

Distinguishing between Cypriot scripts: Steps towards establishing a methodology¹

1. The problem

The surviving Late Bronze Age and Early Iron Age inscriptions from Cyprus, usually labelled ‘Cypro-Minoan’ and numbering more than 200,² are almost certainly written in more than one script. It was É. Masson who first laid out this theory in detail, proposing that different groups of inscriptions be labelled by a numerical classification: CM1, CM2 and CM3.³ Each of these groups was suggested to represent a different script with a different repertoire of signs. CM2 and CM3 were special terms referring to a limited number of texts, with CM2 designating three clay tablets with long inscriptions found at Enkomi, and CM3 designating all of the Cypriot epigraphic material from Ugarit (modern northern Syria); CM1, however, has little by way of coherence except in that it has been used to refer to all the other inscriptions that do not fall into the other two groups.⁴ Olivier further added a fourth group, CM0, to designate the obviously distinct script in which one of the earliest known Cypriot texts, an inscription from Enkomi dated probably to LCI, was written.⁵ If we accept these designations, then it is necessary to refer to Cypro-Minoan scripts in the plural.

¹ Thanks are owed to the reader who provided helpful and incisive comments on the first draft of this paper, to Jean-Pierre Olivier for the use of his Cypro-Minoan fonts, and to several scholars who kindly shared pre-publication versions of their work (especially Silvia Ferrara and Miguel Valério). I am also grateful to the British Academy for their funding of my current research.

² The total number of Cypro-Minoan inscriptions depends on our classification of an inscription. Olivier in *HoChyMin* lists 217 items (from Cyprus and Ugarit), two of which are uninscribed clay balls (##019 and ##073) and the rest consisting of two signs or more. Single-sign inscriptions are excluded (see *HoChyMin* p16 for the rationale, as much practical as analytical; a single-sign inscription could still be a ‘true’ inscription but the many isolated Cypriot potmarks, for example, are very difficult to analyse as reflexes of Cypro-Minoan writing). In Ferrara’s *Corpus* (Ferrara 2012/13 vol. 2), 244 items are listed: Olivier’s 217 items, 25 further items from Cyprus, one further from Ugarit, plus one added as an addendum (the recently discovered clay ball from postpalatial Tiryns: see Veters 2010); of the 25 Cypriot items that do not appear in *HoChyMin*, some are inscribed with only one sign (##219, ##222, ##223) and others should perhaps be excluded as dubious examples of writing (##221, surely a series of ‘+’ and line markings acting as a potmark rather than an inscription; ##227, where possible ‘signs’ may be part of the seal’s decorative repertoire; ##228, an adze with one possible sign marked as probably not being an example of writing; ##232, a seal with two possible signs marked out as ‘very doubtful’, and with a disclaimer that it was only included ‘because the past literature deemed it a *bona fide* inscription’). If we exclude uninscribed items, inscriptions with a single sign and *dubia*, we are left with 235 known and published Cypro-Minoan inscriptions. A recent find of two inscribed tablets from Pyla will raise the number to 237 when they have been published (information from Athanasia Kanta and Massimo Perna).

³ See generally É. Masson 1972, 1974.

⁴ See Steele 2012.

⁵ *HoChyMin* ##001.

The idea that Cypro-Minoan inscriptions represent more than one writing system has, however, been met with considerable criticism, in particular by Palaima who stressed the diverse nature of inscribed Cypriot objects and the possibility of palaeographic variation owing to that diversity.⁶ This could be one reason to consider approaching the inscriptions as a body of varied texts written in one script. He also called for the preparatory work of Daniel to be followed up with a careful evaluation of the archaeological and material context of each inscription, so that such a study of palaeography could be conducted effectively.⁷ Palaima's article was one of the motivations behind Ferrara's recent survey of Cypro-Minoan, providing detailed analyses of a number of inscriptions in her *Analysis* volume, and contextual and bibliographic information and photographs of almost all in her *Corpus*.⁸

Ferrara followed Palaima in attempting to dismantle É. Masson's classification of Cypro-Minoan as multiple scripts, although the conclusions she could safely draw from her analysis were measured, owing in particular to the limited size of the sample of palaeographic data.⁹ A consideration of palaeographic factors such as ductus, often a consequence of the material and method of inscription, allows a better appreciation of what may be variants rather than separate signs: for example, Olivier already conflated the signs 064  (only attested in CM1) and 065  (only attested in CM2), now labelled as 064 (with 065 as a *numerus deletus*).¹⁰ Ferrara suggests further deletions from the standardised sign repertoire.¹¹ However, even if we take palaeography into account, there remain a considerable number of Cypro-Minoan signs that only appear in one of the categories (CM1, CM2, etc) to the exclusion of the others. The fact that Cypro-Minoan inscriptions remain undeciphered, and that any underlying languages remain unidentified, adds a further difficulty in that we have no access to phonological structure, alongside the considerable problem that we have only a small number of surviving inscriptions.

This paper considers by what method we might be able to tell whether one undeciphered inscription is written in the same script as another. Because it is necessary to

⁶ Palaima 1989.

⁷ Daniel 1941. Daniel's work on the classification of inscribed objects was characterised by a much more rigorous methodological approach than is found, for example, in the earlier work of Persson (1937), which also considered some palaeographic factors.

⁸ Ferrara 2012/13.

⁹ Ferrara 2012/13 vol. 1 p261-3; see also Ferrara 2013.

¹⁰ See the table at *HoChyMin* p413; the sign is also discussed at Ferrara 2012/13 vol. 1 p240. See also Steele 2013 p23-30 on the issue of identifying sign variants and separate signs.

