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What is the 'Archanes Formula'? Deconstructing and Reconstructing the Earliest Attestation of Writing in the Aegean

This is the final peer-reviewed author's accepted manuscript (postprint) of the following publication:

*Published Version:*

What is the 'Archanes Formula'? Deconstructing and Reconstructing the Earliest Attestation of Writing in the Aegean / Silvia Ferrara, Barbara Montecchi, Miguel Valério. - In: THE ANNUAL OF THE BRITISH SCHOOL AT ATHENS. - ISSN 0068-2454. - ELETTRONICO. - 116:(2021), pp. 43-62. [10.1017/S0068245420000155]

*Availability:*

This version is available at: <https://hdl.handle.net/11585/833390> since: 2021-11-24

*Published:*

DOI: <http://doi.org/10.1017/S0068245420000155>

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**Silvia Ferrara, Barbara Montecchi, Miguel Valério, What is the 'Archanes Formula'? Deconstructing and Reconstructing the Earliest Attestation of Writing in the Aegean in "The Annual of the British School at Athens", 116/2021, pp. 43-62.**

The final published version is available online at:

<https://dx.doi.org/10.1017/S0068245420000155>

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# WHAT IS THE ‘ARCHANES FORMULA’? DECONSTRUCTING AND RECONSTRUCTING THE EARLIEST ATTESTATION OF WRITING IN EUROPE

## ABSTRACT

*This article examines the earliest attestations of writing on Crete at the beginning of the second millennium BC, the so-called ‘Archanes formula’. The aim is to reassess its origin, purpose, significance and ‘reading’, through a multi-step analysis taking in palaeography, correlations with iconographic seal motifs, and also material culture. Key questions are considered: Which script does the ‘Archanes’ represent? To what extent, despite frequent suggestions, is it comparable with the Linear A ‘libation formula’ a-sa-sa-ra-me? Should it be, conversely, singled out as a separate writing tradition altogether? To address these open issues, the ‘Archanes formula’ will be brought under close scrutiny, vis-à-vis the graphic repertoires of Cretan Hieroglyphic and, in parallel, Linear A. The conclusions we have drawn point in the direction of a very strong connection with the Cretan Hieroglyphic milieu, in terms of sign shapes, direct links to seal imagery and specific referents in Protopalatial physical objects. In this light, the earliest writing in the Aegean should be revisited not so much as a script in itself, nor as a prequel to Linear A religious sequences, but as a direct manifestation of the highly iconic glyptic practices of the Hieroglyphic tradition.*



The earliest attestations of writing in Europe are still a debated issue, in Aegean studies and, more generally, in the scholarship on ancient scripts. The controversy pivots on what specific script is earliest (see, for instance, the marks belonging to the Neolithic Vinča culture in south-eastern Europe), or in more theoretical terms, on what we should define as writing proper. Herein lies an

open-ended question: if the earliest script is, in fact, the Cretan Hieroglyphic, dated to the beginning of the second millennium BCE, what should we make of signs that are dated just slightly earlier, which closely resemble the signs of the Hieroglyphic script?

The question is not idle, nor is it marginal to a broader discussion on beginnings, false starts or real incipits, because it subsumes an even more general issue, especially when confronted with iconic writing (i.e. writing which formally stems from icons and images, with a large figurative repertoire): when does it begin to record sound, namely written language? When does it shed its formal shackles of decoration, to become a specific sound-recording feature? Can we locate, in time, in place, and in essence, such a fundamental turning point, from image to sign, in the history of our Old Continent?

The evidence is, as for every unclear starting point, scanty and uncertain. Being highly implicated with images, the earliest writing in Europe appears on a type of object where images run aplenty, making the exact moment of emergence difficult to grasp: engraved sealstones. These, small and thickly ornate, were the first trail that Arthur Evans followed in his pursuit to discover and unravel the mysteries of the Minoan civilisation (Evans 1909). It is on them that we find clues that images ceased to be mere designs of iconography and acquired a formal structure that carried another message, in what likely was a string of sound values. And so, in a large and important cemetery not far from Crete, Archanes Phourni, lay the beginning of writing. But how we should frame this start, its legacy on the island, its close paleographical ‘reading’, its relation to the Cretan Hieroglyphic script, and its connection to Linear A, is where lies the crux of the problem, still enveloped, as it is to this day, in a murky quicksand of definitions. What is, in effect, the ‘Archanes formula’?

## STATUS OF THE EARLIEST WRITING IN EUROPE<sup>1</sup>

In the first published assemblage of early Cretan seal motifs, the label appeared: ‘the Archanes script’, after the cemetery of Archanes Phourni (Yule 1980, 169-172). Their archaeological context dates to the end of the EM II and the beginning of MM IA (Grumach and Sakellarakis 1966, 111-112). Further studies have narrowed the date to the MM IA-B period, around 2000-1900 BCE (Sbonias 1995, 58-59, 108). This is important because it marks the cusp of the transition to the emergence of the first palaces. The seals show two groups of signs, respectively catalogued as 042-019  and 019-095-052  (Olivier and Godart 1996). Given their repetition on separate seals, they are generally referred to as ‘the Archanes formula’, even though they are also attested on Protopalatial seals and sealings from several other sites, one also outside Crete (Tables 1 and 2).


The term ‘formula’ fits these signs better than ‘script’, as it is clear that they do not constitute a complete system of writing. But what specific definition they should acquire as ‘proper signs’ is still an open question: which script do they represent? A forerunner of the Cretan Hieroglyphic (Sbonias 1995, 108; Olivier and Godart 1996, 18 n. 59; Younger 1996-1997, 380–1, Perna 2014, 252; Karnava 2016, 352), or of Linear A (Godart 1999; Anastasiadou 2016, 177–82), or of both (Schoep 1999, 266, 270–3)? Conversely, as it has also been proposed, do they form a separate script altogether, albeit with some connection to Cretan Hieroglyphic (Decorte 2018b)? To address this question, it is worth presenting a reassessment of the ‘Archanes formula’ *vis-à-vis* the graphic repertoires of Cretan Hieroglyphic and Linear A. This can help us trace not just the beginning of

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<sup>1</sup> In this paper, Linear A syllabograms will be transcribed using the phonetic value of the Linear B homographic signs (for evidence supporting this convention, Duhoux 1989, 66-76). Doubtful readings, both in Cretan Hieroglyphic and Linear A, will be marked with underdots. The Cretan Hieroglyphic inscriptions will be mentioned according to the numbering established in the corpus collected by Olivier and Godart in 1996 preceded by #. The Linear A inscriptions will be mentioned in accordance with the conventions established in *GORILA*. In this article, the labels for time periods of the Aegean Prehistory are abbreviated according to the widespread convention: EM = Early Minoan (3100-2100), MM = Middle Minoan (2000-1600), and LM = Late Minoan (1600-1200).

writing on the island, but also its future path, in terms of continuity, disruption and overall diachronic development.

In particular, we shall address an important controversy still present in the scholarship, namely the long-standing association made between the ‘Archanes formula’ and the Linear A syllabic sequence 08-31-31-60-13/*a-sa-sa-ra-me*. To what extent is this connection tenable? In the later Linear A, as attested in the Neopalatial period, the *a-sa-sa-ra-me* sequence is found on inscriptions incised on stone vessels and on other objects likely used in religious or cultic rituals (readable in full only on IO Zb 10, PK Za 11b-c, PR Za 1c). The tie to Archanes is of long and persistent tradition, first suggested by Bossert (1931, 318-20) and further developed by others (Grumach 1968, 7-26, Hooker 1992, 106-108, Weingarten 1995, 303-4, n. 23, Anastasiadou 2016, Karnava 2016), and hinges mainly on palaeographical matters.



This is worth revisiting, because if Olivier and Godart (1996, 19) have clearly shown the correspondence in terms of shapes in the Archanes and Linear A between signs CH 042 and AB 08/*a*, CH 019 and AB 31/*sa*, CH 052 and AB 24/*ne*,<sup>2</sup> one problematic feature remains, and it requires fresh attention. This feature is the graphic configuration of sign CH 095 , which was classed as Cretan Hieroglyphic, but crucially, present only in the ‘Archanes formula’ and not in the rest of the texts (Olivier and Godart 1996). This sign has been often assumed to correspond to the Linear A AB 60/*ra* (Brice *apud* Brice and Henle 1965, 67, Olivier 1996, 107, Younger 1996-1997, 387, and Godart 1999, 300), but this is problematic. As it turns out, the shapes of the two signs appear to be more different than they were made to be. Upon this very uncertainty, lies the need to revisit the ‘Archanes formula’ and its status.

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<sup>2</sup> Previous different suggestions, as for example CH 052 = AB 13/*me* (Brice 1997, 93), can be nowadays considered outdated.


## POINTS OF DEPARTURE: BODY OF EVIDENCE

### A close-up on the ‘Archanes formula’

The ‘Archanes formula’ is a standard combination of two sign-groups (Grumach 1968, 12–13), respectively catalogued as CH 042-019  and 019-095-052  (Olivier and Godart 1996). It is attested on seals and seal impressions, all dated to the transition from the Pre- to the Protopalatial Period (Table 1). They either appear on different seal faces (#202, #203, #251, #252, #292, #313, #315), or on the same one, but separated by a horizontal or horizontal to vertical line (#205 and #179). It is to be claimed, then, that the two sign groups were therefore independent of one another (Karnava 1999, 197), a fact proved by sign group CH 042-019 being attested also on its own (Table 2). At present, we cannot ascertain whether sign groups starting with CH 042-019-, such as 042-019-009-070 (on #222.β and perhaps #201) and 042-019-031 (#301.δ), are variants of the ‘Archanes formula’ or completely unrelated inscriptions.

Some seals bearing the ‘Archanes formula’ have also one or more additional faces engraved with other motifs, which may be considered either decorations or ‘icons’ (Civitillo 2016) when they are figurative (as the quadrupeds on #313 and #315), as fillers when they are smaller or geometrical, or as isolated signs (as the hand and the leg on sealstone #315, which recall signs CH 008 and 010). Some of these elements may be part of the script as either phonographic or sematographic signs (Decorte 2018b), but there is no reason to assign them to a separate script. The presence of additional elements, beyond the ‘formula’, makes these seals comparable with many other Cretan Hieroglyphic seals, which include both writing *stricto sensu* and decorative motifs.

How to actually read these signs, and delve into their internal structure and meaning, is a more than a marginal problem, not just for the ‘Archanes formula’, but for the Cretan Hieroglyphic signs on sealstones as well: are they to be read only phonetically, which implies proper phonography, or not? The scholarship is again divided, since the possibility of logographic or ideographic readings is accepted by some (Evans 1909; Grumach 1963-64; Brice *apud* Brice and Henle 1965; Reich 1968), while others stick to a close phonetic reading only (Olivier and Godart 1996, Karnava 1999, 35-36). We can state, to all intents and purposes, that comparative evidence showcases that newly created iconic scripts (early Sumerian cuneiform, Egyptian, Anatolian Hieroglyphic, Old Chinese, Maya and Nahuatl or Aztec) spelt words logo-phonetically at least sometimes, and especially at their earliest stages of development (Boltz 1994, 2000; Trigger 2004; Valério and Ferrara 2019). In these writing systems, words could be spelt with combinations of semantic signs (logograms or determinatives) and phonetic signs.

