by the *Description de l'Égypte* (whose volumes began to appear in 1809) and by the consular collections of Drovetti and Salt reaching Europe at the time (Polis 2022a).

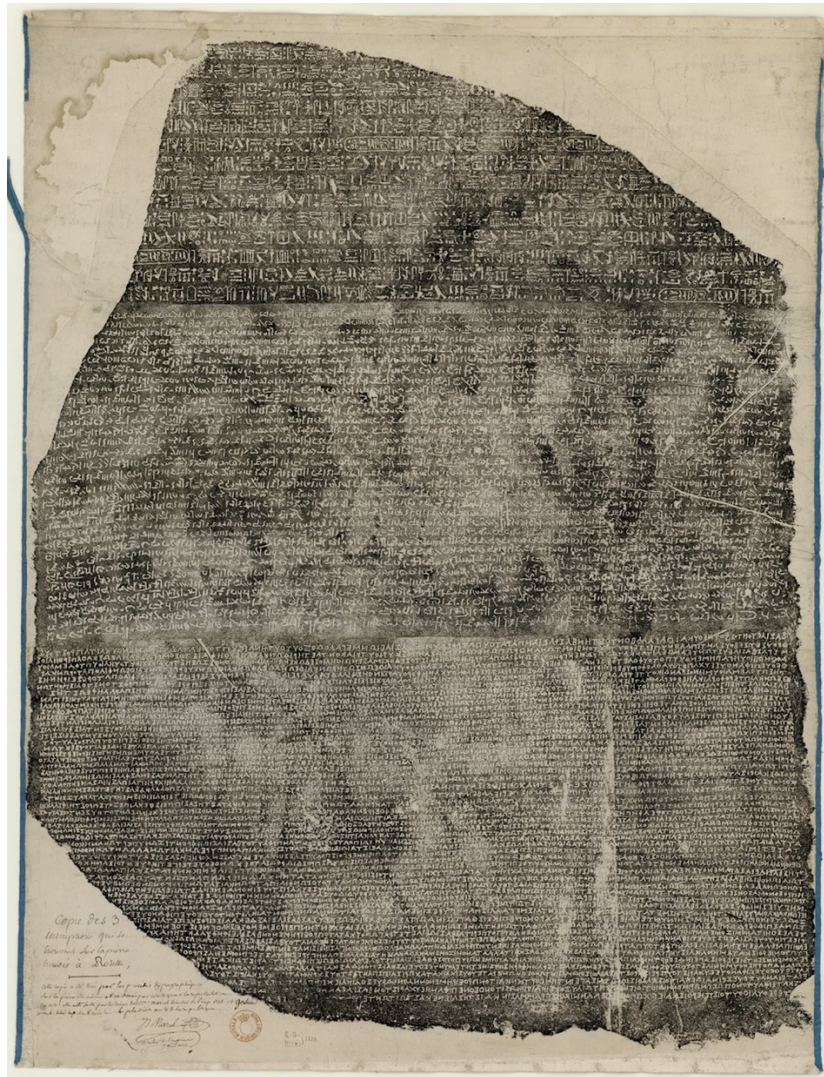


Figure 15. A black-ink print on paper made directly from the Rosetta Stone (Cairo, 1799), by Jean-Joseph Marcel, director of the Printing Office (BnF, Département des manuscrits)

Champollion's attention to the figurative details was not merely a matter of having good sources to hand: it was a positive methodological commitment, visible in the way he had his own work reproduced. The *Grammaire égyptienne*, published posthumously by Didot in three fascicles between 1836 and 1841, appeared at a time when no hieroglyphic type yet existed; the signs had therefore to be drawn and reproduced by lithography. For this Champollion (and, after his

death in 1832, his brother Champollion-Figeac) relied on Salvatore Cherubini, one of the five draughtsmen of the Franco-Tuscan expedition, who recopied the hieroglyphic and hieratic “examples” from the manuscript and corrected the signs through to the end of the process (Cherpion & Christian 2010). In the preface to the *Grammaire*, Champollion-Figeac stresses that these examples are rendered “with admirable precision”, the signs “traced with a spirit and a skill worthy of the most perfect ancient models” (Figure 16).



