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Les  *Ankhou*

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**Signifying without writing:
graphic systems before the emergence of writing
in predynastic Egypt.**

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“L’écriture n’est qu’un code parmi beaucoup d’autres, se distinguant avant tout par son ampleur. La différence est de degré plutôt que de nature, et l’on peut penser que l’apparition de l’écriture eût été impossible si elle n’avait pas été précédée par des expériences de même ordre.” (Forest 1993: 32)

“Does the emergence and development of a particular system of writing have to be conceived of as a one-dimensional process or does it have to be reconstructed as an interaction and final integration of different, relatively independent processes ?” (Damerow 1999: 15)

I. Definition of writing. When was writing invented?

The origins of writing, whether they be located in Egypt or elsewhere, have been much written about. The aim of this article is not to study writing from a phylogenetic point of view: we shall not start with an authenticated stage of writing and go back step by step to the origins of its evolution. On the contrary, we shall approach this subject from a less conventional angle and pay particular attention to the signifying iconographic systems to be differentiated from writing – systems that resemble writing and yet are distinct from it. We have called them “graphic systems”. They are coherent sets of signs with a very neat structure. Their elaboration obeys strict rules so that

the composition and the combination of their various components are both highly codified. They can certainly be seen as examples of proto-syntax according to G.Sauvet's definition of syntax : "*Dans le domaine de la communication graphique préhistorique... la syntaxe... représente l'ensemble des lois qui fixent les relations que les signes entretiennent entre eux*" (Sauvet et Włodarczyk 1977: 551)

Even if those systems are means of communication, they do not form writing systems: "*pictorial representations, which is a precondition for most original inventions of writing systems, also communicates, but in different ways.*" (Baines 2004: 151). To draw as clear a distinction as possible between what is and what is not writing, we need a precise definition of writing in general and of hieroglyphic writing in particular. The dividing line between writing and symbolic systems is a narrow one indeed according to N.Postgate, T.Wang & Wilkinson (1995: 459-460) : "*...to establish a criterion for differentiating between genuine writing, on the one hand, and symbols or systems of symbols which resembles it, on the other. (...) No single simple criterion is likely to suffice. Symbols may well perform a similar function to writing, such as making a statement of ownership ; the difference is that writing needs always to correspond to a segment of language. Moreover, a writing system is only valid if it communicates : there has to be a reader as well as a writer, and for the system to function it must therefore be a finite system, with each side sharing the same repertoire.*" Nevertheless, we shall see that at least as far as hieroglyphic and proto-cuneiform writings are concerned, writing in its early stages of development does not necessarily have to retranscribe a segment of language.

J.Kahl (2001: 104) defines "*the term «writing»... as «a system of human intercommunication by means of conventional visible marks»* (Gelb 1952: 12). Hans Jensen defined writing as "*schriftliche Fixierung eines gegliederten sprachlichen*

Ausdrucks, wobei sprachlichen Einheiten schriftliche Einheiten entsprechen» (Jensen 1969: 33)”. Such a statement may sound too vague and we’d rather use Pascal Vernus’s definition: “système de signes concrets, essentiellement visuels, capables d’encoder des énoncés linguistiques...(...) l’homme est parvenu à supprimer l’éphémère et la labilité intrinsèque du langage en fixant les productions de manière qu’elles demeurent disponibles et consultables à tout moment.” (Vernus 1993: 75). To make things even clearer, it should be stressed that: “Il y a écriture au sens propre lorsque le message fixé graphiquement peut être décodé hors de son contexte de production, pour peu qu’on possède les clefs du code” (Vernus 1993: 76). Another fact to be underlined is that the information conveyed by writing is indeed recorded (Baines 2004: 151).

A last point we should emphasize is the phonetic dimension of writing: writing must convey the sounds of a given language. A-M.Christin insists that writing combines two divergent modes of communication: “*L’écriture a pu naître de la combinaison aléatoire de deux modes de communication hétérogènes et complémentaires qui la précédaient depuis longtemps : l’image, artefact visuel faisant appel à la réceptivité d’un spectateur, et la langue, médium sonore dont l’efficacité implique, à l’opposé, l’intervention d’un locuteur*” (Christin 2001: 12).

These various points may be summed up as follows: writing is a system of signs encoding (linguistic) utterances that can be understood even without the context in which it was produced and that durably preserves the information.

