CHAPTER 2

ORIGINS AND INTERFACE WITH ICONOGRAPHY

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Recent scholarship assumes that Cretan Hieroglyphic was an original creation and the first writing system in the Aegean, though this view is not unanimous. Research and debate centre on the earliest attestations of writing on Crete, in the form of seals bearing the so-called 'Archanes formula' from ca. 2000–1900 BC, and how they relate to later epigraphic material, as well as earlier and coetaneous iconography. The interfaces of Cretan 'hieroglyphs' with imagery have become crucial. The old idea that the script was influenced by Egyptian hieroglyphic has receded, paving the way for a new paradigm whereby local icons, especially as found on seals, should represent the forerunners of its set of signs. The question of how Cretan Hieroglyphic came about then intertwines with issues of typology (what type of signs did it comprise and how phonetic was it?), use (what did the inscriptions convey and in what social settings?) and decipherment. In addressing origins, this chapter echoes recent calls to comparative approaches that consider the trajectories and typology of invented, image-based writing elsewhere in the world, as well as the relationship between seals and writing in the Eastern Mediterranean. It also proposes an agenda to conciliate such approaches with 'internal' analyses of Cretan Hieroglyphic inscriptions that might shed light on the origins and function of its signs.

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2.1 Defining Writing and Tracing Its Origins

'First' writing systems – in the double sense of early and invented – are difficult to investigate, not least at their beginnings. Often the problem lies in the limited material available for the early stages of a script or its undeciphered status, but there is another fundamental issue. In the pre-modern world, invented scripts were all 'iconic' or image-based (i.e. their signs mostly depicted real or fictitious objects and beings) and so could be, to an extent, scripts derived from them. We can include in this group Sumerian cuneiform, Egyptian Hieroglyphic, Anatolian Hieroglyphic, Bronze-Age Chinese, Maya, Nahuatl (Aztec) and most probably also the Indus Valley script, the Rongorongo of Rapa Nui (Easter Island) and Cretan Hieroglyphic itself. At least some of these scripts began their existence in close association with pictures, 'iconography' or 'art' (there is not positive evidence in every case). Their signs can appear as captions to figurative scenes; feature in media which around the time of the invention were also populated by images; or simply look identical to pictorial elements that are not language notation ('decorations', 'iconographic motifs', etc.). Thus, the more we look back to any such script, the more it blurs in its attestations, distinctiveness and decipherability.[1]

Because of these blurred lines, the basic question *what constitutes writing* remains much debated apropos of the origins of early image-based scripts. The literature often engages in discussions of terminology and definitions.[2] Yet, regardless of the terms we use, we should recognise two different manifestations. One takes the form of graphic codes that only convey meaning independently from language and are not strictly speaking 'read'. Modern examples include traffic signs, musical notation and flags. The other manifestation comprises systems of graphic signs, some of which can represent speech sounds and hence transcribe *a particular* language. Systems of this second type can notate not just lexical words (like nouns, adjectives and verbs), but also grammatical words. Thus, what makes this type different is *phonetic notation*, which historically is a more recent human creation, appearing in the archaeological record for the first time only in the late fourth millennium BC, in Egypt[3] and possibly slightly later in Mesopotamia.[4]

[1] Ferrara 2017: 14, 17.
[2] E.g. DeFrancis 1989; Boone 2004: 313; Whittaker 2011; Morenz 2020: 48–9.
[3] Kahl 2001: 119. [4] Woods 2021: 41.

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Some authors use a broad definition of writing that encompasses both types of code, phonetic and not necessarily phonetic.[5] To be sure, expressions such as 'phonetic writing', 'full writing' or 'glottography' can then be evoked for specificity. Yet this choice carries the analytical risk of dimming the presence of the very phenomenon whose origins we try to trace,[6] as it is the *communis opinio* that Cretan Hieroglyphic comprises phonetic signs (Civitillo, Ferrara and Meissner, and Ferrara, this volume). This is largely inferred by analogy with the Linear A and Linear B scripts, rather than demonstrated by decipherment, but we are nonetheless searching for the beginnings of phonetic notation on Crete.

Thus, in this chapter I use 'writing' in the narrow sense to refer to a graphic code that has (or is believed to have) a phonetic component and 'semasiography' to mean graphic signs that do not notate a particular language but carry a coded meaning. Any graphic sign, regardless of what kind of recording it belongs to (iconography, semasiography, writing), I call a graph. However, we should note that a *semasio*graph is any graph that conveys meaning, potentially translatable as a word, without being bound to any language. Thus, semasiographs are also part of early writing systems, in the form of semantic determinatives (also called classifiers) and logograms. Crucially, they often dwell in the nebulous settings where image and writing overlap.

2.2 The 'Archanes Formula' and the Primacy of Cretan Hieroglyphic

The earliest inscriptions in the corpus of Cretan Hieroglyphic are six seals containing the so-called 'Archanes formula' (Godart, Jasink and Weingarten, this volume) (Table 2.1), thus named after the necropolis of Archanes/Phourni, where four of them were found.[7] Two groups of signs, transcribed respectively as 042-019 and 019-095-052 (*CHIC*), make up the 'formula'. The other two seals came from Knossos and the necropolis of Moni Odigitria, in south-central Crete. Three of the four objects from the cemetery of Archanes come from the same context, the Ossuary of Burial Building 6.

[5] See e.g. Schoep 2020. [6] Trigger 2004: 44.

[7] Originally Yule 1980: 170, who called it 'Archanes script'. I follow the conventional use of 'formula' in the broad sense of established form of words or symbols in a ceremony or any procedure, including an inscription.

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Table 2.1 *Late Prepalatial/early Protopalatial (MM I) inscribed seals (adapted from* CMS *II.1,* CMS *VI,* CHIC *and Sbonias 2010, after Ferrara, Montecchi and Valério 2021b)*

CHIC no.	*CMS* no.	Provenance	Seal type and material	Graphs
#202	II.1 394	Archanes/Phourni	Bone disc	α. 042-019 β. 019-095-052
#203	VI 13	Knossos	Steatite discoid	α. 042-019 β. 019-095-052
#251	VI 14	Archanes/Phourni	Steatite 3-sided prism	α. 019-095-052 β. 042-019 γ. 094-038
#252	II.1 393	Archanes/Phourni	Bone 3-sided prism	α. 019-095-052 β. 042-019 γ. 062 -●-●-●
#313	-	Moni Odigitria	Bone cube	α. 042-019 + Flower? β. 019-095-052 γ. Quadruped δ. Human figure with a fish?
#315	II.1 391	Archanes/Phourni	4-sided bone bar (*baton*)	A. Caprid? B. Equid 1 C. Equid 2 D. CH *181? E. Bovine? F. Basket G. Damaged signs H. 019-095-052 I. 042-019 J. Hand/CH 008? K. Human figure with a basket L. Leg/CH 010? M. Floral N. Antelope?

The three inscribed seals from the Ossuary at Burial Building 6 of Archanes/Phourni (*CMS* II.1, 391, 393–4) come from secondary burial deposits in rooms I and III. These spaces yielded 196 human skulls and, among other items, another twelve seals (*CMS* II.1, 379–90, 392, 395). The context was dated by the excavator to between late EM II and early MM IA,[8] or more specifically to MM IA.[9] It has been reported

[8] Grumach and Sakellarakis 1966: 109, 111–12.
[9] Sakellarakis and Sapouna-Sakellaraki 1997: 326–30, 674, 680–1.

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that excavation was carried out under difficult weather conditions that complicated its interpretation.[10] Moreover, Burial Building 6 covers a long time span from EM III to MM I like the Mesara tholos tombs. Sbonias[11] has argued that these seals – as part of a stylistic 'Archanes-Script Group' – date to the late MM IA-IB.[12] He also assigns to the late Prepalatial the Moni Odigitria seal (MO S35 = *CHIC* #313), which was found in a funerary pit ('Ossuary') described as an 'undisturbed closed deposit'.[13] An MM I date (ca. 2100/2050–1875/1850 BC) aligns well with the stylistic attribution of an imported scarab found in the Ossuary at Burial Building 6 of Phourni (*CMS* II.1, 395) to the 11th Dynasty of Egypt, i.e. ca. 2080–1956/1940 BC.[14] The issue remains whether these six crucial seals are from before or after the beginning of the Protopalatial,[15] towards ca. 1925/1900 BC. In any case, their more general dating to MM I has one advantage. It reduces the temporal gap between a few early attestations of writing and the bulk of Cretan Hieroglyphic and early Linear A inscriptions from MM II (ca. 1875/1850–1750/1700 BC).

While Olivier and Godart[16] included the MM I inscriptions with the 'Archanes formula' in their Cretan Hieroglyphic corpus as '*la plus ancienne manifestation connue de l'hiéroglyphique crétois*', this classification is not unanimous. Several authors have shown agreement, before or after the publication of the corpus,[17] but it has also been argued that these inscriptions could represent an initial stage of Linear A.[18] For others still, they are or may be written in an independent script, though related in some way to both Cretan Hieroglyphic and Linear A.[19]

The scenario of a third, poorly attested and earlier script on Crete would naturally have negative implications for the view of Cretan Hieroglyphic as original. Therefore, the debate centres on whether the epigraphic evidence at hand requires us to theorise its existence. Three of the four signs in the 'Archanes formula', CH 019 , 042  and 052 , occur also in other Cretan Hieroglyphic inscriptions. Only sign CH 095 is so far restricted to it, but in a corpus of only over ca. 360 (mostly short) inscriptions, written in a script with many rare signs, this is hardly surprising.[20] The formula occurs also on Protopalatial seals, one of which (*CHIC* #292

[10] Weingarten 2007: 137, n. 51. [11] Sbonias 1995: 58–9, 107–8.
[12] See also Watrous 1994: 727, n. 241; Weingarten 2007: 137; Decorte 2018a: 363–4.
[13] Sbonias 2010: 218.
[14] Absolute dates for Egyptian periods are given after Hornung *et al.* (2006) and those for the Aegean chronology follow Manning (2012: 22, tab. 2.2).
[15] Weingarten 2007: 137, n. 51. [16] *CHIC*: 18, n. 59.
[17] Grumach 1963–4; Grumach and Sakellarakis 1966; Sbonias 1995, 108; Younger 1996–7 [1998]: 380–1; Perna 2014; Karnava 2016a: 81.
[18] Godart 1999; Anastasiadou 2016a. [19] Decorte 2018b; Schoep 2020.
[20] Ferrara, Montecchi and Valério 2021b.