Figure 16. Drawing by Cherubini on the first proofs of the *Grammaire* (Cherpion & Christian 2010, p. 223)

The fidelity was extraordinary: Cherubini’s signs, often less than a centimetre across, are miniatures of astonishing detail, to the point of reproducing the small “rosette” of fur on the shoulder of the walking lion (Figure 17) — a mark that, in pharaonic iconography, connoted the youth and vitality of the animal (and hence the young or regenerated sun) — even though at that scale it is barely visible to the naked eye (Cherpion & Christian 2010, pp. 236–237).



Figure 17. Drawing of the young Lion by Cherubini (Cherpion & Christian 2010: p. 239, figure 16)

The point deserves emphasis, because it sets up the tension at the heart of this paper. The very scholar who deciphered the script insisted that its figurative, iconic surface be reproduced with the greatest possible fidelity, down to details that carry symbolic value in the image but make no difference to the reading of the sign. Champollion was, in this sense, acutely alert to iconicity. And yet — as we shall now see — it was by learning to look *past* that iconic detail, inter alia through the hieratic cursive, that he was able to fix what a sign actually is.

3.2. Identifying the pertinent traits: the hieratic cursive

If faithful sources make the variation visible, they do not by themselves tell us which differences are pertinent. The main instrument that allowed Champollion to draw that line was the hieratic cursive. His earliest contribution here predates the phonemic breakthrough of the *Lettre à M. Dacier* (1822): in 1821, he read at the Académie the mémoire entitled *De l'écriture hiératique des anciens Égyptiens*, in which he demonstrates the systematic equivalences between hieroglyphic and hieratic signs and groups (Figure 18).

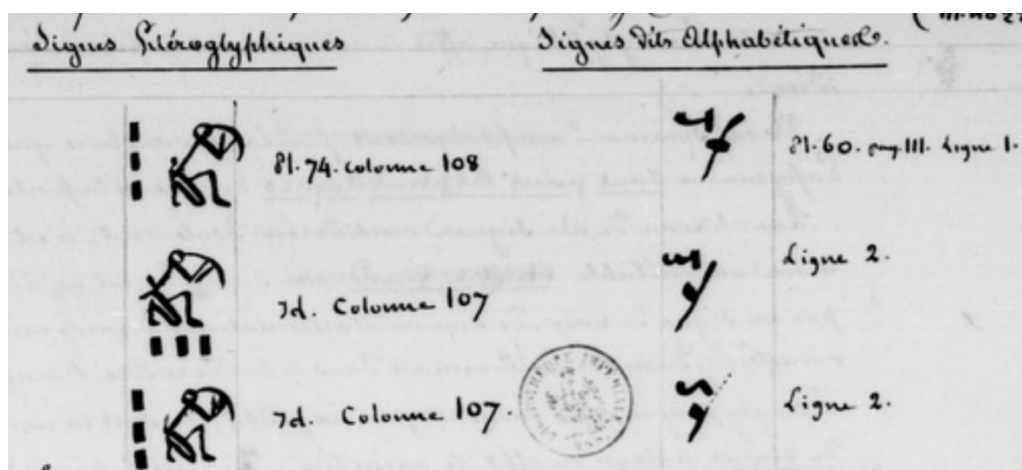


Figure 18. Equivalence between hieroglyphic (left) and hieratic (right) sign groups in the *Mémoire*

Crucially, Champollion established these equivalences on purely formal grounds, since he could not yet read the manuscripts in question, using the illustrated vignettes of *Books of the Dead* as

anchors to align the hieroglyphic and the cursive versions of the same chapters. The order of operations is the decisive epistemic fact: the identity of a sign across the two scripts was inferred *before* any reading was assigned to it. Champollion could recognise “the same signs” without yet being able to read them.