When it comes to studying Egyptian hieroglyphic writing in particular, the specific features of this writing system must be taken into account. The pioneering research conducted by J. Kahl on the earliest stages of hieroglyphic writing have led him to define its basic principles: “*The principles of the ancient Egyptian writing system are ... (1) the rebus principle of writing, whereby a depiction of one object is used to represent a word that sound the same as, or similar to, the object depicted;*

(2) *the alphabetic principle, whereby a set of unilateral signs is used to represent the individual distinctive sound (phonemes) of the language ; and (3) the complement principle, whereby a unilateral or bilateral sign is used to specify a part of the phonemic content of a sign which has more consonants than it itself has.*" (Kahl 2001: 105).

Moreover, a hieroglyphic sign can belong to four different categories: *"The signs can be used as logograms and/or determinatives and/or phonograms and/or phonetic complements. A logogram serves for writing a sound or series of sounds that represent either an entire word or a word root. Therefore, the use of any logogram is limited to the writing of words that are etymologically or semantically related to the signs's own meaning. In distinction from logograms, phonograms are used in any word for notating mono- or bi-consonantal phonemes. Generally, phonograms are established according to the rebus principle. Determinatives are semograms which classify a word according to its semantical sphere. Complements are phonograms which specify a part of the phoneme sequence of a preceding or following sign which has more consonants than itself, thus clarifying the word's meaning."* (Kahl 2001: 116). The various uses of the hieroglyphic sign were established progressively as will be shown in a following paragraph. Indeed in its earliest stages hieroglyphic writing was not aimed at encoding elements of spoken discourse: they were not related, as D. Wengrow shows *"While incorporating isolated elements of speech, the earliest Egyptian writing system -like that of Mesopotamia (Michalowski 1990, 1994; Damerow 1999) - was not initially designed or able to represent continuous spoken discourse. Natural language did not provide a primary model for its development. Rather the representation of linguistic syntax was a later adaptation of its original structures and functions, which related more closely to other, non-linguistic modes of communication (Baines 2004)".* Besides, writing in its earliest stages -proto-writing

systems to borrow P.Damerow's phrase (1999)- conveys only an incomplete message (Damerow 1999: 2). Such incompleteness is deliberate, it is dependent on the nature of the transmitted information: "... *proto-writing is not...a deficient representation of language but rather ... a successful means of representing knowledge and transmitting it from one individual to the other.*" (Damerow 1999:3). In fact, the information deals with administrative and accounting data and therefore does not require a direct connection with spoken discourse (Gosline 1999: 70). As Cooper puts it: "*Trigger's point that no early writing system was the full writing system it eventually became – that is, each was able to fully express language only after centuries of development. The reason is that no writing system was invented, or used early on, to mimic spoken language or to perform spoken language's functions. Livestock or ration accounts, land management records, lexical texts, labels identifying funerary offerings, offerings lists, divination records, and commemorative stelae have no oral counterparts. Rather, they represent the extension of language use into areas where spoken language cannot do the job. Goody (1977: 78) has aptly identified writing's major functions as decontextualization and storage, and it is through these capacities that written language asserts a superiority over spoken language. Only after long experience using writing for things that cannot be done orally do societies begin to apply writing to oral domains such as messages and literary narratives.*" (Cooper 2004: 83).

If we push the argument a step further we can suggest that in the beginning of writing the disconnection between discourse and writing made it understandable to readers who did not use the same language, as long as they had the keys to read this code: "*La vocation de ce nouveau medium devait non pas être de représenter une langue mais, et en cela réside son plus grand effet de transgression, et sa véritable utilité, d'être également accessible à des lecteurs qui ne pratiquaient pas la même langue.*" (Christin 2001: 17).

II. Evolution and establishment of hieroglyphic writing in Egypt.

In 1986 the team led by German researcher Gunter Dreyer discovered a new tomb in the royal necropolis Umm el-Qaab at Abydos, Egypt (Dreyer 1998). The tomb is referred to as “U-j”. It was a large tomb with several rooms containing hundreds of jars, a few of which bore painted inscriptions: other jars had engraved ivory or wooden labels attached to them. The tomb was dated to the Naqada IIIA period, ca 3250 BC, which means that the labels it contained are the earliest known examples of hieroglyphic inscriptions. We shall bring up these inscriptions again in the course of this article when considering potmarks. This discovery has had a huge impact on studies related to the origins of hieroglyphic writing -considerably enriching the corpus of inscriptions for the remotest periods. This new set of objects and those which were known before help identify the successive stages in the emergence of writing between the Naqada IIIA period - the period to which the inscriptions in the U-j tomb were dated - and the IVth dynasty.

