CHAPTER 1

CRETAN HIEROGLYPHIC SIGN REPERTOIRES: YESTERDAY, TODAY AND TOMORROW

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1.1 Introduction

Script and writing system are not, strictly speaking, interchangeable terms. To ascertain whether a script can be defined as a *bona fide* 'system', it needs to have a normalised set of signs. These signs constitute a standardised inventory, or better, a sign list. This is an essential first step in understanding a script, as it provides the essential *abc*, as it were, or foundation upon which correspondences can be built between individual signs and their potential sounds. Therefore, in this chapter, the terms 'repertoire' and 'sign list' are, again, disambiguated at the outset and taken as two separate entities, the one comprising the collected, 'undigested' occurrences of signs, the other containing a rationalised, 'digested', definitive list.

There are typological implications too, as writing systems could have alphabetic, syllabic or logo-syllabic (the latter with a series of signs for 'words' or morphemes, known as logograms) structures. As is well known, typology depends on the definitive number of signs in the normalised repertoire – the more numerous the signs, the more likely that the script is predominantly logographic. Alphabets range around a maximum of thirty signs, syllabaries can reach many hundreds. The standard cuneiform script, for instance, totals about 660, with the logographic series included. The syllabary with fewest signs is the Canadian Aboriginal script Cree (45), followed by the Classical Cypriot Syllabary (56).

As straightforward as this premise may be, several scripts of the ancient world still are lacking a standard sign list. The Rongorongo of Easter Island, the Cypro-Minoan script and, indeed, the Cretan Hieroglyphic are just a few cases in point. The nature of the problem for this situation varies in each case. For Rongorongo many signs appear extremely similar, thus creating a difficulty in assessing whether they are allographs (signs representing the same sound albeit with minuscule graphic variations in their shapes) or signs with a different sound. For Cypro-Minoan, the difficulty is the high level of epigraphic variation, as the script is attested on different supports, from small clay balls and tablets (with differing degrees of

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hardness of the clay) to metal objects, ivory, stone and other materials, with the signs rendered in different hands, *ductus* and general shape.

1.2 The Cretan Hieroglyphic Inventory: Problems

Where Cretan Hieroglyphic is concerned, this state of affairs is, to be sure, intimately tied also to the paucity of inscribed texts, which cannot guarantee a substantial frequency of all the signs attested. Today the corpus amounts to fewer than 150 inscriptions on clay, with about 200 carved on the seals (mainly stone, but bone and metal specimens are attested too), several impressions on clay lumps and painted signs on vessels, lids and potters' wheels (Flouda, this volume).

Beside this, there is an even more fundamental problem that lies in the highly figurative graphic appearance of the signs. On seals and seal impressions, especially, the sign shapes are iconic for the most part. Also, the cohabitation of *bona fide* signs with decorative elements complicates the matter even further, raising the issues of grey areas between 'art' versus 'proper writing' and the boundaries between these two realms in the same close association.[1] Thus, disambiguating between drawings and signs, between ornaments and written language is particularly complicated, as figurative symbols can be *prima facie* confused with decoration.

It needs to be added that the problem of iconicity is one that has historically proven to be a confounding factor for all image-based scripts that underwent ultimately successful decipherment attempts. It applied to the Egyptian hieroglyphs and the Rosetta stone, for instance. Indeed, prior to the decipherment, the reigning view was that the Egyptian hieroglyphs were 'sematographic', they essentially recorded ideas, not sounds. The script's iconicity thus was the very obstacle to its decipherment, its own hidden trap, before the decipherer, Jean François Champollion, admitted to himself that the script could be phonetic.[2] The same hurdle was faced by the early scholars of Maya and a long delay was to be endured for its decipherment.[3] The study of the Indus Valley script is, arguably, tainted by the same bias.[4]

These two aspects, namely a marked interface with iconography and the few attested inscriptions, contribute to the still tentative nature of the sign list. As will become apparent in the following sections, the past of the Cretan Hieroglyphic sign list has been tortuous, and its status today is still a topic of discussion.

[1] Olivier 1981. [2] Champollion 1824. [3] Coe 2012. [4] Sproat 2014.