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= *CMS* VI, 217) bears the Cretan Hieroglyphic fraction signs *302/Δ 𐄇, *307/Σ 𐄋, *308/Ϙ 𐄌 and *309/ϡ 𐄍.[21] Another MM II seal with the formula (*CHIC* #206 = *CMS* III, 149) even features three stiktograms X, one on each side of sign 042 and another next to 052.[22] This X marker is diagnostic of the Cretan Hieroglyphic script.

When we consider all graphs engraved on these six MM I inscriptions, the matches with Cretan Hieroglyphic are not limited to the signs of the 'Archanes formula'. In the badly eroded linear sequence on *CHIC* #252.γ (= *CMS* II.1, 393b) we recognise a possible instance of CH 062 (*CHIC*: 252–3), if not the spear-shaped CH 050. The comparanda extend also to self-standing elements on 'iconographic' faces of the *baton* (*CHIC* #315 = *CMS* II.1, 391, faces J, L and D and 392a, respectively; Figure 2.2): hand = CH 008 𐄁; straight leg = CH 010 𐄂; and an obscure U-shaped graph = CH *181 𐄎.[23]

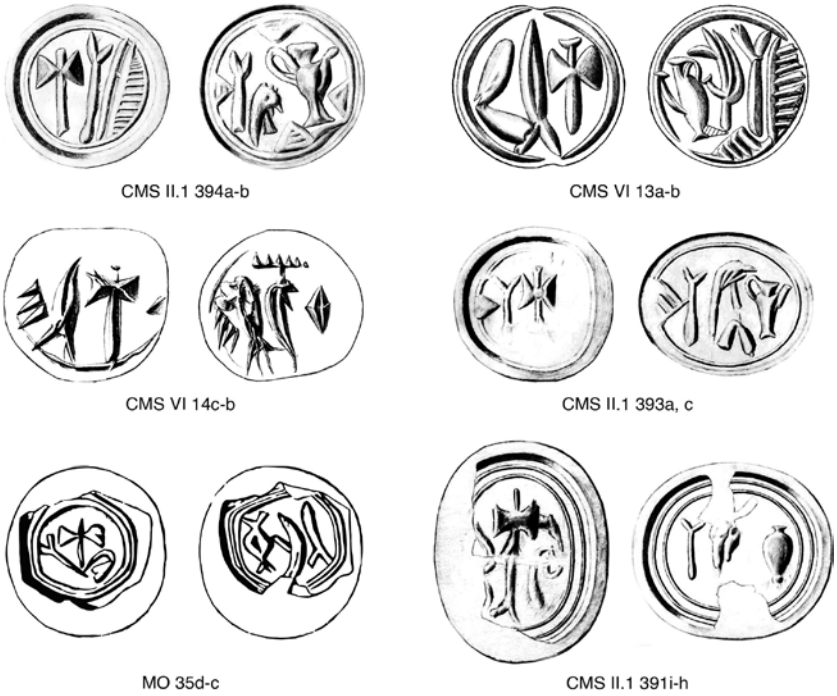


Figure 2.1 Faces of MM I seals that bear the 'Archanes formula'. *CMS* Images are courtesy of *CMS* Heidelberg; MO 35 was redrawn after Sbonias 2010: Pl. 61, nos 35c–d). Presented in the same order as Table 2.1 (from left to right and down to bottom). Not to scale

[21] *CHIC*: 274–5. [22] Decorte 2018a: 368. [23] Flouda 2013: 150.

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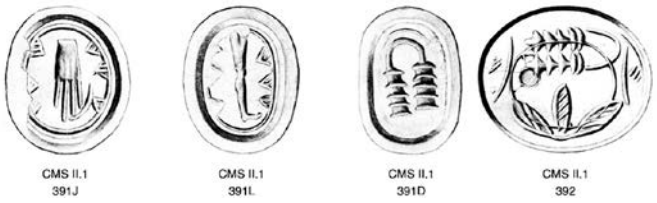


Figure 2.2 From left to right: graphs comparable to signs CH 008, 010 and *181 on seals *CMS* II.1, 391 (= *CHIC* #315) and 392 (Images courtesy of *CMS*; adapted and not to scale)

Even the 'C-spirals' 𐄐, 'S-spirals' (= Evans' no. *SM* 136 𐄑) and possible double coils (= *SM* 137a–b 𐄒) (on faces A, C and I, respectively) continue to appear on Cretan Hieroglyphic seal inscriptions in the MM II period.

There is more evidence pointing in the same direction. The 'Archanes formula' occurs only on seals, which is a typical medium for Cretan Hieroglyphic, but not for Linear A.[24] The shapes of its four signs are also characteristic of Cretan Hieroglyphic rather than Linear A. CH 052 𐄁 is simplified in some instances, but when it is so it is actually the least comparable to its counterpart in Linear A, sign 24/ne 𐘤.[25] It has long been assumed that the Linear A sign sequence 08-31-31-60-13/A-SA-SA-RA-ME, found mainly on stone libation vessels, continues the two sign groups of the 'Archanes formula'.[26] However, Ferrara, Montecchi and Valério (2021b) argue not only that CH 052 matches LA 24/ne rather than 13/me, but also that CH 095 𐄃 is more closely comparable to LA 10/u 𐘊 than to 60/ra 𐘮. Hence, two of three signs in the second group of the formula do not match with the final part of Linear A A-SA-SA-RA-ME.

To sum up, multiple lines of evidence converge to support the view that the early 'Archanes formula' group of seals is part of the tradition of writing in Cretan Hieroglyphic, not Linear A nor a third, otherwise unattested script.

[24] Powell 2009: 129. Perna (2014: 253, 256–8) mentions four possible exceptions of seals inscribed in Linear A: ARM Zg 1 (= *CMS* VS1B 310), CR(?) Zg 3 (= *CMS* XI 311), CR(?) Zg 4 (= *CMS* XII 96) and KN Zg 55 (see also Del Freo and Zurbach 2011: 86–9). Yet he considers 'definitely a Linear A document' only CR(?) Zg 4.

[25] Decorte (2018a: 355) correctly notes that the sign in the position of CH 052 (AS004 in his numeration) is also attested without handle or spout, and sometimes is even like a simple lozenge (see also Ferrara, Montecchi and Valério 2021b). The author interprets those instances as a different sign, not represented in the repertoire of Cretan Hieroglyphic, whereas most scholars treat it as a mere graphic variant of CH 052.

[26] E.g. Bossert 1931: 318–20; Brice *apud* Brice and Henle 1965: 56–68; Grumach 1968; Weingarten 1995: 303–4, n. 23; Schoep 2006: 46, n. 74; Perna 2014: 253; Anastasiadou 2016a; Karnava 2016a: 352–3.

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2.3 Invented or Borrowed?

In his first comprehensive presentation of Cretan Hieroglyphic after his excavations at Knossos, Evans offered a somewhat intricate view of its origins.[27] He spoke both of a 'general formative influence' of Egyptian hieroglyphic and 'a more direct indebtedness' of Cretan Hieroglyphic to it. Then he suggested also links with the Anatolian Hieroglyphic script used at a later period in the Hittite kingdom. Yet, finally, Evans concluded that 'on the whole the Minoan hieroglyphic system is essentially of home growth'.

That Cretan Hieroglyphic is mainly an autonomous development is the theory that gradually settled in. Although scholars diverge on the details, it has been widely endorsed in recent decades.[28] The only other image-based writing system in the Eastern Mediterranean around 2000 BC was Egyptian Hieroglyphic.[29] Yet, there are no systematic matches between the Cretan and the Egyptian signs, nor structural evidence, to sustain the idea of adaptation.[30] Graphemes of the two scripts depict similar things, such as body parts (a hand, a leg and so on), insects (bee, fly), boats, tools, buildings, etc., as first shown by Evans[31] and as is common for early original scripts. However, the conventions for representation and choices of design often differ.

For example, sign CH 057 looks like a plough,[32] with handles drawn like a V or U as well as a T-shaped feature that represents the yoke and beam.[33] On three occasions (*CHIC* #243.β, #243.γ and #295.γ), vertical strokes imply braces connecting the handles. This yields a depiction of a plough in frontal or isometric view.[34] Conversely, the handles of the Egyptian plough hieroglyph (*hb*) are depicted with two short parallel strokes and the yoke and beam are drawn as a circle at the edge of a long oblique stroke. In Egypt, it is the beam and the share that are V-shaped, not the handles, and those parts are connected by a stroke that represents the strap of the plough.[35] Moreover, the plough is shown

[27] *SM* I: 241–3.
[28] See, among others, Olivier 1986: 378; 1989: 41; 1996a: 102–4; Powell 2009: 109; Perna 2014: 252; Ferrara 2015: 16; Karnava 2015: 141; 2016a: 64; Decorte 2018b; Ferrara, Montecchi and Valério 2021a.
[29] This excludes the Phaistos Disk, as it is a *unicum* and the status of its signs as writing is not demonstrated beyond doubt (see, however, Meissner and Salgarella, and Davis, this volume).
[30] Olivier 1996a: 102–4; Powell 2009: 130; Ferrara, Montecchi and Valério 2021a.
[31] Evans 1895: 302ff. *SM* I: 181ff. [32] *SM* I: 190–1.
[33] Notice, however, that Evans imagined a plough seen from a different perspective.
[34] Ferrara, Montecchi and Valério 2021a: 13–15. [35] Gardiner 1957: 517.