¹¹ See the table at Ferrara 2012/13 vol. 1 p255, and more broadly her analysis of potential sign variants, p234-56.

use the largest possible data samples, only the longest Cypro-Minoan texts are used to illustrate the method: the Enkomi ‘CM2’ tablets (##207, ##208, ##209) and the Enkomi cylinder (##097, traditionally classified as a CM1 text).

2. What is a script?

We cannot take this further without stopping to consider what is meant by the term ‘script’.¹² For the purposes of this paper, the most important characteristic of a ‘script’ is that it has a distinct repertoire and is distinguished from other scripts by that repertoire. Its repertoire could be different in the number of signs (e.g. the Cypriot Syllabic script of the first millennium BC has c.55 syllabograms, while Linear B has c.88 syllabograms), the shapes of individual signs (e.g. the Paphian Cypriot Syllabary and the ‘Common’ Cypriot Syllabary have approximately the same number of signs, but some of them diverge in shape, for example Paphian *o*  and ‘Common’ *o* ) , or a combination of both number of signs and sign shapes. Direction of writing can vary within one script, and so is less useful as an indicator (unless we have good evidence that the script is only ever written in one direction, as is the case for example with the Phoenician abjad, always sinistroverse).

By the above reasoning, different variants of the Greek alphabet would be counted as different ‘scripts’: for example, green alphabets such as the Cretan lack some signs (X, Φ, Ψ, etc) that appear in blue variants such as the Ionic, and some variants have different values for the same sign (e.g. red variants such as those found in Italy have X for /ks/ while blue variants use the same sign for /k^h/).¹³ From an epigraphic point of view, it makes sense to distinguish between these variants as different scripts, which can also be helpful for example in identifying the provenance and age of any given inscription.

Different ‘scripts’, defined by the above criteria, might be ‘mutually intelligible’, i.e. able to be read by someone who is more used to using a different but closely related script. For example, a literate Greek speaker in one part of Archaic Greece who is used to using one local alphabet might be able to read an inscription written in a different local alphabet (although one might imagine some difficulty with rarer letters such as *koppa* and *san*, or variants such as the ‘S’-shaped *iota* or ‘lunate’ *pi* found in the Cretan alphabet, and so on).

¹² On the defining the concept of writing generally, see for example Coulmas 2003 p1-17.

¹³ Jeffery 1963 is the classic treatment of the Archaic variants of the Greek alphabet: note her title, *Local scripts of Archaic Greece*.

The Cypriot Syllabic inscriptions found on the walls of the temple of Achoris in Egypt, probably created by a group of Cypriot mercenaries present at the temple at the same time, show the use of the Paphian and ‘Common’ variants side-by-side by different individuals but within the same limited context;¹⁴ this again may suggest that those accustomed to writing in one variety might be able to decode the other. On the other hand, if two scripts, even closely related ones, have very different repertoires that differ in both the number and the shapes of signs, it is more likely that an individual used to using one would need training to use or understand the other: one example would be the many varieties of cuneiform, not only those used for Sumerian, Babylonian, Assyrian, Akkadian and Hittite, but also the more radically developed syllabic scripts used for Ugaritic (creating what is essentially a cuneiform-looking abjad) or for Old Persian (creating a streamlined cuneiform-looking syllabary with far fewer signs).

The basic concept underpinning this definition of scripts is the repertoire of signs. In order to write a text, an individual needs to know what signs to use to represent the sounds he wishes to write. This requires knowledge of the conventions of a script: the repertoire of available signs, as well as the sounds understood to be represented by those signs and also any rules relating to spelling.¹⁵ Some sort of training is required to use any script, whether formal (e.g. scribal training) or otherwise, which can also lead to and compound a sense of ‘correctness’ in using the script (e.g. rejecting ‘signs’ not accepted to be part of the script’s repertoire, judging ways of inscribing particular signs to be either correct or incorrect, etc). Since scripts are conceived to aid communication, it is also necessary not only that an individual be able to write in the script but also that another individual be able to read the written signs and decode the message encoded in an inscription. The context in which a particular script exists could be limited in various ways (e.g. literacy restricted to a small number of individuals, writing used only for a limited purpose, a script in existence only for a

¹⁴ See O. Masson 1981.

¹⁵ This would not apply to certain kinds of writing systems or written signs, since some written signs can be understood not to convey sounds directly (e.g. ideograms, numerals, etc). Some variants of cuneiform present a complex state of affairs where a written sign can be read either as a Sumerogram representing a whole word or as a concept or as a syllabogram representing the sound of a syllable (e.g. the same sign used for the syllable *an* or the Sumerogram DINGIR “god”).

Spelling rules are particularly important in syllabic scripts because the available repertoire of signs may not provide an easy way of representing a given sound or cluster. For example, syllabaries of open syllable structure such as the ones under consideration here (where signs represent a vowel V, a consonant+vowel combination CV or sometimes a complex open syllable CCV) pose a problem when attempting to write a consonant cluster or a final consonant: consider the Linear B spelling of the place name Knossos as *ko-no-so* (with plene spelling of the /kn/ cluster but the final /s/ omitted), or the Cypriot Syllabic spelling of the personal name Stasandros as *sa-ta-sa-to-ro-se* (with plene spelling of the /st/ cluster, omission of medial /n/ before /d/ and spelling of the final /s/ using the syllabogram *se* with a ‘dummy vowel’).

short period of time, etc). However, to be a useful tool it must necessarily be conceived of as a single entity with a coherent repertoire.¹⁶