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1.3 The Earliest Repertoire of Cretan Hieroglyphic Signs

The earliest appraisal of the repertoire of Cretan Hieroglyphic, functional to a coherent classification of its signs, was introduced by Arthur Evans in his monumental introduction to the Aegean scripts, *Scripta Minoa*. His list is designated here as *SM* before each individual sign attestation.[5] For the Cretan Hieroglyphic script, Evans used the specific definition of 'conventionalized pictographs' and 'conventionalized Hieroglyphs' to stress its iconic nature. Evans also assumed that the lifespan of Cretan Hieroglyphic consisted of three consecutive phases. These phases are rooted in an evolutionary trajectory, whereby figurative signs necessarily develop into more stylised, streamlined shapes. The implications of this framework go beyond shape configurations, as they involve their function, following a typological trajectory from 'pictographic' to 'phonographic'.

In Evans' frame, first and oldest are several 'early pictographic' seals, with an extremely long time span, ranging from Early Minoan (EM) II until the MM I period (the chronology will prove erroneous: Civitillo, Ferrara and Meissner, this volume). This class is represented by a number of seals bearing motifs either in narrative scenes or in isolation. Second, he classified the 'Hieroglyphic Class A'. This class groups together almost all hieroglyphic seals fashioned from soft stones and commonly showing small and repetitive formulae. Third is the group named 'Hieroglyphic Class B', composed of seals with a more elaborate iconography, a more dexterous engraving and a wider range of signs, with the later MM III as their *floruit*.

Despite this now-superseded diachronic classification, the sign list Evans proposed is an all-encompassing catalogue of all the attestations of individual graphs,[6] as found engraved on seals, inscribed on clay documents or impressed on sealings. This is already taken to be a consistent whole.[7] In this catalogue we find a total of 135 *SM* signs (Figure 1.1), organised into different classes whose physical referents are clearly recognisable or less so, but in any case, interpreted subjectively (human figures and their parts; arms, implements and instruments; cult objects and religious symbols; houses and enclosures; utensils, stores and treasure; ships and marine objects; animals and their parts; insects; plants and trees; sky and earth). Only a few are classed as unknown, and these are either too schematic or represent wholly unrecognisable objects. To

[5] *SM* I: 181–231.

[6] Graph is an important technical term in this respect, as it refers to any graphic symbol, regardless of its function as a decorative motif, emblem (which is intended as a synonym for semasiograph, to indicate a language-independent graphic symbol of limited use) or writing.

[7] *SM* I: 235.

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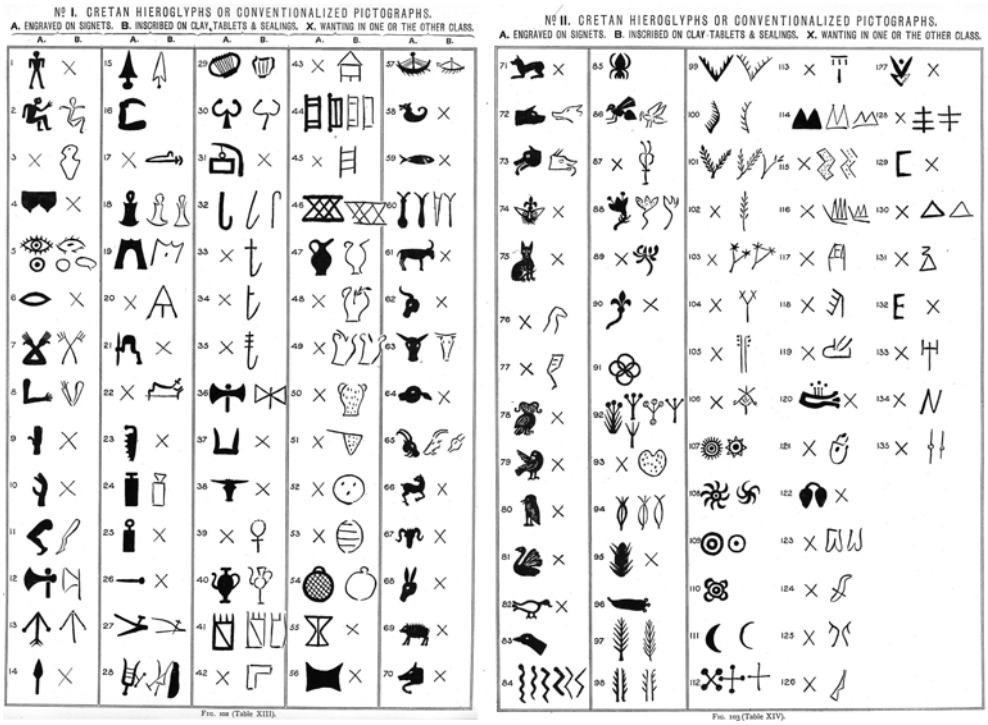

