Roeland P-J. E. Decorte

Cretan 'Hieroglyphic' and the Nature of Script[1]

This paper deals with a problem that has been haunting the study of Cretan 'Hieroglyphic' for over a century, ever since the first publication of Cretan 'picture-writing' by Evans (1894a, 1894b, 1895). It is an issue that was purportedly solved by the publication, two decades ago, of the script's corpus (Olivier 1989),[2] but which in reality remains highly relevant and ill-defined today. The problem is that of defining 'script' in relation to 'decoration' ('writing' in relation to 'art'), and the definitions we supply directly determine what we consider to constitute the 'Cretan Hieroglyphic' script.

Since the publication of *Corpus Hieroglyphicarum Inscriptionum Cretae* (*CHIC*) by Olivier and Godart, reviews have criticised the omission of script signs in individual instances (Younger 1997, Karnava 1997 and Palaima 1998), while Jasink (2009)[3] – though still 'following, as much as possible, the suggested criteria of *CHIC*' – has proposed the reinstatement to the syllabary of as many as 30 signs, maintaining even more elements as 'decorative'. It is testament to the tremendous influence of *CHIC*, however, and the strength of its arguments – first published as a series of articles by Olivier (1981, 1989, 1990, 1995, 2000, 2010) – that scholarly response has limited itself to refining the corpus' approach: not a single serious redefinition of the interpretative framework for understanding Cretan Hieroglyphic has been suggested since its publication. It is exactly such a conflicting approach that will be developed here.

Cretan Hieroglyphic, in active use on Crete between Middle Minoan I and the end of Middle Minoan III (roughly 2000 to 1600 B.C.),[4] is unique among the writing systems of the

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[2] While preparing *CHIC* for publication, Olivier (1989, 48) argued that deciding which signs to understand as script, and which not, was 'not an easy decision to make (…) but it is now a resolved problem.' Olivier (2010, 287) more recently stated that 'en une trentaine d'années, on en est arrivé, *grosso modo*, à un certain consensus.'
[3] Building upon groundwork already laid in this direction by Karnava (2000, unpublished PhD).
[4] In this paper I follow traditional low dates established on ceramic and other material synchronisms with Egypt and Mesopotamia, awaiting the resolution of the current stand-off in radiocarbon dating for our period (the result

Bronze Age Aegean in that roughly half of the script's surviving attestations – next to more typical appearances on clay and ceramic surfaces – are found engraved on seal-stones. In comparison, Linear A, roughly contemporary, can be identified on two or three seals (*CMS* II.2,213b, cf. *CHIC* p. 12, n. 17, Younger 1997; *CMS* XII,96, cf Raison-Pope 1994, 242-3, Perna 2014, Anastasiadou 2016; *CM*S VII,31) and one signet (*CMS* II.3,38), while Linear B produces a single seal (*CMS* V,415). Though much less well attested (its signs were estimated by Olivier in 1989 to constitute only 2% of the whole corpus of Myceno-Minoan scripts),[5] Cretan Hieroglyphic appears on more than 280 seals and sealings,[6] as well as, as will be argued below, potentially many more. It is exactly on these seals and sealings that we find the complex renditions of the script that, together with the supposed 'naturalistic' form of its signs,[7] have led many scholars to argue for the 'ornamental' nature of the writing system.

Past Approaches

As early as 1901, before even the appearance of *Scripta Minoa*, doubts about the nature of the script were expressed. It was argued by the German scholar Zahn, on the basis of Evans' initial announcements, that the writing system was nothing more than a sequence of religious symbols (Zahn 1901, 23; cf. *SM*, 21). Evans himself, however, maintained a firm belief in the 'pictographic' nature of the script, hypothesising the existence of phonographic elements for those cases where sequences made no clear pictographic sense (*SM*, 12; 134; 245; 247). Following then-popular notions of the supposed 'universality of early writing', Evans interpreted elements such as 038 ⌸ 'gate' as 'keeper', and 005 👁 'eye' as 'overseer', with the well-known formula 044-005 ⚒👁 'trowel-eye' representing an 'overseer of builders' (*SM*, 3 for ideas of 'universal writing'; *SM*, 245-247 and 267-268 for sign values).

An extreme of this approach, often ridiculed (laughing away the very real problem of the rarely addressed relationship between sign and image), is Evans' interpretation of 'keeper of the swine' (Figure 3.1). Crucially for us, Evans was the first to systematically argue for some signs as pictographic 'badges' (*SM*, 264) and others as mere 'decoration', both classes

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of a noted oscillation in the calibration curve and questions as to quality of data and results: see Wiener, Friedrich and Manning, 2009).

[5] Olivier (1989) estimated that, at the time, surviving attestations of Cretan Hieroglyphic totalled roughly 1,500 signs, compared to 7,500 for Linear A and 65,000 for Linear B (30,000 at the time of Ventris' decipherment).

[6] The numbers here used are conservative estimates based upon *CHIC*, Karnava (2000) and Jasink (2009).

[7] See e.g. Branigan (1965, 1966) for early attempts to identify the real-world objects behind these 'naturalistic' signs.

fully detached from the actual script. The 'decorative' signs were a result, he argued, of the Minoan artist's supposed '*horror vacui*' (*SM*, 229-231).[8]
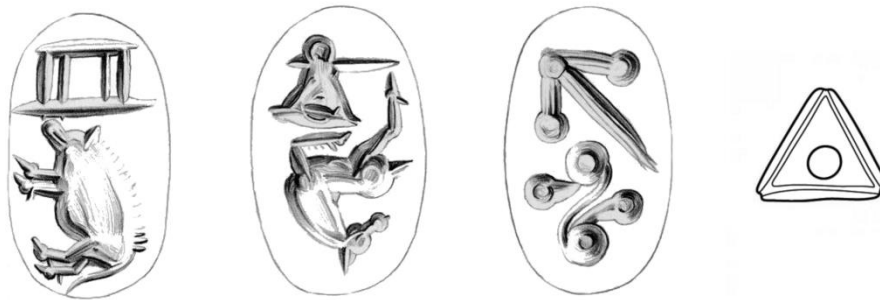

Figure 3.1: *CHIC* #256/CMS VI,95a-c. Evans' 'keeper of the swine'.
Images courtesy of the *CMS* Heidelberg, recoloured by author.

In 1951, reacting against the tendency to explain away the script's idiosyncrasies as due to its 'decorative' nature, Chapouthier reinstated the suggestion that the repetition of signs in Cretan Hieroglyphic might be meaningful, perhaps indicating plurals and duals as in Egyptian Hieroglyphic. Though this had previously been denied for want of tripled signs representing the more common plural, Chapouthier provided exactly such an example, arguing that we could now exclude 'toute intention décorative' (Chapouthier 1951, 73). Observing the appearance of 053 ❡ on actual ceramic material, he furthermore suggested an ideographic function for certain signs as '*déterminants*' (see also *SM*, 247), a concept we will come back to later in this paper.

In 1963, Grumach published the now famous seal #262 (Figure 3.2), in which the reduplication of middle signs seemed to disprove Chapouthier's thesis. To Grumach, reduplication was instead reminiscent of the flanking elements in the 'mistress of animals' motif, well known from Late Bronze Age art. The script was once more to be understood ideographically: words or sounds may not, he argued, be redoubled at will (Grumach 1963a, 12-13: '*in jedem Fall können Zeichen, die entgegen der 'normalen' Schreibung der Gruppen verdoppelt und nach ästhetischen Prinzipien angeordnet werden können, nicht phonetische Zeichen sein*').

Maurice Pope at the first Congress of Mycenology argued, conversely, for a syllabic interpretation of the script, pointing out that 'the script has often been vaguely called "ideographic", [yet] I do not know of any consistent theory of how [this] would work' (Pope

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[8] Evans thus started the long tradition, continued to this day, of identifying the idiosyncrasies of Minoan art and iconography as a direct consequence of such a perceived '*horror vacui*'. For perhaps the earliest mention of this, see Evans' (1894a) very first article on Mycenaean/Minoan writing in *Athenaeum*, p. 812.

Figure 3.2: *CHIC* #262/CMS XII,117. Face a-b with supposed formulae 036-092-031 �Ↄꚜ↑ and 038-010-031 ▯ꚞ↑. Images courtesy of the *CMS* Heidelberg.