In the case of deciphered scripts, it is also possible to consider the script's structure in terms of the phonetic value of its signs (and, further, the way in which its signs relate to the phonological inventory of the language or languages written in it). For example, we can observe that the two related deciphered scripts, Linear B and the Cypriot Syllabary, both used to write the Greek language, have different structures: for example, Linear B distinguishes voicing in the dental series (having separate series of signs to represent the phonemes /d/ and /t/) while the Cypriot Syllabary does not; and while Linear B does not distinguish between the liquid phonemes /l/ and /r/ (having only one series for both, conventionally represented in transcription by 'r'), the Cypriot Syllabary does distinguish them with different series of signs.¹⁷ However, for undeciphered scripts such as Cypro-Minoan, it is impossible to observe such differences in structure because we have very little basis on which to ascribe sign values and no knowledge of the language(s) represented in Cypro-Minoan inscriptions. The question of underlying structure is therefore considered to be beyond the scope of this paper. Nevertheless, it is assumed here that the majority of Cypro-Minoan signs, like those of the related Linear B and Cypriot Syllabic scripts, represent open syllables of the type V or CV (and perhaps also CCV).¹⁸

3. The sample

This paper focuses on four particular Cypro-Minoan inscriptions that are long and so provide us with the best possible basis for assessing the repertoire of the script(s) in which

¹⁶ We may add caveats here. A script may of course change over time, leading to the question of when to label a later variant as a different script. There are also reflexes of writing that may be considered to be something different, for example 'pseudo-writing' (including deliberate imitation of writing designed to make an 'inscribed' object look high-status or similar) and potentially illiterate or semi-literate 'inscriptions' (potmarks stand out as a possible related example).

¹⁷ Treated in detail in Steele forthcoming.

¹⁸ Ferrara 2012/13 p221-34 demonstrates the validity of this assumption also via a typological and comparative approach. The approximate number of signs (for any given variety of Cypro-Minoan, between 50 and 100) itself points towards a syllabic script since the number is too great for a typical alphabet and too small for a typical logographic or pictographic script.

they are written. These are the longest four of the surviving inscriptions, all found at Enkomi:¹⁹ three clay tablets and one clay cylinder.

The three clay tablets were found at different locations during the excavation of Enkomi. The tablet labelled as ##207 is composed of two fragments discovered in different places: one in Quartier 1W (out of original context), the other in Quartier 7E.²⁰ The others were found in Quartier 4W next to the Sanctuary of the Horned God among a layer of broken pottery used as a hearth base (##208), and in Quartier 4E on a rocky surface out of original context (##209). They are difficult to date because of their obscure contexts, but are probably to be ascribed to LCIIIA-B (i.e. some time between the later 13th century and the mid-11th century BC).²¹ Despite their diverse find spots and archaeological contexts, the three tablets give the appearance of belonging to the same writing tradition because of their very similar shape, type (all three being opisthographic), method of inscription and epigraphic features (see section 4 below). The three inscriptions are the only ones grouped under the label of ‘CM2’.²²

The CM2 tablets are all broken and have considerable surface damage, making it difficult to estimate their original length. The tablet that has survived as two now joined fragments (##207) has 42 lines of text on its side A, although not all of them are legible. The others preserve fewer lines, but may once have been as long. Because of the damage to the inscriptions, many of their inscribed signs are now unclear: Olivier estimates that the surviving fragments contain c.2,000 signs, of which c.1,500 are legible syllabograms, while the original documents may once have contained c.3,600 signs in total.²³ They are usually understood to contain 61 different syllabograms (but see section 4 below),²⁴ and also feature regular word division by means of a small vertical stroke as well as some deliberate ‘puncts’ (deeply incised circular marks). Although the tablets have frequently been suggested to display a ‘cuneiformised’ ductus showing potential influence from the Near East, Palaima has convincingly argued that the appearance of the signs is due only to the nature and method of

¹⁹ However, the new Cypro-Minoan inscribed tablets from Pyla-Kokkinokremos, when they are published (by Kanta and Perna), may prove to be among the longest surviving inscriptions.

²⁰ On the join, see Michaelidou-Nicolaou 1980.

²¹ On the objects and their inscriptions, see O. Masson 1957 p22-3, É. Masson 1970a-b and 1978, *HoChyMin* ##207-9, Ferrara 2012/13 vol. 2 ##207-9.

²² However, see Ferrara 2012/13 vol. 1 p254 on the possible appearance of a sign otherwise attested only in the tablets appearing in her ##240, a pottery sherd from Maroni-Vournes dated to LCIIIC.

²³ Olivier 2013 p11, 13-14. Duhoux (2013 p31) estimates the number of legible syllabograms as 1,369, based on a personal count of the securely identified signs as given in *HoChyMin*. Palaima (1989 p157) estimates ‘some 1310 signs’. The exact number depends on the degree to which each individual sign is considered to have been identified with certainty, hence some variation in counts and estimates.

²⁴ See the table at *HoChyMin* p415.

inscription, not to any deliberate attempt to make them appear similar to cuneiform signs.²⁵ The tablets themselves, however, are not dissimilar to types used in the Near East, including the archives at Ugarit, where further Cypro-Minoan inscriptions (including some tablets) have also been found.

The fourth inscription under consideration is a clay cylinder also from Enkomi, probably originating from Quartier 4E and dated possibly to LCIIA-B (between the late 15th and the end of the 14th century BC).²⁶ Although cylindrical in shape, it was not intended to be rolled out in a soft medium in the manner of a cylinder seal, but rather the inscription is to be read on the cylinder by rotating it. Measuring only 13cm in length, its inscribed signs are very small, although considerable care has clearly gone into distinguishing individual syllabograms. This is the longest surviving inscription that is usually ascribed to the ‘CM1’ group of texts.

The surface of the cylinder is damaged in places, but most of the signs in its 27 lines of text are legible: out of a total of 203 syllabograms, only 8 are too damaged to read. As in the tablets, the cylinder seems to feature regular word division usually by means of a vertical stroke, but some words are probably separated by a sign different from the usual divider (𐀓, labelled “&” by Olivier in *HoChyMin*) that seems to serve a dual function of appearing regularly word-finally and thereby marking the end of words, which may mean it represents an enclitic particle.²⁷ In total, 39 different syllabograms appear in the inscription, or 40 if & represents a syllabogram that also happens to act (sometimes or always?) as an enclitic particle.²⁸ The ductus of the signs is somewhat different to that of the signs in the CM2 tablets, almost certainly due to palaeographic factors.