The stages read as follows:

- Naqada IIIA: in G.Dreyer’s opinion the inscriptions in the U-j tomb mention kings’ names. His construction has been questioned by other researchers (Kemp 2000; Kahl 2001; Wengrow 2006) who argue that the inscriptions refer to toponyms and foodstuffs (Regulski 2008: 990; Kahl 2003: 123; Bard 1992: 297). Whatever the interpretation may be, the inscriptions (along with those in the U-s tomb, belonging to the monarch who succeeded the U-j tomb king and was also buried at Abydos) are the earliest known hieroglyphic inscriptions (Kahl 1994: 171). The spread of writing seems to have been rapid since engraved cylinder seals have been found in Tell el-Farkha in the Delta only slightly later than the period associated with the U-j tomb (Gialowicz 2008, paper delivered at the Origins 3 symposium).

- The syntactic constructions are genitival (Regulski 2008: 990; Kahl 2003: 123). They use only a limited number of signs (Baines 2004: 172), about one hundred (but 51 in the U-j tomb (Regulski 2010: 240)).

- A few monoconsonantal words can be found during the first dynasty (from the reign of Narmer onwards). Biconsonantal and triconsonantal signs appeared during the first dynasty, and so did phonetic complements (Fischer 1990: 63).
- The number of signs used increases strongly. In the first two dynasties the number of signs was far larger than in the early Old Kingdom (Reguslki 2010: 240).
- It is usually considered that hieroglyphic writing was not properly established until Djoser's reign, in the third dynasty, when the reproduction of spoken language became one of its functions.
- During the fourth dynasty, both the numeral system which was used to count the regnal years and the elaboration of year names became more extensive and elaborate (Wengrow 2006: 132, endnote 3). Halfway through the Old Kingdom, before the writing of the Pyramid Texts, only a few hundreds signs were used (Baines 2004: 172). In the page setting of the Pyramid Texts the paragraph divisions act as punctuation.

III. Unwritten signs. The various types of graphic systems.

1. Potmarks form the first class of graphic systems to be studied here since no other artefact is more akin to an inscription (see plate, box 1). Potmarks are signs carved on the outer surface of a clay vase before baking. Apparently only two types of vases bear potmarks: “...*the potmarks appear on a few, apparently selected, types of pottery only; foremost on the tall jars with tapering body (called for no obvious reason « wine jars », Weinkrüge) and to a lesser extend on the class of ovoid-shaped jars with blunt-pointed bases. To this latter class it seems that linear signs, such as strokes, and dots were mainly applied.*”(Van den Brink 1992: 267). Potmarks can be found on Egyptian vases as well as on imported pottery (Van den Brink 1992: 274). They have been variously interpreted by researchers as either information on the owner of the jar or on its content and capacity (Van den Brink 1992: 276, note 3).

Potmarks appeared in Egypt at an early period: some can be found at the early Neolithic site of Merimde Beni Salama, in the West Delta of the Nile. Still, there have never been as many potmarks as during Dynasty 0 and 1: “*Relatively few potmarks were applied to ceramic vessels before and during the reign of Horus Aha, the first king of Dynasty I. During the following reigns of Djer and Djet there was a steady increase in the frequency of potmarks; the peak lies in the time of Merneith and Horus Den/Udimu. During the following reigns of Anedjib and Semerkhet the total number of potmarks seems to have dropped back to the level observed during the times of Djer and Djet, and fades out almost completely during the reign of Qa’a, the last king of Dynasty I.*” (Van den Brink 1992: 271).

Potmarks have been identified at fifteen sites located in both Upper and Lower Egypt. In his 1992 synthesis, E. Van den Brink registered 3360 potmarks. Since then, recent digs have brought further potmarks to light (Adams & Porat 1996; Kroeper 2000; Tassie, Wetering & Calcoen 2008) and a specialized research group was founded in 2005. The ***International Potmark Workshop*** can be found on the following website: **potmark-egypt.com** (Van den Brink 2008).