1968, 438-439). Cautioning, however, against interpreting every inscription as meaningful, Pope drew attention to two problematic instances: a seal (#294) showing heavy repetition seemingly uncharacteristic for syllabic texts, and a clay document (#43a) showing what he considered 'arms and legs gathered together' (007-010-006, ꚙꚞ⬎). Arguing that most such instances of 'dubious writing' appear on seals, Pope famously stated that 'we cannot tell whether the seal inscriptions communicated awe, prestige, or pleasure, but they are unlikely to have conveyed serious information' (Pope 1968, 446).[9]

At the same congress, John Reich once more posited the opposite view. Stressing the need to look at all sides of the seal, Reich argued that accompanying figural and pictorial scenes are 'no less significant [than] hieroglyphic signs': such naturalistic scenes and signs were not, he stressed, 'merely decorative in purpose; on the contrary, their function as particularizing elements for the hieroglyphic signs (…) appears to be among the most important features of the script' (Reich 1968, 456 and 461). Reich's application of these ideas to the material evidence, however, led him to interpret scenes in a straightforward, pictorial way, arguing seals displaying animals alongside tools to be related to the hunt, and even suggesting different vessel-signs as indicative of 'local variations in methods of cooking' (Reich 1968, 457).

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[9] Using Mackay (1965)'s formula, Pope assured himself that the Cretan Hieroglyphic found on clay documents was, indeed, true writing. In the failure of the formula to prove pertinent for the script on seals, however, Pope saw a final confirmation of their detachment from 'true script'. It is my belief that these calculations underlie the current tendency in scholarship to omit supposed 'decorative' elements completely from our analyses of the script, without the apparent need for further justification. If this is indeed so, it is never explicitly stated. There are, however, some serious problems in regarding Mackay's formula as a certain predictor of what is script and what is not: not only was the formula devised for a different purpose altogether (the estimation of the number of signs in a syllabary/alphabet), it is impossible for it to have any use when there is still debate as to what to identify as the 'signs' of a script, as the selection of input data is, in itself, necessarily biased. Such objections were already made by Reich (1968) as a comment to Pope (1968). Especially problematic to my mind is Pope's stated omission of single 'isolated' signs from his calculations, an issue further addressed below. A similar inability to define a syllabary without fully grasping the nature of a script, may be recognised in Cypro-Minoan (see Ferrara 2012, 220-221), where the problem of palaeographic 'variants' (cf. the chapter by Valério, this volume) creates, I would argue, issues of carrying forward bias from the selection of individual signs put into the formula (cf. the chapter by Duhoux, this volume) to our investigation of the typology of the script(s).

It is in reaction to the latter kind of imaginative approach that the currently accepted framework for understanding Cretan Hieroglyphic was formed. In 1978, Olivier reiterated the problem of defining writing, taking a first crucial step towards a more consistent approach by offering his own clear definition of the term: *'une technique graphique permettant à un individu de transmettre à un ou à plusieurs autres individus, aussi bien dans l'espace que dans le temps, un message bien précis et univoque'* (Olivier 1981, 106; an updated, slightly modified, but semantically identical version is given in *CHIC*, p. 12).

At the time, Olivier agreed with Pope that writing on seals was wholly ornamental (Olivier 1981, 113-115).[10] Elsewhere, he argued that any serious study of Cretan Hieroglyphic should start from 'real inscriptions, that means the archival inscriptions' (Olivier 1989, 43-44). In 1990, however, Olivier admitted that certain seals *could* be read, even if they were not necessarily *meant to be*, stressing that he was nonetheless 'more convinced than ever that the script on the seals is a *decorative* one' (Olivier 1990, 13). Based mainly on #256 (see Figure 3.1 above), displaying all its supposed 'non-script' signs on a lower level, Olivier also contended that in some cases only half a seal contained script, and thus only half would be impressed (Olivier 1995, 175). The 'non-script' signs were once more identified as 'badges', without any further elaboration on the supposed function or workings of such 'badges'.

It is clear, as Pope already alleged in 1968, that 'no consistent theory' for tackling the relationship between 'script' and 'decoration' has as of yet been developed. Though Olivier's system has progressed the furthest – providing its own definition of writing – the interpretation of some features as 'decorative' and therefore somehow meaningless, and others as 'badges' (in some instances 'talking badges') remains highly ill-defined. It is furthermore highly revealing that despite the definitions of writing offered over the past few decades specifically for the study of Cretan Hieroglyphic, not a single definition of 'art' has ever been brought forward in the context of the script.

My argument in this paper is thus divided into two parts: first, I identify and problematize each category of the so-called 'decorative' signs lost in the normalised transcriptions of *CHIC*. Secondly, I propose a theoretical framework for the interpretation of each of these signs as an integral part of the script, building upon concepts borrowed from the typologies of other early writing systems. However, we first need to address the problem identified above of defining 'art' and 'writing' in the context of Cretan Hieroglyphic: though

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[10] In response to a question by Van Effenterre, Olivier (1981) further argued that there are no clear associations between sign-combinations and 'decorative' motifs in Cretan Hieroglyphic, an observation here considered to be incorrect.

necessarily and unavoidably subjective, scholars' unstated understandings of these have formed the basis for every approach to the script, past or present.

Let us start by adopting Olivier's definition of writing, seen above. Though to my mind highly restrictive (favouring only the most traditional forms of writing), for the purpose of this paper – and at this comparatively early point in the discipline – it is deemed best to start from a consensus, which may then be made more precise as we uncover more of the complexities presented by the script. My objections, however, may be briefly summarized as follows: even if classic examples of sematographic writing,[11] such as musical notation or numerals (Sampson 1985; Bennett 1963, 98 in the context of Aegean scripts), can still be argued to fit under this definition, more unconventional examples, such as Pre-Columbian Mesoamerican map-writing (see e.g. Boone and Mignolo 1994), cannot. Indeed, some forms of 'writing' depend, it seems to me, exactly on exploring that boundary between the graphic universality of art and Olivier's specificity of script. Forcing such complex scripts into the framework of more recognisable writing systems, or disregarding them as a forms of writing altogether, seems wholly unjustifiable.

For the definition of 'art', as already pointed out, there is no scholarly tradition to build on in the context of the script. Any definition offered here will, like that of writing, be inherently controversial and, no doubt, strongly contested. However, the virtue of offering such definitions lies exactly in the clear exposition of the interpretative structures involved in our analyses, bringing these to the fore, rather than burying them in unstated and implicit assumptions (cf. Morgan 1985, in the context of iconographic analysis). It is clear that a definition of art in the context of Cretan Hieroglyphic must pay special attention to framing hermeneutic interpretation, specifically the scope and limits of signification. As we have seen, and as we will consider more extensively below, recent implicit definitions of art in the context of the script have been highly restrictive, side-lining the signifying value of elements by dismissing them as 'decorative' and thus somehow meaningless. For the purpose of opening up and deepening the narrative, I thus here propose a radically inclusive synthesis of definitions developed by art-historian Gombrich and art-critic Danto: 'art is any manipulation of the human environment of which the material result (i) is about something, and (ii) embodies its meaning' (Gombrich 1950; Danto 1997, 195).[12]

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[11] For a definition of the term, see below.

[12] The opening sentence of Gombrich's (1950) seminal volume *The Story of Art* famously reads '[t]here really is no such thing as Art, only artists'. Asked to clarify his position fifty years later, Gombrich professed that he went 'back deliberately to the old meaning of the term "art", when art was identified with skill or mastery, the art of

Let us now start our analysis of the so-called 'decorative' signs lost in the normalisations of *CHIC*. As the scope of this paper does not allow for a comprehensive list of all signs omitted in *CHIC* or elsewhere, discussion in part one will limit itself to some token examples of each category.

Identifying the Problem

First, let us address the **omission of otherwise accepted 'syllabic' signs**. Often omitted because their absence transforms the sequence into well-known formulae, the 'decorative' nature of such signs was first proposed by Pope (1968). Let us, by way of illustration, consider all instances on seals or sealings of the two most common formulae in Cretan Hieroglyphic: 044-005 and 044-049.[13] Of 37 instances of 044-005 attested in the index of *CHIC* as solely present on a single epigraphic surface, three may be immediately dismissed: one (#259) requires the reading across different seal-faces, one hypothesizes signs on an illegible surface (#311), and another is formed by arbitrarily adding a non-existent trowel to a suspicious-looking eye (#314). Of the 34 seal faces left, only *seven* present us with just the formula on a single seal-face, while *eighteen* show us the formula plus an omitted syllabic sign.[14] A further nine show the formula in combination with 'decorative' signs that Jasink (2009) has argued to be part of the script.

Thus, of all the seal-faces identified as showing the formula – and nothing else – in the index of *CHIC*, only 19% actually do. Even if we would accept Olivier and Godart in disregarding Jasink's (2009) signs, just over half of the instances identified in the index remain 'false' attestations. It is furthermore highly revealing that the omitted signs found in combination with 044-005 sometimes recur, such as 013 in the case of #140 and #264 (see Figure 3.3 below). Such signs may even appear more than once in the same position: 065 is considered to appear in the middle of the formula on both #158 and #174 (Figure 3.3).[15] It is worth noting that *CHIC* considers 065 to appear in the same medial position with the formula 044-049 (see #278), though there too the sign is omitted from the index.