4. The coherence of CM2

The three clay tablets from Enkomi appear very similar in type, as described above, and for that reason alone we might hypothesise that they belong to the same tradition of

²⁵ Palaima 1989 p155-7.

²⁶ See O. Masson 1968, É. Masson 1971 and 1973, *HoChyMin* ##097, Ferrara 2012/13 vol. 2 ##097. The dating of the object is however difficult to confirm, given the quite vague details given by the excavators: Schaeffer et al. (1968) p267-8.

²⁷ *HoChyMin* p123. É. Masson labelled it as a ‘diviseur en spirale’ (É. Masson 1971), but did not explain adequately why the inscription might employ two types of divider if their function was the same.

²⁸ We may compare Linear B *qe*, which can appear as a regular syllabogram representing /k^we/; in early Greek the syllable /k^we/ also happens to be an enclitic particle “and”.

writing. A close examination of their epigraphy also points towards their coherence as a group, as shown in the lists of attested syllabograms below. Only signs identified with certainty are included in following lists. Signs 008 𐤄 and 091 𐤌 are included in the CM2 repertoire in *HoChyMin* (p415) but are not identified with certainty in any of the inscriptions; we could therefore consider the known repertoire to contain only 59 well identified signs.

The following syllabograms are attested in the three inscriptions:

##207:

001 𐤀, 004 𐤁, 005 𐤂, 006 𐤃, 009 𐤄, 010 𐤅, 011 𐤆, 012 𐤇, 013 𐤈, 017 𐤌, 021 𐤎,
 023 𐤏, 024 𐤐, 025 𐤑, 027 𐤒, 028 𐤓, 029 𐤔, 030 𐤕, 033 𐤖, 035 𐤗, 036 𐤘,
 037 𐤙, 038 𐤚, 044 𐤛, 047 𐤜, 049 𐤝, 051 𐤞, 052 𐤟, 054 𐤠, 056 𐤡, 059 𐤢,
 , 060 𐤣, 061 𐤤, 062 𐤥, 064 𐤦, 066 𐤧, 068 𐤨, 069 𐤩, 070 𐤪, 072 𐤫, 074 𐤬,
 075 𐤭, 076 𐤮, 078 𐤯, 079 𐤰, 080 𐤱, 081 𐤲, 082 𐤳, 087 𐤴, 089 𐤵, 090 𐤶,
 092 𐤷, 095 𐤸, 096 𐤹, 097 𐤺, 102 𐤻, 104 𐤼, 107 𐤽, 110 𐤾

Total: 59 signs (i.e. all certainly attested CM2 syllabograms)

##208:

004 𐤁, 005 𐤂, 006 𐤃, 009 𐤄, 010 𐤅, 011 𐤆, 012 𐤇, 013 𐤈, 017 𐤌, 021 𐤎, 023 𐤏,
 , 024 𐤐, 025 𐤑, 027 𐤒, 028 𐤓, 029 𐤔, 030 𐤕, 033 𐤖, 035 𐤗, 037 𐤙, 038 𐤚,
 044 𐤛, 047 𐤜, 049 𐤝, 051 𐤞, 052 𐤟, 054 𐤠, 056 𐤡, 059 𐤢, 060 𐤣, 061 𐤤,
 062 𐤥, 064 𐤦, 068 𐤨, 069 𐤩, 070 𐤪, 072 𐤫, 074 𐤬, 075 𐤭, 076 𐤮, 078 𐤯,
 079 𐤰, 080 𐤱, 082 𐤳, 087 𐤴, 089 𐤵, 090 𐤶, 095 𐤸, 096 𐤹, 097 𐤺, 102 𐤻,
 104 𐤼, 107 𐤽, 110 𐤾

Total: 54 signs (i.e. all CM2 syllabograms except 001, 036, 066, 081, 092)

##209:

004 𐀀, 005 𐀁, 006 𐀂, 009 𐀃, 012 𐀄, 013 𐀅, 017 𐀆, 021 𐀇, 023 𐀈, 024 𐀉, 025
 𐀊, 027 𐀋, 028 𐀌, 029 𐀍, 030 𐀎, 033 𐀏, 035 𐀐, 037 𐀑, 038 𐀒, 044 𐀓, 047
 𐀔, 049 𐀕, 051 𐀖, 054 𐀗, 056 𐀘, 059 𐀙, 060 𐀚, 061 𐀛, 062 𐀜, 064 𐀝, 068
 𐀞, 069 𐀟, 070 𐀠, 075 𐀡, 076 𐀢, 078 𐀣, 079 𐀤, 080 𐀥, 082 𐀦, 087 𐀧, 089
 𐀨, 090 𐀩, 092 𐀪, 095 𐀫, 096 𐀬, 097 𐀭, 102 𐀮, 104 𐀯, 107 𐀰, 110 𐀱

Total: 50 signs (i.e. all CM2 syllabograms except 001, 010, 011, 036, 052, 066, 072, 074, 081)

The number of attested different signs in each inscription is affected by its state of preservation and depends on the number of signs surviving: in ##207, the tablet with the most surviving signs, all 59 syllabograms of the known CM2 signary are attested; in ##208, a well preserved tablet but smaller and with broken edges, all but 5 syllabograms of the known signary are attested; and in ##209, the most damaged of the inscriptions, all but 9 syllabograms of the known signary are attested. We may also note that the slightly shorter inscriptions ##208 and ##209 do not contain any syllabogram that is not attested in the longer ##207. Taken all together, there is considerable consistency in the set of syllabograms attested in the three tablets. Out of the total of 59 different attested syllabograms, there are 49 that are attested with certainty in all three inscriptions. The fact that ##208 and ##209 do not have any syllabograms that are not also attested in ##207 in itself points towards ##207 containing most or all of the syllabograms of the script in which the three texts are written.

