Early Greek alphabetic writing

A linguistic approach

Edited by
Natalia Elvira Astoreca

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A mis padres, Izaskun y Luis,

Por hacer de mí un espíritu libre.

A la memoria de Engracia Segura.

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Abbreviations

AEph	*Ἀρχαιολογικὴ ἐφημερίς: περιοδικὸν τῆς ἐν Ἀθήναις Ἀρχαιολογικῆς Ἑταιρείας*
Arena IV	= Arena 1994
Ath. Ag.	= Lang 1976
BCH	*Bulletin de Correspondence Héllenique*
CL	Compensatory Lengthening
CEG	= Hansen 1983
Daphnephoros	= Kenzelmann Pfyffer, Theurillat and Verdan 2005.
EG	= Guarducci 1995
ET	= Rix *et al.* 2014
Hymettos	= Langdon 1976
IC	*Inscriptiones Creticae*
IG	*Inscriptiones Graecae*
IvO	= Dittenberger and Purgold 1896
Kalapodi	= Palme-Koufa 1996
Kommos	= Csapo, Johnston and Geagan 2000
Lefkandi	= Jeffery 1980
LGPN	= Fraser *et al.* 1987–2014
LSAG	= Jeffery and Johnston 1990
Methone	= Besios, Tzifopoulos and Kotsonas 2012
ML	*Matres Lectionis*
NEM	Northeast Mediterranean
NWS	Northwest Semitic
Smyrna	= Jeffery 1964
VC	Vowel contraction
WD	Word divider

Chapter 1

The advent of alphabetic writing in Greece

The emergence of the 'Greek alphabet' is still today one of the main mysteries faced by those interested in the history of Greek writing. Puzzled scholars have made of it a prolific research field and many have approached the topic with the idea that this 'Greek miracle' was one of the greatest advancements in Western culture, seeing it as a writing system superior to those created earlier in the East and one that would allow the development of critical thought.[1] Claiming the supremacy of alphabets above other writing systems is in itself a dangerous and deeply flawed belief, but is there any truth in the fact that the Greek alphabet was the first alphabet in world history?

To answer that question, we should analyse the evidence with two other questions in mind: what is the Greek alphabet? And how is it different from previous writing systems? We often assume that the answer to the first question is the script that goes from A to Ω used to represent the Greek language. However, the earliest epigraphical evidence shows a graphic diversity that seems to clash with this idea. Around the 8th century BC, inscribed objects with an alphabetic system for the Greek language start to appear almost simultaneously in several populations around the Aegean and in the Hellenic colonies in the Italic peninsula and Sicily. This happened long after the syllabic Linear B system, employed by the Mycenaean administrations, had fallen out of use with the collapse of those kingdoms. No other written evidence in the Greek language has been found that could be dated during the four centuries between the disappearance of Linear B and the emergence of alphabetic Greek. After this 'silent' period, we see a discontinuity in the writing practices, not just in the change from a syllabic into a new alphabetic system, but also in the fact that, while the former has a more standardised form across sites with minor palaeographic differences,[2] the latter shows unmistakable and numerous regional varieties already in its earliest stages.

Scholars often call these local alphabets 'epichoric' to show their strongly territorial nature; each of them is deeply rooted in a specific polis and is an element

[1] See the discussion in Boyes and Steele 2019, 8–13.
[2] Cf. Salgarella 2020.

in the identity of its citizens.[3] All epichoric alphabets have characteristic traits which differentiate them from their neighbours, ranging from specific uses of a given grapheme to the creation of unique letters not seen in other alphabets. In *LSAG*, the most important reference work in this field, Jeffery identifies at least 32 varieties.[4] Much earlier, Kirchhoff categorised the local alphabets into big groups represented by four different colours on a map (Figure 1.1):

- Green alphabets do not have the supplemental letters Φ X Ψ or the Phoenician Ξ *i.e.* these do not have a grapheme for the aspirated /p^h/ and /k^h/ or the clusters /ps/ and /ks/.
- Dark blue alphabets have <ɸ> for /p^h/,<Χ> for /k^h/, <Ŧ> for /ks/, <Ψ> for /ps/.
- Light blue alphabets have <ɸ> for /p^h/,<Χ> for /k^h/, but used digraphs for /ks/ and /ps/.
- Red alphabets have <ɸ> for /p^h/, <Ŧ> for /k^h/, <Χ> for /ks/, but a digraph for /ps/.[5]

Although the similarities across Greek alphabets and with other neighbouring writing systems such as Phrygian and the Northwest Semitic scripts are evident, it is still unknown how the epichoric alphabets came to be. In fact, this is one of the main issues that scholars face when considering the origins of 'the Greek alphabet'. While the focus of mainstream scholarship has been for many decades on the reconstruction of the invention of an alphabetic system for the Greek language, as if this were a historical event rather than a process, there is still work to be done in accounting for the alphabetic diversity seen across Greek-speaking communities already in its earliest attested stages: the 8th and 7th centuries BC.