[footnote continuation] war, the art of love, or whatever else. Art is something with a skill. There is no disembodied skill as such' (Carrier 1996, 279).

[13] The formula 044-005 only appears twice on the clay documents (#18 and #59).

[14] Three of which admittedly show the additional sign in a smaller font, with another three showing variations on the combined formulae 044-005/044-049.

[15] Though the middle sign in #158 is transcribed as 065 in *CHIC*, 062 is to my mind equally possible here. A sign cognate to 065 and 062 might also be seen in the same position in #247c in **Figure 3.6** below.
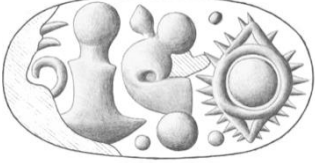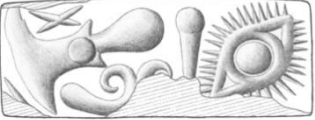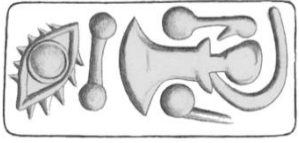
	CHIC transcription	*CHIC* index
CHIC #140/*CMS* II.8,64	👤{🦆}👁	👤👁
CHIC #264/*CMS* VI,92b	{🦆}👤👁	👤👁
CHIC #158/*CMS* II.8,65	👤{ ❘ }👁	👤👁
CHIC #174/*CMS* II.6,245	👤{ ❘ }👁	👤👁

Figure 3.3: Instances of 044-005 👤👁 with recurring CHIC signs. Images courtesy of the CMS Heidelberg, recoloured by author.

Let us now consider 044-049 👤↑: of the 63 attestations in *CHIC*'s index of just the formula on seals or sealings, we can dismiss four (#235, #259, #285, #311) for the same reasons as with 044-005 👤👁 above,[16] leaving us with 59 possible instances. Twenty-four of these show only the formula (as well as 'decorative elements' associated with 044 👤 discussed below), eighteen show the formula with additional syllabic signs, and seventeen show the formula with Jasink (2009) script signs. Only 38% can therefore be conclusively said to just show the formula (see Figure 3.4).

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[16] #235 is too badly broken to be read with any degree of confidence; #259 reads across multiple seal faces (and includes a dubious version of 049 ↑); #285 is severely damaged, with only 044 👤 clearly attested; #311 is weathered to the point that individual signs cannot be identified with any certainty.

Figure 3.4: Instances of just 044-005 🪨👁 and 044-049 🪨↑ on a single seal-face according to *CHIC*.

It is thus extremely common for syllabic signs to disappear in the normalisations of *CHIC*, and to be subsequently disregarded by scholars in their study of the script. From the basis of our 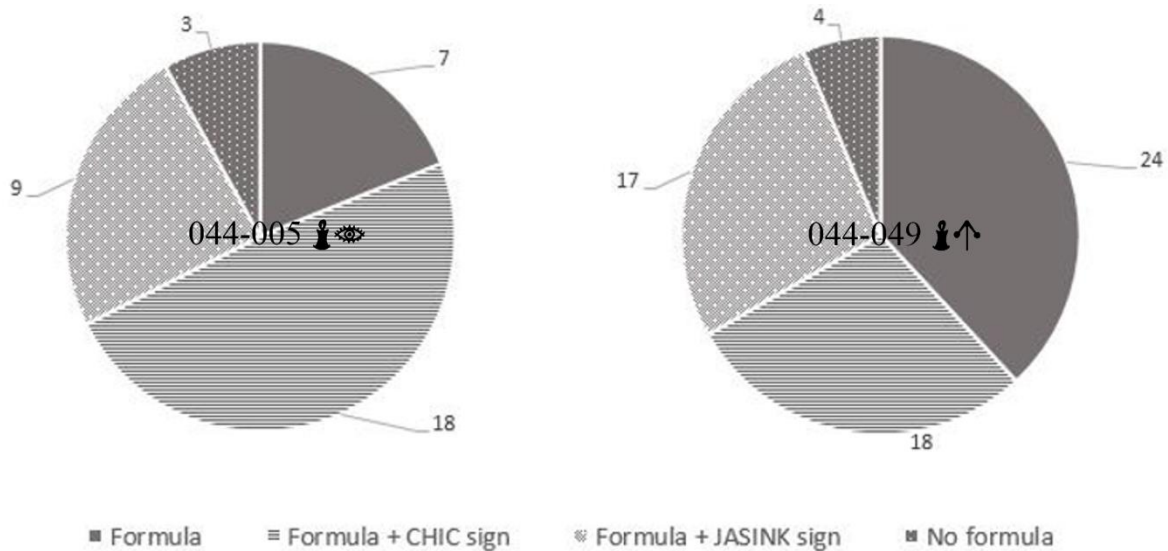definitions (including CHIC's own definition of writing), however, there is little justification for such an approach: we are still entirely uncertain about the meaning of the formulae, and as such we cannot with any certainty argue that the omitted signs do not contain '*un message bien précis et univoque*'.

In the case of the recurring instances of syllabic signs in the middle of our formulae, e.g. 065 🪨 seen in Figure 3.3 above, there is no reason not to accept the combinations as sequences in their own right. Nor are hapax sequences in any way problematic in a corpus as limited as ours: none of the sign-groups found in the recently excavated archive at Petras, for instance, had previously been attested in the corpus (Tsipopoulou and Hallager 2010, 176) – a highly revealing, though in scholarship as of yet rarely mentioned, fact which we need to keep in mind at all times. For recurring signs associated with the formulae in varyingly initial, medial and final positions, e.g. 013 🍢 in Figure 3.3 above, though perhaps hapaxes, a more complex approach may need to be developed. We will do so below. It is important to note here, however, that such omission of 'syllabic signs' is equally well attested outside our token investigation, often on the basis of their size and supposed 'ornamental' position.[17]

Another category of otherwise accepted script-signs omitted in the corpus is that of isolated single signs. It was once more Pope who first suggested not allowing instances of less

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[17] An example of such omissions not associated with formulae in *CHIC* can be seen in the omission of 028 🪶 and 026 ⤬ on #300c in **Figure 3.7** below. Another token example of a much larger corpus of such omissions is #309g (**Figure 3.19**, below), where possible instances of 025🪶 and 081🔆 are omitted.

than two signs into the study of the script, to facilitate statistical discussion.[18] Similar ideas of 'dressing the material for statistical analysis' (Olivier 1989, 53) are perhaps at the basis of *CHIC*'s omission of these signs.[19] Once more, such signs cannot, however, be argued with any certainty not to conform to Olivier's own definition of 'writing': in *CHIC*, isolated signs interpreted as 'logograms' are accepted as part of the writing system. Furthermore, in one document (#56, see Figure 3.5) a clear relationship between numbers associated with 044-049 ⚐↑ and numbers associated with a variable longer sign-group – a relationship best characterized as (x) to (x/~10) – seemingly proves the existence of single-sign abbreviation in Cretan Hieroglyphic.[20] This is made even more clear by the fact that the numerals accompanying 044-049 ⚐↑ on face aA, when added to those accompanying the abbreviation 044 ⚐ on face aB, come to the exact same sum, namely 129, as the two sets of numerals accompanying the two instances of 044-049 ⚐↑ further in the document. Olivier, however, dismisses the instance as a mistake: '*il ne s'agit pas d'une abréviation, mais d'un oubli du second signe*' (Olivier 2000, n. 34).

Regardless of what one thinks of this particular document, there is the extremely telling instance of two signs (042 ⊕ and 089 ✗), both on the same document (#65), forcibly incorporated into *CHIC*'s lists as 'adjuncts' due to their peculiar placement in front of 'logograms', the only two of their kind supposedly attested. The latter signs once more prove the acceptance in *CHIC*, at least to some extent, of single signs being able to contain '*un message bien précis et univoque.*' Furthermore, *CHIC* allows for the identification of single signs on seal-faces when these are thought to form a well-known formula across those faces (e.g. #256 and #259).[21] In conclusion, it is clear that we have unjustifiably excluded what may be up to multiple hundreds of single-sign inscriptions from a script which is currently thought to possess only a few hundred inscriptions overall. How we can envisage such isolated signs as part of our script, however, will once more be discussed in the theoretical exposition below.

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[18] See above, n. 9. See Olivier (1981, 108) for his justification in leaving out single signs.