5. The completeness of attested CM2

The assumed completeness or near completeness of the attested CM2 signary is crucial to our attempt to distinguish between potential different scripts represented in Cypriote Minoan inscriptions. The epigraphic coherence of the small CM2 corpus may be taken as one factor suggesting that we have in the surviving documents most or all of the syllabograms of the script in which they are written (see the previous section). The length of the tablets also points towards the same conclusion.

A Cypriot inscription of the first millennium, the Cypriot Syllabic fifth-century BC Idalion Bronze (*ICS 217*), has been used as a test case for determining whether an inscription of a given length is likely to contain most or all of the syllabograms of the syllabic script in which it is written. The inscription has 1,023 signs in total (not counting word dividers and numerals), and contains 51 different syllabograms.²⁹ It is written in the ‘Common’ Cypriot Syllabary, a script that we know from hundreds of surviving inscriptions to have contained probably 55 signs, although a small number of those are late additions to and/or rare members of the signary.³⁰ The four signs lacking from the Idalion Bronze are *mo*, *mu*, *jo* and *xa*, but of these the last two, *jo* and *xa* are rare, late and optional additions to the signary and we should not necessarily expect them to be used in this fifth-century tablet.³¹ We may therefore say that the inscription lacks only two signs out of a signary of 53 syllabograms.

Both Olivier and Duhoux have used a count of signs in the Idalion Bronze as a way of confirming that, given an inscription or set of inscriptions of sufficient length, we can assume that most or all syllabograms of its script will be attested in it.³² Since the three surviving CM2 tablets from Enkomi have considerable epigraphic coherence and have at least 1,300 surviving legible signs (see section 3 above on estimates of the number), we may assume that the majority of the syllabograms of the script in which they were written are attested in those surviving legible sections. This paper proceeds on the assumption that the preceding statement is valid. The assumed validity of the statement is crucial for the following assessment of the signs of the Enkomi cylinder ##097 and the question of whether it is written in the same script as the tablets or a different one.

6. The signs attested in the Enkomi cylinder ##097

²⁹ Personal count.

³⁰ See Olivier 2008 p619 for a table of signs.

³¹ See Olivier 2008 p607. The sign *jo* represents a glide rather than a Cypriot Greek phoneme (consider spellings in the inscription such as *e-ta-li-o-ne* “Idalion” with the glide not represented in writing), and *xa* a combination of sounds (/ks/) that can be written in a different way (though note the use of the sign *xε* in this inscription). We may also note that *mu* is a relatively uncommon sign in Greek Cypriot Syllabic inscriptions.

³² Olivier 2008 p607 and 2013 p11, Duhoux 2013 p28 n.6. Duhoux also specifically uses the formula devised by Mackay for determining the number of signs in a script based on the size of the surviving sample (Mackay 1965), which estimates that the Idalion Bronze was composed using a script of 54 signs (very close to the actual number) and that the CM2 tablets were composed using a script of 64 signs: see Duhoux 2013 p28 n.6 (noting his comments on the tendency of the Mackay formula to underestimate the size of larger syllabaries, as tested on Linear B) and p31.

The epigraphic coherence of the inscription on the Enkomi cylinder ##097 is not in doubt, given that it is a single inscription. It contains 203 syllabograms in total, of which 195 are legible. If we count & ʃ' as a syllabogram, then 40 different syllabograms appear in the inscription, listed below.

##097:

& ʃ', 004 𐀀, 005 𐀁, 006 𐀂, 007 𐀃, 008 𐀄,³³ 009 𐀅, 011 𐀆, 012 𐀇, 019 𐀈, 021 𐀉,
 023 𐀊, 024 𐀋, 025 𐀌, 026 𐀍, 027 𐀎, 035 𐀏, 037 𐀐, 038 𐀑, 039 𐀒, 041 𐀓,
 044 𐀔, 046 𐀕, 050 𐀖, 053 𐀗, 069 𐀘, 070 𐀙, 073 𐀚, 075 𐀛, 082 𐀜, 087 𐀝,
 088 𐀞, 096 𐀟, 097 𐀠, 099 𐀡, 101 𐀢, 103 𐀣, 104 𐀤, 107 𐀥, 110 𐀦

Total: 40 signs

Because the inscription is relatively short (compared with the CM2 tablets) at only 195 legible syllabograms, we cannot assume in this case that all or nearly all syllabograms of the script in which it is written are present. Indeed, we might expect that a considerable number are lacking, though without being able to quantify such an assumption.

7. Comparing the tablets and the cylinder

The Enkomi tablets (##207, ##208, ##209) contain 59 different syllabograms and the Enkomi cylinder (##097) contains 40 different syllabograms. In order to attempt to ascertain

³³ I count four examples of sign 008 𐀄, in a form where the vertical stroke just extends above the upper horizontal, making the sign potentially confusable with 006; however, since all examples of 006 in this inscription have the two horizontals considerably lower down, these four signs cannot be examples of 006. Olivier marks them as examples of 013 rather than 008 (*HoChyMin* ##097), but I have not followed his identifications because of the lack of the usual characteristic feature of 013 𐀄 here, namely the separation between the two horizontals, with the vertical meeting only the lower horizontal. Valério 2013 analyses the distribution of the shapes 𐀄, 𐀄, 𐀄 and 𐀄 in Cypro-Minoan inscriptions and argues for some potential confusion between the *to* and *na* signs and resulting efforts to distinguish them in new ways (i.e. other than by the presence or absence of a gap between the upper and lower horizontal stroke). Whether these four signs in ##097 should be identified as 008 or as 013 does not change the statistics: they are either one or the other.

whether they are written in the same script or not, we must assess the epigraphic overlap between the tablets and the cylinder. Counts of the number of signs attested in both are given below.