Potmarks are made up of one or a few signs (seldom more than four, though) (Van den Brink 1992: 276). These signs belong to the following categories: animals, parts of the human body, celestial bodies, tools, architectural items, simple or complex geometric forms, and *serekhs*. *Serekhs* represent the façade of the royal palace and mention the reigning sovereign’s name (Jiménez Serrano 2002; 2003). Some of these signs will become hieroglyphs, some will not.

After studying the way these signs combine with one another, E. Van den Brink was able to make out a few rules which, in his opinion, may be called grammatical: “*As for functional interpretations, the key to proper understanding may lay in focusing on the principles of a denotative system in these potmarks which perhaps points to clear administrative entities. The underlying grammatical principles observed in the potmarks corpus may be*

summarized as follows : although occurring most frequently in combinations with one or more signs, most of the 77 group signs can and do appear alone as well as potmarks consisting of a single sign. This indicates that these group-signs were considered «self-sufficient» in themselves, each referring to a separate unit (of whatever -perhaps toponymal ?- nature), well understood by the people (officials of the king ?) of those days. Together with the observed systematic combining of individual group-signs with others signs, this could lend some support to a working hypothesis that in a given combination of signs constituting a potmark, each of its component refer to well circumscribed and segmented information at different tiers, in addition to the information expressed by the main or group-sign.” (Van den Brink 1992: 274).

Potmarks were used for administrative reasons: they helped with the checking of goods travelling long distances, and so did seals, as we shall see now.

2. Among the various categories of objects under consideration here, seals and seal impressions form the only group which is not of indigenous origin (see plate, box 2). These objects were made in Mesopotamia and then introduced into Egypt. Seals are seldom found in Egypt. On the contrary, seal impressions on clay tablets are a much more common sight: whenever they are found there are usually a few of them and they seem to have been stored in various contexts. Abydos is the Egyptian site which has provided the vast majority of these documents: some were discovered in several tombs of Cemetery U (including in the earlier mentioned U-j tomb) (Hartung 1998), some in the royal necropolis excavated in the early XXth century by archaeologist W.Petrie (1900; 1901) and others were located in a deposit of the Osiris temple (Petrie 1902). Hierakonpolis is another site in which ivory seals were discovered in the deposit of a temple: two or three pits filled with hundreds of objects including seals were dubbed “The Main Deposit” by excavators Quibell and Green in 1898 (Quibell & Green 1902).

Another group of seals was unearthed during the Naqada “South Town” settlement excavations (Di Maria 2007; 2008: 89). At the Sakkara site, the royals tombs - or “cenotaphs” - from the Early Dynastic period contained many seal impressions. A group of 239 seal impressions – among which 104 date back to predynastic times - were found in a difficult context at Giza, near the pyramid of Menkaure -Mikerinos (Torcia 2008: 169-170). Outside Egypt some Egyptian seals were discovered during excavations at Qustul, a Nubian necropolis, and in various necropolises between the First and the Second Cataracts (Hill 2004). Finally, 90 seal impressions and one seal were found at En Besor, an oasis in southern Palestine (Hill 2004: 4).

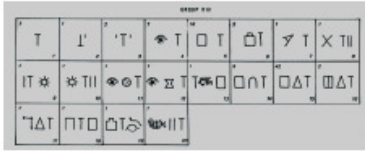
From a chronological point of view the oldest seals are those found in the U necropolis of Abydos. They date back to the Naqada IID period (Hill 2004: 3). There is a continuous list of excavated seals from that period until the end of the First Dynasty. At Giza a few seals bore the cartouches of Cheops and Khephren, two Pharaohs of the Fourth Dynasty (Torcia 2008: 169-170).

The sealings found in Egypt are usually either cylinder seals or bullae. They are small stone or ivory objects - only a few centimeters high. They went through great stylistic changes over time: the oldest seals found in Egypt rely on Mesopotamian iconography. From the Naqada IIIA2 period onwards, a change occurred: decoration broke free of Mesopotamian influences to be replaced by themes and motifs of Egyptian origins. During the Naqada IIIB-C period, the Egyptians can be said to have found their own style as far as seal imagery was concerned. Admittedly, Mesopotamian influences could still be traced in Egyptian adaptations of the “Master of Animals” motif or in rows of figures representing animal processions. Nevertheless, the developments of royal iconography (with scenes illustrating victories, commemorations or *hebsed* jubilees), the representations of temples and the increasing presence of royal names and nobility titles in *serekhs* during the Early Dynastic period were unmistakably of Egyptian origin.