[19] At the end of his survey of possible methods of decipherment, Olivier (1989, 52) concluded that 'finally, the statistical methods will probably be the most satisfactory.' This 1989 article is, I would argue, crucial to understanding the methods of selection employed in *CHIC*, written at a time when computer analysis acquired far-reaching fame in deciphering complex signaries, a result of the successes and excitement of post-World War II and Cold War computerised cryptography.

[20] This relationship was already described by Younger (1997, 390-391); for a different deconstruction of the document, see his Appendix H. Extremely interesting from a linguistic point of view are the variations in endings of the sign-group on faces b and dA: I hypothesised a similar situation for the potentially omitted sequence associated with the abbreviated formula on side aB (see deconstruction in **Figure 3.5**).

[21] It should furthermore be noted that single-sign inscriptions are abundant in GORILA (*Études Crétoises* 21: Godart et Olivier, *Recueil des Inscriptions en Linéaire A*), the five-volume corpus of Linear A, which was compiled by the same authors.
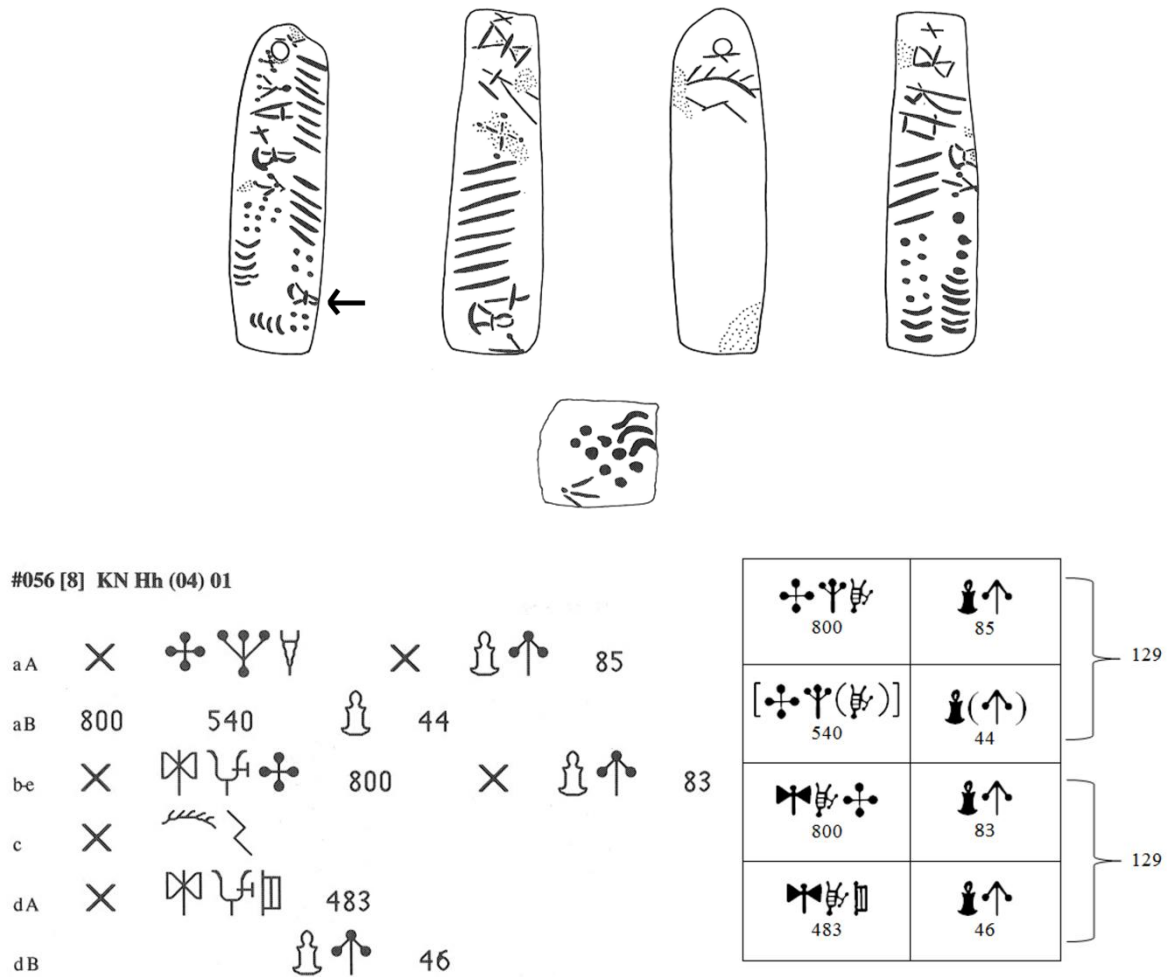
Figure 3.5: *CHIC* #56, drawings and transcription courtesy of J.-P. Olivier and L. Godart; an arrow highlights the possible abbreviation 044(-049) 🚶(↑). Deconstruction (table) by author.

Let us now, as our second category, consider the **omitted large 'ornamental' signs**, recently exhaustively surveyed by Jasink (2009). These are either ignored completely in *CHIC*, or variously marked with {!} or { }, though all such signs are omitted from the index. Some of these signs could already be seen interacting with the formulae above. The most frequent to appear with, for example, 044-005 🚶❀ were the 'spiral' ⟨, (#165, #261, #266, #309), Jasink's 'scroll' ⟨/⟨ (#145, #158 in Figure 3.3, #246, #254) and the famous 'cat-mask' or full-bodied cat 🐾/🐈 (#247, #295; #309 in Figure 3.8 below).[22] Some examples are given in Figure 3.6. All of these signs alternate in position with regards to the formula, and all of them behave in identical ways to the first category of the 'omitted syllabic signs associated with formulae' discussed above. More generally, large 'decorative' signs also very often form

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[22] See Krzyszkowska (2015), 105 for the 'cat-mask' and full-bodied cat in relation to the formulae 044-005 🚶❀ and 044-049 🚶↑. The paper in question offers a holistic investigation of cat iconography in MM II glyptic. See also Krzyszkowska (2012), 152-153 and Krzyszkowska (forthcoming) for the standing female as a potential hieroglyphic sign.

part of simple script-sequences (e.g. #154, #288, #304, #310, etc.) in which, as already argued by Jasink (2009), there is little justification for their omission.

There is a further category to be discussed here: large ornamental signs seemingly connected with specific syllabic signs. Let us once more undertake a token investigation, this time of two signs which maintain a consistent relationship with omitted 'decorative elements': 036 🔺 and 044 🕯. The addition of 'decorative elements' to 036 🔺 seems to make 'aesthetic sense' if we accept Evans' idea of the '*horror vacui*' of Minoan artists; in the case of 044 🕯, however, this is less clear.
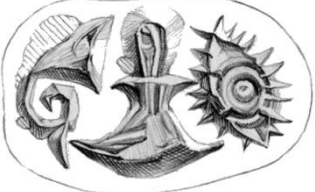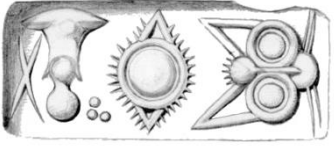
	CHIC transcription	*CHIC* index
CHIC #145/*CMS* II.8,78	🕯 👁 { 🔮 }	🕯 👁
CHIC #246/*CMS* VI,27a	🕯 👁	🕯 👁
CHIC #247c/*CMS* IV,156b	{ ! } ˣ 🕯 👁	🕯 👁
CHIC # 295/*CMS* II.2,316d	ˣ 🕯 👁 { ! }	🕯 👁

Figure 3.6: Selected instances of 044-005 🕯👁 with recurring Jasink signs. Images courtesy of the CMS Heidelberg, recoloured by author.

Let us first have a look at 036 ⋀: of twenty-five instances of the sign in our corpus of seals, twenty-one (!) embrace another sign, ten such instances recognized by *CHIC*. Of the remaining eleven, where the extra signs have been omitted from transcriptions/index, six of the omitted signs are accepted elsewhere by *CHIC* as syllabic, while five are Jasink (2009) signs. Particularly puzzling is the omission of 031 ⍦ in #131 (Figure 3.7, right), as it is part of a common formula, and Younger (1990, 91-92) has already described the tendency of the formula 036-092-031 ⋀ᛞ⍦ to form a 'cartouche' around its final sign (see e.g. *CHIC* #272/*CMS* IX, 21D). Combined with the omission of 028 ᚢ (and possibly 026 ⚬) in #300c, it is clear that this decision has been made purely on the basis of size (Figure 3.7.1).

Figure 3.7: Left: *CHIC* #300c/*CMS* X,52c. Right: *CHIC* #131/CMS II.6,179. Drawings courtesy of J.-P. Olivier and L. Godart.