Thus, if we are dealing with a highly iconic, newly invented script, as it seems to be the case (Powell 2009, Ferrara 2017), one may expect to find words spelled logographically as well as phonetically. With this in mind, we can take into consideration the possibility that at least one of the signs of the ‘Archanes formula’, namely the double axe sign, may not have been used phonetically, but rather as a determinative categorising a word expressed by nearby sign(s), or as a logogram standing for a complete word. This can be inferred by the general behaviour of the double axe sign (CH 042 ) in Cretan Hieroglyphic inscriptions, where it is separated from sign-groups by means of dividers, or, in alternative, emphasised by a 90-degree rotation (Ferrara 2018, 97–9).

So, if the identification and nature of the signs of the ‘Archanes formula’ are thus still problematic, not so is the case for the Linear A *a-sa-sa-ra-me*, which is recognisable as a syllabic sequence, well embedded within the so-called ‘libation’ formulas. To assess the extent to which we can compare



the ‘Archanes formula’ to this sequence, we should recall its essential characteristics, as well as its variants, and contexts of use.

### **Linear A *a-sa-sa-ra-me* in the ‘libation’ formulas**

The Linear A ‘libation’ formulas are ordered sequences of several syllabic groups (i.e. phrases), which are attested in Cretan sites and on the island of Kythera, during the Neopalatial period (MM III–LM I). These sequences are carved on about fifty stone vessels and receptacles (the so-called ‘libation tables’) used in religious contexts in peak and cave sanctuaries. The presence of logograms for olives and olive oil on one of them (SY Za 2) indicates that they were probably used for poured libations offered as symbolic food to the gods (Davis 2014, 99–107), although some miniature examples from the Iouktas and Syme sanctuaries might have been votive offerings themselves (Karnava 2016, 349).

Most of the inscriptions on the vessels are fragmentary. Despite this, we can still detect some recurrent sign groups: *a-ta-i-\*301-wa-ja/e* or in alternative *ta-na-i-\*301-*, groups which point to possible place, sanctuary or divine names (e.g. *se-ṭo-i-ja*, *i-da*, *-di-ki-te-*), and sequences such as *ja/a-sa-sa-ra-me*, *u-na-ka-na-si* or *u-na-ru-ka-na-ti*, *i-pi-na-ma*, and *si-ru-te*. An important feature is that there appears to be a pattern in these sequences. According to whether a sequence is present or not, and their ordering, these inscriptions have been grouped into primary and secondary ‘libation’ formulas (Karetsou, Godart, and Olivier 1985, 134). And even if the specific identification of the words is uncertain, they appear to represent variations of a dedicatory formula, possibly containing a verb like “consecrate”, the name of the dedicant, the item(s) offered, and the name(s) of the deity or deities recipients of the offer (Pope 1961; Brice 1983; Finkelberg 1990–1991; Owens 1996; Monti 2005; Davis 2014).

Important to our ends is that the Linear A syllabic sequence *a-sa-sa-ra-me*, which has been compared with the ‘Archanes formula’ for decades, is a variant of the more frequently attested *ja-sa-sa-ra-me* (Table 3). Both variants appear as middle component in the primary ‘libation’ formula, and as final in the secondary one (PR Za 1, IO ZA 6). Moreover, this syllabic group also appears on two inscriptions, both to be read retrograde, which do not show any other component of the ‘libation’ formulas, but could still have a dedicatory function. This might support the idea that this syllabic sequence indicates the offered object or the act of offering (Davis 2014, 270). These are PL Zf 1 and POR Zg 1 (Fig. 1). The former is incised on a broken LM I silver pin found in a tomb (Alexiou and Brice 1976). It comprises at least six sign groups divided by means of short vertical strokes, the third and the fourth of which are *u-qe-ti*, *ja-sa-sa-ra-me* (Fig. 1.a). The latter is painted on a clay figurine dated to the LM IIIA1 period without context of use (Olivier, Rethemiotakis, and Dimopoulou 1993). This inscription is complete and consists of a sequence of eight signs (Fig. 1.b), which was read as *ri-qe-ti-a-sa-sa-ra-\**325 (Olivier, Rethemiotakis, and Dimopoulou 1993, 509-13).

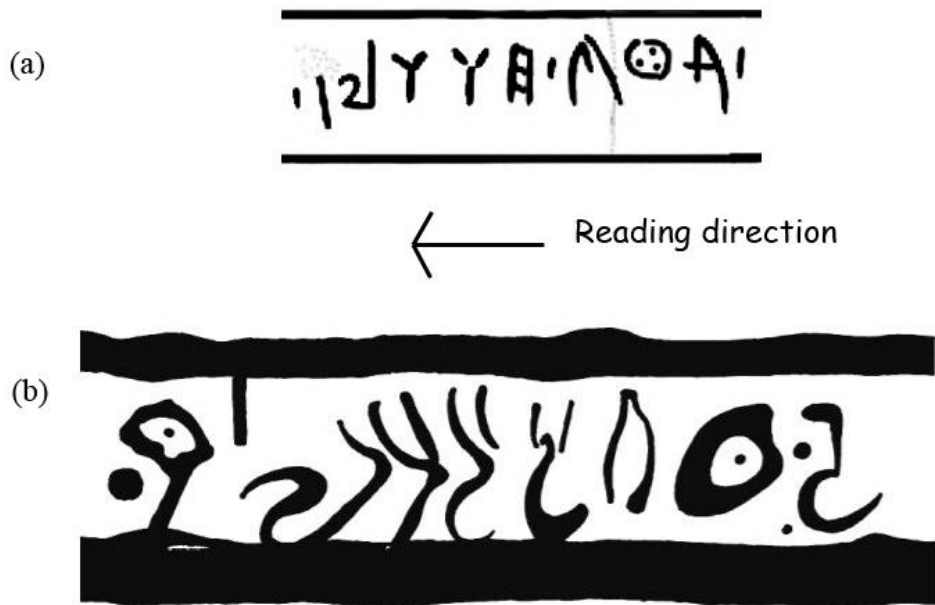



Fig. 1. (a) Drawing of a part of inscription PL Zf 01 (after *GORILA* 4); (b) drawing of inscription POR Zg 1 (after Olivier, Rethemiotakis, and Dimopoulou 1993, 510, fig. 8). Not to scale.

A peculiar palaeographical feature of POR Zg 1 is the cursive shapes of the signs, with straight traits executed as curves. Keeping in mind the stark difference in *ductus* between these painted shapes and those we normally see incised, we can suggest that the dot in both the first and the last sign might stand for a horizontal stroke crossing a vertical stroke. This would allow the comparison of signs AB 10/*u*<sup>3</sup> and AB 13/*me* with the first and last signs of POR Zg 1, respectively, bringing the whole inscription even closer to PL Zf 1. In fact, the final sign of POR Zg 1 differs from the currently accepted A 325  in two ways: first, it has two extra dots and, second, its vertical stroke is not centred with respect to the upper circle. Conversely, AB 13/*me* might be preferable as a reading because its upper part is sometimes also a simple loop (see especially the instances in PS Za 2.2, PK Za 14 and KH 53.1, in Fig. 2), and it has strokes that could have been simplified as dots when written in ink. We therefore propose to read POR Zg 1 tentatively as two sequences: *u-qe-ti a-sa-sa-ra-me*. The close similarity to PL Zf 1, the fact that A 325 is a very rare sign,<sup>4</sup> and the consistent spelling of (j)*a-sa-sa-ra-me* with final *-me* (Table 3) all converge towards this reading.

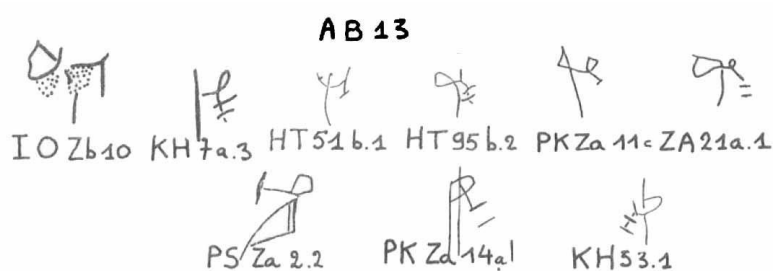


Fig. 2: Range of palaeographical variation of Linear A sign AB 13/*me* (after *GORILA* 5, xxx).

<sup>3</sup> See especially the instance on the inscribed libation vessel AP Za 1 (as shown here in Fig. 6).

<sup>4</sup> The sign occurs only in the sequences *u*-\*325-*za* (HT 10a.2.3 and 85a.3) and *a*-\*325-*za* (PE 2.3) (*GORILA* I, 20-21, 130-131; Tsipopoulou and Hallager 1996, 33).

It is also important to stress that Linear A *a-sa-sa-ra-me* is never attested on its own, without other specifications, on an intact inscription. The two only possible instances may be PK Za 4 and IO Zb 10, but both are fragmentary.

#### DECONSTRUCTION: IS THERE ANYTHING TRULY SIMILAR BETWEEN THE ‘ARCHANES’ AND THE LINEAR A ‘LIBATION’ FORMULA?

The ‘Archanes formula’ and Linear A *a-sa-sa-ra-me* have been prominently drawn close in the scholarship, to the point of becoming accepted as a match, with little question (e.g. Bossert 1931, 318-20; Brice *apud* Brice and Henle 1965, 56-68; Grumach 1968, 7-26; Hooker 1992, 106-108; Weingarten 1995, 303-4, n. 23; Anastasiadou 2016; Karnava 2016, 352-4). Upon close inspection, however, the evidence appears to be tenuous. On the one hand, contextually, namely in terms of function and epigraphical features, the two sets are comparable only to an extent: the ‘Archanes formula’ is found uniquely on seals, namely on objects that were worn for personal display as well as administrative activities, while the Linear A sequence *a-sa-sa-ra-me* is mainly attested on stone vessels, in a clear dedicatory context. While context of use may not be a guiding principle, the difference is quite stark. And if the silver pin PL Zf 1 is clearly a high-status object worn on the body and highly individualised, it is difficult to prove that the Archanes seals were perceived as luxury items in the same category. Also, Linear A *a-sa-sa-ra-me* is usually part of a longer dedicatory formula, and this difference from the Archanes ought not to be discounted, because we cannot be certain that whether it could stand on its own.

The differences do not cease here. In terms of arrangement and layout, the Linear A signs always form a single sequence, while the ‘Archanes formula’ is to be disjointed in two groups (Fig. 3). In addition, the final sign in *a-sa-sa-ra-me* does not match with the final sign of the ‘Archanes

formula', as already said above. Yet, several explanations have been brought forth to support the match, despite the sequence split and different final sign. Godart (1999, 299) suggests that they are two variants of the same Linear A word, which differ because of chronological development or a morphological change. We should, in this case, envisage two initial words, which ended up merging, at a later stage, in compound formation. Karnava (2016, 352-353) explains the differences in terms of linguistic development, or in terms of scribal idiosyncrasy. Be that as it may, the differences are apparent, and the very fact that we cannot explain them, or ascertain the graphic correspondence between the first four signs of the formulas makes the association weaker.