This recognition of cross-scriptal identity is what allowed Champollion to treat hieroglyphic and hieratic as two realisations of one and the same system. In the *Précis* he states that “the general principles of the hieratic script are absolutely the same as those that govern the pure and linear hieroglyphic script” (Champollion 1824, p. 353, §114). What varies between the two is not the system but the degree of figurative realization (see Figure 5). And Champollion himself thought in these terms, describing hieratic as a “second simplification” of the hieroglyphs — the first being the reduction of the “pure”, monumental signs to the “linear” or “abridged” book-hand forms (Champollion 1836). The same *Grammaire* that lavishes figurative precision on the pure hieroglyphs thus also codifies the graduated stripping-away of that figurativity — without, at any stage, changing what the signs are.

3.3. De-iconization, and the separability of form and function

We may give this stripping-away a name: “de-iconization”, understood here in a strictly *formal* sense — the progressive loss of figurative shape as a sign is rendered in an increasingly cursive hand, even if hieratic always have a potential iconic aspect, sometimes highlighted.¹ The essential observation is that de-iconization in this sense leaves the *graphemic value* of the sign intact. The phenomenon is well captured by a worked example: in Egyptian, the spiral <ꜥ> is a de-iconized outcome of the quail chick <ꜥꜥ> reintegrated in the monumental norm, where the two remain free variants for the same value. Form has changed dramatically; function has not.

The converse case is equally instructive, and equally cautionary: formal resemblance, by itself, settles nothing. In Egyptian, several distinct graphs (such as  or ) may attach to a single grapheme because their substitution opposes the word *wʿb* “to be pure” to no other meaning, whereas a sign formally very close to one of them reads /zʾt/ “libation” and would, on

1 The phenomenon of de-iconization finds a parallel in sign languages where, in most of cases, the phonology of the signs tends to be simplified and become more abstract through history, even if iconicity often remains understandable for the signers. Sign language with numerous second language speakers tend to remain more iconic (Nyst 2007, especially pp. 202–203 and 212–217). The parallel between language and script evolution could be explained by the fact that writing uses cognitive processes of language (Gnanadesikan 2020). On the comparison between sign languages and Egyptian grammarology: Lincke & Kutscher 2012.

substitution, produce exactly such an opposition (Klinkenberg & Polis 2026). Visual similarity is therefore neither necessary (the quail chick and the spiral look nothing alike yet are signifiers of the same sign) nor sufficient (two near-identical shapes may correspond to different signs). What decides, in every case, is commutation in context.

These two cases jointly expose a confusion that has long dogged the description of figurative scripts: the conflation of the *formal* loss of figurativity with the *functional* reanalysis of a figurative sign as a phonogram. The two are independent dimensions. A sign may be de-iconized in form while keeping its value (the hieratic case); and, conversely, a sign may retain its full pictorial richness while functioning purely phonetically — for signs “can lose their motivation or be re-motivated”, sometimes on several levels at once (Houston & Stauder 2020). The iconic surface, in other words, is read at two distinct levels simultaneously: as the motivation of a *linguistic* value (the level at which decipherment fixes the identity of the sign) and as the bearer of *extra-linguistic* values — register, decorum, sacredness, symbolic nuance (the level at which the lion’s rosette signifies youth and the regenerated sun). De-iconization removes the second without necessarily touching the first.

This separability is no peripheral remark: it became the working principle of decipherment itself. Yuri Knorozov — who had trained in Egyptology and modelled his method on Champollion’s — made it the cornerstone of his decipherment of Maya writing, insisting that “what is important is not the origin of a given sign, but its actual meaning in a given text ... [it] is quite unimportant whether the sign is a realistic picture of an object, a stylized picture, or a conventional symbol” (Knorozov 1952, trans. in Zender 2017). The functional value of a sign is, in other words, independent of the degree and manner of its iconic realisation — exactly what the hieratic equivalences had established for Egyptian, and exactly what allows the figurative surface to be set aside, when necessary, in fixing the identity of a sign. What Champollion discovered for the script of the pharaohs thus became a general maxim of decipherment, carried over to scripts that were still, at the time, undeciphered.