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in profile.[36] Thus, even if the Cretans saw Egyptian objects inscribed with the plough hieroglyph and were inspired by them to devise their own plough sign, the latter still conformed to different conventions. The same conclusion applies to several other Cretan Hieroglyphic signs.

Similarly, Karnava[37] compares votive clay human body parts with CH signs 007 𓂝, 008 𓂧, 009 𓂬 and 010 𓂺 and clay figurines with triangular lower bodies with CH 002 𓀀 and 003 𓀁. She concludes that votive figurines and miniature limbs could have served as models for these CH signs. Whatever the direction of inspiration, the match suggests that these signs were linked to local representational conventions in MM II (though see below on the origins of the hand as imagery).

By contrast, CH *156 𓆑 is the only Cretan Hieroglyphic sign – out of a repertoire of over 100 signs – whose shape indicates a direct borrowing from Egypt. This grapheme is the forerunner of the Linear A and Linear B logogram for 'wine' (cf. AB 131a VIN 𐄷 in Linear A), and it most probably had an identical meaning in Cretan Hieroglyphic. The sign is comparable to the Egyptian 'vine' hieroglyph M43 𓇋, which also spelled *irp* 'wine' in the Middle Kingdom.[38] Both the Cretan and the Egyptian signs depict a vine on trellises with beams, with either dots or circles depicting grapes.[39]

Cretan Hieroglyphic is considered a 'syllabary',[40] with signs representing open syllables of the types V (vowel) and CV (consonant + vowel). Implicitly or explicitly, it is presumed that every sign in a Cretan Hieroglyphic sign group is phonetic and syllabic (except, of course, for punctuation marks). This follows an analogy with, and backwards extrapolation from, Linear A and Linear B. In the so-called 'linear' scripts, sign sequences are fully phonetic spellings of words, while logograms are mainly used outside sequences to denote commodities (although it is possible that even Linear A did not function exactly like Linear B in this regard, at least not always).[41] Thus, the list of Cretan Hieroglyphic signs in *CHIC* distinguishes two sub-sets: ninety-six 'syllabograms' (nos 1–96) and thirty-three 'logograms' (nos *151–*182). All 'logograms' are taken to stand for commodities when they are not part of sign groups. Some are assumed to play both roles, syllabic and logographic, so they are duplicated and have two separate entries (thus

[36] The Egyptian plough hieroglyph has this appearance in variants engraved on contemporary scarab seals. See e.g. the Middle Kingdom example in Wegner 2018: 240, fig. 13.5.
[37] Karnava 2015. [38] Gardiner 1957: 484. [39] Ferrara, Montecchi and Valério 2021a: 7–9.
[40] E.g. Olivier 1986: 378; Davis 2014: 151–2; Karnava 2016a: 79.
[41] Cf., for instance, the Linear A sequence 100/102-28 à VIR-I on tablet HT 11a.4 (*GORILA* I: 22–3), which *in theory* could be the logo-phonetic spelling of a designation of people.

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CH 013 and *152, for instance, are the same sign). Sometimes the term 'logo-syllabary' is used to describe Cretan Hieroglyphic and Linear A,[42] but this only refers to the use of commodity logograms beyond sign groups. As the structure of inscriptions in Cretan Hieroglyphic and Linear A is very different,[43] there is no reason *a priori* to expect these writing systems to have functioned in the same way.

All assumptions about the nature of the Cretan Hieroglyphic script have ramifications for decipherment, and some may even clash with the view that it was invented. This is also the case with the notion that Cretan Hieroglyphic was 'logo-syllabic' (and hence logo-phonetic) only in the sense that it had logograms used in isolation to denote goods. From the perspective of typology, the 'logo-' affix in 'logo-phonetic' does not indicate the mere presence of logograms in a script. That would not tell us much, as all or almost all scripts have logographs of some kind (even our modern alphabetic script combines with signs that stand for whole words, such as the numbers, &, €, etc.). Rather, 'logo-phonetic' describes a more significant feature, common to all original writing systems that are image-based like Cretan Hieroglyphic (Egyptian, Sumerian cuneiform, early Chinese) and even original creations in regions where writing was already known (Anatolian Hieroglyphic, Nahuatl). While the specifics varied in each case, all these scripts spelled at least some words with *combinations* of semantic and phonetic signs. For instance, Anatolian Hieroglyphic FEMINA-*na*-*ti* combines the logogram FEMINA with syllabograms to spell the Luwian word */wanatt(i)-/ 'woman'.[44]

Thus, if Cretan Hieroglyphic was an autonomous creation, then it is very probable that at least some of its sign groups are combinations of semantic signs (either logograms or determinatives) and phonetic signs. It is unlikely that word-signs are only those that appear in isolation on incised clay documents to stand for the names of agricultural products, domestic animals and other goods. Despite recent attention to comparative and typological data,[45] this notion is yet to be fully integrated into the investigation of Cretan Hieroglyphic. In addition, it is even possible that phoneticism in Cretan Hieroglyphic was very limited,[46] as was also the case with the initial stages of some invented scripts, such as proto- and early cuneiform and Anatolian Hieroglyphic. It is perhaps useful to review the comparative evidence that points in that direction.

[42] E.g. Bennet 2008: 5; Karnava 2021: 253–4. [43] Ferrara, Montecchi and Valério 2022.
[44] Hawkins 2000: 632. [45] Ferrara 2015; 2017; Decorte 2017.
[46] Cf. already Grumach 1963–4: 375.

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2.4 Seals, Graphic Codes and Writing: Cretan Hieroglyphic in Its Macro-Regional Context

Cretan Hieroglyphic is first seen on seals and this medium remained important throughout the life of the script. From a historical perspective, seals as a technology had a close relationship with the emergence of writing in the geographical area between the Eastern Mediterranean and the Indus Valley.[47] Everywhere in this macro-region, sigillary devices came first: stamps (not necessarily administrative) appear in the archaeological record of northern Syria in the second half of the eighth millennium BC, stamp seals as part of 'control systems' are documented about a thousand years later[48] and the first writing systems were devised only towards the end of the fourth millennium BC, in Egypt and Mesopotamia, before spreading to surrounding areas. Crete is no exception to this tendency,[49] as the first seals found on the island date to EM II, ca. 2500–2200 BC.[50]

Sealing in the sphragistic sense was the placing of a portion of wet clay over the mouth or stopper of a vessel, or the door of a storeroom, and impressing it with a carved seal. This left a recognisable mark that traced the origin of stored goods to a particular individual or social group/institution, or indicated tampering.[51] As mechanisms of control, seals in early Eurafrasia are associated with growing social 'complexity' and the emergence of 'proto-states' or 'states'.[52] But where does the link to writing lie? The shapes of seals, varied as they were, afforded surfaces that could be engraved, eventually with figurative elements and, later, writing *stricto sensu*. In at least two societies, seal imagery was either related to or the trigger for the emergence of writing. Thus, several icons of standards, buildings, vessels and animals on protoliterate Mesopotamian cylinder seals match the non-numerical signs of early cuneiform[53] and may have inspired them, while the Anatolian Hieroglyphic script of the Hittites first appears in the form of emblem graphs and auspicious symbols on stamp seals.[54] Moreover, no matter how their writing originated, different Bronze-Age societies inscribed seals with the names, titles or affiliations of their owners.[55]

Functionally, seals could also be amulets. They might carry not just the *figurations*, *marks*, *emblems*, or *written designations* of the persons who owned them, or the institutions on whose behalf they acted (including tutelary deities), but also auspicious or protective symbols.[56]

[47] Already Childe 1951: 93–4. [48] Duistermaat 2012. [49] Ferrara 2017: 15.
[50] Krzyszkowska 2005: 36. [51] Wengrow 2010: 62; Duistermaat 2012. [52] Rahmstorf 2012.
[53] E.g. Pittman 1994. [54] Yakubovich 2008: 10–12. [55] Ameri *et al.* 2018.
[56] Cf. Childe 1951: 93.