Indeed, the palaeography is where we should zoom in. As we have stated, the fourth sign of the 'Archanes formula', catalogued by Olivier and Godart (1996) as CH 095, is widely made to correspond to AB 60/*ra* (e.g. Olivier 1996, 107; Younger 1996-1997, 387; Godart 1999, 300). Olivier and Godart (1996, 421) list altogether ten occurrences of CH 095, including two badly eroded instances (#179, #202.β, #203.β, #205.α2, #251.α, #252.α, #292.γ, #313.β, #315.H), shown in Fig. 4. Here is where the complications start, because when we compare its palaeographical variations with those for the Linear A sign AB 60/*ra* (Fig. 5), we struggle to find diagnostic traits in common, even considering processes of schematisation, cursivisation or handwriting style.

	042	019	019	095	052
#134					
#135					
#136					
#137					
#179				—	—
#202					
#203					
#205					
#251					
#252					
#292					
#313					
#315					

Fig. 3. Palaeography of the signs (CH 042, 019, 095 and 052) that compose the ‘Archanes Formula’ (adapted from CMS and Sbonias 2010, Pl. 61, S35).

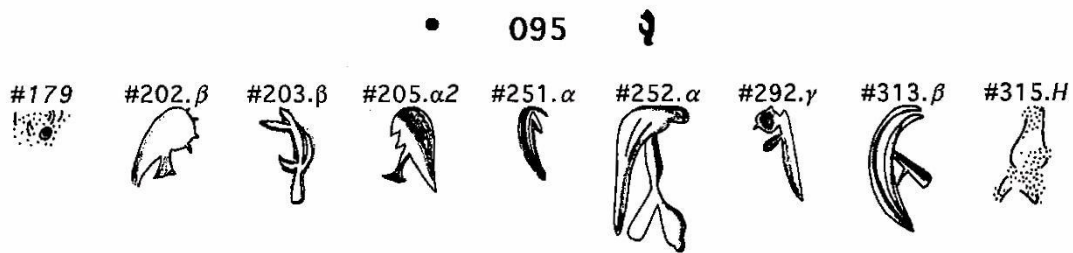


Fig. 4. Attestations of CH 095 according to Olivier and Godart (1996, 421). The instances in #252.α and #315.H have been vertically flipped in order to be shown with the same orientation as the others.

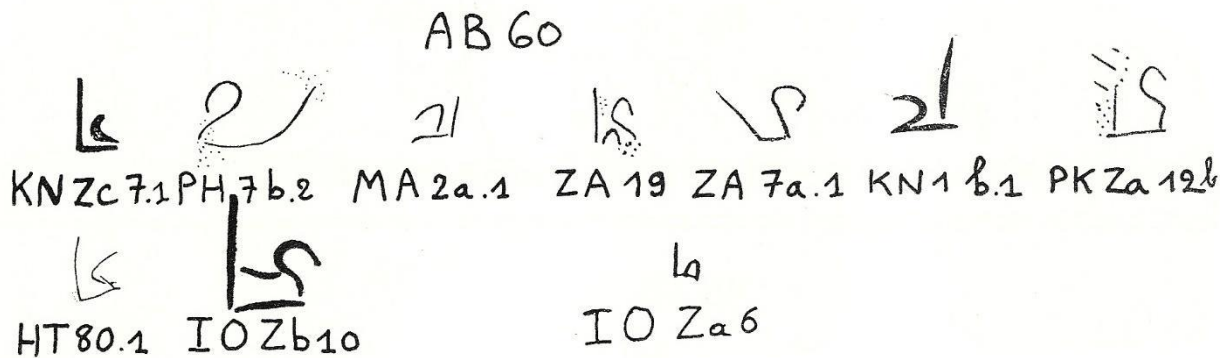


Fig. 5. Range of palaeographical variation of Linear A sign AB 60/ra (after *GORILA* 5, xxxviii).

Probing into the Linear A sign repertoire proves instructive, as a more fitting *comparandum* than AB 60/ra can be identified. If we look at the variants of the Linear A syllabogram AB 10/u, we can find a closer match to sign 095 (Fig. 6). In several instances, sign AB 10/u is drawn with an emphasised curve or angular shape, and with a smaller stroke or inverted ‘T’ trait pointing downwards. The curved or angular shape is consistent with the main body of sign CH 095 and both signs have a protruding feature. These instances of the Linear A sign are dated mainly to the MM II and III phases, which brings us closer to Cretan Hieroglyphic also in terms of chronology.

It needs to be stressed that this is just a paleographical similarity that should in no way induce us into reading the ‘Archanes formula’ as a specular phonetic rendering of specific Linear A signs. The fact that we can see better-fitting matches should not induce us into reckless reading practices. There is an inherent danger in transposing phonetic values: such an exercise implies that every sign ought to be read phonetically, and this, worth reiterating again, could well not be the case for the ‘Archanes formula’.

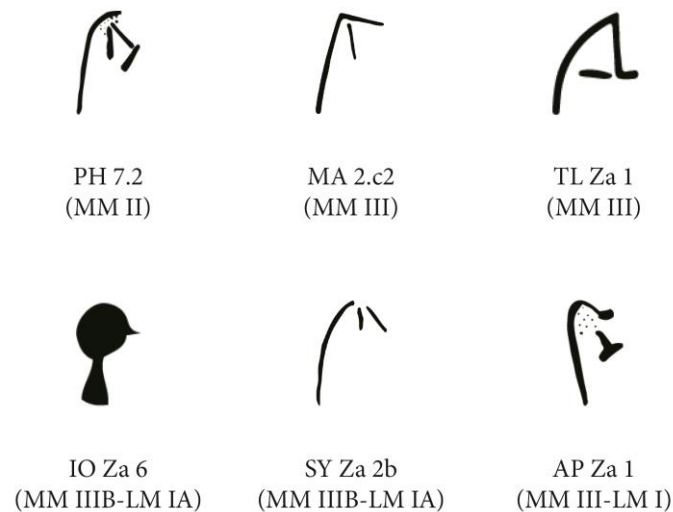


Fig. 6. Attestations of Linear A sign AB 10/u that compare well with CH 095 (adapted from *GORILA* 5, xxx and Karetsou, Godart, Olivier 1985).

Caution notwithstanding, this revisitation encourages us to modify our view of the ‘Archanes formula’ and its legacy. Because, if we were correct in our analysis, it would be striking that two out of three signs in the second group of the ‘Archanes formula’ do not appear to correspond with the signs of the Linear A sequence *a-sa-sa-ra-me*, as they should if, and as stated repeatedly in past literature, the two were to be associated as a resounding match. Again, we should be left with little






to support a close relationship with Linear A. This in turn would compel us to rephrase the question at the opening of this article: to what writing system does the ‘Archanes formula’ belong?

## RECONSTRUCTION: THE ‘ARCHANES FORMULA’ IN THE CRETAN HIEROGLYPHIC *MILIEU*

If the association with Linear A is tenuous, we need to turn to the possible evidence tying Archanes to the Cretan Hieroglyphic script. A crucial point of departure is the idea that sign CH 095 □ is the only sign in the ‘Archanes formula’ that is not attested elsewhere in the Cretan Hieroglyphic inscriptions (Karnava 2000, 197; Decorte 2018b, 347). A possible identification has in fact been suggested (Brice 1997, 95; Jasink 2009, 107), with a variant of a ‘seated bird’ sign attested on two Cretan Hieroglyphic inscriptions, namely #141 and #314. This very sign and its chance discovery among the signs of the script is one minute detail, upon which hinges the argument that the ‘Archanes formula’ is a self-standing writing tradition.

At the outset, we may question the validity of a method that relies on the absence or presence of specific signs to claim affiliation. Can a sign limited to a rare, if repeated attestation be singled out and used as proof of difference? The extant corpus of Cretan Hieroglyphic comprises only about 400 inscriptions, most of which are very brief, and replete with unique attestations (hapax) and rare signs (Olivier and Godart 1996, 386-431). Thus it can be treacherous to pose that rare signs like CH 095 only appear exceptional or different due to accidents of archaeological preservation. Yet, it is no less dangerous to argue that by virtue of one single sign *looking* different we must forcibly extrapolate the whole thing and ascribe it to a different script. We should, at least as a tentative exercise, probe into the possibility that sign CH 095 may have been embedded in the Cretan

Hieroglyphic system of signs instead of dismissing it as absent. If we look at how the sign has been classified in the scholarship, we may find instructive indications.

When Evans published *Scripta Minoa I* (1909), he had access to only two of the seals today considered as examples of the ‘Archanes formula’ (Jasink 2009, 107): P.41 = #205 = *CMS* VII 35 and P.49 = #203 = *CMS* VI 13. These bear two instances of sign CH 095, which at that time had been identified as ‘a bird seated’ (Evans’ sign no. 80 ) in inscription #205, but as a ‘hand in profile’  (Evans’ sign no. 10) in inscription #203 (Figs. 3–4). Olivier and Godart (1996, 16, 421) normalised sign CH 095 as , based on the hand-like instance on #203.b, even though this differs significantly in shape from most of its other attestations (Jasink 2009, 2017). However, they did not classify the sign as a ‘part of the human body’, but rather as ‘linear’, hinting at the difficulties in interpreting its iconicity.

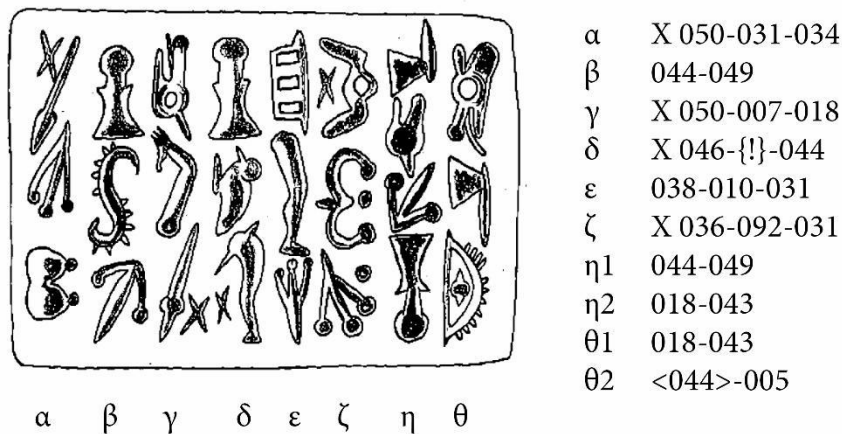





Fig. 7. Cretan Hieroglyphic inscription #314 and its transcription after Olivier and Godart (1996, 290-291).