Let us now move to 044 ⚘. In the whole of *CHIC* I counted 109 clear instances of the sign on seals, of which fifty-one seemingly carry no 'attached' decoration, and fifty-eight instances do. Of the latter, twenty-two showed a single or double version of the 'spiral' ⚬ (seven single, and fifteen double: for an example of the latter, see Figure 3.8), nine instances had Jasink's 'scroll' ☽/☾ attached or nearby (e.g. #140 and #158 in Figure 3.3), and nineteen instances showed varying numbers of crescents or dots surrounding 044 ⚘ (most often four, symmetrically arranged). Of the remaining eight, five were associated with small versions of *CHIC* syllabic signs, and three with Jasink (2009) script signs.

Figure 3.8: *CHIC* #309. Drawing courtesy of J.-P. Olivier and L. Godart.

Interestingly, 044 ⚑ flanked by double ⚇ 'spirals' and 044 ⚑ flanked by crescents does not appear anywhere in the corpus except with our two previously discussed formulae. However, as most instances of 044 ⚑ in *CHIC* are part of these formulae, this may simply be coincidence. The minute size of some of these elements, sometimes less than a millimetre (thus properly belonging to a separate category of small 'ornamental' signs discussed below), makes them hard to chalk up to the traditional '*horror vacui*'. A good example of such intricacies are the minute flanking elements in #308 (see Figure 3.9).
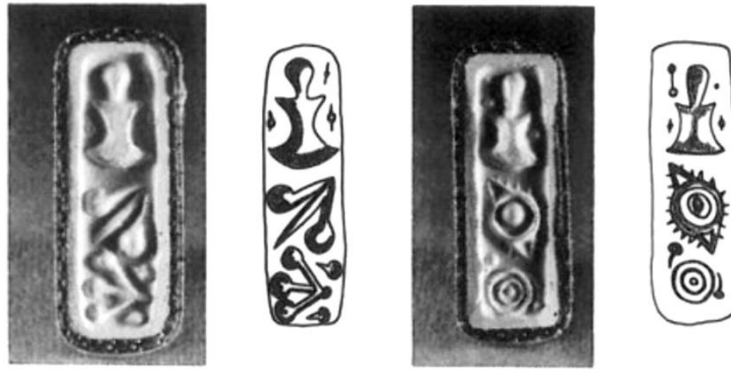
Figure 3.9: Impressions and drawings of #308 in *CHIC*. Images
courtesy of J.-P. Olivier and L. Godart.

I would suggest that we can perhaps even recognize such elements flanking 044 ⚑ in our archives, where peculiar dots sometimes appear in or next to 044 ⚑ (Figures 3.9, 3.10). A common argument against considering some of these elements as part of the script is that they are occasionally found attached to each other in seemingly decorative ways (e.g. #295); however, we may find 'proper' signs behaving in the same way elsewhere (e.g. #242).
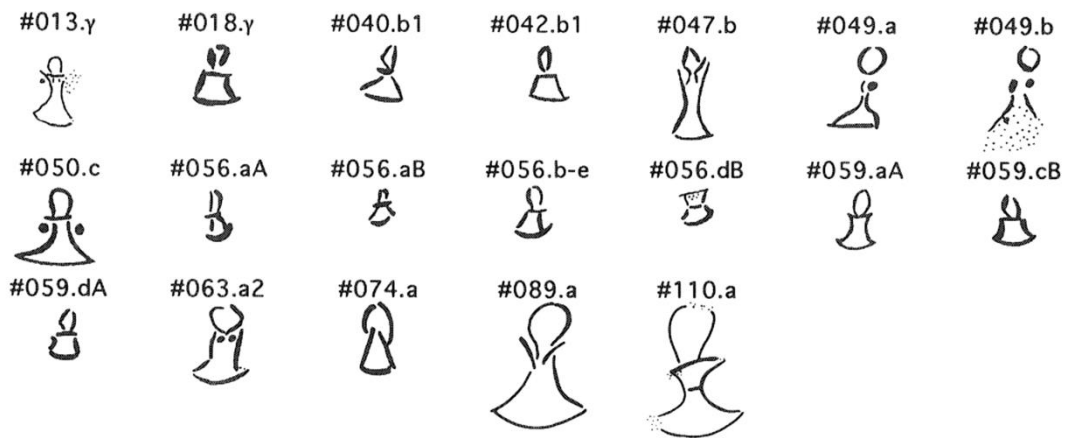
Figure 3.10: All instances of 044 ⚑ on clay documents in *CHIC*. Images courtesy of J.-P.
Olivier and L. Godart.

Having presented some token examples, let us now move on to the **omitted small 'ornamental' signs and 'decoration'**, already briefly touched upon in the context of 044 🚶 above. Such minute signs consist, among others, of dots (see e.g. Figure 3.2, face b; #140, #264 in Figure 3.3; #295 in Figure 3.6), irises (see e.g. Figure 3.2 face b), fleurs-de-lis, and crescents. The so-called 'initial x' stiktogram is not discussed here, as its participation in the script is well accepted.

A first observation that ought to caution us against the long tradition of neglecting these 'background elements', is that some of them closely mirror – or are indeed identical to – accepted script signs, as we have already seen earlier in this paper when we encountered small versions of 062 ↑, 063 ↑ and 065 ↑ (see e.g. Figure 3.9). Equally revealing is 154 〰, found on the clay documents, perhaps a visual abbreviation of 023 ♈; the latter, quite common on the clay documents, is accepted as a sign on seals by *CHIC* in some instances (e.g. #243g), ignored as part of our *omitted large ornamental signs* in others (e.g. #301g). Indeed, 154 〰 bears quite a resemblance to the 'ornamental' crocuses (e.g. top left #124; bottom right #212; #214; #262b) mentioned above. The same is true for the "lily", which variously appears same-size next to accepted script signs (e.g. #283b; #293a; #301d; #268; CMS II.8,74), or in a smaller size elsewhere on the glyptic field (e.g. #295 a-g; #155; #160-1; #254). Crescents occur in the script as numerals, but it would be a step too far to consider them as such here, even if their symmetrical arrangement in certain instances (such as with 044 🚶 discussed above) reminds us of their archival counterparts.

Most of these elements are, once more, generally considered as completely detached from the script. Various approaches have, however, argued them to be differentiating in nature, allowing for the identification of individuals: Weingarten, for example, has likened the use of 'decorative fillers' on Cretan Hieroglyphic seals to modern PIN numbers (Weingarten 1995, 307). Though this suggestion may carry some truth, the constant reappearance of only a small number of physically identical signs (some identical to syllabic signs), as well as the association of these signs with specific patterns, seems to defeat such a purpose.

Finally, what I term 'true artistic motifs' such as cross hatching (see Figure 3.19 below), 'decorative frames' (e.g. #257) and parallel lines (e.g. #273 or #274g), also appear on some of our seals. To my knowledge no scholar in the discipline has ever considered these as part of the Cretan Hieroglyphic script. I will, however, attempt to link even these into my interpretative framework. Having thus surveyed all categories of so-called 'ornamental' signs, let us now build the long promised theoretical framework to accommodate each of these instances as part of the script.

Theoretical Framework

Let us first address the 'syllabic' and 'ornamental' **signs, whether large or minute, that appear either in isolation, or interjected in varying positions among well-known formulae** and other seemingly closed sign-groups.

From the administrative documents (e.g. #56 and #59) we know that the 044-005 𝑖☉ and 044-049 𝑖↑ formulae discussed above are occasionally followed by numerals. We have already considered the case where a direct relationship seems implied (#56, see Figure 3.5 above). One observation, which I think ought to be stressed, is that in each attestation of these two formulae accompanied by numbers, another sign group is present, whether as header of the document as a whole, or of a section: the formulae seemingly need to be qualified by other sign groups. This fits well with the two possible readings currently offered in scholarship of the formulae as either transactional terms or administrative entities:[23] though both groups could conceivably stand on their own when directly inscribed onto objects qualifying the sign group (as demonstrated by their impression on ceramic materials),[24] neither would normally be expected to appear isolated on administrative documents. If we subsequently consider the nature of some of our so-called 'interjected' signs, identified elsewhere in *CHIC* as 'logograms' (e.g. 152 ☙, 153 ⚱, 177 ⇡), the relation between formula and single 'erratic' sign(-group) may become somewhat clearer.