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There could be also rules and conventions in the society that established who could bear what signs on what types of seal. The social role of seal-amulets could extend beyond the sphere of administration, making them something worth carrying in daily life and being buried with. Thus, to inquire into whether a seal was an amulet, a marker of social status or a bureaucratic device might be a misplaced question. It could have been all these things simultaneously.[57]

The seal practices of Egypt around the time writing was emerging on Crete might inform our approaches to Cretan Hieroglyphic. Cylinder seals had been dominant in the Egyptian land until the First Intermediate Period (ca. 2118–1980/1955 BC), but then they were largely replaced by button stamps, also called 'design amulets'. These button seals were decorated with deeply cut designs: geometric patterns; depictions of humans, often squatting or seated; animals (including the lion and the ibex) and plants; and auspicious signs, such as  *ʾnḫ* 'life' or  'protection'.[58] Indeed, hieroglyphs on Egyptian seals (whether phonograms, logograms or determinatives) could *also* be used to convey a general notion, independently from language, i.e. as semasiographs. In this role, they can appear in iterations and very elaborate forms, often described as decorative, which nonetheless coexisted with their use as script-signs.[59]

Towards 2000 BC, Egyptian button seals were replaced by an array of 'amulet-seals' with three-dimensional figurations modelled on the back of a flat decorated base that could be used for sealing.[60] Both buttons and zoomorphic seals are types attested in Prepalatial Crete as well,[61] showing that objects and ideas travelled.[62] In the First Intermediate Period Egypt, amulet-seals had been mainly associated with women,[63] but funerary evidence points to an increase in adult male ownership of seals by the beginning of the Middle Kingdom (ca. 1980/1964 BC–1760 BC), which has been tied to changes in administrative practices. Scarabs symbolising the regenerative power of the beetle deity *Ḫpry* had emerged shortly before as the main funerary

[57] Ferrara 2015: 9; Ferrara and Jasink 2017: 42.
[58] Hayes 1978: 141–2, fig. 85; Wiese 1996; Wegner 2018: 237.
[59] Schulz (2021: 374) makes the following remark about writing on Egyptian seals: 'The transition between script, icons, and pattern is fluid, the ascertainment of which is not always definite (e.g. whether a *nb*-basket hieroglyphic sign on the top and bottom of an oval sealing-surface should be translated as 'all' or 'master', interpreted as a symbol of control and kingship, or just regarded as a 'fill' element), and the connotation is often multi-layered.'
[60] Wegner 2018: 237.
[61] Yule 1980: 38, 92–3; Krzyszkowska 2005: 64, 72.
[62] Multi-sided prisms (*mehrseitige prismatische Siegel*) have also been documented for the Old Kingdom and First Intermediate Period (see Wiese 1996: 45–6, nos 35, 391–2, 1168, 1170, 1172, 1174–6; Anastasiadou 2011: 23–4).
[63] Schulz 2021: 377.

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amulet type in Egypt, and by the early Middle Kingdom they had moreover become the primary type for sealing practices.[64] New decorative schemes emerged which included cord designs, interlocking scroll patterns and 'amuletic' or auspicious hieroglyphs such as *nfr* 'goodness, beauty' () and *ʾnḫ* 'life' (). Scholars still debate whether cord and scroll motifs evolved in Egypt and were then borrowed into the Aegean or vice versa.[65]

Throughout the Middle Kingdom, administrative seals were inscribed with royal names, anthroponyms and titles of non-royal individuals and the names of institutions and departments.[66] Ten Egyptian occupational titles of this period, attested on seals as well as other media, contain the words *ḫtmtj* 'sealer', *ḫtmw* 'seal-bearer' and *ḫtm* 'seal', all written with the seal hieroglyph .[67] By far the most common is 'seal-bearer of the *bjtj* king', a 'courtly rank'[68] with 195 attestations. Later in Anatolia, the hieroglyphic sign L327  SIGILLUM also indicated ownership ('seal of…') on various Hittite sigillary inscriptions.[69]

Indeed, the trajectory of Hittite Anatolia is just as insightful.[70] In the Old Hittite period (ca. 1650–1400 BC) stamp seals – the prevailing type in the region – feature a reduced number of graphs, completely excised from any complex representational scenes. At first, these functioned only as semasiographs and were not language dependent. Figure 2.3 shows the example of a seal impression with the pair of amuletic signs BONUS 'good, well-being'  and VITA 'life'  (reminiscent of the Egyptian hieroglyphic phrase  *dj ʾnḫ* 'given life');[71] divine emblems like the thunder (TONITRUS)  as a metonym for the Anatolian Storm-god Tarhunt; and socio-political titles such as REX 'king'  and SCRIBA 'scribe, official' .[72] By the fourteenth century BC, an incipient writing system was in place which included phonetic signs in addition to logograms and semantic determinatives, and Luwian emerged as the language behind it. The Hittite kings and officials began to record their names and titles with this script and soon it 'leaped' to large stone monuments and was carved in long inscriptions.[73] Nevertheless, formulaic *complexes of logograms* that lacked phonetic complements, such as MAGNUS.REX, 'Great King', remained in use from the early stages of the script down to its decline in the Iron Age.

[64] Wegner 2018: 237–8. [65] Ben-Tor 2007: 12; Wegner 2018: 238. [66] Ibid.: 237–8.
[67] *Persons and Names of the Middle Kingdom* – Online database: https://pnm.uni-mainz.de/3/info
[68] Cf. Schulz 2021: 369. [69] Gelb 1949; Hawkins 2000: 581. [70] Ferrara 2017.
[71] I thank Ignasi Adiego (pers. comm.) for pointing me to this comparandum.
[72] Yakubovich 2008: 11; Weeden 2018: 59. [73] Yakubovich 2008: 12.

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Figure 2.3 Old Hittite bulla from Tarsus, with impression of seal with Anatolian Hieroglyphic inscription: within the circle of dots, we observe signs TONITRUS, REX and SCRIBA (on the left), and BONUS and VITA (on the right) (Boehmer and Güterbock 1987: Taf. XI, no. 111)

2.5 Developed from Images … or Alongside Them?

A current idea is that Cretan Hieroglyphic – not unlike other invented writing systems – developed in close connection to local iconography, especially as produced on early seals.[74] However, it is difficult to trace the precise trajectory and timeline of the development.

To date, the four signs of the 'Archanes formula' (CH 019 𓆟, 042 𓌉, 052 𓃾, 095 𓃰) appear to emerge in MM I without iconographic antecedents. CH 042 𓌉 depicts a double axe, which is a characteristic Cretan object. As a self-standing image (and thus an emblem?) it appears only on Protopalatial seals,[75] so the sign may have been directly inspired by physical double axes (not depictions thereof), which have been found in Prepalatial *tholoi* burials.[76] When compared with animals depicted on Protopalatial seals, CH 019 𓆟 resembles a tunny fish (*Scombridae*), as first suggested by Evans for one of its instances,[77] rather than a sepia (as also proposed by Evans for most other attestations). If it is a fish, the sign depicts only the contour, being more schematic than aquatic animals engraved on late Prepalatial seals (cf. *CMS* II.1, 287b in Figure 2.5). CH 052 𓃾 has no close counterparts in the glyptic iconography of the MM II period or earlier. Rather, it seems directly inspired by

[74] Sbonias 2010: 218; Flouda 2013: 148–55; Ferrara 2015: 31–2; 2017: 15; 2018; Decorte 2018b: 39–42.

[75] Yule 1980: 168, Pl. 29. The double axe is attested on sealings from the MM IIB deposit of Room 25 at the Palace of Phaistos (*CMS* II.5 231–3, 235) and the 'Hieroglyphic Deposit' at Knossos (*CMS* II.8, 55), as well as on two seals from the MM IIB Workshops Γ and Δ of Malia's *Quartier Mu* (*CMS* II. 2 129 and 155c). It is also engraved on the side of one MM II seal (*CMS* XII D007).

[76] Flouda 2015a: 44a, n. 4.

[77] *SM* I: 204–5.

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Figure 2.4 Hand graphs on seals *CMS* II.1, 391J and II.8, 15. *CMS* Images are courtesy of *CMS* Heidelberg. Not to scale

the footed 'teapot', a ceramic vessel shape attested in the Protopalatial period and possibly influenced by similar Eastern Mediterranean metal vessels found, e.g. in tombs at Byblos dated to the Middle Bronze Age. CH 095 is comparable to the 'headless waterfowl' motif of Protopalatial seals and, again, it seems earlier.[78] Thus, none of the signs of the formula is closely paralleled by iconographic manifestations on late Prepalatial seals.

The same is true of other graphs from the same group of seals which resemble Cretan Hieroglyphic signs. The hand and the leg (attested on *CMS* II.1, 391J, L and *CMS* II.8, 15; cf. Figures 2.2 and 2.4) have no other precedents on Crete. We might then turn to comparisons with the Egyptian hieroglyphs 𓂝 and 𓃀, but hand and leg signs were devised independently in several primary scripts, so they are comparable only insofar as they depict the same parts of the human body. Below, I shall suggest another stimulus for the development of the hand-shaped sign. In the meantime, CH *181 𐄁, as found in MM II inscriptions, is classed as a commodity logogram (*CHIC*), and it has also been compared to the Linear B commodity logogram *134 = *190 𐄪.[79] However, its referent remains elusive.[80]

In theory, Cretan Hieroglyphic signs attested only in MM II have more chance of having precursors in late Prepalatial iconography, but in practice few appear to do so (Figure 2.5). CH 001 𐄀 echoes

[78] Ferrara, Montecchi and Valério 2021b. [79] Younger 2000–2021.

[80] CH *181 has been tentatively compared to an Egyptian sistrum (Flouda 2013: 155), but the frames of sistra are not open and U-shaped. In addition, a musical instrument would be a surprising referent for a commodity logogram. Despite all doubts, what seems certain is that the shape of CH *181 was not borrowed from the Egyptian 'sistrum' hieroglyph 𓉐 (cf. Ferrara, Montecchi and Valério 2021a: 17–19).