Signs attested both in the tablets and in the cylinder: 004, 005, 006, 009, 011, 012, 021, 023, 024, 025, 027, 035, 037, 038, 044, 069, 070, 075, 082, 087, 096, 097, 104, 107, 110 (total 25³⁴)

Signs attested in the cylinder that are not attested in the tablets: &, 007, 008, 019, 026, 039, 041, 046, 050, 053, 073, 088, 099, 101, 103 (total 15³⁵)

It is the second of the two lists of signs above that is the significant one. The number of signs shared by the tablets and the cylinder tells us very little, except that they are written in related scripts if not in the same script. However, if we assume the CM2 signary as attested in the surviving tablets to be complete or nearly complete, then the second statistic looks odd: the relatively short inscription on the cylinder (only 195 legible syllabograms in total) contains 15 (or at least 13, see n. 35) syllabograms that do not appear in any of the much longer tablets (more than 1,300 syllabograms in total): i.e. 37.5% (or 33.33%) of the syllabograms in the cylinder are ones that do not appear in the tablets.³⁶ This is clearly incongruous: it would surely be extremely unlikely that a much shorter inscription should contain such a high number of signs missing by chance from much longer inscriptions written in the same script (the number of legible signs in the cylinder, 195, is just 15% of the approximate number of legible signs in the tablets, 1,300).

Provided that we are correct to assume that the CM2 clay tablets attest most syllabograms of the script in which they are written, only one conclusion is possible: the cylinder is written in a different script.

³⁴ If 013 is attested in the cylinder (see above), the number would be raised to 26.

³⁵ This assumes that & is a syllabogram and that the four examples of 008 in the cylinder are identified correctly. If & is not a syllabogram, then we could omit it from the statistics, bringing the number down to 14. If the examples assumed to be 008 are in fact 013, then since this sign does appear in the tablets, it would bring the number down to 13.

³⁶ The same method is employed in Steele 2013 p30-5.

8. Appendix: Are the signs identified correctly?

It is worth considering whether and how we can be certain that we have identified the signs correctly. For example, are we sure that the different signs are different from each other, or could some be palaeographic variants of the same sign? Given the agenda set by scholars seeking to reach a better understanding of contextual and palaeographic factors affecting Cypro-Minoan inscriptions, it is important to ask this question (see above, section 1).

When working with an undeciphered script attested in a relatively small number of inscriptions, it is difficult to be certain of the size and composition of the overall signary. Even for Linear A, attested in more than 1,500 inscriptions, there are still debates as to the number of signs in its repertoire and what may be missing from attested inscriptions;³⁷ it is only quite recently, for example, that a sign comparable to Linear B *nwa* has been found (although it could already be guessed that it must have existed in Linear A because its Linear B value is not very useful for writing the Greek language and so it was unlikely to have been created for Linear B).³⁸ A number of scholars have sought to reconstruct a Cypro-Minoan signary (or signaries in the plural, following É. Masson's research),³⁹ each creating a slightly different reconstruction and making different assumptions about how different signs are distinguished from each other.⁴⁰

The above counts of syllabograms attested in the Enkomi tablets and cylinder (sections 4 and 6) follow Olivier's numbering in *HoChyMin*. In general, the signs in each inscription are distinguished with sufficient care that we can assume there was a deliberate attempt on the part of the author to distinguish between them, which in turn suggests that they are different signs with different phonetic values. On the basis of ability to distinguish between the signs, the only ones that might be consistently confusable are 089  and 090 

³⁷ E.g. Duhoux 1978 p119 suggests that the number of known Linear A syllabograms may be somewhat short of the total number.

³⁸ Predicted in *Docs*¹ p40; see Olivier 2013 p8.

³⁹ In particular Daniel 1941, Meriggi 1972, É. Masson 1972 and 1974, Olivier in *HoChyMin*, Ferrara 2012/13 vol. 1.

⁴⁰ On the general issues, see Steele 2013 p23-30.

(both of which occur only in the tablets),⁴¹ and it is occasionally difficult to tell the difference between these two: the only difference between them is in the upper right portion of the sign, and so is always drawn very small. However, in tablet ##208 especially (whose side A has the best-preserved signs of all the tablets) there appears to have been a deliberate attempt to distinguish between them.

Ferrara's palaeographic reanalysis of Cypro-Minoan syllabograms has the potential to change our statistics significantly, and must also be addressed. She uses a study of sign shapes, alongside a survey of the frequency of signs in different positions in words, to reduce the overall size of the Cypro-Minoan signary to 74 signs as presented in her table giving a 'tentative standardized sign repertoire'; as she stresses, this is intended as 'a concise and readily consultable visual aid to the signary, rather than professing the last, definitive word on the matter'.⁴² A full critique of the methods employed is beyond the scope of this paper, and it will suffice to say that Ferrara's analysis gives careful consideration to previous scholarship and typological comparanda, assessing the script type thoroughly before proceeding to assess individual signs and potential variants.⁴³ In general, it is very difficult to confirm or refute her conclusions while the Cypro-Minoan inscriptions remain undeciphered, because only a partial or complete decipherment will allow any definitive statements to be made about the overall repertoire of signs. The comments below are confined to the assessment of those syllabograms that appear in our data sample (the Enkomi tablets and cylinder) and so would affect the statistics and conclusions presented here. The following relevant signs are deleted by Ferrara (all page references are to Ferrara 2012/13 vol. 1):

Sign 010  (tablets only): Deleted as an *épine* variant of sign 009  (p246, 248).