Rather than following the typical path of vague 'ideographic' interpretation, as criticised by Pope, let us use these examples to establish part of our interpretative framework. In 1963, Emmett Bennett – writing in the context of Aegean scripts – proposed to divide all writing systems into lexigraphic and sematographic elements, 'writing representing speech, implying that the signs have a linear order directly corresponding to that speech,' on the one hand, and 'writing not representing speech, implying that signs may have any conventional order or arrangement' on the other (Bennett 1963, 109-110; see 119 for an overview of Bennett's definitions of various categories of writing). Bennett further proposed to subdivide lexigraphy into 'logography' and 'phonography' (representing words and representing non-significant segments of speech respectively), and remarked that any lexigraphic part, when 'ordered on sematographic principles' can become sematographic in nature (Bennett 1963,

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[23] See Olivier (1990) for the initial hypothesis that they represent administrative institutions; for elaborations on Olivier's thesis, see Weingarten (1995, 303) and Poursat (2000), the latter stressing the various hierarchies of administration that the formulae represent. See Meriggi (1973), Brice (1991) and Younger (1997) for the interpretation of the formulae as transactional terms.

[24] See e.g. #151/*CMS* II.6,189, where the 044-049 𝑖↑ formula is impressed on an amphora handle.

110). This is the nature of the so-called 'logogram', which presents the marriage of lexigraphic meaning and sematographic presentation.

The sematographic elements of writing systems generally, and the ideogram specifically, have come under serious attack over the last half century, most famously by Gelb (1952) in his *Study of Writing*. Though Gelbian ideas on the evolution of writing no longer hold sway, many scholars and grammatologists have supported his rejection of the 'ideogram', and within our field specifically, Olivier has stated his support for the complete removal of the term from our corpora (Thompson 2010, 545): a stance arguably at the basis of many of the omissions in *CHIC*. As already discussed in this paper in the context of Cretan Hieroglyphic, the rejection of the ideogram came as a reaction to past approaches focussing on the magical, mythological or 'universal' nature of early writing, giving sematography, to quote Thompson (2010, 546), 'a certain lunatic air'.

As argued by Thompson, however, the presence of ideographic elements in our scripts is undeniable and their presence in the Bronze Age Aegean scripts demonstrable: think only of numerals. The practice of 'double-writing' and the behaviour of monograms – retained across scripts and ordered not according to lexigraphic, but aesthetic principles – hint at such sematographic structures. The most convincing examples in Linear B are the famous 'sexing' signs, which, as shown by Killen (1964, 10), do not straightforwardly signify gender, but more complex ideas of 'breeding age females' and 'all animals', changing in meaning only when contrasted to each other (Thompson 2010, 558).

Let us now look at some parallels further away from home. Phonetic complementation, repeating phonetic elements for semantic reasons (a practice perhaps not entirely unlike the so-called 'double-writing' identified in Linear B), can be found in, to give only some examples, Egyptian (Ritner 1996), Akkadian (Caplice 2002, 5-7), Anatolian Hieroglyphic (Morpurgo Davies and Hawkins 1978; Melchert 2004), and Mayan Hieroglyphic (Bricker 2008, 168-173; Grube 2010; Grube 2012, 849; Kettunen and Helmke 2014, 19/151),[25] see Figure 3.11 and Figure 3.12. In the latter it was likely initially used to differentiate logograms with several variant readings, and later extended to unambiguous logograms (Bricker 2008, 169; Grube 2010, 27). We may theorise similar functions for some of the above identified elements in Cretan Hieroglyphic.

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[25] The problem of defining writing and its complex relationship with art has been extensively explored in the context of Mesoamerican scripts: see e.g. Boone and Mignolo (1994). As such, theoretical approaches developed in these disciplines may be used to inform directly upon the study of Cretan Hieroglyphic, and as comparative evidence to improve our general understanding of early scripts and their relation to other modes of visual communication. The gradual decipherment of the Mayan script was already cited with excitement in the 1980s and 90s in scholarship on Bronze Age Aegean writing systems (see e.g. Duhoux, Palaima and Bennet 1997, 7).

Logographic   Phonetic   Phonetic Complementation

BALAM   ba-la-ma   BALAM(-ma)
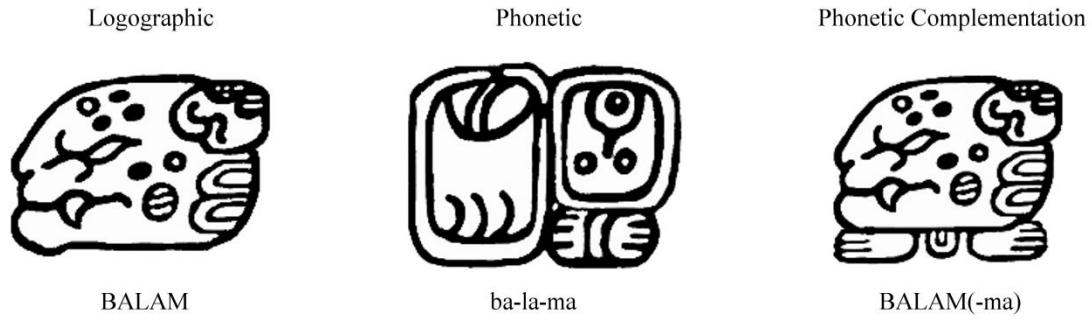
Figure 3.11: Phonetic complementation in Mayan: 'jaguar' in logographic, phonetic and phonetically complemented logographic form. Drawings by author after Harris and Stearns 1997. Though in the latter work (and many other reference works), (ba-)BALAM is also depicted, such a glyph is not actually attested in the epigraphic record (Grube 2010, 28). BALAM(-la-ma), on the other hand, does seem to exist: Kettunen and Helmke 2014, 80/151.

(ya-)YAXUN?-BALAM   (ya-)YAXUN?-BALAM(-ma)

(wa-)WAY   WAY(-ya)   (wa-ya-)WAY   WAY(-wa-ya)

MUYAL(-la)   MUYAL(-ya-la)   (mu-)MUYAL(-li)

Figure 3.12: First row: the royal name Yaxun Balam or 'Bird-Jaguar' on Yaxchilan lintel 43 and lintel 30 respectively, with preposed, and then pre- as well as postposed phonetic complementation. Drawings by author after Kettunen and Helmke 2014, 18/151. Second and third row: further examples of preposed, postposed and full phonetic complementation in iterations of the word WAY 'spirit/co-essence', and MUYAL 'cloud'. Second row drawings courtesy of Stephen Houston (Stuart and Houston 1989), third row drawings by author after Stuart and Houston 1994.