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Figure 2.5 Prepalatial seal faces and seal impressions with possible forerunners of Cretan Hieroglyphic signs. *CMS* Images are courtesy of *CMS* Heidelberg; MO 35 was redrawn after Sbonias 2010: Pl. 61, no. 35a. Not to scale

representations of seated or squatting humans, in isolation (*CMS* II.1, 477a from Mochlos, grave XVIII), in compositions (*CMS* II.1, 222 from a tholos at Mavrospelio) or in circular iterations (*CMS* II.1, 310a, from Platanos, Tholos B and 385a from Phourni, Burial Building 6). Two bees or wasps in *tête-bêche* arrangement on *CMS* II.1, 159 (from Koumasa, Tholos B) are comparable to CH 020 𐄁.[81] The sun, star or whirl on *CMS* II.1 308 (Platanos, Tholos B) is similar to CH 033 𐄇. A boat on *CMS* II.1, 287b (also from Platanos, Tholos B) is comparable to sign CH 040 𐄈, even though it is part of a more complex scene also showing two fish or dolphins. The graph at the centre of *CMS* II.1, 64a (Ayia Triada, Tholos A) is a depiction of cloth on a loom with three hanging loom weights[82] and is the possible forerunner of CH 041 𐄉 (which is in turn the counterpart to Linear A sign 54 𐄊 TELA / *wa*).

[81] Ferrara, Montecchi and Valério 2021a: 12. [82] Ulanowska 2016.

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Certain quadrupeds found on Prepalatial seals, namely the Cretan goat, the boar and possible equids, might relate to signs CH 016 , 017 and 014 respectively (Figure 2.6).[83] They are full-length depictions of the animals whose heads constitute signs in the standard repertoire of *CHIC*. Nevertheless, the swine on *CMS* II.1, 64d does compare well with the full-length boar that appears alongside CH 038 on *CHIC* #256.α. On the same inscribed seal, face #256.β features sign CH 043 and a hornless quadruped that is reminiscent (though not identical in its movement) of two quadrupeds seen on seals from Burial Building 6 of Archanes/Phourni (*CMS* II.1, 391N, i.e. the *baton*, and 392b) and another on *CMS* II.1, 64c (Figure 2.6). These comparanda suggest that certain CH signs may have had both full-length and *pars pro toto* (face- or head-only) variants. However, the full-body types have not been catalogued as script-signs in *CHIC*, because they do not occur on incised clay documents. The same range of variation has long been implied, for example, with regard to the graphs cat (*SM* No. 75) *vis-à-vis* the cat face (*SM* No. 74).[84]

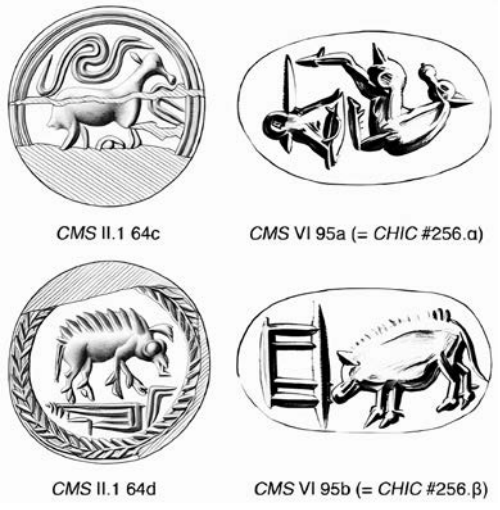


Figure 2.6 Parallel depictions of full-body quadruped animals on early seal *CMS* II.1, 64 and inscribed *CMS* VI 95 (= *CHIC* #256). Images courtesy of *CMS* Heidelberg. Not to scale

[83] The composition on *CMS* II.1 64b, where a caprid (or antelope?) is depicted along with branches of plants, is reminiscent of figurations of antelopes on Egyptianising scarabs from Canaan, dated to the Second Intermediate Period (ca. 1759–1539 BC) and found at Tell el-Far'ah, Gezer and Lachish (Ben-Tor 2007: 175, Pl. 96, nos 14–15, 17–20, 22, 24–6). In this case, the Cretan *comparandum* is earlier in date.

[84] Younger 1996–7 [1998]: 387; Jasink 2009: 140.

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Other comparisons are also possible, but more problematic.[85] Writing or not, most of these few potential forerunners of script-signs form self-standing units, excised from any narrative scene, sometimes with an extra spiral, coil or plant-shaped element. Beyond the squatting human on *CMS* II.1, 222 and the boat on *CMS* II.1, 287b, there are few exceptions. On face γ of the Moni Odigitria seal (= *CHIC* #313, but see MO 35 in Figure 2.5) a man holds something that looks like sign CH 019 as engraved on face α. This could represent a staff, but it also echoes the figure of a human holding a fish by its tail on a Protopalatial seal (*CMS* II.2, 174a).[86] On the Archanes *baton* (*CMS* II.1, 391), face K displays a man holding a basket or vessel of some sort, whereas face F shows the same container on its own (). However, the latter does not match closely any Cretan Hieroglyphic sign.[87]

We have seen that Egyptian hieroglyphs were not copied wholesale on Crete, and that we have strong evidence only for the borrowing of one Egyptian sign ('wine') into Cretan Hieroglyphic. Still, we need to consider the possibility of vaguer inputs from Egypt in the formative stages of the Cretan script, in the guise of meaningful seal decorations (semasiographs). This is like the case of the Anatolian hieroglyphic sign VITA (‘life’), if it originated with the Egyptian hieroglyph as used on seals imported to Anatolia. Flouda suggests that the early 'Archanes formula' seals emulated imported Egyptian scarabs,[88] triggering the adoption of more and more sigillary designs at the end of the Prepalatial period. Imported scarabs deposited in tholos tombs incorporate Egyptian hieroglyphs without obvious comparanda in Cretan Hieroglyphic, but also C- or S-spirals (,) that recall similar elements used, for example, on the Archanes *baton*. Moreover, these scarabs often have hatched designs and elliptical frames that are consistent with the designs on the Border/Leaf seals of the late Prepalatial phase (Figure 2.7). Yet, we have seen that the geographical source of some of these decorations is debated. As for the rare Egyptian hieroglyphs

[85] Four insects on *CMS* II.1 474 (reportedly from an EM III deposit at the settlement of Mochlos) resemble the more iconic variants of CH 068 . Yet they might be crudely engraved spiders as well (cf. *CMS* II.1 248a from Platanos, Tholos A), hence corresponding to Evans' *SM* 85 . If the latter were a script sign (cf. its use within an inscription in *CHIC* #310.γ), then it would be the likely counterpart of Linear A sign AB 44 *ke* (cf. Ferrara, Montecchi and Valério 2022, with references). Likewise, if Evans' no. *SM* 137c (variant of 'coil' with tassels) is a Cretan Hieroglyphic sign (cf. also Jasink 2009), then its potential precursor appears on *CMS* VI 7 (dated stylistically to EM III–MM IA).

[86] See Ferrara, Montecchi and Valério 2021b.

[87] The same container is a self-standing graph on another late Prepalatial seal, *CMS* IV 66. The only sign remotely comparable is CH 047 , but its shape is not angular like the graph in question.

[88] Flouda 2013: 152–5.

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attested on imported scarabs, they are all 'augural' or 'amuletic', conveying positive notions as semasiographs rather than writing *stricto sensu*:[89] *nfr* 'goodness, beauty' (𓄤), *ʾnḫ* 'life' (𓋹) and the papyrus clump (𓇋). This is not to say it is impossible that early Cretans saw actual Egyptian writing on materials that have not survived to us. Yet, so far, other than the 'wine' sign, we have no evidence of direct borrowings. Thus, the only one of these auspicious hieroglyphs comparable to a Cretan Hieroglyphic sign is the clump of papyrus, which might have influenced CH 032 𓇋.[90]

Based on style, the earliest imported scarabs on Crete date to the 11th Dynasty of Egypt (ca. 2080–1956/1940 BC). They are *CMS* II.1, 201, 204, 238 and 395, according to the online catalogue of *CMS* (the first two are shown in Figure 2.7). This is also the period in which scarabs had just begun to flourish in Egypt,[91] and the last of these four specimens comes from Burial Building 6 of Archanes/Phourni. Therefore, this type of seal may have arrived only around or after the time writing was invented on Crete, perhaps too late to play a role in the genesis of Cretan Hieroglyphic.

Conversely, closer parallels for Cretan Hieroglyphic signs emerge when we look to earlier Egyptian button or design seals from the late Old Kingdom and First Intermediate Period (ca. 2200–1980/1955 BC), already mentioned above. CH 020 𐄁 is a case in point. It has been tentatively suggested that the sign was not copied directly from the Egyptian bee hieroglyph (𓆇), but rather began as an ornamental symbol before entering the repertoire of Cretan Hieroglyphic signs.[92] Now, the potential forerunners of CH 020, depicted in profile and in *tête-bêche* on a late Prepalatial seal (see *CMS* II.1, 159 in Figure 2.5), are very similar to



Figure 2.7 Faces of Egyptian scarabs from Lendas. From left to right: *CMS* II.1, 201 (Tholos II, 11th Dynasty), *CMS* II.1, 204 (Tholos IIa; 11th Dynasty) and *CMS* II.1, 180 (Tholos I; 12th Dynasty). Images courtesy of *CMS* Heidelberg. Not to scale

[89] Schulz 2021: 375, 392.
[90] As part of inscriptions, CH 032 is attested only on incised clay documents, not seals (*CHIC*: 397), but we may note the occurrence of its shape as the only motif on the seal impression *CMS* II.5 41 (stylistically MM II).
[91] Wegner 2018: 237. [92] Ferrara, Montecchi and Valério 2021a: 11–13.