Figure 1.1 Sign list as presented by A. Evans (*SM* I: 232–3)

this list of signs, Evans added a limited number of decorative elements, signposted with an asterisk (*SM* 136*–139*). These are found only on the seals (defined as 'signets').[8]

More generally, Evans noted a crucial aspect, namely that some signs are confined to the seal repertoire, and that some other signs are only attested on the clay documents. Also, on the seals, certain sign groups tended to occur in a formulaic and repeated fashion, in association with what Evans classed as decorative symbols, or isolated. These sign groups have been coined 'formulae' since then and occupy almost half of the material on seals, but they also occur, if rarely, on clay documents.[9] The most frequent are the so-called trowel- and trowel-arrow combinations (for a reassessment of 'trowel');[10] others are also attested. In Evans' view these formulae are to be interpreted as 'canting badges', tied to the official role of the individuals that owned them.

Evans is also sensitive to the paucity of frequencies, claiming that 'the majority of the signs at present only known in their graffito form [that

[8] Ibid.: 229. [9] Decorte 2017. [10] Ferrara and Cristiani 2016.

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is, on clay] have corresponding glyptic types [that is, on seals]'.[11] Also clear is the epigraphic relation between stone seals and clay inscriptions: 'the main characteristics of the script are essentially glyptic in origin'.[12] The gradual process of schematisation from picture-writing to progressively more linear shapes is very clearly showcased and has, to this day, stood the test of time.

The sign list published by Evans is a maximalist collection of the attestations of Cretan Hieroglyphic graphs known at his time. With all due caution, and a minimal number of inscriptions at his disposal, Evans did not attempt to define, assess or contextualise the occurrences of the graphs. Nor did he propose to rationalise with an eye to formally reducing the repertoire. It can be claimed that his was a balanced and neutral description of the evidence, without any subjective interpretation or bias in selecting or excluding graphs.

1.4 The Corpus Sign List

The first proposal of a rationalisation of the Cretan Hieroglyphic repertoire was published in 1996, within the corpus of inscriptions known as *CHIC*. The corpus collected for the first time, with transcriptions and photographs, 331 engraved and inscribed objects, comprising the inscriptions found at Malia and *Quartier Mu*, which Evans had not seen.

Crucially the authors divided the inscriptions between seals and all other clay documents. This generates a differentiated sign list. This list has ever since become the standard reference point for all scholars working on Cretan Hieroglyphic. It contains 144 signs divided into five classes: syllabograms (nos 001–96); logograms (nos *151–*182 and *159*bis*); klasmatograms, that is fractions (nos 301–9); arithmograms, that is whole numbers (units, tens, hundreds and thousands); and stiktograms, that is punctuation signs (X and |) (Figure 1.2). It must be noted that since *CHIC*, a number of inscriptions have been uncovered, from Petras, Simi and other sites on Crete, but these do not fundamentally change the repertoire of graphs.

Some methodological guidelines adopted by *CHIC* to define the sign list need to be considered. Although the authors are terse in their commentary with regard to the principles they adopted in inventorying items, the overarching line is their definition of 'inscription'. An inscription can only be represented by at least three consecutive signs, in close and coherent association with each other, specifically attested on the clay documents (see below). From this line of reasoning, three distinct categories of graphs, that are crucially found only on the seals, emerge.

[11] *SM* I: 235. [12] Ibid.