Taking a different perspective, Brice (*apud* Brice and Henle 1965; 1997) and Jasink (2009, 50, 107) recovered Evans’ interpretation of the instance in #205 () as a ‘seated’ or ‘crouched bird’. In doing so, they proposed to identify two additional instances of sign CH 095, one on sealstone #314, and

another, much more doubtful, on sealstone #141. We shall focus on the clearer example from inscription #314, the well-known eight-sided prism from Neapolis (Fig. 7). The fourth column of the prism,  $\delta$ , contains three signs (): the middle one, considered merely a decorative symbol by Olivier and Godart, is the one that Brice and Jasink reinterpreted.

Another bird, described by Evans (1909, 210, no. 82) as “duck sign”, appears on a sealing from Palaikastro (*CMS* II.6 246) alongside two other motifs or signs, a one-handle spouted jug and a possible sea animal (Table 4). Jasink (2009, 50) suggested that this was yet another variant of sign CH 095 alongside . Other iconic birds may have been used as signs of writing, and we should mention also the full-body creatures on inscriptions #229. $\alpha$  and #294. $\gamma$ 1. All these instances as shown in Table 4.

These additions to occurrences of sign CH 095 bring to the fore the long-debated problem, already brushed on, namely what constitutes a proper sign as opposed to a mere decorative symbol. This is more apparent on seals, on which the iconic, figurative nature of the signs emerges more readily (Olivier 1989: 43; Olivier and Godart 1996: 12; Jasink 2009; Ferrara 2015; Civitillo 2016: 29-55; Decorte 2017). Indeed, on the Neapolis prism (Fig. 7), all graphic elements are executed in a very homogeneous manner, even if sizes and orientations vary to an extent. All are arranged in a linear configuration and separated from one another clearly. This applies also to the ‘crouched bird’ in column  $\delta$  and the notched spiral  $\S$  in column  $\beta$ .

Thus, it is plausible that all these are signs meant to be ‘read’ as sequences, even though the iconic, figurative character is largely and intentionally preserved. This can be seen also on the two birds on #229. $\alpha$  and #294. $\gamma$ : they blend in the layout (Table 4) and, as such, should be treated as proper signs like the other elements. But every general ‘rule’ has an outlier, and this seems to be seal impression

*CMS* II.6 246. On it, it is less clear if proper writing was intended, as suggested by Brice (*apud* Brice and Henle 1965, 64), or merely decorative elements in no particular arrangement.

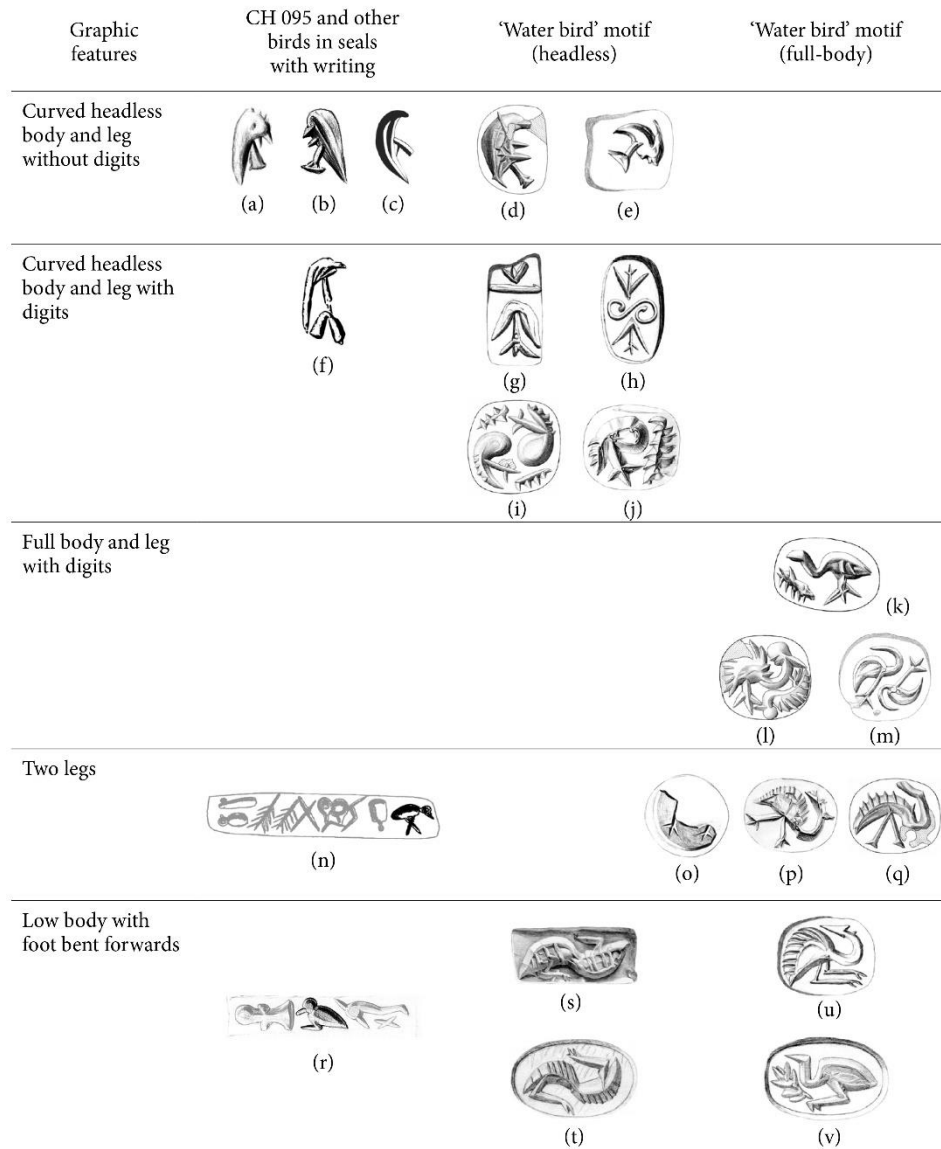




Fig. 8. Iconographic variation of the 'water bird' motif in Pre- and Protopalatial Minoan seal imagery and comparable variants of CH 095 and bird 'motifs' on seal inscriptions: (a) #202 = *CMS* II.1 394b (dated to MM I); (b) #205 = *CMS* VII 35a (MM II); (c) #313 (MM I); (d) *CMS* III 212a (MM II); (e) *CMS* XII 22b (MM II); (f) #252a = *CMS* II.1 393c (MM I); (g) *CMS* XII 67b (MM II); (h) *CMS* II.2 121 (MM IIB); (i) *CMS* III 152a (MM II); (j) *CMS* VI 69b (MM II); (k) *CMS* III 200c (MM II); (l) *CMS* VS1A 326a (MM II); (m) *CMS* XIII 79c (MM II); (n) #294.γ1 (data uncertain); (o) *CMS* II.1 184 (EM II–MM IA); (p) *CMS* VI 63c (MM II); *CMS* III 164b (MM II); (r) #314.δ (MM II); (s) *CMS* IX 17d (MM II); (t) *CMS* II.2 104a (MM IIB); (u) *CMS* XII 62c (MM II); (v) *CMS* II.2 184a (MM IIB) (adapted from *CMS*,

Olivier and Godart 1996, and Sbonias 2010, Pl. 61, no. S35. While drawings inevitably entail an interpretative element, here they were preferred to the available photographs of the actual objects because on the latter the contours are not always easy to make out.







Yet, one thing is to identify full-bodied birds on seals #229.α, #294.γ1 and #314 as proper signs of writing, quite another is to demonstrate that they can be actual variants of sign CH 095 . Even in its most iconic look, complete with features suggestive of a tail, a leg and feathers, sign CH 095 shows no traits that are remotely comparable to a bird's head (Fig. 4). Indeed, it is the iconicity of the bird itself, as a whole, with or without a head component, that should point us in the right direction.

Iconography and script on Crete run in similar trajectories, and the notion that the Cretan Hieroglyphic script was tied to icons and decorations on seals, in its early phases in Early Minoan III to Middle Minoan IB, encounters a lot of favour (Sbonias 2010, 218; Flouda 2013, 148-155; Ferrara 2015, 31–32, 2017, 15, 2018; Decorte 2017, 2018a, 40–2). The connection between writing and art is tantalising: various signs can be correlated with motifs on Minoan glyptic, even though the comparison stands better with seals mostly dated to the MM II period. In a similar way, we can examine several variants of sign CH 095, along with the signs on inscriptions #229.α, #294.γ1 and #314.

Shared graphic features show that CH 095 can be compared with both headless and full-body versions of the *Wasservogel* or 'water bird' motif found in Minoan seal imagery from the Protopalatial phase (Fig. 8). Water birds on seals (with and without head) were depicted with similar features and in analogous arrangements: with extended or bent feet, marked or unmarked toes, optional representation of feathers or wings, and doubling in symmetric positions sometimes with ornamental dividers. In their most schematic version, with a curved headless body with one leg


and denticulations that evoke feathers, these motifs are identical to some instances of sign CH 095 as we see it attested in the ‘Archanes formula’ (Fig. 8a-j). In more iconic variants, with their long feet bent forwards (a typical gesture for many species of water birds) and lowered body, they are comparable with the sign we see on seal #314 () (Fig. 8r-v).


Thus, there is reason to believe that the Cretan Hieroglyphic script possessed a bird sign that occurred in its headed and headless version, and that the two had counterparts in the series of motifs used on Protopalatial seals. This may be the sign CH 095 we are looking for. *Prima facie*, it may be odd to omit a salient component from an iconic sign, without this implying a change in meaning. Humans tend to focus on the head as a repository of identity and, not least, this principle played a crucial role in the invention of image-based writing in Mesoamerica (Houston 2004, 287). Yet, such emphasis on the head may apply more to depictions of humans than animals or, at least, may lose importance as a script develops. In fact, Cretan Hieroglyphic would not be unique in schematising icons by depicting them headless, alongside a headed variant used, too, at later stages. A parallel can be seen in the development of Egyptian hieroglyphs G5 (a falcon), G7 (a falcon on a standard) and G36 (a swallow or some other member of the *Hirundinidae*) into their cursive hieratic versions:

 > ;  > ;  >  (Möller 1927; Gardiner 1957, 467–8, 471). As such, sign CH 095 appears to be fully integrated in the trajectory of development of Cretan Hieroglyphic. In addition, the identification of bird icons in inscriptions #229.α, #294.γ1 and #314 as possible variants of sign CH 095 fit the pattern well.

So far, we have seen that sign CH 095, presumed absent from Cretan Hieroglyphic beyond the ‘Archanes formula’, is well at home with Protopalatial seal motifs. And this development converges with all the other signs of the formula, whose Cretan Hieroglyphic allegiance is not put into question. Thus sign CH 095, far from aberrant or unique in its development, moved through paths similar to the other signs of the Cretan Hieroglyphic repertoire. The other signs find matches that

are even more readily recognisable and prove that the formula is very much embedded not only in CH as a script but also within the existing Cretan iconography and its material culture.