Sign 026  (cylinder only): Deleted as a non-*épine* variant of sign 041 , which is considered to have an *épine* (p246).

Sign 029  (tablets only): Deleted (not discussed).

⁴¹ Ferrara deletes both 089 and 090 from her table of signs (2012/13 vol. 1 p255) on the assumption that 089  is a palaeographic variant of 088  (for the reasoning, which is based on a wider reassessment of signs, see p242-3 and p250).

⁴² Ferrara 2012/13 vol. 1, quotation p254, table of signs p255. The number of signs can be compared with the 96 given in *HoChyMin* (p413). Ferrara's and Olivier's tables represent separate and independent refinements of É. Masson's presentation of Cypro-Minoan signaries.

⁴³ Ferrara 2012/13 vol.1 chapter 5 (p214-63).

- Sign 039  (cylinder only): Deleted. Reason for deletion not discussed, but ‘the very low visibility of this sign’ is mentioned (p238).
- Sign 041  (cylinder only): Deleted as a sign that occurs in only one inscription (the clay cylinder ##097) (‘If a sign is relegated to one inscription, albeit a long and continuous one, does a twice-occurring character constitute a legitimate allograph?’ p238.) However, this sign also appears on a pottery sherd ##123,⁴⁴ and there are further occurrences of what is probably a palaeographic variant of the same sign in the clay balls, including the recent find from Tiryns, ##244 (a similar arrangement of lines but drawn in smaller strokes: ). In fact, the sequence on the Tiryns clay ball 041-041-097 is also found on the cylinder ##097.⁴⁵
- Sign 052  (tablets only): Deleted because assumed to be a palaeographic variant of sign 53 , on the basis that 051  (usually ascribed to CM2 and CM3 but not CM1) could be a variant of 050  (usually ascribed to CM1 and CM3). The suggestion is made ‘very hypothetically’ (p239).
- Sign 054  (tablets only): Deleted as an *épine* variant of sign 035  (p240, 246).
- Sign 060  (tablets only): Deleted as a variant of sign 059  with an extra horizontal line at the bottom (p241, 249). However, on p241 the discussion of the addition of the extra line as ‘conforming to given graphical rules upon which variations are imparted, which does not nevertheless mean that the two signs are identical’ could be taken as an argument against conflating signs 059 and 060.
- Sign 062  (tablets only): Deleted (not discussed).
- Sign 066  (tablets only): Deleted as hapax *épine* variant of sign 064  (p240, 246, 250).

⁴⁴ The drawing of the sherd ##123 in Ferrara 2012/13 vol. 2 does not represent the stroke at the top of this sign (its *épine*), but this is clearly visible in the photograph on the same page (p171).

⁴⁵ See Vettors 2011/12.

Sign 074  (tablets only): Deleted as a variant of 069  with an extra horizontal line and curved sides (p241). However, sign 072  is also discussed in this light and yet is not deleted.

Sign 089  (tablets only): Deleted because assumed to be a palaeographic variant of sign 088  (p242-3, 250).

Sign 090  (tablets only): Deleted. Reason for deletion not given, but discussed alongside signs 089 and 088 (p242-3, 250).

Sign 101  (cylinder only): Deleted (not discussed).

All of the above deletions could be questioned on varying grounds. It is difficult to comment on the signs that are not discussed in Ferrara's analysis, except to say that signs 029  and 062  seem to be well distinguished from other signs in the tablets, sign 039  (found in the cylinder but not in the tablets) does not appear graphically close to any other sign (and 'low visibility' does not seem a safe reason to discard it in such a limited and fragmented corpus of inscriptions), and sign 101  in the cylinder appears different from the usual shape of sign 102  (if indeed this was deleted on the assumption that it is a palaeographic variant of 102, on the basis that the otherwise frequent sign 102 does not otherwise appear in the cylinder). The deletion of 074 seems strange given that signs 069 , 072  and 074  all appear in the tablets and appear to be carefully disambiguated: why assume that the extra internal horizontal line in 072 creates a new sign, but the curved sides and omission of the top horizontal line in 074 do not? The deletion of signs 052  and 089  relies on hypotheses that are very difficult to test because of the relatively small pool of data available in studying Cypro-Minoan. Attempting to eliminate possible palaeographic variants in this way is certainly a valid exercise, but again any attempt to confirm or refute proposed deletions falls foul of the very small amount of surviving epigraphic evidence.

Several of the signs deleted above are discussed by Ferrara in relation to the phenomenon of the *épine*, a small slanted stroke usually at the top right of a sign whose possible significance had been highlighted by É. Masson.⁴⁶ Although Ferrara does not state

⁴⁶ É. Masson 1985 p153.

specifically that *épine* variation is one of the motivations behind deletions in her sign table (p255), most of the *épine* variants she identifies are absent: only 012  (seen as a possible variant of 011 , see p246) and 070  (seen as a variant of 069 , see p246) remain as separate entities among her 74 signs. Signs 010 , 054  and 066  are absent from her table; since all three of these are attested only in the Enkomi tablets, this neatly does away with three signs that would be CM2-only and so conforms notionally with a view of Cypro-Minoan as a single script. Both sign 026  and sign 041  are also absent, even though the latter is seen as an *épine* variant of the former, which means that neither the base sign nor the *épine* variant is represented in the table (see p238, 246, 255).