1. POTMARKS



(After Van den Brink 2001: 59)



From the Van Den Brink's corpus (Van Den Brink 1992)

2. SEAL IMPRESSIONS



(After Dreyer 1998, Abb. 11)



Seal impression from Tarkhan (Wengrow 2006, fig. 9.7)

3. PALETTES, KNIVES HANDLES AND MACE HEAD



Narmer's Mace head (Vernus 1993: 91, fig. 11)



Gebel el-Arak Knife handle (Czichon & Sievertsen 1993: fig. 1) The Two Dogs Palette (Baines 1993: 60, fig. 1)

4. D-WARE CERAMICS



(Graff 2009: 271)



(Graff 2009: 320)

Seals can be categorized as graphic systems as long as they do not contain hieroglyphic inscriptions. When they do mention a name or a title, they become writing media and therefore cannot be relevant to this study.

As far as we know, in Mesopotamia during the IVth millenium seals provided information about the owner or the consignee of the goods whose quantity was referred to in *calculi* (Schmandt-Besserat 2007: 27). We can wonder whether seals still performed this function in Egypt.

If the front surface of the seal impression relies on iconography to suggest identities, the back surface gives information about what was sealed, the sealed objects having left marks on the soft clay: “*Generally, sealings were affixed to the followings broad classes of objects : storeroom doors, both refined and coarses boxes and chests, door and box knobs, door and box pegs, baskets, vessels and jars, cloth and leather sacks, bundles, and payrus rolls. Finally, they could also be applied to doors of enclosure fences that sheltered the herds belonging to an institution or the community*” (Di Maria 2008: 88).

Seals were a means of recording transactions and keeping receipts for goods travelling over long distances with probably more than one middleman between the manufacturer and the client. They gave evidence of the different stages of the transport. They are inseparable from the development of both royal administrations (in Mesopotamia and in Egypt) and foreign trade involving precious goods (such as oil, fabrics, wine, etc...). This explains why Egyptian seals were found in Nubia or in Palestine, both natural trading partners of Predynastic Egypt. An interesting remark was made by R.Di Maria about the universality of this graphic system “*All these variables (shape, iconography, dimensions, materials...) form a kind of protocol of standardized rules, allowing communication between peoples who did not necessarily speak the same languages. In other words, seals and clay sealings were a common*

concepts within a widely distributed communication and trade network.” (Di Maria 2008: 89).

3. Ceremonial palettes, knife-handles and maceheads (see plate, box 3): during the Naqada III period, a certain number of originally utilitarian objects were literally overrun by a very rich iconography, which sometimes went as far as preventing their intended use. Among the objects whose utilitarian function became secondary to their decorative function were cosmetic palettes, knife-handles and maceheads. The choice of materials sometimes ran against their original purpose: hence a limestone macehead could not be as shockproof as the same object made of hard stone. Ceremonial objects are ostentatious, prestige items. Palettes for crushing cosmetic powder, flintstone knife-handles and maceheads had been used at least since the beginning of the Naqada period, but their function as ornamental items only became preponderant during Naqada III, with the exception of the zoomorphic palettes of the early Naqada II period (Badaud 2008).

Ceremonial objects are crucial to our understanding of the period, but in reality there are only a few of them. The Narmer Palette is certainly the most emblematic object of Prepharaonic Egyptian cultures. And yet, only thirty-two historiated palettes or fragments of palettes have been found so far, along with twenty-four knife-handles (Whitehouse 2002: 444-445 for a complete list), one of which was made of gold, and four decorated maceheads (according to Gialowicz 1987: 31, *there are five mace-heads, all coming from the archaic temple of Hierakonpolis, and two of them are complete from an archaeological point of view*).