I would argue that this tendency needs to be corrected, since it clearly clashes with the nature of the epigraphical evidence. If there is no such thing as a unitary Greek alphabet, but a variety of alphabets, how can we answer the questions about its origin and characteristics? Perhaps the only way might be by asking about each and every alphabet found in Greece. Treating the local alphabets as the subject of research on early Greek alphabetic writing, instead of secondary elements, might take us closer to a better understanding of what writing meant to these communities during the advent of alphabetic literacy.

It is still not clear where, when or how Hellenes came into contact with some sort of West Semitic script and adapted it to write their own dialects and, most importantly, which innovations are purely Greek and not borrowed from other neighbouring writing systems. Approaches to these topics have been attempted from different disciplines using various methodologies, each with its own research questions, but none has given definitive answers that help elucidate how these alphabets emerged. The following sections will explore the most frequently pursued themes and the

[3] Luraghi 2010; Forthcoming.
[4] Cf. 'Table of letters' in the appendix to Jeffery and Johnston 1990.
[5] Kirchhoff 1826.

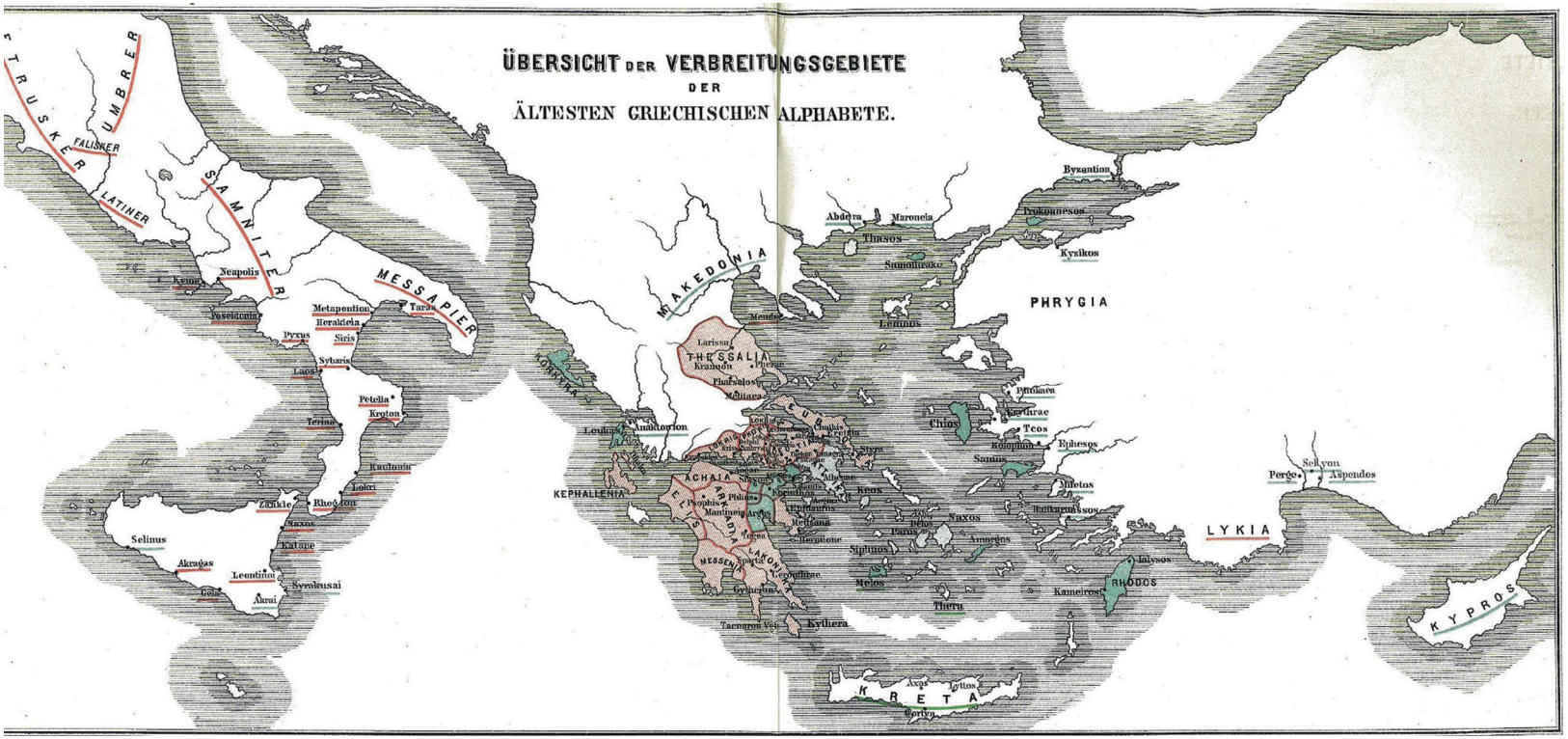

Figure 1.1: Coloured map from Kirchhoff 1826.

different proposals that have been put forward, assessing their validity and contrasting them with the new tendencies seen in the field from which the research on ancient Greek and Mediterranean alphabetic writing can still grow.[6]

1.1 Place

One recurrent question is the geographic location where Semitic writing was first adapted for the Greek language. The evidence concerning this issue is quite ambiguous, if not completely opaque. It has been argued that a process of adoption must have happened in a region where contact between the literate and illiterate peoples was constant.[7] This idea of a bilingual community as the point where the transmission took place was already mentioned by Herodotus, who states that the Gephyraeans settled in Boeotia – *i.e.* Kadmos' descendants – were the first to use the *Phoenician letters* in Greece:

> οἱ δὲ Φοίνικες οὗτοι οἱ σὺν Κάδμῳ ἀπικόμενοι, τῶν ἦσαν οἱ Γεφυραῖοι, ἄλλα τε πολλὰ οἰκίσαντες ταύτην τὴν χώρην ἐσήγαγον διδασκάλια ἐς τοὺς Ἕλληνας καὶ δὴ καὶ γράμματα, οὐκ ἐόντα πρὶν Ἕλλησι ὡς ἐμοὶ δοκέειν, πρῶτα μὲν τοῖσι καὶ ἅπαντες χρέωνται Φοίνικες· μετὰ δὲ χρόνου προβαίνοντος ἅμα τῇ φωνῇ μετέβαλλον καὶ τὸν ῥυθμὸν τῶν γραμμάτων. περιοίκεον δέ σφεας τὰ πολλὰ τῶν χώρων τοῦτον τὸν χρόνον Ἑλλήνων Ἴωνες· οἳ παραλαβόντες διδαχῇ παρὰ τῶν Φοινίκων τὰ γράμματα, μεταρρυθμίσαντές σφεων ὀλίγα ἐχρέωντο, χρεώμενοι δὲ ἐφάτισαν, ὥσπερ καὶ τὸ δίκαιον ἔφερε ἐσαγαγόντων Φοινίκων ἐς τὴν Ἑλλάδα, Φοινικήια κεκλῆσθαι. (Hdt.5.58.1–2)

> The Phoenicians who came to Greece with Cadmus, among whom were the Gephyraei, ended up living in this land [Boeotia] and introducing the Greeks to a number of accomplishments, most notably the alphabet, which, as far as I can tell, the Greeks did not have before then. At first the letters they used were the same as those of all Phoenicians everywhere, but as time went by, along with the sound, they changed the way they wrote the letters as well. At this time most of their Greek neighbours were Ionians. So it was the Ionians who learnt the alphabet from the Phoenicians; they changed the shapes of a few of the letters, but they still called the alphabet they used the Phoenician alphabet, which was only right, since it was the Phoenicians who had introduced it into Greece.[8]

Unfortunately, there is no epigraphical evidence to corroborate this and ancient accounts do not suggest another location.[9] Therefore, scholars have tried to find a settlement inhabited by a Semitic-Greek bilingual community.[10]

---

[6] For other recent states of the question see Bourgignon 2010b and Bourogiannis 2018. Although quite old, Heubeck (1979, 73–109) and McCarter's (1975, 1–27) bibliographic reviews are still relevant for early discussions on the topic.