A test case for the model is provided by §2.2.2, where the iconic detail varies in ways that align suspiciously closely with what the surrounding discourse asserts. The two chariots of Pasherenptah III spell the same word *wrry.t*; the iconic contrast between them — the galloping team and the standstill — *mirrors* the contrast between the two clauses of the inscription, the king’s coming out on his chariot and the king’s stopping it. Likewise, the king’s sceptres and crowns place a more or less specific emphasis on the aspect of power at issue without ever

altering the lexeme. The question forced by such cases is sharp: does the iconic detail *specify* the *graphemic signified* — making the stationary chariot the writing of a more determined lexical content (something like “stopped chariot”) — or does it operate at a distinct, *visuo-spatial* level, mirroring discourse and qualifying the lexeme expressed at the graphemic level?

Two analytic options are open, and they have markedly different consequences for the way a repertoire must treat the data (see §4). The cleaner option, and the one we adopt here, is the second: the graphemic sign is *wrry.t* “chariot” in both cases; what differs is a value at the level of the *gramme* (Klinkenberg & Polis 2018) — an icon-image whose signified happens to coincide with the verbal content of the surrounding utterance. To take the other route — namely to fold the iconic specification into the graphemic signified — is to collapse the very orthogonality that makes the formal/functional separability possible, and is precisely what the bottom-up reading of figurative scripts by visual similarity tends to do.

It is worth being explicit, then, that a single empirical difference may be pertinent at one level and inert at the other. A striking Egyptian case is what Schenkel (2011, pp. 134–145) has termed “negative iconicity”: because hieroglyphic signs were felt to share in the agency of the beings they depict, signs picturing animate figures and creatures of potentially harmful agency could be neutralised or mutilated (Thuault 2020b) in funerary and other ritual contexts — a knife planted in the body of the snake, the head removed from an animate hieroglyph, the figure replaced or otherwise modified — so that the power attributed to the image could not turn against the deceased (Figure 19).

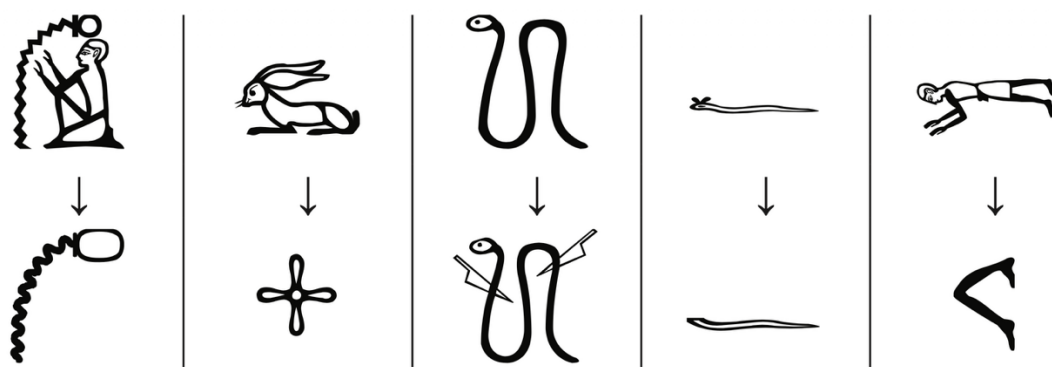


Figure 19. Non-mutilated (top) vs. mutilated variants of hieroglyphic signs

The graphemic value of those signs is, in all of this, left untouched: the mutilated horned viper still notes phoneme /f/, the decapitated bird still serves its classificatory role, etc. What changes is the value borne by the *gramme* — the icon-image is no longer that of a live, potentially

malevolent being but of a defused one, charged with an apotropaic significance the unmutilated form does not carry.

3.4. The complementary loop

We can now see why the two movements of §3.1 and §3.2 are not in tension but mutually dependent. Fidelity to the sources puts the entire range of graphic variation in view, iconic detail and all; the analysis of pertinent traits then sorts that variation, deciding which differences individuate signs and which do not. The hieratic cursive is a major hinge between the two, because it shows — case by case, through established equivalences — that the figurative surface can be largely removed while the sign remains the same.