Similarly, signs commonly recognised as semantic determinatives or classifiers, disambiguating interpretation and indicating semantic categories, appear, amongst others, in the Chinese, Mayan, Egyptian and Bronze Age Mesopotamian scripts. Examples of such determinatives include the cuneiform sign '*dingir*' (Akkadian '*ilu*'), a star-like symbol used in both art and writing to denote divinity (see Figure 3.13), as well as minute elements used to differentiate animal types and human body parts in Mayan glyphs (Figure 3.14; Hopkins 1994; Hopkins and Josserand 1999; Mora-Marín 2008, 200-201: 'if these authors are correct, semantic classifiers are so pervasive in the script that epigraphers have taken them for granted'). Punctuation – in Cretan Hieroglyphic referred to as 'stiktogrammatic' – and diacritic markers are equally common in early scripts (Figure 3.14 shows an example of the remarkable 'syllabic doubling sign' in Mayan, which consists of two small dots in the margin, indicating that the phonetic value of the adjacent sign should be repeated: Stuart and Houston 1994, 46, 50; Kettunen and Helmke 2014, 20/151) .
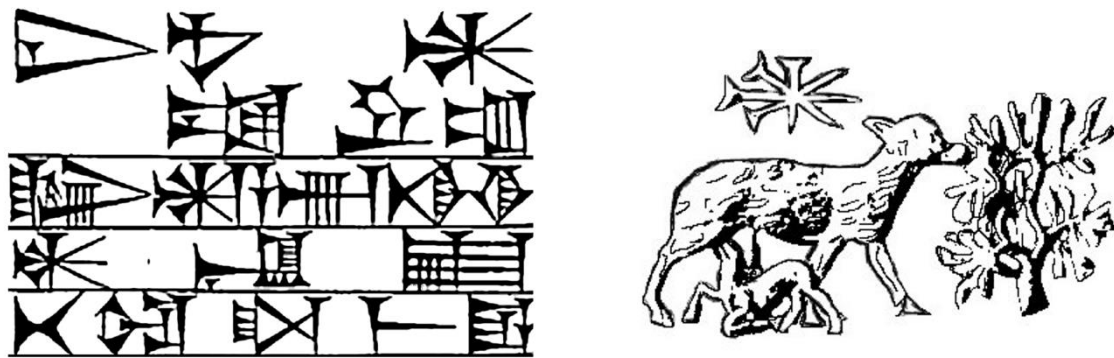
Figure 3.13: Left: opening lines of the famous law code of Hammurabi, with '*dingir*' as a logogram for the god Anum in the header, and as a determinative next to Anunnaki (all gods) on the second line, and Enlil (a deity) on the third line. Drawing after normalisation by Harper (1904). Right: '*dingir*' in art, accompanying a ewe suckling a lamb on a 13th century B.C. cylinder from Ashur (Harper et al. 1995, 73), drawing by author.
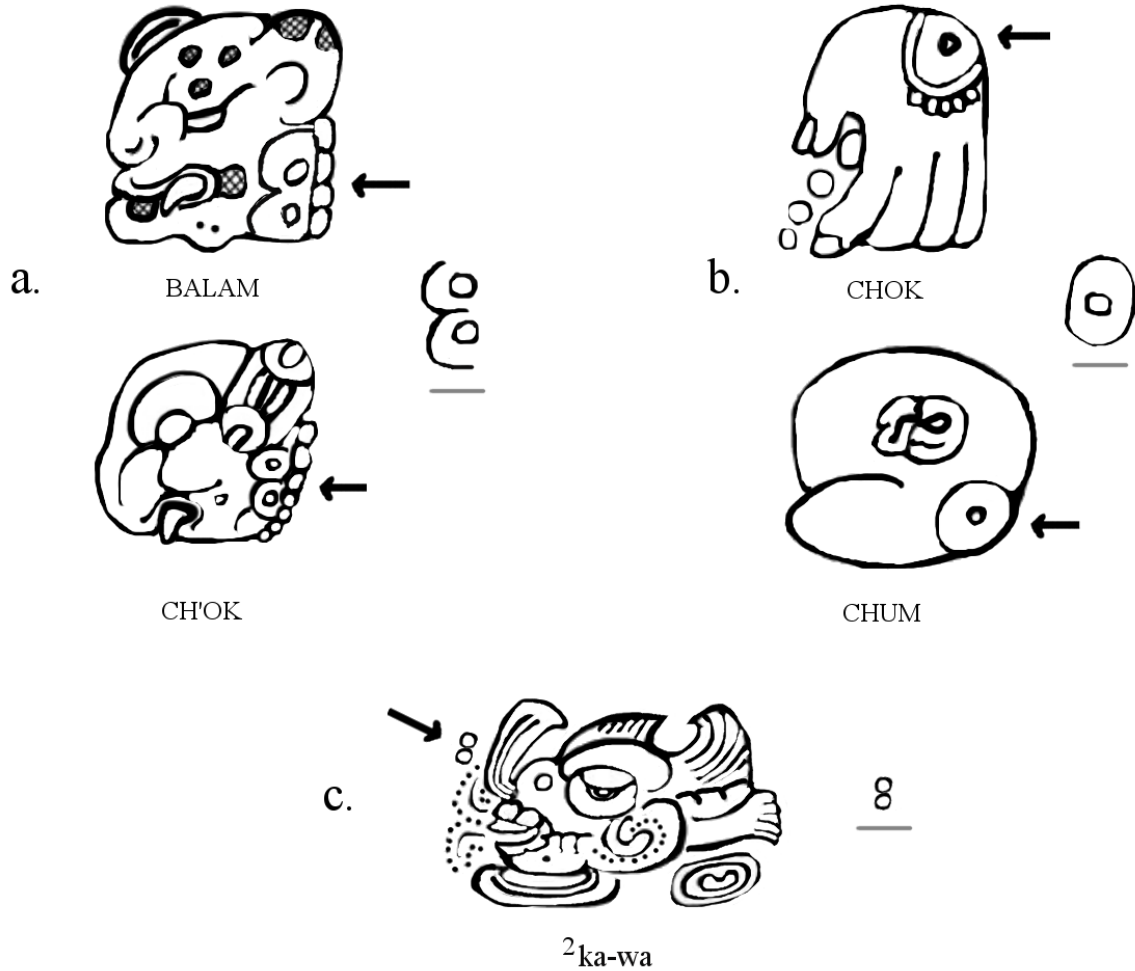
Figure 3.14: Double bracket elements signifying 'night animals' (Stephen Houston, pers. comm.; Stone and Zender 2011), dotted circle elements signifying human body parts, and the 'syllabic doubling sign' accompanying the word 'ka-wa' – to be read as 'kakaw' or cacao/chocolate – in Mayan. Drawings by author after glyphs from Kettunen and Helmke 2014.

I would thus suggest approaching the supposedly erratic signs in Cretan Hieroglyphic as potential sematograms, within a framework of either: **(i)** semantically meaningful phonetic complementation, **(ii)** semantic classifiers or determinatives, **(iii)** stiktogrammatic or diacritic markers, **(iv)** abbreviations or adjuncts, or **(v)** simple or complex ideograms – distinct in that they can appear on their own.

That such possible sematograms are seemingly scarce on the clay documents may be indicative of different writing practices, perhaps due to the static nature of the visual information encoded on seals, and the more dynamic nature of contemporary archives. Yet they are certainly not absent: the signs identified by *CHIC* as adjuncts, the logograms, as well as individual instances such as the abbreviation on #56, or perhaps even the possibly

meaningful dots accompanying instances of 044 🪨, all point to a complex sematographic system being in place.

A final example here brings together both engraved and inscribed material, in the form of the inscriptions accompanied by seal-impressions on the crescent nodules from the Knossos Hieroglyphic deposit. Though divorced from each other in *CHIC* (supposed non-Hieroglyphic seal impressions even omitted altogether), I consider these elements to constitute one document, and contend that they should be interpreted as such. Weingarten has already argued for a meaningful relationship between the text on sealings and that on sealed documents, based on repeated instances of sequences and individual signs in the Hieroglyphic deposit from Mallia (Weingarten 1995, 292).[26] The Knossos crescents have so far only been published as a single unit in schematic form by Weingarten, and currently cannot be consulted in full anywhere.[27]

The specific example I want to pick out here, however, is that of #18. This particular crescent nodule is traditionally argued to show the formula 044-005 🪨🟤 repeated three times: once incised, twice impressed. A closer look at the sealings (#140 and #158 in Figure 3.3), however, reveals that each contains two 'omitted' signs, both times one from the *CHIC* syllabary and one from Jasink's (2009) list. Though the document has been used in the past as 'proof' for the redundant nature of script on seals when used sphragistically, I would here argue the exact opposite: namely that this document presents us with one of the most convincing indications of the semantic relevance of the omitted signs. For, if we want each part of the document – in its essence a utilitarian tool– to be meaningful, an appreciation of the three instances of the formula as somehow different is almost inescapable.[28]

A holistic analysis of the crescents yields forty sealings from thirty-three unique seals, of which eighteen are hieroglyphic according to *CHIC*, and fifteen are supposedly 'non-

[26] Four noduli – Weingarten's (1986) class of nodules that seemingly did not seal anything – were found as part of the same assemblage as twelve medallions in room III 3b of Building A in Mallia, Quartier Mu. Each nodulus contained Cretan Hieroglyphic sealings, all depicting 'one or more animal heads', while 'similar signs were written (…) on six of the twelve medallions' (Weingarten 1995, 292). One nodulus contained a sealing displaying but a single sign (016 🎷): in the context of this 'animal head' archive, this single sign seems to strongly support our contention that isolated signs ought to be viewed as inscriptions in their own right, not as a separate class of 'figurative' or 'decorative' art. In her article, Weingarten identifies and discusses this issue, arguing that 'other seemingly naturalistic seals [may], in fact, [be] lurking hieroglyphs'(Weingarten 1995, 304-305).

[27] The schematic nature of the drawings Weingarten (1995) had to work with bear testament to just how much the study of Cretan Hieroglyphic owes to *CHIC* (as well as the continued publications of the *CMS*).

[28] I say 'almost', as a counterargument could be made by likening the crescents to the so-called 'roundels' (cf. Hallager 1990), where the number of seal-impressions on each nodulus, rather than their content, has been argued to be of importance (Hallager 1990, 126-127). However, the apparent relationships between sign-sequences inscribed on the clay and the glyptic material, as already noted in this paper (and by Weingarten 1995, 292; cf. n. 26), as well as the fact that the Knossos crescent nodules display a maximum of up to three sealings at any time (while roundels carry up to fifteen), caution against interpreting the nodules in this way.

hieroglyphic'. Of the fifteen supposed 'non-hieroglyphic' seals, however, all but four display single *CHIC* signs, the remaining four displaying Jasink (2009) signs. Despite the prevalence of figure scenes in the corpus of Middle Minoan seals, only one such scene is attested on all of the forty sealings impressed (see Figure 3.16 below). Some of the isolated signs omitted from *CHIC* may, I would suggest, further elucidate the script's sematographic structures. Indeed, it is possible to identify some of the supposed single signs as potential ligatures (see Figure 3.15), Cretan Hieroglyphic famously being the only Aegean writing system to include ligatures in its syllabary.