The double axe sign is sure to be identified with sign CH 042 . It is on the Archanes material itself that we find the very earliest examples of this sign, namely on six seals (#202, #203, #251, #252, #313, #315). This is significant, because the symbol is part of an important tradition. Indeed, the double axe appears also on seal iconography of the later Protopalatial phase, most often as a single attestation, be it a proper sign or just a decoration (Yule 1981, 168, pl. 29).<sup>5</sup> This connection with iconography is particularly strong and worth noting, as it ties with the problem we have already highlighted, namely the way we interpret isolated attestations of icons (perhaps to be ‘read’ as potential logograms?) such as these.

Equally accepted is the match between the sign found once in each of the two groups of the ‘formula’ and sign CH 019  of the Cretan Hieroglyphic script. Moreover, we can also reconstruct ties to the seal iconography. Sign CH 019 has been interpreted as a cuttlefish since Evans (1909, 205). Yet this is unlikely, as shown on Protopalatial seals with cephalopods (Fig. 9a-c). Cuttlefish have eight short arms and two long tentacles, and even though these details are schematic on seal imagery, they are not as minimal as on sign CH 019. Evans (1909, 204) himself gives us a more plausible interpretation. He classed a sign, that is now accepted as attestation of CH 019, on seal #134 (Fig. 9i), as “tunny fish” (of the *Scombridae* family) rather than cuttlefish. This description is, in effect, fitting for CH 019 as a whole, tying well with Protopalatial iconographic depictions of fish (Fig. 9m-r): the two protruding traits would represent the caudal fin and the rest a schematic depiction of the body of the animal. The fish tail is generally oriented upwards in CH 019 (though Cretan Hieroglyphic signs could be rotated), whereas the position of fish as decorations on seals is usually horizontal or ambiguous. However, the vertical ‘hanging fish’ perspective can be observed

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<sup>5</sup> It occurs on sealings from the MM IIB deposit of Room 25 at the Palace of Phaistos (CMS II.5 231-233, 235),# in the ‘Hieroglyphic Deposit’ at Knossos (CMS II.8 55), and on two seals found at the MM IIB Workshops γ and δ of Malia’s Quartier Mu (CMS II.2 129 and 155c).

on *CMS* II.2 174a and III 156a (Fig. 9o-p). Finally, #313.γ, a seal whose faces α and β contain the ‘Archanes formula’, shows a person and probably another instance of sign CH 019 (see Fig. 9l; Sbonias 2010, pl. 61, no. S35a). This combination is remarkably similar to the depiction of a person grabbing a fish on seal *CMS* II.2 174a.

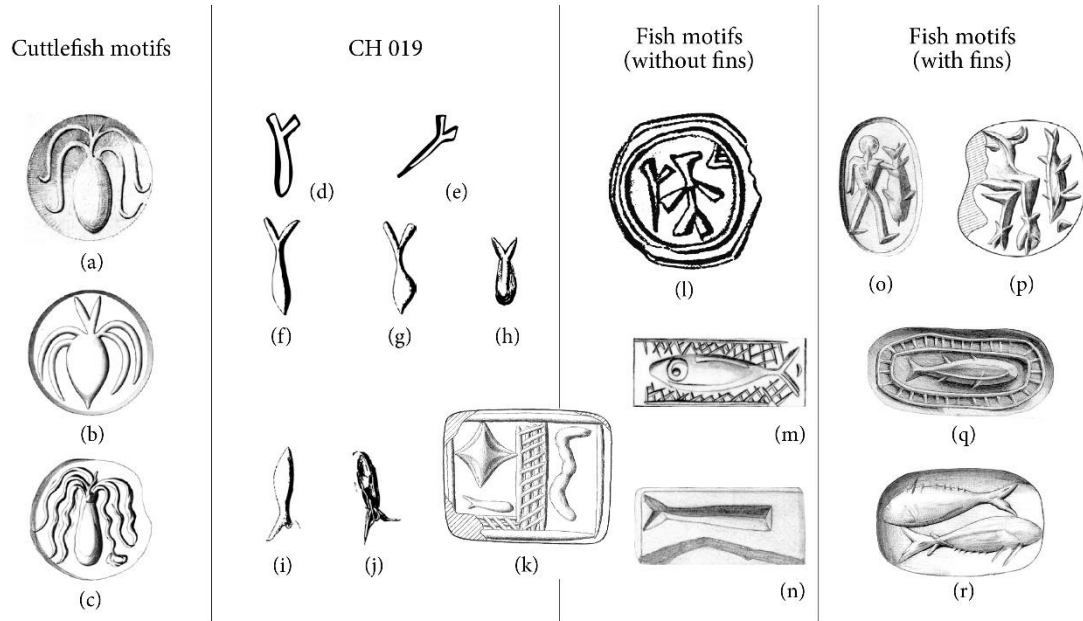


Fig. 9. Comparison between sign CH 019 (d-j) and representations of cuttlefish (a-c) and fish (k-r) on Protopalatial seal iconography: (a) *CMS* II.5 302 (MM II); (b) *CMS* II.5 312 (MM II); (c) *CMS* VII 219 (MM II); (d-e) #313.β-α (MM I); (f) #135 = *CMS* VS1B 326 (MM II-III?); (g) #136 = *CMS* VS1B 325 (MM II-III?); (h) #205 = *CMS* VII 35a (MM II); (i) #134 = *CMS* II.8 56 (MM II-III?); (j) #251.β = *CMS* VI 14c (MM IA); (k) *CMS* VS3 343 (MM II); (l) #313.γ (MM I); (m) #290.α = *CMS* I 73a (MM II); (n) *CMS* II.2 185 (MM IIB); (o) *CMS* II.2 174a (MM IIB); (p) *CMS* III 156a (MM II); (q) *CMS* II.2 185 (MM IIB); (r) *CMS* II.2 261a (MM II) (drawings after *CMS* and Sbonias 2010, pl. 61, S35).



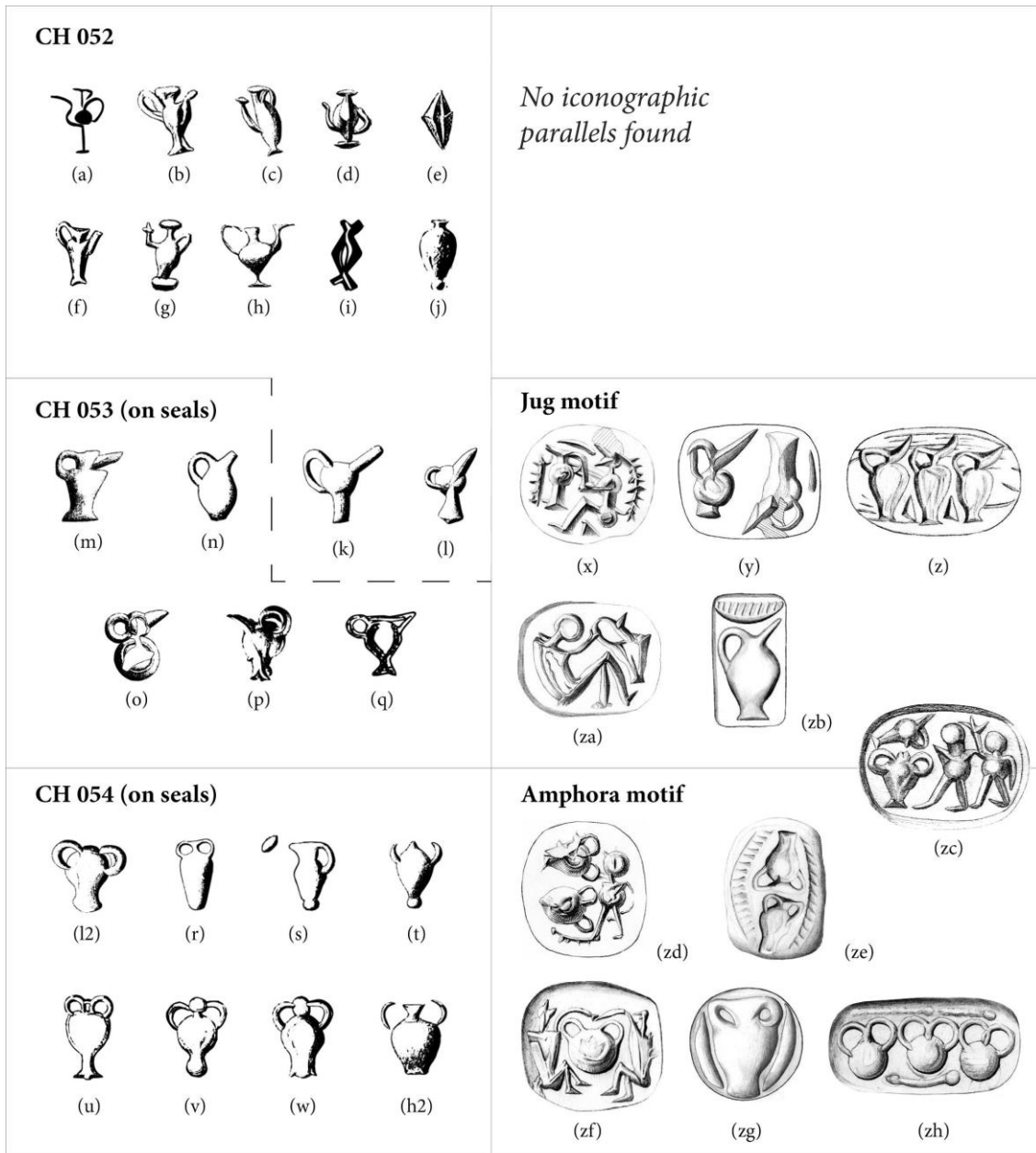








Fig. 10. Comparison between Cretan Hieroglyphic signs CH 052 (a-j), CH 053 (k-q) and CH 054 (12, r-w), and Protopalatial glyptic representations of spouted jugs (x-z, za-zc) and two-handled amphoras (zd-zh): (a) #031.a (MM II); (b) #202.β = *CMS* II.1 394b (MM I); (c) #203.β = *CMS* VI 13b; (d) #205.α2 = *CMS* VII 35a (MM II); (e) #251.α = *CMS* VI 14b (MM I); (f) #252.α = *CMS* II.1 393c (MM I); (g) #292.γ = *CMS* II.2 217.d (MM II); (h, h2) #306.α = *CMS* II 234b (MM II?); (i) #313.β (MM I); (j) #315.H = *CMS* II.1 391h (MM I); (k) #125 = *CMS* II.8 84 (LM IIIA2); (l, 12) #130 = *CMS* II.6 181 (MM II); (m) #128 = *CMS* II.6 182 (MM II); (n) #151 = *CMS* II.5 239 (MM II); (o) #187 = *CMS* II.1 27 (MM II); (p) #296.β = *CMS* VI 104c (MM II); (q) #309.β (MM II); (r) #152 = *CMS* II.7 213 (MM II); (s) #153 = *CMS* II.7 214; (t) #155 = *CMS* II.6 143 (MM II); (u) #273.α = *CMS* X 312a (MM II); (v) #293.γ = *CMS* II 256c (MM II); (w) #303.β = *CMS* II 109c (MM II); (x) *CMS* VI 29a (MM II); (y) *CMS* III 165c (MM II); (z) *CMS* XI 265a (MM II);

II); (za) *CMS* XII 28a (MM II); (zb) *CMS* II.5 240 (MM IIB); (zc) *CMS* II.2 159a (MM II); (zd) *CMS* VI 33a (MM II); (ze) *CMS* II.2 2b (MM II); (zf) *CMS* II.2 241 (MM I-II); (zg) *CMS* II.6 166 (MM I-II); (zh) *CMS* II.2 79b (MM II) (drawings adapted from *CMS*, Olivier and Godart 1996, and Sbonias 2010, Pl. 61, S35).