The decisive point is that Champollion did not only describe this categorisation: he enacted it in his own copying practice, well before the *Grammaire* put it into print. From his work in the 1820s on the Egyptian collections (notably of the Louvre and of the Museo Egizio in Turin), to the Franco-Tuscan expedition of 1828–1829, he transcribed by hand hundreds of inscriptions directly from monuments. What his notebooks record is not a slavish facsimile of each individual token but, in effect, the first hieroglyphic “font” — a standardised, formally refined rendering of each sign, drawn from the gradient of attested glyphs and stripped of accidental token-level variation while preserving the iconic signature that fixes graphemic identity (Figure 20).

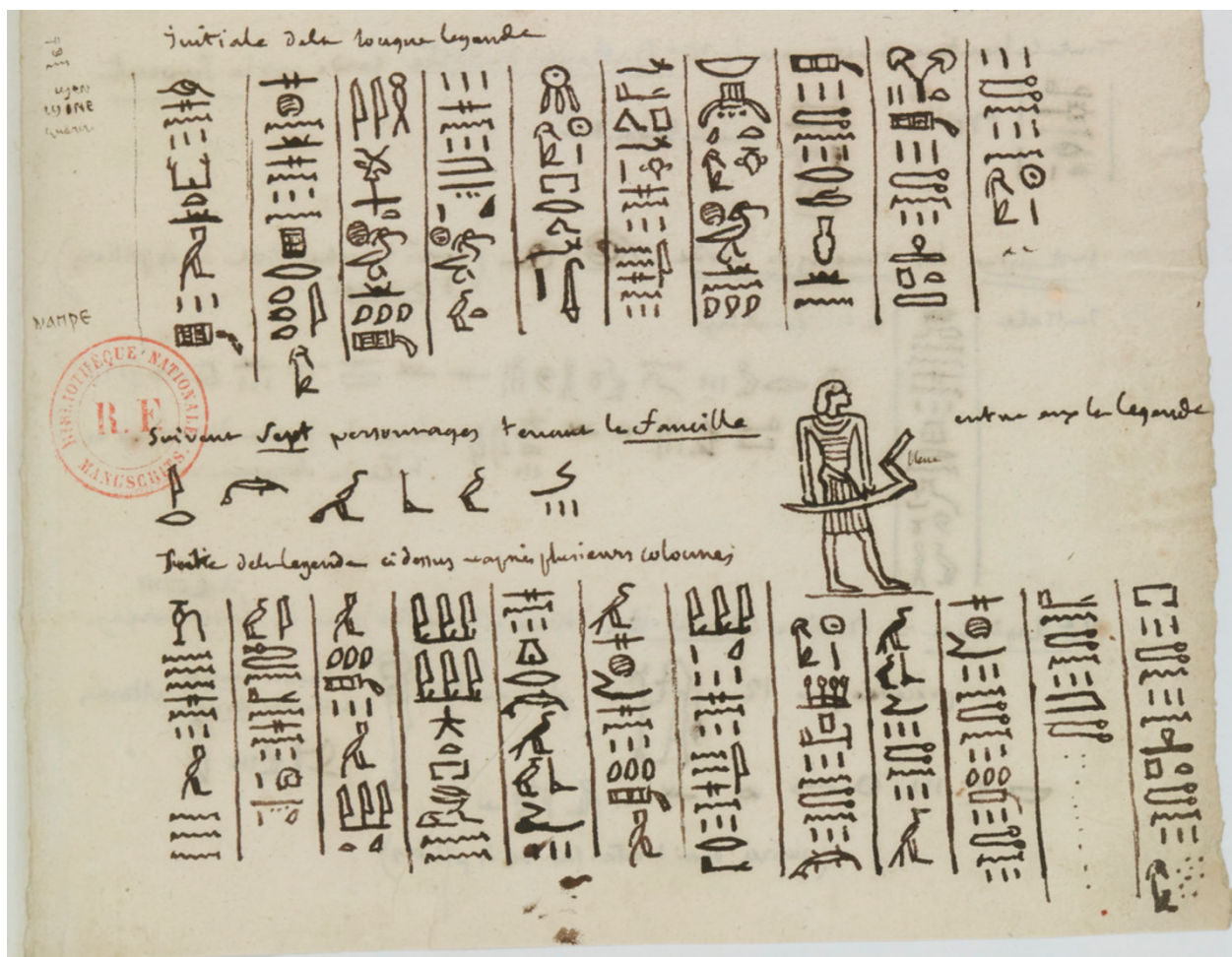


Figure 20. Texts from the tomb of Ramesses V/VI in the Valley of the Kings,
hand-copied by Champollion (BnF, MSS NAF 20308)

Standardisation, in this sense, is categorisation made graphic: each entry in his notebooks is already a decision about which features are essential to a sign and which are not.

What the decipherment accomplishes, then, is a categorisation with both a theoretical and a material face: a sustained sorting of the visible variation into differences that are graphemically distinctive, differences that are merely formal variants of one sign, and differences that are iconically meaningful without bearing on the sign's identity. And, at the same time, the production of a standardised graphic instrument that records and transmits that sorting. The same enterprise extends from Champollion's notebooks to the first typographic hieroglyphic font cut by the Imprimerie Nationale in 1842 (Dils 2022) and on to the digital sign lists now under construction. It is to those that we turn in §4.

4. Decipherment as categorization: the lesson for digital repertoires

Out of a continuum of visible — and largely iconic — variation, the decipherment of the hieroglyphs carved a finite set of signs endowed with stable values. This final part draws the theoretical consequence of that claim (§4.1) and its practical one (§4.2). The categories that decipherment builds are, we argue, of two orthogonal kinds; a model (e.g., Meletis 2020), a description, or a database — that fails to keep them apart will misrepresent the writing system and its script(s). That lesson bears directly on the digital sign lists we construct today, and on the undeciphered scripts that form the other half of this meeting's concern.