042-049 ⊪↑?   042-025 ⊪⚘?   042-019 ⊪Υ?

Figure 3.15: Possible ligatures on sealings from the Knossos crescent nodules. Left to right: CMS II.8, 49 (for similar such instances of 049 ↑, see CHIC p. 407, e.g. #219, #208, #209 and #312); CMS II.8, 55; CMS II.8,124. Images courtesy of the CMS Heidelberg.

It is even tempting, though a different matter entirely, to interpret the one figurative scene as part of the same sematographic network, whether as incorporating known script signs (e.g. 053 ⸙ and 023 ⚘), or as an image with a semantic significance strongly related to that of ideographs.

053 ⸙ and 023 ⚘?
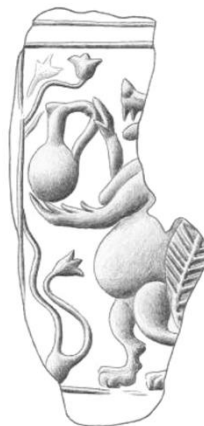
Figure 3.16: Tentative identification of script values in figurative sealing CMS II.8,195. Image courtesy of the CMS Heidelberg.

It is here, at the end of our paper, that our definition of art finally proves its use, helping us to address **the most convincingly 'decorative' elements in the script**. If we accept that all art (i) is about something, and (ii) embodies its meaning, then we cannot simply dismiss any element as 'decorative' or 'ornamental' and be done with it. Though various degrees of meaning are obviously encoded in the various elements found on our seals, scenes such as the one displayed above encode a complex set of interpretative structures, as does their relationship with the script signs on the same object. Both categories, 'image' and 'sign', are, after all, elements of the same visual language, even if the modes of viewing can differ. The fact that Cretan Hieroglyphic stands at the earliest diverging point of 'art' and 'script' in our region, cautions against viewing them too differently.[29] In many ways, the assertion, often encountered in scholarship, that Cretan Hieroglyphic seals ought to be 'viewed' not 'read', thus becomes meaningless.

One example of this may be demonstrated by #207 (Figure 3.17): the formula 044-049 ⚇↑ is here combined with a scene generally interpreted as a figure stomping grapes. That this scene might have had the same effect as our isolated signs appearing alongside known formulae may be suggested by the fact that on another seal (#274, Figure 3.18) we find 044-049 ⚇↑ accompanied by the logogram for wine, 156 ⼝. Similarly, a version of the formula with an extra sign can be found on a sealing on crescent #007 from Knossos, which has 156 ⼝ inscribed. If the figural scene indeed represents wine-making, a function of the figurative scene similar to the logogram 156 ⼝ seems here very likely.
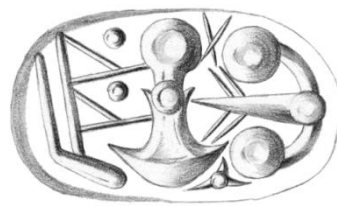
Figures 3.17 and 3.18: CHIC #207/CMS II.1,420b and CHIC#274/CMS XII,105a respectively. Images courtesy of the CMS Heidelberg.

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[29] The prevalent tendency to present and transcribe Cretan Hieroglyphic in a way that is purposefully identical to its later linear counterparts is therefore, I would argue, highly problematic. Indeed, attempts at a standardised approach to all writing systems of the Bronze Age Aegean arguably underlie many of the problems faced in the study of Cretan Hieroglyphic today. Conformance to the principles set in the Mycenological conventions of Gif-sur-Yvette (1956), Wingspread (1961) and the first Congress of Mycenology (1967) has come at the cost of compromising – at times even ignoring – the idiosyncrasies of our script. The authors of *CHIC* ought to be commended for rejecting the original suggestion made at Ohrid (1985; Ilievski and Crepajac 1987) of compiling all signs of the Cretan Hieroglyphic, Linear A and Linear B scripts into a single numerical list (cf. Karnava 1997; Palaima 1998), as this would have further integrated – and presented as a virtually consistent system – three scripts which are, in most of their attestations, highly individualised and fundamentally independent.

A final token investigation of what we called a 'true artistic motif' above, namely cross-hatching, may elucidate another aspect of the nature of this relationship between 'art' and 'writing'. Of the twelve instances of cross-hatching on hieroglyphic seals, nine remarkably lack the extremely common ˣ stiktogram indicating direction of reading. A clue for such omissions can be found in #298d (see Figure 3.19), where the formulae 044-005 ⚶✹ and 044-049 ⚶↑ are combined on a single field, a feature already discussed above (cf. n. 14). It seems clear that attention is drawn here to 044 as the initial sign of two different sign-sequences, differentiated from 005 ✹ and 049 ↑ by vertical lines as well as our cross-hatching motif, indicating opposing reading directions. Cross-hatching may also be tentatively identified as dividing two sign groups on another side of the same seal (#298g), and as stressing what are most likely initial signs (as many display common sign groups) on others (#147, #268a and #309g in Figure 3.19). The fact that the motif only appears in instances where additional signs are added to our formulae, supports such suggestions. Furthermore, only in the company of same-size 'extra' signs does cross-hatching engulf a different initial than that which we have come to expect (#268b, #161 in Figure 3.19), arguably indicating the validity of these as independent sign-sequences (something anticipated above).[30]
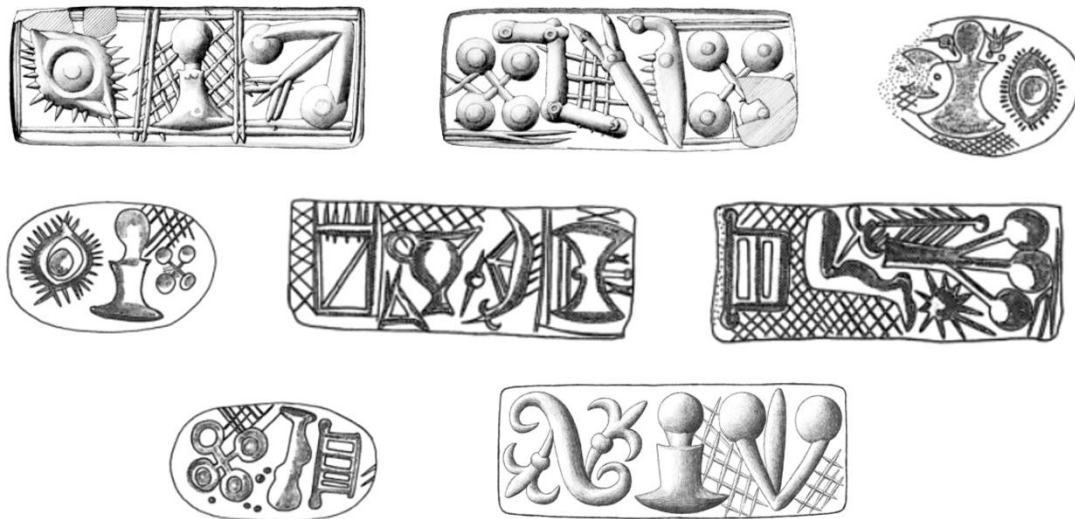
Figure 3.19: Row 1: CHIC #298d/CMS XI,14b; CHIC #298g/CMS XI, 14d; CHIC #147/CMS II.8,88. Row 2: CHIC #268a/CMS III,229a; CHIC #309b; CHIC #309g. Row 3: CHIC #268b/CMS III,229b; CHIC #161/CMS II.8,83. Images 1, 2, 8 courtesy of the CMS Heidelberg. Images 3-7 courtesy of J.-P. Olivier and L. Godart.

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[30] Interestingly, such a potential stiktogrammatic use of cross-hatching seems to be attested on rectangular seal-faces only: round faces (e.g. #176, #181, #193 and #195) display a much more complex use of cross-hatching in the glyptic field.

Conclusion

The 'decorative elements' of the Cretan Hieroglyphic script, most of which have been detached from scholarly investigations since the very beginning of the discipline, have here been shown to possess all necessary qualities to form an integral part of the writing system. This indicates that there is no justification for the overly syllabocentric view employed in the study of Cretan Hieroglyphic today. Indeed, through the rejection of possible sematographic elements, we have limited an already extremely limited corpus, excluding perhaps as many instances as we currently possess. A more careful approach for understanding the relationship between 'art' and 'writing' needs to be adopted in our study of the script, taking into account the nature of script as necessarily intertwined with, and part of, other modes of visual communication.

In conclusion, these elements of our script can no longer be dismissed without justification: to ensure that we can accommodate all probable paths of interpretation, nothing but a *complete turnaround* in the way we approach and define Cretan Hieroglyphic is needed.

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