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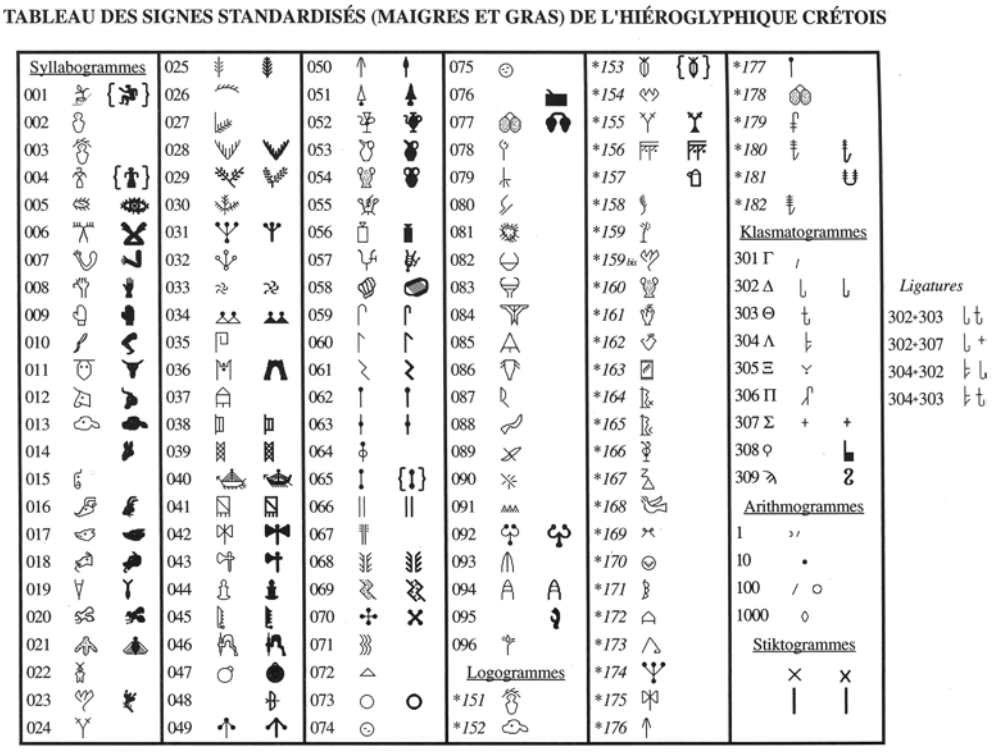

Figure 1.2 Sign list as presented by *CHIC* (17)

These are graphs that should not, in the authors' view, be included in the definitive sign list:[13]

(1) Clear decorations without symbolic value ('*décoration non signifiante évidente*')
(2) Clear decorations with possible symbolic value ('*décoration éventuellement signifiante évidente*')
(3) Unclear decorations with possible symbolic value ('*décoration éventuellement signifiante non évidente*').

The first group includes graphs already listed as decorations by Evans,[14] namely *SM* signs 136*–139*, and other elements interpreted as fillers (small geometric inclusions used for *remplissage*). These graphs are geometric motifs, a spiral and a scroll. It must be noted that they are attested already as Prepalatial seal decorations, so they belong to a long-standing tradition of local iconography. These graphs are ignored in the normalised transcriptions in the corpus.

[13] *CHIC*: 13–14. [14] *SM* I: 229–31.

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The second group is equally not transcribed in the corpus. It comprises graphs that are included in Evans' original sign list (these are *SM* 66, 69, 75, 84a, 85, 90), and are not included in *CHIC* because they are not attested on the clay documents or may show dimensions that are not consistent with, or diverge too significantly from, *bona fide* Cretan Hieroglyphic signs.

The third group comprises instances of signs that are included in the *CHIC* sign list (CH 031 ), but also signs from Evans' list (*SM* 59c  , 74  and 82 ). As we will see, later lists add other signs to this group. For instance, a possible 'fish(?)' and a 'two-handled vessel'  are treated in Jasink.[15] In *CHIC*, only graphs from this third group are transcribed and rendered between scroll brackets {} if they are included in the sign list, or with exclamation {!} if they are not. These may be ideographic or logographic in nature, but the authors do not venture into strengthening this hypothesis, justifying it contextually.

The result is that *CHIC* includes in its final list only signs 014  , 0048  , 076  , 095  , 157  , 181  , 309/  . This leaves out many graphs that conceivably may be considered *bona fide* signs worthy of being included in a definitive sign list.

Notably, graphs deemed to be 'ornamental' or 'symbolic' (cit.) can, on the seals, be found inserted in varying positions among well-known repeated sign groups, the 'formulae' mentioned above. These graphs can be found interposed in between formula signs or placed before or after them. The result is that in a way they appear to disrupt the harmony of the 'formulae'. For some of these 'intruders', *CHIC* borrows the notion of 'badge', already introduced by Evans, to refer to a meta-linguistic 'heraldic' connotation, which one can assume refers to iconic semasiography, that may qualify groups or titles (Valério, this book).[16]

A general comment needs to be made about the parameters adopted by *CHIC* in relation to inclusion or exclusion of graphs in their list. Olivier and Godart used the attestation on clay documents as a guiding principle for inclusion, because only on these supports, which are created specially to bear text, can we ultimately find the *raison d'être* for glottographic representation,[17] or, as Palaima first commented, only when they are 'part of a phonetic/logographic textual syntax'.[18]

This implies that graphs on seals ought to behave differently, as they straddle boundaries between artistic display and writing *stricto sensu*,

[15] Jasink 2009: 190 and 49–50 respectively. [16] Also Civitillo 2016a.