4.1. Two orthogonal inventories

What decipherment establishes, first of all, is an inventory of *graphemes*: classes of graphs individuated by the linguistic values they carry, and identified by *commutation* at the higher level of articulation — by asking whether substituting one graph for another changes the linguistic message — rather than by grouping visually similar shapes from the bottom up (Klinkenberg & Polis 2026). Cases discussed in §3 show why the bottom-up route fails: the quail chick < > and the spiral < > look nothing alike yet are one grapheme for /w/, while two very similar shapes may read wʼb and zʼt respectively. Visual resemblance neither makes nor unmakes a grapheme.

But the figurative surface simultaneously sustains a second inventory of *grammes*: classes individuated by their visuo-spatial values (of symbolic, indexical or iconic nature). These two inventories are *orthogonal* and potentially *coexist in every single glyph*. A single written token instantiates both at once, and neither can be reduced to, or ranked beneath, the other: there is no single axis along which all the variation of a figurative script can be laid out. Trying to force one — to build a single tree of “the signs” on grounds of visual form — is precisely what collapses the two inventories into a misleading unity.

Once the two inventories are distinguished, the kinds of variation surveyed descriptively in §1 fall into place. At the graphemic level we find *allography* — graphs with strictly the same graphemic values, such as the quail chick and the spiral for /w/ — together with its purely formal subdivisions, *suballography*, such as the varying postures of the seated man; and we find *allographemy* — graphs that share at least one value but not all, as with the many signs (the seated man, the woman, a god, a king) that can each classify the suffix pronoun =j while differing in their other values. At the grammemic level we find *allogrammy* and *allogrammemy*

— as when the king’s figure is furnished with one sceptre or crown rather than another, or when the chariot is drawn galloping rather than at a standstill: the linguistic value is untouched, but an iconic value is added or varied.