[7] Carpenter 1945, 456; Jeffery and Johnston 1990, 6 f.; Mazarakis Ainian 2000, 127; Teodorsson 2006, 170.

[8] Ed. Wilson 2015a; trans. Waterfield 1998.

[9] For a collection of ancient accounts about the origin of the Greek alphabet see especially Schneider 2004. Also Jeffery 1967; Ruijgh 1997, 556; Ghinatti 2004a, 27–9. Specifically about Herodotus' account see Carratelli 1976; Heubeck 1979, 105–109; Garbini 1996; Nenci 1998; Mavrojannis 2007.

[10] So far there is no archaeological evidence of any bilingual settlement in Geometric Greece (Bourogiannis 2015, 161).

Al-Mina, a Greek trading post in the Syrian coast, has been put forward as a probable site where the adaptation could have happened.[11] In contrast, Guarducci claimed that this argument is flawed since this settlement was not created until the mid-8th century BC,[12] which is quite a late date considering the earliest epigraphical samples in alphabetic Greek. Moreover, based on the complete absence of Phoenician inscriptions in the site, she believes that there is no real evidence of a bilingual community there.[13]

Another proposal sees Cyprus as the place where the contact between Greek speakers and Phoenician writing, present in the island from the 9th century BC,[14] could have contributed to the creation of the Greek alphabet. The main problem with this suggestion is that Cypriots, who already had syllabic scripts, do not use an alphabetic system for the Greek language inside or outside the island until the 6th century BC.[15] However, this fact has not stopped scholars from arguing for a Cypriot intervention in the process of adapting Phoenician writing, independently of the place where this might have happened.[16]

In a recent article, Mavrojiannis brought Herodotus' account back into the discussion.[17] He tried to give credit to the ancient historian by adopting a multidisciplinary approach bringing together archaeological and historical data with linguistic arguments and a close reading of Hdt.5.57–61. Mavrojiannis locates the Gephyraeans in Boeotia following Hdt.5.57.1:

> οἱ δὲ Γεφυραῖοι, τῶν ἦσαν οἱ φονέες οἱ Ἱππάρχου, ὡς μὲν αὐτοὶ λέγουσι, ἐγεγόνεσαν ἐξ Ἐρετρίης τὴν ἀρχήν, ὡς δὲ ἐγὼ ἀναπυνθανόμενος εὑρίσκω, ἦσαν Φοίνικες τῶν σὺν Κάδμῳ ἀπικομένων Φοινίκων ἐς γῆν τὴν νῦν Βοιωτίην καλεομένην, οἴκεον δὲ τῆς χώρης ταύτης ἀπολαχόντες τὴν Ταναγρικὴν μοῖραν.
>
> The Gephyraei – the family to which Hipparchus' assassins belonged – came originally, according to their account, from Eretria. However, my own researches have led me to conclude that they were Phoenicians, and were among the Phoenicians who accompanied Cadmus to the region now known as Boeotia, where they lived in Tanagra, the district allotted to them.[18]

Yet, using historical and archaeological evidence, he locates the Gephyraeans in Eretria as well as in Boeotia and even attributes the construction of the famous

[11] Cook and Woodhead 1959, 178; Young 1969, 256; Heubeck 1979, 85; Jeffery and Johnston 1990, 11 f.; Powell 1991b, 16 f.
[12] Guarducci 1978, 382. Although there is a possibility that the settlement existed before this date, there are no archaeological finds to corroborate this. Cf. Woolley 1948.
[13] Against Al-Mina as possible place of the transmission see also Burzachechi 1976, 91; Niesiołowski-Spanò 2007, 56; Papadopoulos 2016, 1249.
[14] Steele 2019b, 71–75. Some of the supporters of the Cypriot theory are Johnston 1983; Burkert 2004; Bourgignon 2010a; Papadopoulos 2017.
[15] Steele 2019b, 220.
[16] See §1.3.
[17] Mavrojannis 2007.
[18] Ed. Wilson 2015a; trans. Waterfield 1998.