The iconographic themes to be found on the ceremonial objects revolve around two main issues: manifestations of power and animal life. These two themes can also be seen in chronological order since the objects belonging to the second thematic class are more ancient than the ones belonging to the first. As a theme, animal life falls into three categories: hunting scenes (Tefnin, 1979), animal parades (without any human presence)

(Cialowicz 1992) and palettes representing lycaons without any explicit reference to hunting (Baines 1993; El-Bagdadi 1999). Manifestations of power can be divided into two categories: royal imagery on the one hand (including celebrations of *hebsed* jubilees, victory scenes, the slaughter of prisoners, the collection of tribute money and the digging of canals (Gautier & Midant-Reynes 1995) or the founding of a city (Cialowicz 1987: 34) and the representation of war and prisoners without the presence of royal personages on the other hand. The royal theme has drawn the attention of most scholars so far particularly since the period under consideration is a time when the state developed, when pharaonic power was established (Wengrow 2006: 215-217; Baines 2003; Millet 1990; Cialowicz 1987; Williams & Logan 1987) and when exchanges with the Near East took place (Vertesalji 1992).

Although the reading of these documents may have looked like a linear or a narrative process it is in reality a very complex task. The first semiologic approach to this kind of documents was undertaken by R. Tefnin (1979; 1993). It opened broad perspectives for the reading of iconographic documents in the field of Egyptology. W. Davis's approach to the documents from the Naqada III period (Davis 1992) consisted in studying the way the iconographic rules of the pharaonic period were established through a process which he called "*the chain of replications of image making*" (Davis 1992: 8-13). He offered further evidence of the complexity of image making in historiated documents (Davis 1992: 161-200), and so did other scholars after him (Gosline 1999; Czichon & Sieversten 1993).

Their studies show that the reading of these documents is neither a narrative nor a historical process, but that the delivered message (the exact nature of which will probably continue be discussed for a long time to come) combines different sequences and creates connections between them as it associates or repeats some elements (like the rope on both the Hunters Palette and the Gebel al-Arak knife-handle). The sequences echo one another, taking advantage of all the possibilities offered by the

symmetric composition of the image and its arrangement in registers while relying on dual oppositions of contrary elements (fleeing animals versus wounded animals, bearded men versus clean-shaven men, size contrasts for the characters, etc.). R.Tefnin evokes “*le caractère antithétique de la composition : oppo-sitions manifestes réseau complémentaire - cohérence du tout - forces de désintégration - éléments juxtaposés.*”(Tefnin 1979: 224-225).

The iconography of prestige items during the Naqada III period was undoubtedly meant to help new rulers rise to power. It established their authority and probably made them acceptable to the elites who had lost their hold on power. Complex though it may be, the iconography of historiated objects cannot be equated with writing because writing probably was not necessary to perform the functions which were ascribed to it: “*If we compare the administrative needs of a growing state with requirements of a nascent royal ideology, it seems reasonable, though, of course, not necessary, to presume that the logophonetic Egyptian writing system would have been devised for the administrative bureaucracy, and that royal display alone could have been very effectively accomplished with a highly sophisticated iconography that was not language-bound.*” (Cooper 2004: 78).

4. The D-Ware paintings (see plate, box 4).

Between Naqada IIC and IID, some vases bear complex painted decorations combining between half a dozen and a dozen different signs on average. They belong to a category of ware mentioned as “Decorated Ware (D-Ware)” by archaeologist W. M. Petrie (1920; 1921) in his typology of predynastic pottery. It is the most ancient group of artefacts under consideration in this study (between 3600 and 3400 BC). These vases have been analyzed in a recent semiologic study (Graff 2009). Almost 500 items have been discovered so far: they come mainly - though not exclusively - from funeral contexts.

At first sight the decoration on these vases seems stereotyped. A more thorough analysis shows that the decoration is actually organized according to strict standards: the selection of its elements obeys association and exclusion rules (Graff 2009: 94-99). The ornamental elements are combined to create a scene with a clearly defined subject (*see* Graff 2009: 79-89): they can represent human figures (men and women), certain species of animals (in particular addaxes, ibexes and ostriches), plants, boats, power sticks, animal skins stretched over sticks (Hendrickx 1998) or mats (Graff & Hendrickx, to be published).