The development of sign CH 052  is more difficult to place. First, the sign is mainly found in the ‘Archanes formula’ only. In total, Olivier and Godart (1996, 409) count twelve possible attestations (Fig. 10). These include very schematic versions, down to a lozenge, recognisable only because of their context in the formula. Most often, instead, the sign takes the clear depiction of a vessel, diagnostic of a foot, a handle, a neck, and a spout stemming from the body at mid height. Two instances (#125, #130) are significant, because they depict a neck-less vessel, with its spout at the height of the mouth. This version corresponds very closely to one variant of sign CH 053 () , as attested on #296.β and #309.β (Fig. 10). Thus, only ten specimens of sign CH 052 are identical, eight of which occurring in the ‘Archanes formula’ (Fig. 3). Second, in the iconography on seals, vessel motifs converge into two generic types, a jug or pitcher and a two-handled jar or amphora, roughly corresponding to CH 053 () and CH 054 () . Conversely, outside the ‘Archanes’ group and to the best of our knowledge, we never see a jug with a spout at mid height depicted on seals.

This lack of iconographic counterparts indicates that the trajectory of sign CH 052 differed from the other signs in the ‘Archanes formula’, but this does not necessarily imply that it is at odds with the Cretan Hieroglyphic repertoire. In fact, evidence shows that it was equally embedded in it. On the one hand, CH 052 is attested in the Cretan Hieroglyphic documents inscribed on clay. On the other, certain Cretan Hieroglyphic signs lack corresponding seal icons, like CH 052, and may have been designed *ad hoc* as representations inspired directly by their physical referents. This tie to material culture is possibly the case for sign CH 044 , strikingly similar to a seal type called *Petschaft*, or sign CH 057 , probably recognisable as a plough (Ferrara, Montecchi, Valério, forthcoming).

Along these lines, we might also identify a very close material counterpart to sign CH 052. Its referent can be traced to a footed teapot, a shape known on Protopalatial Crete only in few clay examples, originated perhaps from a metal prototype. Similar silver spouted vessels from tombs at Byblos, dated to ca. 1830-1770 BCE (Montet 1929: pl. CXI, CXII; Bouillon 2015, 6-7), show us a parallel (Fig. 11). We cannot discount that the Cretans may have encountered these vessels and drawn inspiration from them for the shape of sign CH 052, without it ever appearing as a seal motif. This exercise in reconstructing the source of the so-called ‘Archanes formula’ suggests that it is only under a close and broad examination calling in paleographical criteria and correlations with icons and material culture that we can see proper affiliations emerge. For three of the four signs in the formula, we can retrace close counterparts on seal imagery from the MM II phase. This is a phenomenon that is, in general as well as specific terms, more associated with the Cretan Hieroglyphic script than Linear A and its tradition as a whole.




Fig. 11. (a) Silver spouted vessel from Middle Bronze Age Byblos (after Montet 1929, pl. CXI); (b) MM IIA clay footed teapot from Phaistos (after Levi and Carinci 1988, pl. 44.e). Not to scale.

## IMPLICATIONS

We have stated, from the outset, that beginnings are difficult to place, in time, in place, but especially in essence. The earliest writing on European soil, from the Archanes Phourni cemetery on the island of Crete, is no less vague, especially in its essence, as a sample of writing belonging to a specific, yet to this day debated, script. The urgency to give beginnings specificity, complete with a proper name, and placed within a frame, is a tendency that can lead us into error. In the case of this writing, attributions may have been made in an effort to tie things together, to give them continuity and lifespan, despite the glaring differences, or the tenuous chains that bind scripts together. This is why we have thought it worthwhile to revisit old claims and long-standing views, positions that may have been accepted more at face value and less on the strength of close scrutiny.

Our close scrutiny has led us to the following claims: in its palaeography, the ‘Archanes formula’, rather than a form of Linear A or a self-contained Archanes ‘script’, is fittingly embedded in the Cretan Hieroglyphic. In its iconicity, the ‘Archanes formula’ is more at home in Cretan seal iconography than in any other tradition. In its archaeology and materiality, the ‘Archanes formula’ finds close referents present in physical objects that may have provided inspiration, connection and grounding for the repertoire of its signs. In brief, in all its manifestations, at the very earliest phases or at a later stage, the ‘Archanes formula’ fits into a Cretan Hieroglyphic milieu much better than into an imperfect reading of a Linear A religious sequence.

And the very signs which, it is claimed, find no perfect match with Linear A (signs CH 095 and 052) are exactly where Hieroglyphic creativity abounds instead. In them we see a wide range of palaeographical variation, including many different ways of depicting the same object. Their iconicity, with close material referents, matches that of seal motifs especially from the Middle Minoan II phase, when, incidentally, the Cretan Hieroglyphic script begins to bloom. If seen from

this perspective, we should not be led astray by the schematic look of some of the Archanes signs (for instance on seals #202, #251 and #315) to stress and justify a close connection to the ‘linearity’ of Linear A. As it is apparent, sign CH 052 is closest to Linear A sign AB 24/*ne* when the two are most iconic with clear depictions of vessels, whereas the simplified CH 052 on #251 is a terse lozenge (Fig. 3), hence very different from the simpler versions of AB 24/*ne* (). The greater schematism of the Archanes signs may be, in fact, due to the seals’ early chronology, marking a linear, coarse phase predating their ‘iconic’ full boom during MM II, when script and a variety of icons thrive in parallel.

And more importantly, if we are right in our interpretation of sign CH 095, the implications do not end here. We would be enticed to reconsider, too, the way in which we draw regional lines in the use of Linear A and Cretan Hieroglyphic scripts. Some of the instances of the ‘headless water bird’ motif that supplied parallels for sign CH 095 are linked to Malia and eastern Crete specifically (Fig. 8g-j). This connection has ramifications for our understanding of the origins of writing on Crete. As it happens, it blurs the great divide drawn between Malia and eastern Crete, purported home of Cretan Hieroglyphic, and Knossos and central Crete, home of the ‘Archanes formula’, suggested as the earliest form of Linear A (Anastasiadou 2016). If all of this is correct, Malia and Archanes would be tied together by Cretan Hieroglyphic, in a view less sharply divided with a ruler.

Ultimately, if we accept all of the above, we see no plausible reason to divorce the ‘Archanes formula’ from the Cretan Hieroglyphic script and its milieu. This implies that no other script tradition on the island should be forced as an alternative. If, then, the ties that bind Archanes with Linear A are to be loosened, and a close phonetic reading through the latter made unlikely, the opportunity to start from scratch becomes inviting, to finally call the earliest signs in Europe what they actually are: Cretan Hieroglyphic.

## REFERENCES

- CMS II.1* = Platon, N. 1969. *Corpus der minoischen und mykenischen Siegel II,1. Iraklion, Archäologisches Museum. Teil 1. Die Siegel der Vorpalastzeit* (Berlin).
- CMS II.2* = Platon, N., Pini, I. and Salies, G. 1977 *Corpus der minoischen und mykenischen Siegel II,2. Iraklion, Archäologisches Museum. Teil 2. Die Siegel der Altpalastzeit* (Berlin).
- CMS II.5* = I. Pini. 1970. *Corpus der minoischen und mykenischen Siegel II,5. Iraklion, Archäologisches Museum. Teil 5. Die Siegelabdrücke von Phästos* (Berlin).
- CMS II.6* = Müller, W. and Pini, I. 1999. *Corpus der minoischen und mykenischen Siegel II,6. Iraklion, Archäologisches Museum. Teil 6. Die Siegelabdrücke von Aj. Triada und anderen zentral- und ostkretischen Fundorten, unter Einbeziehung von Funden aus anderen Museen* (Berlin).
- CMS II.8* = Gill, M.A.V., Müller, W. and Pini, I. (2002), *Corpus der minoischen und mykenischen Siegel II,8. Iraklion, Archäologisches Museum. Teil 8, 1. Die Siegelabdrücke von Knossos, unter Einbeziehung von Funden aus anderen Museen* (Berlin).
- CMS III* = Müller, W. and Pini, I. 2007. *Corpus der minoischen und mykenischen Siegel III. Iraklion, Archäologisches Museum. Teil 1. Sammlung Giamalakis* (Mainz).
- CMS VS1A* = Pini, I. 1992. *Corpus der minoischen und mykenischen Siegel V. Kleinere Griechische Sammlungen. Supplementum 1 A. Ägina – Korinth* (Berlin).
- CMS VS1B* = Pini, I. 1992. *Corpus der minoischen und mykenischen Siegel V. Kleinere Griechische Sammlungen. Supplementum 1 B. Lamia – Zakynthos und weitere Länder des Ostmittelmeerraums* (Berlin).

- CMS VS3 = Pini, I. 2004. *Corpus der minoischen und mykenischen Siegel V. Kleinere Griechische Sammlungen. Supplementum 3. Neufunde aus Griechenland und der Westlichen Türkei* (Mainz).
- CMS VI = Hughes-Brock, H. and Boardman, J. 2009. *Corpus der minoischen und mykenischen Siegel VI. Oxford. The Ashmolean Museum* (Mainz).
- CMS VII = Kenna, V.E.G. 1967. *Corpus der minoischen und mykenischen Siegel VII. Die Englischen Museen II. London, British Museum; Cambridge, Fitzwilliam Museum; Manchester, University Museum; Liverpool, City Museum; Birmingham, City Museum* (Berlin).
- CMS IX = Van Effenterre, H. and van Effenterre, M. 1972. *Corpus der minoischen und mykenischen Siegel IX. Cabinet des Médailles de la Bibliothèque Nationale Paris* (Berlin).
- CMS XI = Pini, I. 1988. *Corpus der minoischen und mykenischen Siegel XI. Kleinere Europäische Sammlungen* (Berlin).
- CMS XII = Kenna, V.E.G. 1972. *Corpus der minoischen und mykenischen Siegel XII. Nordamerika I. New York, The Metropolitan Museum of Art* (Berlin).
- CMS XIII = Kenna, V.E.G. 1974. *Corpus der minoischen und mykenischen Siegel XIII. Nordamerika II. Kleinere Sammlungen* (Berlin).
- Alexiou, St. and Brice, W.C. 1976. 'A silver pin from Platanos with an inscription in Linear A: Her. Mus. 498', *Kadmos* 15, 18–27.
- Anastasiadou, M. 2016. 'Drawing the Line: Seals, Script, and Regionalism in Protopalatial Crete', *AJA* 120.2, 159–93.
- Boltz, W.G. 1994. *The origin and early development of the Chinese writing system* (New Haven).
- Boltz, W.G. 2000. *Monosyllabicity and the origin of the Chinese script* (Berlin).
- Bossert, H.Th. 1931. 'Die Beschwörung einer Krankheit in der Sprache von Kreta', *Orientalische Literaturzeitung* 34, 303–30.