Protogeometric heroon in Lefkandi's Toumba cemetery to this Phoenician population, arguing that this may be Palamedes' burial. In this way he connects the birth of the alphabet both with Euboea – an area more widely accepted as the origin of the Greek alphabet – and with another hero linked with the introduction of writing in Greece by the ancient sources.[19] Nevertheless, Mavrojiannis' theory lacks sufficient archaeological evidence to argue for a Phoenician settlement in the region and he himself recognises that this might be seen as quite a romantic idea.[20]

Euboeans are one of the most popular suggestions as the original Greek adaptors of alphabetic writing.[21] The fact that many early inscriptions were found on Euboean soil or in its colonies make it a solid proposal, especially for those who see the archaeological record as absolute evidence.[22] More scholars have adhered to this claim in recent years due to the retrieval of many early inscriptions in the temple of Apollo Daphnephoros in Eretria and in the colony of Methone in Pieria.[23] Archaeology also supports a Euboean origin, for their colonies and traces of their trade can be followed across the Eastern Mediterranean. It is especially in the Northern Aegean where Phoenician and Euboean trade would cross paths,[24] producing a favourable social context for the transfer of writing and its rapid spread throughout the Aegean and the Italic peninsula.

These arguments, however, have not convinced all scholars, among them Janko, who is ready to accept that Euboea might be the second stop of the transmission, but prefers to think that the Cretan alphabet came earlier.[25] Supporters of Crete as the place of transmission tend to explain this on the basis of the 'archaising' characteristics of its script.[26] Their main argument is the absence of supplemental letters, for it would be more difficult to argue that the Cretans took another Greek script and decided to ignore the additions to the Phoenician one.[27] It is true that of all Greek scripts, the Cretan would appear to have the fewest additions compared with Northwest Semitic writing. However, this could easily be explained as a *fossilisation* of the script in Crete, not necessarily with an earlier date for the appearance of alphabetic writing in the island.[28] Slings excludes the possibility of Crete being the

[19] Eur. Pal. fr.578, Hyg. Fab. 277, Plin. Nat. 7.56.
[20] 'However, these arguments cannot be conclusive, on the contrary they may appear as fanciful conjectures or wild speculations to any hypercritical or "anti-romantic" scholar' (Mavrojannis 2007, 312).
[21] Powell 1991a, 12–18; Marek 1993; Ruijgh 1997, 556; Mazarakis Ainian 2000, 129.
[22] This idea is expanded below in §1.2 and relevant references can be found there.
[23] Papadopoulos 2016. For the recent epigraphical discoveries in these areas see also Kenzelmann Pfyffer *et al.* 2005; Besios Tzifopoulos and Kotsonas 2012; Marchand 2014.
[24] Papadopoulos 2016, 1251.
[25] Janko 2017, 140–147, 159 f.
[26] Segert 1963; Guarducci 1978; Duhoux 1981; de Hoz 1983; Naveh 1988; 1997; Oikonomaki 2012; Janko 2015; 2017.
[27] Powell (1991a, 62 f.) does argue, with difficulty, that each area kept or discarded some of the supplemental letters.
[28] Johnston 1983, 68.

original place of Greek alphabetic writing on linguistic grounds, arguing that, since Cretans had an affricate /t͡s/, for which Phoenician ṣade would have been an obvious match, they would have applied such a value to san instead of using zeta for the affricate and san for /s/. So, he believes that a region where the dialect lacks /t͡s/, like Euboea, is a more plausible option.[29] Similarly, Papadopoulos also argues against Crete and in favour of Euboea and the northern Aegean given the recent epigraphical finds in the latter area.[30]

All the approaches mentioned above are problematic in one way or another, partly because of the evidence that we count on, as Sass has already pointed out:

> The fact that at least four different locations for the adoption could be defended so eruditely and with such excellent arguments [...] indicates that the evidence presented thus far is perhaps less forthcoming than one would wish.[31]

It seems clear that the current evidence is fragmentary and makes this pursuit fruitless. However, most of these theories have also shown that the treatment given to the question is probably not the right one to find answers. The 'origin of the Greek alphabet' is often treated as if it were a discovery or an invention, rather than the complex historical process that it most probably was. Many of these interpretations on the place of origin simplify the issue into a linear development that involves the following steps:

1. A Semitic writing system is introduced to Greece.
2. A specific region decides to adapt this system to write the Greek language and creates a *Uralphabet*, *i.e.* a model alphabet.
3. This *Uralphabet* spreads around the Greek world, where each area modifies it in a unique way.