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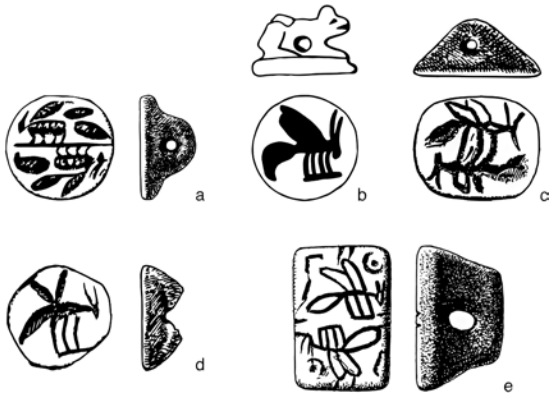


Figure 2.8 Egyptian button seals with depictions of bees dated to: 6th Dynasty, ca. 2200–2150 BC (a); 7th/8th Dynasty, ca. 2150–2118 BC (b, c); and early First Intermediate period/9th Dynasty, ca. 2118 BC (d, e). Redrawn after Wiese (1996: nos 804, 794, 806, 782 and 807, respectively). Not to scale

tête-bêche bee decorations on Egyptian button seals from the late third millennium BC (Figure 2.8). Details differ, such as the number of legs, the size of the wings and the thickness of the waist, but this is barely a hindrance. The shapes of bees on Egyptian seals vary as much as the palaeography of CH 020. Thus, even if the Cretans took creative licence, it now seems very likely that they drew inspiration from Egyptian designs.

In a similar fashion, decorated seals like the ones shown in Figure 2.9 and Figure 2.10.d, arriving to Crete from Egypt or elsewhere, may have contributed to the late Prepalatial *Leitmotif* of humans in squatting or sitting positions (Figure 2.5), which later crystallised in sign CH 001 𓀀.[93] At the same time, Egyptian seal-amulets with isolated hand motifs, including examples with bent thumbs (Figure 2.10), may have influenced the adoption of a similar symbol on Crete, as found on *CMS* II.1, 391J and *CMS* II.8, 15 (see above), before it developed into sign CH 008 𓂝.

The scarcity of potential forerunners of Cretan Hieroglyphic signs in the late Prepalatial correlates with the smaller proportion of figurative seals in this early period. It is unlikely to be only the consequence of the limited glyptic material available to us from that period. As evidence stands, both iconography and writing would appear to have flourished in the Protopalatial phase. This casts doubt on the idea that Cretan Hieroglyphic developed exclusively from an iconographic 'substratum'

[93] The Egyptian motifs echo hieroglyphs of humans in sitting postures, with arms raised, or both, which functioned as determinatives for vocabulary of youth, joy, praise, or worship (Gardiner 1957: 443–4). Thus, they may have had auspicious connotations, but it is unclear whether they were deliberately emulated as such on Crete.

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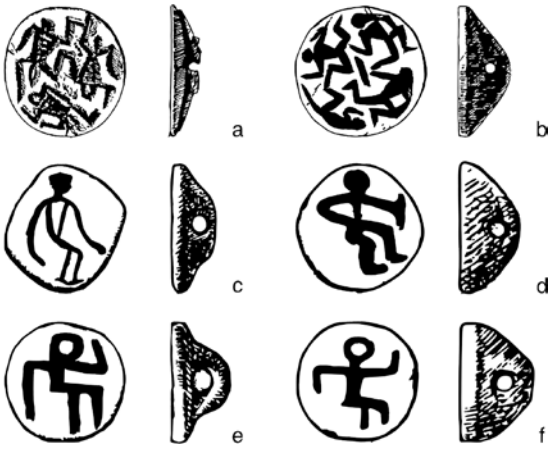


Figure 2.9 Egyptian button seals with squatting or seated humans dated to: 6th Dynasty, i.e. ca. 2200–2150 BC (a), the 7th/8th Dynasty, i.e. ca. 2150–2118 BC (b), and the early First Intermediate period/9th Dynasty, i.e. ca. 2118 BC (c–f). Redrawn after Wiese (1996: nos 145–6, 326–7, 329–30, respectively) and adapted. Not to scale

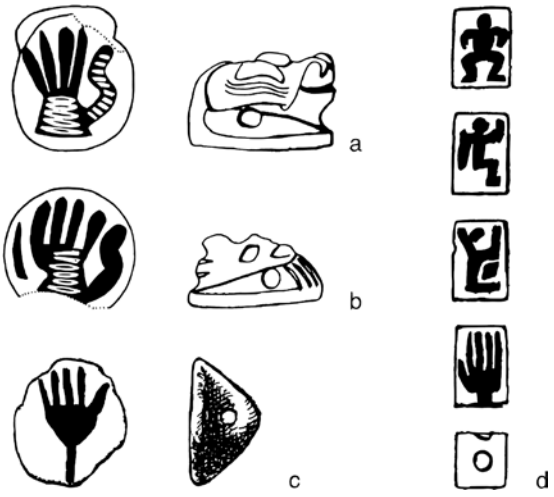


Figure 2.10 Egyptian button seals decorated with hand motifs, dated to: Old Kingdom/late 6th Dynasty, ca. 2200–2150 BC (a–b) and the early First Intermediate period/9th Dynasty, ca. 2118 BC (c). Late First Intermediate Period, 10/11th Dynasty, ca. 2100–1940 (d). Redrawn after Wiese (1996: nos 382–4, 391, respectively) and adapted. Not to scale

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and reinforces the scenario in which designs on seals developed in parallel with glyptic imagery.[94]

2.6 Writing and Images in MM II

Thus, in MM II we find the Cretan Hieroglyphic system of signs fully formed and it is hard to discern any developmental stages. Script-signs and iconography or 'decorations' continued to share space on seal faces, but the significance of these combinations is poorly understood.[95] If Cretan Hieroglyphic was formed in a short span of time,[96] in the transition to the early Protopalatial, then its close relationship with glyptic iconography in this phase can suggest ways in which script-signs developed. The seminal study of Poursat (2000) has argued that the combinations of repeated Cretan Hieroglyphic sign groups on 3- and 4-sided prisms imply hierarchical levels within MM II society. The distribution of glyptic 'motifs' (non-script graphs) also reveals combinatorial patterns. Some groups of 3-faced prisms repeat similar groupings of motifs on separate seal faces, which then allow us to detect variations, as seen in the examples in Figures 2.11–13.

These groups show strategies of representation more typical of iconography (though not without parallels in writing systems), such as multiplication of icons,[97] as if to suggest plurality, collectiveness or emphasis. Thus, the alternation between one ceramic container, multiple vessels and one or two people handling a vessel (Figure 2.12) is suggestive of 'pottery' or 'potter(s)'. Duplication of signs is also attested in at least three Cretan Hieroglyphic sign groups: cf. 036-092-092-031 instead of the more common 036-092-031 in #262.α, 010-010-031-038 instead of 038-010-031 in #262.β and 013-044-049-049 in the place of the more common 044-049 in #264.β.

Some depictions are suggestive of occupational groups or departments. In addition to possible potters, we find human figures holding spears or bows alternating with one or two daggers, and a person holding a pole with hanging vessels instead of only the stick and the vessels, as if representing a water carrier (Figures 2.11, 4).[98] And there are more cases worth considering.[99] Such figurations may stand for productive

[94] Ferrara, Montecchi and Valério 2021b. [95] Krzyszkowska 2005: 72.
[96] As pondered by Ferrara 2015: 17. [97] Ferrara 2018: 92.
[98] Burke (1997, 418–19, followed by Nosch and Ulanowska 2021, especially 80) has argued that the 'pole slung with string vessels' motif (as correctly identified by Anastasiadou 2011: 350, 371–2) represents loom weights, in connection to 'the administration of textile industry'. However, our third group of prisms (Figure 2.13) shows that it alternates with a person carrying the pole on their shoulders. This is consistent with the depiction of a water carrier.
[99] Cf. Yule 1980: 119–20; Ferrara 2018: 93.

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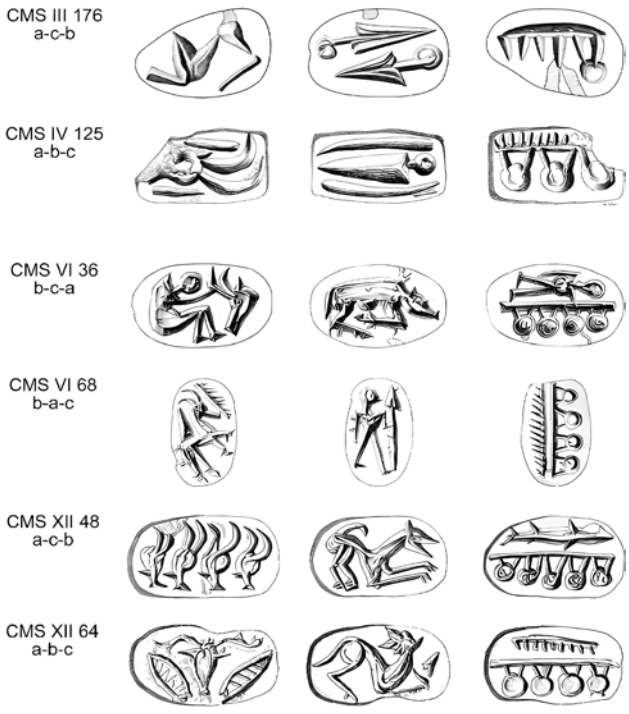


Figure 2.11 Protopalatial 3-sided prisms showing variations of the combination caprid(s) + weapon(s)/warrior/animal + vessels hung on a pole. Images collected by Miguel Valério, courtesy of *CMS* Heidelberg. Not to scale



Figure 2.12 Protopalatial 3-sided prisms showing similar combinations of graphs: pots or potters/whirling motif/creature. Images courtesy of *CMS* Heidelberg. Not to scale