We do not know the function of the *épine*. Does it modify the value of the sign, functioning as a sort of diacritical mark (perhaps indicating phonetic modification of the basic value of the sign)? Does it serve to distinguish between two signs that would otherwise appear similar? Is it a scribal flourish that does not alter the value of the sign? The last of these seems very unlikely given the apparent care taken in distinguishing the *épine* and the presense of similar-looking signs with and without the *épine* in the same inscriptions. It cannot be a reflex of palaeographic variation and its presence or absence is not affected by inscription type, material or ductus. The other two hypotheses are very difficult to prove or disprove for an undeciphered script, and especially one where we have so little opportunity to observe the behaviour of the signs (in particular, there are very few recurring sign sequences where we might be able to observe meaningful alternations⁴⁷).

Ferrara attempts to show that *épine* signs tend to appear in the same or similar positions as their *épine*-free counterparts, although on an admittedly very limited basis of material (of those discussed, only signs 069 and 070 display significant consistency in appearing frequently in word-final position; see p247-51). Without being able to observe something of the morphological structure of any underlying language, we might furthermore question why and whether frequency in word-final position is significant in an attempt to distinguish signs. Ferrara's conclusion is that 'the presence of the *épine* does not seem to control or induce a drastic phonetic change of the base-sign' (p251). This is then used as a basis for sign deletion: 'This can imply that most of the couplets may be justifiably assimilated, since the contextual analysis of their frequencies in the word-sequences shows that the *épine*-signs regularly conform to the behaviour of the base-sign' (p251). However,

⁴⁷ See Steele 2013 p62-71.

such a conclusion is highly hypothetical and based on very scanty evidence. Indeed, one might very well conclude the opposite: if it is correct to assume that the *épine* does not modify the phonetic value of a sign, then it may only serve as a common structural element and form one way of distinguishing between different signs. If this were the case, then signs with and without *épines* might have entirely different values and so should be retained as separate elements in the reconstructed script repertoire. If 012  has an *épine* and 011  is the related ‘base sign’, then the reading of the *Opheltau* inscription (##170) where 012=*u* and 011=*pe* (sign values obviously unrelated to each other) would confirm such an assumption.⁴⁸ As Ferrara admits (p251), ‘there is no incontrovertible and definite proof that would enable us to dissect the difference between a sign with *épine* and its basic *épine*-free counterpart’.

A further case in point is Ferrara’s deletion of sign 060  on the basis that it could be a variant of sign 059  with a separate horizontal line at the bottom (p241, 249; this is suggested despite the fact that ‘their frequencies are hardly comparable’ p241). She also suggests in a footnote to her sign table that sign 067  ‘is likely to correspond’ to sign 064  (p255 n.110), again presumably on the basis of the extra line at the bottom, even though both are included as separate entries. A consideration of the later Cypriot Syllabary used during the first millennium reveals some pairs of signs with and without an extra horizontal line at the bottom: *pi*  and *o*  (cf. also *so* ); *ri*  and *ni* ; *ti*  and *ka* . None of these appears to originate in the modification of the value of a sign, and it seems much more likely that a stroke at the bottom of a sign was simply one way of making one sign look distinct from another. The Cypriot Syllabary also preserves what looks like an old Cypro-Minoan *épine* variant in *la* . Evidently the development of the Cypriot Syllabary must have involved the creation of new signs as well as developments of old ones,⁴⁹ and it is difficult to comment on the possible extent of sign reallocations during the process. Nevertheless, some of the Cypriot Syllabic signs give the impression of preserving some of the graphic strategies by which Cypro-Minoan signs might have been formally distinguished from one another.

It seems to me dangerous to delete *épine* ‘variants’, given that we have so little evidence for the function of the *épine*: by doing so we might lose valuable data. If further

⁴⁸ On the reading of the *Opheltau* inscription, see Steele 2013 p90-7.

⁴⁹ The sign *tu*  stands out as an innovation that is obviously modelled on the pre-existing *to* . See Steele 2013 p51 on signs whose shapes and values appear relatively stable across Linear A, Linear B, Cypro-Minoan and the Cypriot Syllabary (based on the known values in Linear B and the Cypriot Syllabary).

Cypro-Minoan inscriptions are discovered and the basis of evidence expands significantly, then we may be able to refine our view and some of Ferrara's suggestions for deletion could indeed prove to be valid. However, in the current state of the evidence and for the purposes of a survey such as the one given in this paper, it seems safest to adhere to Olivier's numbering of signs in *HoChyMin*, itself a revision of É. Masson's signaries with attention to the possibility of palaeographic variation.⁵⁰

⁵⁰ It is worth considering what difference it would make to the numbers given in section 7 above if we were to apply Ferrara's deletions to the sign repertoires of the inscriptions under consideration:

The total number of different signs in the cylinder would change very little: 026 and 041 would be conflated into one sign and 101 would be recategorised as 102; we cannot delete 039 because it is there in the cylinder and is not obviously to be conflated with any other sign. The total number of different signs in the cylinder would then be 39.

The total number of signs in the tablets would also change by only a small degree: 010 would be conflated with 011, 052 would be recategorised as 053, 054 would be conflated with 035, 059 would be conflated with 060, 066 would be conflated with 064, 074 would be conflated with 072 and 089 would be recategorised as 088. The signs 029, 062 and 090 cannot obviously be conflated with any other signs and so must be counted. The total number of different signs in the tablets would then be 54.

The signs attested in the cylinder that do not appear in the tablets would be the following: &, 007, 008, 019, 026/041 (now as one sign rather than two), 046, 050, 073, 099, 103 (total 10 – or 8 if we discount & and recategorise the cylinder's examples of 008 as 013). If the repertoire of signs of the script in which the long tablets are written is assumed to be nearly complete (now with a total of 54), this would mean that the much shorter cylinder contains 10 signs (or 8 signs) that do not occur in the tablets. This still a significant proportion (10 signs out of 39 would be 25.64% or just over a quarter of the signs of cylinder's signs; if a quarter of the cylinder's signs do not appear in the assumed near-complete signary of the much longer tablets, this again points to the conclusion that the cylinder is written in a different script).

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