[17] Despite this general rule, CH signs 14, 76 and 95 are included in the sign list, even though they do not appear on clay documents. This choice seems to be tied to the fact that these signs are not found close to frequently repeated groups of signs (defined as 'formulae').

[18] Palaima 1998: 435.

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with the general implication that choices need to be made as to what constitutes writing and what does not. If a graph is attested only on seals, the likelihood of it not being a sign is deemed to be higher. This belief was, to be sure, already entrenched in the spirit of the scholarship concerned with Cretan Hieroglyphic graphs on seals, where decoration was implied to be virtually meaningless, or hardly 'serious'.[19]

Scepticism over this principle of division was raised in recent times (even before the publication of the corpus by Palaima;[20] also, soon after publication by Karnava)[21] with an eye to a more open-ended and systematic approach to Cretan Hieroglyphic. In any case, and beside the nature of the script on seals, a note of warning is necessary. The graphs on Cretan Hieroglyphic, be they partly decorative, wholly decorative or wholly glottographic, show perilously low frequencies of attestations, and this inevitably hinders a comprehensive analysis in terms of their individual and overall distribution patterns. Quite simply, it is impossible to chart the behaviour of a high number of graphs in the repertoire.

1.5 Recent Reassessments of the Sign List

The past two decades or so, since the publication of *CHIC*, have stimulated the interest of several scholars who have been drawn to the reassessment of the list as established by Olivier and Godart. This spark of interest was generated, in the first place, by the principles employed to exclude signs, specifically those found on seal or seal impressions.[22] Signs previously recognised by Arthur Evans were, as a result, reconsidered contextually, and in their individual arrangement and distribution.

Also, many a reassessment of the sign list has benefited from drawing typological evidence from other early writing systems. This has proved instructive in light of the problematic identification of signs in a fluid, image-based script. Indeed, these re-evaluations show that some graphs may have been excluded from the *CHIC* list prematurely and should rightly be considered as Cretan Hieroglyphic signs. We will treat individual contributions to the reassessment of the list in chronological order.

Younger was the first to raise suspicion that certain graphs may need to be reinstated. Crucially, the identification of the so-called cat mask

[19] *Verbatim* Pope 1968: 446; but see, *contra*, Reich 1968; Poursat 1978; Olivier 1981.
[20] Palaima 1990: 21; 1998: 435. [21] Karnava 1997; 2000.
[22] Younger 1996–7 [1998]; Karnava 2000; Jasink 2009; Civitillo 2016a; Decorte 2017; Ferrara 2018: 91; Ferrara, Montecchi and Valério 2021c; Ferrara and Weingarten 2022.

graph (*SM* 74 ), with the later syllabogram found in Linear A and in Linear B as sign AB 80, which corresponds to the syllable /*ma*/ was flagged.[23] This is a graph frequently found on the seals, which warrants by distribution and contextual association a rightful inclusion in the list, a possibility that the authors of *CHIC* foresaw but never implemented. Palaima and Karnava in their reviews of the corpus[24] draw attention to similar methodological issues concerning the exclusion of graphs.

But it is Jasink who takes this further, with the first systematic reassessment of the dataset, graph by graph.[25] While she does not disrupt the state of the art laid out in *CHIC* and claims to follow its criteria closely, her conclusions point in the direction of a general restoration of more than thirty graphs into the formal list (Figure 1.3), harking back all the way to Evans' list.

Crucial inclusions are, for instance, the full-bodied cat *SM* 75  and the cat-mask *SM* 74  , already reinstated by Younger, and various animals and plants and other classes of graphs that *CHIC* did not transcribe. Her approach stimulated a number of scholars to reopen the debate and many other questions concerning the nature of the script, especially as it appears on seals. For instance, Jasink introduces the possibility, already postulated in the 1960s,[26] that some restored graphs may have had a logographic or a determinative value, given their contextual position within sign sequences or by means of emphatic signposting. This would naturally change their function beyond that of purely decorative devices.