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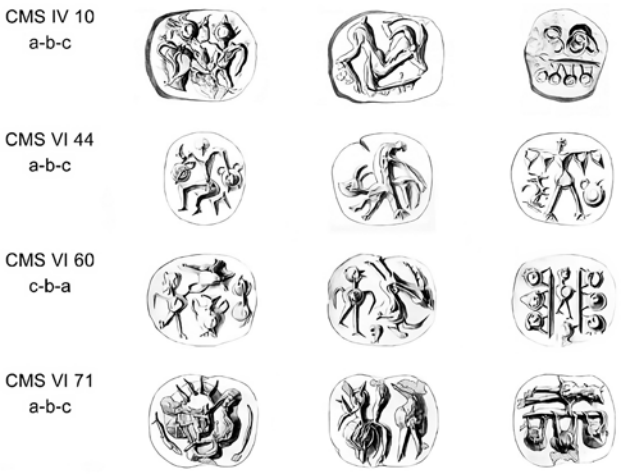


Figure 2.13 Protopalatial 3-sided prisms showing similar combinations of graphs: pots or potters + caprid or person with caprid, perhaps a shepherd (with one exception) + vessels hung on pole/water carrier. Images courtesy of *CMS* Heidelberg. Not to scale

sectors dealt with by seal bearers in the Protopalatial administration – as often happens, the idea goes back to Evans.[100] A metonymic principle may have operated, whereby an object could indicate a sphere of activity or occupation.[101] This principle is widely observed in the values of signs of original image-based scripts, and it may have applied also to Cretan Hieroglyphic. Unlike Egyptian hieroglyphs, the Cretan script is scarce in signs that depict humans holding objects, another common way of denoting spheres of activity. Thus, the values of some of the Cretan Hieroglyphic signs that depict vessels, weapons and implements might refer not to the name of the objects themselves (or not exclusively), but to the occupation associated with them. For example, the holders of three of the seals shown in Figure 2.13 might 'oversee' potters, shepherds and water carriers. Against the case for an iconography of human occupations, it has been objected that many other images on prisms lack human depictions.[102] Yet not all iconic graphs need to have the same function. Some might be, for instance, auspicious symbols or emblems of over-arching entities, such as institutions or tutelary supernaturals. This is worth considering (if difficult to ascertain) especially for animal icons like the beast with protruding tongue, the spider, the waterfowl, etc. In any event, we should be cautious about taking alternating images as fully equivalent among themselves or with Cretan

[100] *SM* I, 131–4. [101] Anastasiadou 2011: 354. [102] Ibid. 2011: 349, n. 2100.

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Hieroglyphic signs, as some interchanging pairs resemble script-signs that are clearly distinct: e.g. CH 053 and 054 , or CH 050 and 051 (see Figures 2.11 and 2.12).

Among these iconographic combinations on multi-facial prisms, we also see permutations between full-length and the head-only depictions of an animal. These substitutions follow a *pars pro toto* convention that we also see at work in Cretan Hieroglyphic and other writing systems. Thus, the heads of caprids in these groups (cf. *CMS* IV, 125; VI, 36; XII, 48) are not very different from sign CH 016 , especially as inscribed on *CHIC* #148 and #290.δ. This is indirect evidence that CH 016 is related to full-body caprids already found on Prepalatial seals. However, we need not always assume reduction in the course of time, whereby the full-body animal came first, and then its head was just excised. The two kinds of depiction might be coetaneous. Moreover, Krzyszkowska (2015) argues that the famous cat face (Evans' *SM* 74, known in the literature as 'cat-mask') may have been the original graph from which the rarer full-body depictions (Evans' *SM* 75) derived. The latter show the body in profile but the face also in frontal view.

Because at times script and iconography are combined on the same seal, certain images may have fulfilled the same role as an inscription, thereby substituting for one another on different seals. For example, the set in Figure 2.14 implies that: sign group 011-009-068 may have substituted for the frontal head of a long-horned mammal comparable to CH 011, as main element; and 044-049 could take the place of the interlaced circles motif. Another telling case of permutation between image and script involves the pair of seals *CHIC* #207b = *CMS* II.1, 420b and *CHIC* #274a = *CMS* XII, 105a (Figure 2.15): the former combines

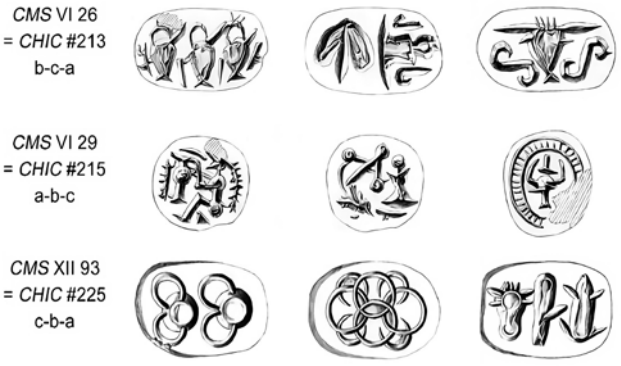


Figure 2.14 3-faced prisms engraved with: pots/potter + 044-049 or interlaced circles + frontal head of long-horned mammal or 011-009-068. Images courtesy of *CMS* Heidelberg. Not to scale

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Figure 2.15 Seals *CHIC* #207b = *CMS* II.1, 420b (left) and *CHIC* #274a = *CMS* XII, 105a (right). Images courtesy of *CMS* Heidelberg. Not to scale

the inscription X 044-049 with the elaborate scene of a human stomping grapes next to a larger container; the latter is inscribed with *156-044-X-049, where *156 𐄷 is the sign for 'wine'.[103] Further structural analyses of script and iconography on multi-faced prisms and other seals could yet throw much light on the function of Cretan Hieroglyphic signs.

2.7 In Search of a Model for the Inception of Cretan Hieroglyphic

Most inscribed Cretan seals from the period around the emergence of writing were recovered from mortuary contexts, so the ritual side of these objects is emphasised by archaeologists. Conversely, evidence for sphragistic practices in non-funerary contexts in the same period is scant. Thus, the notion that MM I seals and their writing had an 'economic' or administrative function has been called into question,[104] but the historical trajectories of other regions warn us that burials may have been just their 'last stop'. We do not know a lot about the life of these objects and their owners at the settlement of Archanes/Tourkogeitonia, located one kilometre to the southeast of Phourni, nor what exact sort of structures of power existed there.

We have, however, several indications that inscribed seals, and potentially their inscriptions, did play a role in early Cretan administration. Weingarten[105] has stressed that in the Protopalatial period 'almost half of the seals impressed at Knossos and *Quartier Mu* were engraved with hieroglyphic inscriptions'. During this period, most hieroglyphic seals are 3-faced or 4-faced prisms. These are types closely associated with the use of writing, and which on statistical evidence appear to combine sign groups according to specific rules.[106]

[103] Decorte 2017: 54. [104] Schoep 2006: 47. [105] Weingarten 1995: 287.
[106] See especially Poursat 2000.

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Crucially, multi-facial seals as conveyers of meaning through 'series of images' have roots in the late Prepalatial.[107] Among the six seals containing the 'Archanes formula' from MM I, the following morphological types are represented: discs or discoids, 'gables' (3-sided seals), one cube and one *baton* (*CMS* II.1, 391), which Weingarten[108] rightly described as (three) stacked cubes. All four shapes are also attested within the Ossuary of Burial Building 6 at Phourni. These seal types are based on geometric shapes that yield multiple flat faces and have circular fields for engraving (though not necessarily on all faces). The fields bear figurative contents, be they script-signs (CH 019, 042, 052, 095), isolated graphs that resemble Cretan Hieroglyphic signs (CH 008, 010 and *181) or more complex compositions. The main difference lies in the number of sides: two (discs), three (gables) and six (cubes); the *baton* triples the cube and has thirteen faces (not eighteen) because of the stacking and the handle. Their frequency from EM II through MM I in the online catalogue of *CMS*, even if approximative because the database does not contain all extant seals, indicates the following: the *baton* is a *hapax*; and there are six seals of cubic type (*Kubus*), ten 3-sided gables (*Giebelprisma*), and twenty-two examples of discs (*Diskus*). This distribution shows a reverse proportion: the higher the number of sides, the rarer the shape. This suggests social rules that restricted the use of seals with more engraved faces, and this logic may have paved the way for the situation in the Protopalatial. The gables foreshadow the 3-sided prisms that later characterise MM II.[109] The cubes as such disappear from the archaeological record in the transition to the Protopalatial phase, but it is as if they were replaced by the parallelepipedal 4-sided prisms.

By virtue of their flat faces, the geometric seal types that bore Cretan Hieroglyphic signs (or their forerunners) made for ideal sigillary devices and there is indirect evidence that they were. The sealing from Knossos *CMS* II.8, 15, showing a hand comparable to CH 008 as central motif, compares well with the cubic seal *CMS* II.1, 64a (cf. Figures 2.4 and 2.5) and is most probably from this family of shapes.[110] There is also evidence connecting the 'Archanes formula' and sphragistic practices. Seals with the formula were for sure used sphragistically in MM II. We have impressions of its first sign group (*CMS* V.S1B, 326 and 327; V.S3, 343 = *CHIC* #135–7, 137*bis*) on clay objects and possibly one with the two groups (*CMS* II.8, 29 = *CHIC* #179). Some of these come

[107] Krzyszkowska 2005: 71–2. [108] Weingarten 2007: 137.
[109] Poursat 1995; Anastasiadou 2011: 23–30.
[110] Weingarten 2007: 137. *CMS* II.8, 15 is reported as coming 'from a secure MM IIA context', but, as underlined ibid., this dates the sealing and not necessarily the seal.