- Bouillon, H. 2015. 'On the Anatolian Origins of Some Late Bronze Egyptian Vessel Forms', *Anatolia Antiqua XXIII*, 1–10.
- Brice, W.C. 1983. 'The libation vessels' inscribed in Linear A', in Heubeck, A., and Neumann, G. (eds.), *Res Mycenaeae. Akten des 7. Internationalen Mykenologischen colloquiums in Nürnberg vom 6-10 April 1981* (Göttingen), 55–62.
- Brice, W.C. 1997. 'Notes on the Cretan Hieroglyphic Script', *Kadmos* 36, 93–6.
- Brice, W.C., and Henle, J.E. 1965. 'Studies in the structure of some ancient scripts IV and V', *Bulletin of the John Rylands Library* 48.1, 56–80.
- Civitillo, M. 2016. *La scrittura geroglifica minoica sui sigilli: il messaggio della glittica protopalaziale* (Pisa – Roma).
- Davis, B. 2014. *Minoan Stone Vessels with Linear A Inscriptions* (Aegaeum 36; Liège).
- Decorte, R.P.-J.E. 2017. 'Cretan hieroglyphic and the nature of script', in Steele, P. M. (ed.) *Understanding Relations between Scripts. The Aegean Writing Systems* (Oxford), 33–56.
- Decorte, R.P.-J.E. 2018a. 'The origins of Bronze Age Aegean writing: Linear A, Cretan Hieroglyphic and a new proposed pathway of script formation', in Ferrara, S. and Valério, M. (eds.), *Paths into Script Formation in the Ancient Mediterranean* (SMEA NS, Suppl. 1; Rome), 13–49.
- Decorte, R.P.-J.E. 2018b. 'The first 'European' writing: Redefining the Archanes Script'. *OJA* 37, 341–72.
- Del Freo, M. 2008. 'Rapport 2001-2005 sur les textes en écriture hiéroglyphique crétoise, en linéaire A et en linéaire B', in Sacconi, A., Del Freo, M., Godart, L., and Negri, M. (eds.), *Colloquium Romanum. Atti del XI colloquio internazionale di micenologia, Roma 20-25 febbraio 2006* (Pisa – Roma), vol. 1, 199–222.
- Duhoux, Y. 1989. 'Le linéaire A: problèmes de déchiffrement', in Duhoux, Y., Palaima Th. G., and Bennet J. (eds.), *Problems in Decipherment* (Louvain-la-Neuve), 59–119.



- Evans, A.J. 1909. *Scripta Minoa: The Written Documents of Minoan Crete with Special Reference to the Archives of Knossos. Vol. I. The Hieroglyphic and Primitive Linear Classes* (Oxford).
- Ferrara, S. 2015. 'The beginnings of writing on Crete: Theory and context', *BSA* 210, 27–49.
- Ferrara, S. 2017. 'Another Beginning's End: Secondary Script Formation in the Aegean and the Eastern Mediterranean', in Steele, P.M. (ed.), *Understanding Relations Between Scripts. The Aegean Writing Systems* (Oxford), 7–32.
- Ferrara, S. 2018. 'De la figure à l'écriture. Tradition, iconographique et naissance du Hiéroglyphique en Crète minoenne', *Terrain* 70, 82–103.
- Ferrara, S., Montecchi, B., and Valério, M. forthcoming. 'The making of a script: Cretan Hieroglyphic and the quest for its origins', *BASOR* 384 (November 2020).
- Finkelberg, M. 1990-1991. 'Minoan Inscriptions on Libations Vessels', *Minos* 25-26, 43–85.
- Flouda, G. 2013. 'Materiality of Minoan Writing: Modes of Display and Perception', in Piquette, K.E., and Whitehouse, R.D. (eds.), *Writing as Material Practice: Substance, Surface, and Medium* (London), 143–147.
- Gardiner, A. 1957. *Egyptian Grammar. Being an Introduction to the Study of Hieroglyphs*. 3rd Edition (London).
- Godart, L. 1999. 'L'écriture d'Archanès: hiéroglyphique ou linéaire A?', in Betancourt, Ph. P., Karageorghis, V., Laffineur, R. and Niemeier W. D. (ed.), *Meletemata. Studies in Aegean Archaeology Presented to Malcolm H. Wiener* (Aegeum 20; Liège), vol. 1, 299–302.
- Grumach, E. 1963-64. 'Studies in the structure of some ancient scripts III: The structure of the Cretan Hieroglyphic script', *Bulletin of the John Rylands Library Manchester* 46, 346–384.
- Grumach, E. 1968. 'The Minoan libation formula-again', *Kadmos* 7, 7–26.
- Grumach, E. and Sakellarakis, J. 1966, 'Die neuen Hieroglyphensiegel vom Phourni (Archanes) I', *Kadmos* 5, 109–114.
- Hooker, J. 1992. 'Early Balkan 'scripts' and the ancestry of Linear A', *Kadmos* 31, 97–112.

- Houston, S.D. 2004. Writing in early Mesoamerica, in Houston, S. D (ed.), *The First Writing: Script Invention as History and Process* (Cambridge), 274–309.
- Jasink, A.M. 2009. *Cretan Hieroglyphic Seals. A New Classification of Symbols and Ornamental/Filling Motifs* (Pisa – Rome).
- Karetsou, A., Godart, L., Olivier, J.-P. 1985. Inscriptions en linéaire A du sanctuaire de sommet minoen du Mont Iouktas, *Kadmos* 24, 89–147.
- Karnava, A. 1999. ‘The Cretan Hieroglyphic script of the Second Millennium BC: description analysis, function and decipherment perspectives’ (unpublished PhD thesis, Université Libre de Bruxelles).
- Karnava, A. 2016. ‘On sacred vocabulary and religious dedications: the Minoan “libation formula”’, in Alram-Stern, E., Blakolmer, F., Deger-Jalkotzy, S., Laffineur, R. and Weilhartner, J. (eds.), *METAPHYSIS: Ritual, Myth and Symbolism in the Aegean Bronze Age. 15th International Aegean Conference, University of Vienna, 22-25 April 2014* (Aegaeum 39; Leuven), 345–55, pl. CVI-CVIII.
- Knappett, C., Del Freo, M., and Zurbach, J. 2017. ‘A Fragmentary Libation Table with Inscription in Linear A from Petsophas, Palaikastro (Pk Za 27)’, *SMEA NS* 3, 73–82.
- Levi, D. and Carinci F. 1988. *Festòs e la civiltà minoica II Fascicolo secondo* (Rome).
- Macdonald, C.F. and Knappett, C. 2007. *Knossos. Protopalatial Deposits in Early Magazine A and the South-West Houses* (BSA Suppl. 41; London).
- Möller, G. 1927. *Hieratische Paläographie. Die ägyptische Buchschrift in ihrer Entwicklung von der 5. Dynastie bis zur römischen Kaiserzeit*, vol. 1. 2nd rev. ed. (Leipzig).
- Montet, P. 1929. *Byblos et l’Egypte: quatre campagnes de fouilles à Gebeil, 1921-1922-1923-1924. Atlas* (Paris).
- Monti, O. 2005. ‘Considérations sur quelques termes des texts votifs linéaires A’, *Kadmos* 44, 19–22.

- Olivier, J.-P. 1996. 'Les écritures crétoises: sept points à considérer', in De Miro, E., Sacconi, A., and Godart, L. (eds.), *Atti e Memorie del Secondo Congresso Internazionale di Micenologia. Roma-Napoli, 14-20 ottobre 1991* (Rome), 101–13.
- Olivier, J.-P. and Godart, L. 1996. *Corpus Hieroglyphicarum Inscriptionum Cretae* (Études crétoises 31: Paris).
- Olivier, J.-P., Rethemiotakis, G., and Dimopoulou, N. 1993. 'Une statuette en argile MR IIIA de Poros/Irakliou avec inscription en linéaire A', *BCH* 117.2, 501–21.
- Owens, G.A. 1996, 'Evidence for the Minoan Language (1): the Minoan Libation formula', *Cretan Studies* 5, 163–206.
- Perna, M. 2014. 'The birth of administration and writing in Minoan Crete: some thoughts on Hieroglyphic and Linear A', in Nakassis, D., Gulizio, J., and James, S.A. (eds.), *KE-RA-ME-JA: Studies Presented to Cynthia W. Shelmerdine* (Philadelphia), 251–9.
- Pope, M. 1961. 'The Minoan Goddess Asasara - an obituary', *BICS* 8, 29–31.
- Powell, B.B. 2009. *Writing: Theory and History of the Technology of Civilization* (Oxford).
- Reich, J.J. 1968. 'The rôle of the naturalistic signs in the Minoan hieroglyphic script', in Gallavotti, G. (ed.), *Atti e memorie del 1° congresso internazionale di micenologia. Roma 27 settembre – 3 ottobre 1967* (Roma), vol. 1, 448–461.
- Sakellarakis, Y., and Sakellaraki, E. 1997. *Archanes, Minoan Crete in a New Light*. Vol. 1 (Athens).
- Sbonias, K. 1995. *Frükkretische Siegel: Ansätze für eine Interpretation der sozial-politischen Entwicklung auf Kreta während der Frühbronzezeit* (British Archaeological Reports 620; Oxford).
- Sbonias, K. 2010. 'Seals from the cemetery', in Vasilakis, S. and Branigan, K. (eds.), *Moni Odigitria: A Prepalatial Cemetery and its Environs in the Asterousia, Southern Crete* (Philadelphia), 201-309, tab. 100, fig. 81-84, pl. 54–70.
- Schoep, I. 1999. 'The origins of writing and administration', *OJA* 18.3, 265-76.

- Trigger, B. 2004. 'Writing systems. A case study in cultural evolution', in Houston, S. D (ed.), *The First Writing: Script Invention as History and Process* (Cambridge), 39–68.
- Tsipopoulou, M., and Hallager, E. 1996. 'Inscriptions with Hieroglyphs and Linear A from Petras, Siteia'. *Studi Micenei ed Egeo-Anatolici* 37, 7–46.
- Valério, M. and Ferrara, S. 2019. 'Rebus and Acrophony in Invented Writing', *Writing Systems Research* 11, 66-93.
- Weingarten, J. 1995. 'Sealing studies in the Middle Bronze Age, III: the Minoan hieroglyphic deposits at Mallia and Knossos', in Pini, I. and Poursat, J.-C. (eds.), *Sceaux minoens et mycéniens. IVe symposium international 10-12 septembre 1992, Clermont-Ferrand*, (CMS Beiheft 5; Berlin), 285–311.
- Younger, J.G. 1996-1997. 'The Cretan Hieroglyphic script: a review article', *Minos* 31, 379–400.
- Yule, P. 1980. *Early Cretan Seals. A Study of Chronology* (Mainz).