The decoration of late Naqada II painted vases is hierarchical and very constrained, not only as far as sign selection is concerned, as we shall see below, but also with respect to the spatial layout of elements. Indeed in most cases, decorated vases have handles. There are usually two of them and they are most often perforated, tubular handles (Graff 2009: 137). In sixty cases though, the handles are triangular and vertical and there are generally three of them. These handles help structure the decoration. They very often delimit panels. D-Ware decoration sometimes involves one panel (for example vases number 401 or 460 from Graff's corpus 2009) or three panels (for example Graff 2009, *number* 218, 232). But in the vast majority of cases, the vases have two panels (Graff 2009 *number* 194, 338, 469). The panels offer a repetition of the same scene (twice or thrice), with sometimes a few minor differences. In addition to their being delimited by the handles, the panels generally contain two superimposed registers. The disposition of the ornamental elements on the lower or upper register, under the handles or between two handles, is predetermined and fixed. The area which is usually the most decorated is situated on the upper register, between two handles, in the middle of the panel. Then we have the two areas in the lower register, under the handles. The other ornamental patterns are arranged around the ones that have been painted first.

As far as the selected elements are concerned, factor analysis (Graff 2009: 94-99) shows that there are two pairs of prevailing elements which exclude each other and therefore never appear together on the same vase. The first pair combines an addax and a woman (represented in front view, with her arms raised above her head), whereas the second pair brings together an animal skin stretched over sticks and the Naqadan plant. A second group of signs is arranged around these two pairs, and is primarily or exclusively associated with one or the other. Accordingly, the man figure is always represented close to the woman and the addax and never appears next to the skin and plant. Finally, a third group knows no such restriction and can be used with one pair or the other.

There is very little connection between the elements: a few men hold sticks which they hold out towards an addax, a woman or a flag raised on a boat (Aksamit 2006), a few women hold each other's hands, some men touch the muzzle of the addax or the ibex. But apart from these isolated cases when physical contact is established between the elements, the signs are usually placed side by side, without any explicit connection between them. As a result, the reading of such a scene will not be linear, as is the case with the long rows of impressions left by rolling seals, but will be more like observing a nebula, starting from the most noticeable signs and then taking into account the most peripheral ones. This is global, non-analytical reading (Schmandt-Besserat 2007: 2).

Thus the painted decoration on Naqada II vases is the oldest complex graphic system that can be identified in Egypt: painted Naqada I vases rely on too loose a structure indeed to fit into this category. Naqada II painted vases provide the earliest example of such high-level structuring and systematizing of the image in order to make it meaningful -that was four centuries before the U-j tomb labels were engraved.

Of the four graphic systems which have been introduced in this paper, the earliest one appeared during the Naqada IIC period whereas the most recent ones are contemporary with the first inscriptions and persist after them (Regulski 2008: 997). These systems differ from each other in their purposes (accounting, political purposes or purposes linked to funeral rituals) and therefore themes, and in their inner structure or complexity. D-Ware paintings and ceremonial artefacts are far more constrained graphic systems than seals while constraints are simply non-existent as far as potmarks are concerned. One can even speak of an inverted process: the mediating object lost much of its importance (without becoming insignificant) with the invention of writing. An evolution can also be noticed from a three-dimensional medium like the vase or the macehead to two-dimensional media with a front side and a back side (which sometimes showed graphic continuity, as can be seen on the Gebel al-Arak knife-handle where the hunter and the dog are linked together by the lasso), and later to two-dimensional media with only a front side (seal impressions and potmarks).

As the medium and the arrangement lost their influence on the sign, the sign itself gained more importance as an autonomous entity, not as part of a whole. As a consequence, when it comes to potmarks, meaning is conveyed by signs - either one sign only or a group of two or three items; conversely in vase paintings or palettes the whole object conveys meaning. An element cannot be read when taken out of context. Potmarks or seals no longer depend on hierarchical systems of signs and constraining combinations: there was an evolution from a more or less rigid synthetic mode of representation to analytical variations offering unlimited combinations.

This leads us to the conclusion that Egyptian writing is deeply rooted in its iconography. As a matter of fact its genesis is far more complex than that of cuneiform writing which as far as we know originated from the accounting system based on *calculi* and *bullae* (Schmandt-Besserat 1992).

The roots of Egyptian writing seem to have divided into more complex ramifications. One branch led to writing but Egyptian iconographic tradition, which had the same origin, continued to develop on its own. Actually the relationship between iconography and writing remained very close and intricate throughout pharaonic history. Deeply rooted as it is in prehistory, the genesis of Egyptian writing further supports the hypothesis that it was a native invention (Gosline 1999: 67; Regulski 2008: 1002) which occurred at about the same period as the development of Mesopotamian writing, but was very probably independent of it.

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