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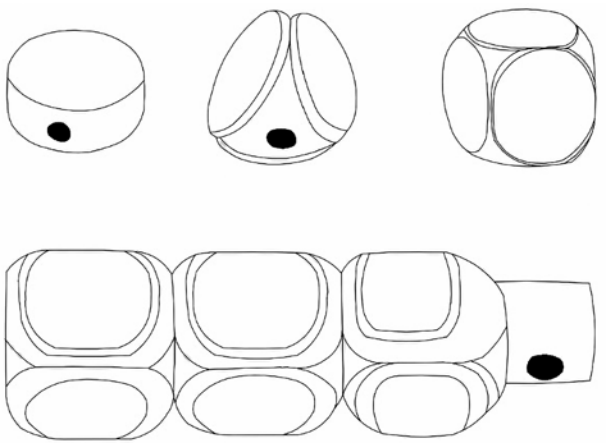


Figure 2.16 Geometric seal shapes associated with incipient writing on Crete (from top left to bottom): disc, gable, cube and stacked-cube bar (*baton*) (shapes redrawn and schematised after Yule 1980: 27–30)

from Mikro Vouni in Samothrace, suggesting a link to long-distance exchanges. *CMS* VII, 31, a seal engraved with the first sign group of the formula,[111] is a *Petschaft*, the typical Protopalatial stamp. Another MM II seal, a flattened onyx cylinder (*CMS* VII, 35 = *CHIC* #205), features the sign groups of the formula separated in two sections of the same face. In turn, this seal is comparable in shape, material and measurements to *CMS* III, 149 = *CHIC* #206, which also has signs inscribed on separate encasements. Remarkably, one of the two sides of #206 features signs that stand for commodities, CH *155 = 024 (figs) and *156 (wine), while the other side has signs for fractions, CH *302/Δ, *307/Σ, *308/Q and *309/𐄁 (*CHIC*: 228–9, 429–31).[112] The comparison comes full circle with the seal *CHIC* #292 = *CMS* VI, 217.[113] It has a different morphology, but as far as the inscriptions across its four faces go, it combines in one object the fraction signs of #206 (302/Δ, 307/Σ, 308/Q, 309/𐄁) and the 'Archanes formula' as seen on #205. The point is that the formula was applied on seals alongside signs related to the sphere of economy. And while this evidence stems from Protopalatial objects, Flouda[114] notes that the 3-sided steatite seal *CMS* VI, 14b (= *CHIC* #251b), dated to MM I, shows traces of 'intensive use' on the face inscribed with 019-095-052.

[111] Perna 2016.
[112] See Jasink (2005) for the different interpretation of the instances of 302/Δ, 307/Σ, 308/Q, 309/𐄁 on seals as logograms or even syllabograms.
[113] MM IB-II according to Yule 1980: 102. [114] Flouda 2013: 155.

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In the Protopalatial phase, the most frequent Cretan Hieroglyphic signs by far are CH 044 and 049 , which are attested 132 and 134 times, respectively. Furthermore, CH 044 is part of the two most frequent sign groups occurring on 3- and 4-sided prisms, 044-049 and 044-005 .[115] Because seal faces containing these 'formulae' were used for sealing, CH 044 surely played a key role in Protopalatial administration, regardless of its category (determinative, logographic, phonetic) and precise meaning. But what exactly might the sign indicate?

For a long time since Evans (1909), CH 044 has been interpreted (or at least described) as a trowel and, to be sure, metal tools showing a resemblance to it but defined as 'cutters' are attested in Prepalatial burials.[116] Recently, however, Ferrara and Cristiani (2016) equated the shape of the sign with stamping signet seals of the *Petschaft* type. The Cretan *Petschafte* have parallels in Anatolia and evolved from simpler signet seal shapes during MM IB.[117] Both cutters and signet seals have profiles like the contour of CH 044, but the signets account for the sign's variation (Figure 2.17) and make for a superior hypothesis for another

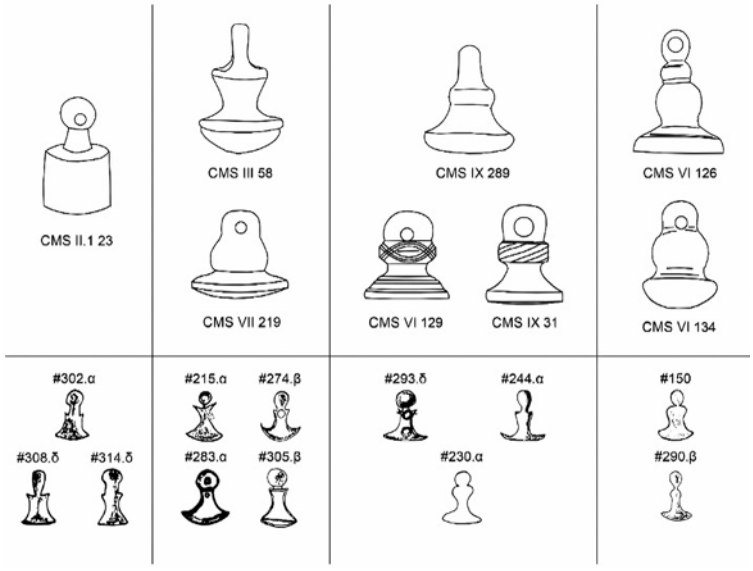


Figure 2.17 Comparison of Minoan signet seal shapes, mostly of the type defined as *Petschaft* (contours of shapes redrawn after Yule 1980: 82, 86–7 and *CMS*), and selected palaeographical variants of CH 044 (after *CHIC*: 403–5). *CMS* II.1, 23 is a hammer-head type dated stylistically to EM II–III

[115] Poursat 2000. [116] E.g. Xanthudídes 1924: Pl. LVI, no. 1944.
[117] Ferrara and Jasink 2017: 43–4, 47; cf. also Yule 1980: 86.

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reason: an iconic sign that pervades seal inscriptions is less likely to depict a mason's tool (as originally proposed by Evans) than a seal.[118]

Evans (1909: 265ff.) famously suggested that some of the repeating Cretan Hieroglyphic formulae (038-010-031 𐄫𐄁𐄐, 044-005 𐄀𐄂, 044-049 𐄀𐄇) represented titles of high-ranking Minoans. His main argument derived from the iconicity of the signs, which he interpreted as metonymic logographs: the gate or door (CH 038 𐄫) should stand for 'keeper, guardian', the leg (CH 010 𐄫) for 'a leader' and the eye (CH 005 𐄂) for 'overseer'.[119] This may seem too superficial, but typologically speaking there is nothing uncommon about metonymic values in script systems. Rather, the problem is that such interpretations are difficult to falsify. Olivier and Weingarten have also interpreted 044-049 and 044-005 as titles of influential entities in the realm of Minoan administration, but their argument draws mainly on the distribution of the sign groups. Olivier[120] suggested very tentatively that they could mean something like 'temple' and 'palace'. Weingarten proposed, also tentatively, that they stood for 'the royal estate' and 'a department of bureaucracy (such as the Treasury or Central Storehouse)'.[121] Ferrara and Cristiani (2016) interpreted CH 044 as the image of a *Petschaft* whose meaning as a logograph was '(basic) administrative act' or a 'synecdoche for administration', in other words, 'seal(ing)'. We could add that in the case of inscriptions #207b and #274a, as mentioned above, 044-049 might represent an official or department that oversaw the production of wine. Thus, the hypothesis of Ferrara and Cristiani has the advantage of aligning the iconicity and distribution of CH 044. It also echoes the connection of emergent writing with seals observed in other regions during the Bronze Age, and the ubiquitous tendency of seal inscriptions to contain names of persons and institutions.

While the language(s) behind Cretan Hieroglyphic and its users remain(s) largely inaccessible (Davis, this volume), the context, distribution and iconicity of some signs may have already advanced us somewhat towards their origin and function. The essence of Evans' old idea

[118] By way of comparison, in Egypt words related to sealing occur in Middle Kingdom titles more than 200 times, whereas forms of the word *qd* 'builder, mason' (the sense which *SM* I: 187, 241, 246 associated with CH 044) are attested only fifteen times in designations of people (*Persons and Names of the Middle Kingdom*, with refs.).

[119] Analogies with Egyptian writing also played a role. Evans interpreted as a collective designation for a 'mason' the combination of his 'trowel' (CH 044) and the sign he thought resembled the Egyptian hieroglyph for 'adze' (CH 046). However, according to Faulkner (1962), neither *qd* (or *ḳd*) 'builder' nor *ḫrtj-nṯr* 'stone mason' are spelled with the combination of 'adze' and 'saw' hieroglyphs in Middle Egyptian.

[120] Olivier 1990: 18.

[121] Weingarten 1995: 303, n. 23. Weingarten preferred to see the 'temple' in the first sign group of the Archanes formula (042-019).

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of titles conveyed by combinations of semantic signs, i.e. logograms and semantic determinatives (though Evans used a different, at times confusing, terminology), is not at odds with the history of writing systems. We saw that logographic complexes that conveyed titles, tutelage and auspicious notions were predominant in early Anatolian Hieroglyphic writing on seals, before phonetic notation expanded. Likewise, proto-cuneiform was a very productive notation in early Mesopotamia, mainly tied to accounting clay records – also typical of Cretan Hieroglyphic – and yet phoneticism, if present, was minimal at this stage of cuneiform writing.[122] Future research into the origins and development of Cretan Hieroglyphic might well benefit from an approach that balances internal, iconographic and comparative-typological data.

[122] Woods 2021: 41.

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