## FIGURE AND TABLE CAPTIONS

- Fig. 1. (a) Drawing of a part of inscription PL Zf 01 (after *GORILA* 4); (b) drawing of inscription POR Zg 1 (after Olivier, Rethemiotakis, and Dimopoulou 1993, 510, fig. 8). Not to scale.
- Fig. 2: Range of palaeographical variation of Linear A sign AB 13/*me* (after *GORILA* 5, xxx).
- Fig. 3. Palaeography of the signs (CH 042, 019, 095 and 052) that compose the 'Archanes Formula' (adapted from CMS and Sbonias 2010, Pl. 61, S35).
- Fig. 4. Attestations of CH 095 according to Olivier and Godart (1996, 421). The instances in #252.α and #315.H have been vertically flipped in order to be shown with the same orientation as the others.

Fig. 5. Range of palaeographical variation of Linear A sign AB 60/*ra* (after *GORILA* 5, xxxviii).

Fig. 6. Attestations of Linear A sign AB 10/*u* that compare well with CH 095 (adapted from *GORILA* 5, xxx and Karetsou, Godart, Olivier 1985).

Fig. 7. Cretan Hieroglyphic inscription #314 and its transcription after Olivier and Godart (1996, 290-291).

Fig. 8. Iconographic variation of the ‘water bird’ motif in Pre- and Protopalatial Minoan seal imagery and comparable variants of CH 095 and bird ‘motifs’ on seal inscriptions: (a) #202 = *CMS* II.1 394b (dated to MM I); (b) #205 = *CMS* VII 35a (MM II); (c) #313 (MM I); (d) *CMS* III 212a (MM II); (e) *CMS* XII 22b (MM II); (f) #252a = *CMS* II.1 393c (MM I); (g) *CMS* XII 67b (MM II); (h) *CMS* II.2 121 (MM IIB); (i) *CMS* III 152a (MM II); (j) *CMS* VI 69b (MM II); (k) *CMS* III 200c (MM II); (l) *CMS* VS1A 326a (MM II); (m) *CMS* XIII 79c (MM II); (n) #294.γ1 (data uncertain); (o) *CMS* II.1 184 (EM II-MM IA); (p) *CMS* VI 63c (MM II); *CMS* III 164b (MM II); (r) #314.δ (MM II); (s) *CMS* IX 17d (MM II); (t) *CMS* II.2 104a (MM IIB); (u) *CMS* XII 62c (MM II); (v) *CMS* II.2 184a (MM IIB) (adapted from *CMS*, Olivier and Godart 1996, and Sbonias 2010, Pl. 61, no. S35. While drawings inevitably entail an interpretative element, here they were preferred to the available photographs of the actual objects because on the latter the contours are not always easy to make out.

Fig. 9. Comparison between sign CH 019 (d-j) and representations of cuttlefish (a-c) and fish (k-r) on Protopalatial seal iconography: (a) *CMS* II.5 302 (MM II); (b) *CMS* II.5 312 (MM II); (c) *CMS* VII 219 (MM II); (d-e) #313.β-α (MM I); (f) #135 = *CMS* VS1B 326 (MM II-III?); (g) #136 = *CMS* VS1B 325 (MM II-III?); (h) #205 = *CMS* VII 35a (MM II); (i) #134 = *CMS* II.8 56 (MM II-III?); (j) #251.β = *CMS* VI 14c (MM IA); (k) *CMS* VS3 343 (MM II); (l) #313.γ (MM I); (m) #290.α = *CMS* I 73a (MM II); (n) *CMS* II.2 185 (MM IIB); (o) *CMS* II.2 174a (MM IIB); (p) *CMS* II.2 185 (MM IIB); (q) *CMS* II.2 185 (MM IIB); (r) *CMS* II.2 261a (MM II) (drawings after *CMS* and Sbonias 2010, pl. 61, S35).

Fig. 10. Comparison between Cretan Hieroglyphic signs CH 052 (a-j), CH 053 (k-q) and CH 054 (l2, r-w), and Protopalatial glyptic representations of spouted jugs (x-z, za-zc) and two-handled amphoras (zd-zh): (a) #031.a (MM II); (b) #202.β = *CMS* II.1 394b (MM I); (c) #203.β = *CMS* VI 13b; (d) #205.α2 = *CMS* VII 35a (MM II); (e) #251.α = *CMS* VI 14b (MM I); (f) #252.α = *CMS* II.1 393c (MM I); (g) #292.γ = *CMS* II.2 217.d (MM II); (h, h2) #306.α = *CMS* II 234b (MM II?); (i) #313.β (MM I); (j) #315.H = *CMS* II.1 391h (MM I); (k) #125 = *CMS* II.8 84 (LM IIIA2); (l, l2) #130 = *CMS* II.6 181 (MM II); (m) #128 = *CMS* II.6 182 (MM II); (n) #151 = *CMS* II.5 239 (MM II); (o) #187 = *CMS* II.1 27 (MM II); (p) #296.β = *CMS* VI 104c (MM II); (q) #309.β (MM II); (r) #152 = *CMS* II.7 213 (MM II); (s) #153 = *CMS* II.7 214; (t) #155 = *CMS* II.6 143 (MM II); (u) #273.α = *CMS* X 312a (MM II); (v) #293.γ = *CMS* II 256c (MM II); (w) #303.β = *CMS* II 109c (MM II); (x) *CMS* VI 29a (MM II); (y) *CMS* III 165c (MM II); (z) *CMS* XI 265a (MM II); (za) *CMS* XII 28a (MM II); (zb) *CMS* II.5 240 (MM IIB); (zc) *CMS* II.2 159a (MM II); (zd) *CMS* VI 33a (MM II); (ze) *CMS* II.2 2b (MM II); (zf) *CMS* II.2 241 (MM I-II); (zg) *CMS* II.6 166 (MM I-II); (zh) *CMS* II.2 79b (MM II) (drawings adapted from *CMS*, Olivier and Godart 1996, and Sbonias 2010, Pl. 61, S35).

Fig. 11. (a) Silver spouted vessel from Middle Bronze Age Byblos (after Montet 1929, pl. CXI); (b) MM IIA clay footed teapot from Phaistos (after Levi and Carinci 1988, pl. 44.e). Not to scale.

# TABLES

No.	Provenance	Medium	Chronology	Inscriptions and salient iconographic elements
#179	Knossos	Clay direct-object sealing	MM II	(1-2.) <b>042-019</b>   <b>019-095</b> [
#202	Archanes	Bone disc	MM I	$\alpha$ . <b>042-019</b> $\beta$ . <b>019-095-052</b>
#203	Knossos	Steatite discoid	MM I	$\alpha$ . <b>042-019</b> $\beta$ . <b>019-095-052</b>
#205	Crete	Agate cushion	MM II (III?)	$\alpha$ (1-2). (x) <b>042(x)-019</b>   <b>019-095-052(x)</b>
#251	Archanes	Steatite gable	MM I	$\alpha$ . <b>019-095-052</b> $\beta$ . <b>042-019</b> $\gamma$ . 094-038
#252	Archanes	Bone gable	MM I	$\alpha$ . <b>019-095-052</b> $\beta$ . <b>042-019</b> $\gamma$ . 062-●-●-●
#292	Gouves	Four-sided marble prism	MM II	$\alpha$ . <b>042-019</b> $\beta$ . 2   + $\gamma$ . <b>019-095-052</b> $\delta$ . 1   1
#313	Moni Odigitria	Bone cube	MM I	$\alpha$ . <b>042-019</b> + Flower? $\beta$ . <b>019-095-052</b> $\gamma$ . Quadruped $\delta$ . Human figure with a fish?
#315	Archanes	Four-sided bone bar	MM I	A. Caprid(?) B. Equid 1 C. Equid 2 D. Acanthus-like flower(?) E. Bovine(?) F. Basket G. Uncertain signs H. <b>019-095-052</b> I. <b>042-019</b> J. Hand (CH 008?) K. Human figure with a basket L. Leg (CH 010?) M. Floral N. Antelope(?)

Table 1. Seals and sealings featuring the ‘Archanes formula’ (in bold).

No.	Provenance	Medium	Chronology	Transcription
#134	Knossos	Clay nodule	MM II or III	Motif? <b>042-019</b>

#135	Mikro Vouni (Samothrace)	Clay roundel (four identical impressions)	MM II or III	<b>042-019</b> + wheel-like motif (or sign AB 77?)
#136	Mikro Vouni (Samothrace)	Clay roundel (two identical impressions)	MM II or III	<b>042-019</b>
#137	Mikro Vouni (Samothrace)	Clay <i>nodulus</i>	MM II or III	α. <b>042-019</b> β. Linear A(?) inscription
#137bis <sup>6</sup>	Mikro Vouni (Samothrace)	Clay <i>nodulus</i> ?	MM II or III	α. <b>042-019</b> + sign similar to CH 061 or A 305 β. Linear A(?) inscription

Table 2. Seal impressions featuring only the first sign group of the ‘Archanes formula’ (in bold).

Syllabic sequence (in transnumeration)	Syllabic sequence (in phonetic transcription)	GORILA code
08-31-31-60-23	<i>a-sa-sa-ra-me</i>	PR Za 1c; IO Zb 10
08-31-31-60-23	<i>a-sa-sa-ra-me</i>	PK Za 11b-c
08-31-31-60-23	<i>a-sa-sa-ra-me</i>	POR Zg 1
08-31-31-60[	<i>a-sa-sa-ra[</i>	PK Za 4
57-13-13-60-23	<i>ja-sa-sa-ra-me</i>	IO Za 6; IO Za 16a-b; PK Za 27.a-b; PS Za 2.2; TL Za 1
57-31-31-60-23	<i>ja-sa-sa-ra-me</i>	PL Zf 1
57-31-31-60-23	<i>ja-sa-sa-ra-me</i>	IO Za 12a-b
57-31-31-60-80-06	<i>ja-sa-sa-ra-ma-na</i>	KN Za 10a-b
57-31-31-60[	<i>ja-sa-sa-ra[</i>	IO Za 2b.1-c.1
57-31-31[	<i>ja-sa-sa-[</i>	IO Za 9; PK Za 14b
57-31[	<i>ja-sa-[</i>	PK Za 8b; MA Zb 8
]60-23[	<i>]ra-me[</i>	PK Za 12b

Table 3. Attestations of the Linear A sequence 08-31-31-60-23 / *a-sa-sa-ra-me* and variants (after GORILA 4 and 5, and Knappett, Del Freo, and Zurbach 2017, 78). The reading of the sequence in POR Zg 1 corresponds the one argued by the authors in the text.

<sup>6</sup> Del Freo 2008, 201. The sign here doubtfully read as 042 is shaped as a lozenge like CH 052 on #251.