The decisive point for decipherment is that one and the same visible difference may belong to different inventories — or to both at once. The two chariots of the stele of Pasherenptah III are a single grapheme (the word *wrry.t*), yet they differ at the grammemic level, the galloping team encoding a contextual nuance that the stationary one does not; the difference is also, on the graphemic axis, a contrast of function (logogram versus classifier). Conversely, an iconic detail that is normally inert can *become* distinctive in context: the shape of a goose’s beak individuates a species only once an offering list sets several birds in contrast, so that what was suballographic variation shifts into a difference of grapheme. To decipher is to learn, difference by difference, which inventory a given variation belongs to. In the terms of this conference, the question “is this an allograph of one sign, or a distinct sign?” is the question of *which inventory a difference is pertinent to* — and it is settled by commutation, downward, not by resemblance, upward.

4.2. Building repertoires at the right level: the *Thot Sign List*

The stakes are not merely theoretical. A sign list is, in comparative grammatology, at once a precondition and a product of decipherment — the very compilation of a catalogue of signs being one of its recognised pillars (Zender 2017). For a figurative script, in which minor variations may or may not be significant, distinguishing graphemes from their variants is “notoriously difficult” (Polis et al. 2021). A repertoire that *over-splits*, treating every iconic variant as a separate sign, severs the connections between different writings of the same word; a repertoire that *over-standardises*, collapsing everything onto a normalised form, erases distinctions that do real work. This is the dilemma already flagged at the end of §1 and rise major issues in the digital era when encoding texts in large searchable databases.

The *Thot Sign List* (<https://thotsignlist.org>) has been built with this concern in mind, encoding variation at explicitly distinct levels. Its data model articulates four: the Token (the concrete attested occurrence, anchored to a sourced image), the Function (the graphemic values a sign carries in context), the Class (tokens that share iconic features), and the Grapheme (clusters of classes sharing their functions) (Polis et al. 2021). This is, in effect, an operationalisation of the two orthogonal inventories: it allows the iconic richness of a token to

be recorded, sourced and indexed *without* being mistaken for graphemic identity, and it lets a single grapheme gather formally diverse tokens beneath it.

The chariot returns here as the test case. A flat list must choose: either two entries (over-splitting one word into two “signs”) or one entry (losing the galloping/stationary contrast). A level-aware model can say both things at once — one grapheme, two token-level iconic realisations corresponding to grammemic classes — which is exactly the description the phenomenon requires. The same holds, in reverse, where the iconic detail *is* graphemically pertinent. A traditional repertoire such as the *Manuel de Codage* handles some cases well, grouping the sign  A6 with its variants A6A–D as graphic variants of one grapheme; but it mishandles others, e.g., splitting  D19 from  D20. Each such case is, at bottom, a decision about which inventory a difference belongs to.

Building level-aware repertoires for the deciphered scripts is therefore not bibliographical housekeeping but the continuation, by digital means, of the categorising work of decipherment itself. And it is, at the same time, a service to the scripts that remain unread: a sign list that keeps the graphemic and the grammemic inventories distinct — that records resemblance without surrendering to it — is the instrument an undeciphered figurative script most needs. In this the *Thot Sign List* is offered less as a finished product than as a model to be followed.

5. Conclusion: the order of the forest

We may return, in closing, to the writing of the birds. The pre-decipherment gaze saw an aviary — figures without number — because it read the iconic surface as though it were the whole of the script, inferring a value directly from a form. Champollion’s achievement, and the achievement of decipherment more generally, was to show that the forest in which those birds live has an order, that beneath the figurative profusion lies a finite system of signs.

Figurative scripts are therefore a revealing limit case, because in them the two inventories are most spectacularly superimposed and merged: every grapheme is also an image, and every image is potentially a grapheme. For that very reason they teach, more sharply than any alphabet could, the discipline this meeting seeks on behalf of the scripts that are still unread — to ask of every graphic difference not only “is this the same sign?” but “at what level does this difference matter?” The birds, it turns out, are not all alike; but telling them apart is a matter of knowing what kind of difference one is looking at.

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