An even more groundbreaking methodological approach was embraced by Decorte. His main contribution is not so much to propose a revised sign list, but to reframe the theoretical standpoint from which we should view each individual Cretan Hieroglyphic graph by conceiving it as an integral part of the script and the seal decoration.[27] A much closer attention to the detail on the engravings is encouraged, geared towards considering every single element on the seal face as meaningful. This implies not disregarding or dismissing any mark, be it the so-called small fillers, dots, cross hatchings, crescents, crosses (the frequent x-shaped stiktogram), which encircle, and at times separate, graphs and signs. Rather than representing background noise or a form of *remplissage* particular to a Minoan *horror vacui*, each of these devices is deemed to be part of an integrated Cretan Hieroglyphic syntax.

More recent approaches sought a revision that is based on statistical methods. Also, it must be stressed that previous work devoted to the

[23] Younger 1996–7 [1998]: 387. [24] Palaima 1998; Karnava 1997. [25] Jasink 2009.
[26] Grumach 1963a; 1963b. [27] Decorte 2017.

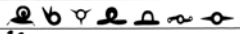
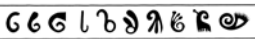
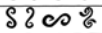
Geometric motifs		
circle with outgoing elements		
coil		*SM* 138*[2]
dot with outgoing elements		
interlaced circles		*SM* 91
scroll		*SM* 137*
spiral		*SM* 136*
semicircular composed symbol		
"Vegetal" and floral motifs		
bifoliate figure		*SM* 139*
two-forked branch		
three-forked branch		
ear of barley		*SM* 95
lily		*SM* 90
palmette		
petaloid loop		
"Astral" motifs		
star or rayed solar symbol / centrally radiating motif		*SM* 107
crescent moon		*SM* 111
day-star / sun with revolving rays		*SM* 108
solar disk without rays		*SM* 109
sun and four moons		*SM* 110
Animals		
(wild) boar		*SM* 69
cat		*SM* 75
cat-mask		*SM* 74
dog		*SM* 72
duck		*SM* 82
fish		*SM* 59
ibex (kid)		*SM* 66
snake		*SM* 84
spider		*SM* 85
waterbird		
sea-snail(?) / bird's head and neck(?)		
fish(?)		
Vessels		
two handled globular vessel(?)		
Tools		
plough		*SM* 27
Cult symbols		
horns of consecration		*SM* 37

Figure 1.3 Graphs reinstated by Jasink 2009 (Appendix B, 189–90) after Civitillo 2016a: 205

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reassessment of the Cretan Hieroglyphic repertoire generally has involved a case-by-case study, rather than a systematic method, even when the corpus was exhaustively surveyed. The INSCRIBE ERC team, active from 2018 to 2023, attempted further progress to rationalise the sign list[28] by addressing distribution, sign associations with other signs and specific layout configurations. The team presents evidence emerging from several inconsistencies in the graphic behaviour of signs, especially those of single (*hapax*) or low frequency. They also propose mergers of signs, attempt to reassign a function to specific signs and try to settle uncertain cases that can be read as Linear A instead of Cretan Hieroglyphic. The resulting sign list aims to be a systematic and contextual approach to the dataset, rather than a proposal for a definitive list (Figure 1.4).

1.6 Future Prospects

Contributions in the last few decades have shown that progress can be made, despite the uneven evidence (paucity, shortness and limited variety of inscriptions) and the nature of the texts. Highly formulaic syntagms, which include frequently attested signs and sign groups, and many one-time attestations (*hapax*) represent two fundamental factors that limit the appreciation of meaningful patterns of distribution. Despite this, a few considerations can be made. The standard sign list published in 1996, while without a doubt a seminal reference point that enabled decades of in-depth research, today can be reassessed and integrated with several graphs that Evans first identified. The number of individual items in the sign list, while not definitive until the scholarship reaches a unanimous consensus, will be pending until further evidence comes to light.

However, it is worth noting that, as also apparent (Valério, Bennet and Petrakis, this volume), several scholars converge over the possibility that logographic notations or semantic determinatives can be postulated, alongside purely syllabic sequences.[29] Semantic classes are impossible to gauge with certainty within an undeciphered script, but any script at its earliest stages tends to show a flexible behaviour and initial multi-valence. This 'functional plasticity' cannot and should not be excluded as a possible avenue to explore further. It is with the same flexibility of mind that we should look at Cretan Hieroglyphic and its signs, however many they were and whatever normalised sign list we choose to adopt.

[28] Ferrara, Montecchi and Valério 2021c; 2023.
[29] Jasink 2009; Ferrara and Cristiani 2016; Civitillo 2016a; Decorte 2017; Ferrara and Weingarten 2022.

Figure 1.4 The INSCRIBE sign list (Ferrara, Montecchi and Valério 2021c)

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