Therefore, if we identify which of the Greek alphabets was – or was closer to – the *Uralphabet*, we could establish where the Greek alphabet was created.

This approach already rules out two possibilities that will be discussed further below: explanations other than the monogenesis of these alphabets, and the mediation of intermediaries in this process.[32] Moreover, it relies on a basic methodological issue that, in my opinion, has flawed research deeply: the conception of the Greek alphabet as a unity with several variations, instead of acknowledging the so-called 'epichoric scripts' as alphabets in their own right. I believe that the way to move forward is by exploring each alphabet individually and trying to identify their characteristic reforms and influences to and from neighbouring scripts without extrapolating to

[29] Slings 1998, 651.
[30] Papadopoulos 2016, 1251, although probably with the intervention of people literate in Cypriot syllabic writing (Papadopoulos 2017, 101).
[31] Sass 2005, 149.
[32] See §1.2 and §1.3 respectively.

all Greek alphabets. This is the approach that inspires this book and that will be followed throughout.

1.2 Date

For many scholars the chronology is the most important question concerning the arrival of alphabetic writing to Greece, and it is also possibly the most contested. Dates have been proposed ranging from the 14th to the 8th century BC.[33] As with the question of the place of origin, the available evidence is not helpful in this respect. Nonetheless, this is a controversy that has divided academics working on the topic.

One of the basic issues is whether to follow an *argumentum ex silentio* or not. Some researchers have relied on the epigraphic evidence to set a date and believe that the Semitic to Greek transmission could not have happened long before the earliest samples of Greek alphabetic writing appear. The problem that these scholars face is that their proposals have been proven wrong by later epigraphic discoveries: a transmission during the 8th century,[34] for example, cannot be accepted after the finds of inscriptions dated through archaeological context in the first half of that century;[35] not to mention the new chronology of the earliest palaeo-Phrygian inscriptions from Gordion, now dated in the 9th century,[36] and the appearance of an isolated alphabetic inscription in Osteria dell'Osa (Lazio) ca. 775.[37] The writing in these inscriptions is closely related to the Greek alphabets; therefore, these cast more doubts on the late chronologies for all these scripts. This shows how archaeological evidence cannot be a valid argument in the date of the transmission, but merely a *terminus ante quem* that keeps moving backwards. Nevertheless, scholars still tend to relocate the chronology of the transmission based on the latest archaeological finds instead of abandoning the argument altogether.[38]

Those who reject the *argumentum ex silentio* have another pressing argument in their favour: if we look at other writing traditions, not related to alphabetic Greek, it is not uncommon to find long periods in which writing is not visible in the archaeological record, after which it is usual to see a continuity in the writing system that shows

[33] For a visual summary of the dates proposed and their supporters see Heubeck 1979, 75 f. For more recent states of the question see Bourgignon 2010b; Bourogiannis 2018.

[34] Second half: Carpenter 1933, 1938. Mid-8th century: Johnston 1983, 66; Jeffery and Johnston 1990, 21. First half: Heubeck 1979, 149; Powell 1991a, 20; Slings 1998; Sass 2005, 146.

[35] See *e.g.* Lefkandi 102, Daphnephoros 66.25, 66.26 and 75.64.

[36] Following the new dates, there is one inscription dated before the end of the 9th century and it is clear that alphabetic writing is already well established in the early 8th century. Cf. Brixhe 2004; van Dongen 2013, 49. The new dates were published in Manning *et al.* 2001; 2003; DeVries *et al.* 2003; against the veracity of these dates see Keenan 2004.

[37] This is the traditional dating (cf. Ridgway 1996), but some would argue that it could be raised to ca. 825 following recent radiocarbon dates (Janko 2017, 149, following Nijboer *et al.* 1999).

[38] Nowadays archaeologists prefer dates ca. 800 or the 9th century BC: Amadasi Guzzo 2000, 238; Burkert 2004, 18; Sass 2005, 146; Voutyras 2007, 268; 2012, 87; Lemaire 2008, 52; Powell 2009, 240; Bourgignon 2010a, 8; Bourogiannis 2015, 167; Papadopoulos 2017, 98; Węcowski 2017, 327.

that writing was not abandoned altogether but has simply disappeared from the surviving record and cannot be traced. This is the case of the Cypro-Minoan syllabic scripts of the 2nd millennium that are clearly the model for the Cypriot syllabaries of the 1st millennium.[39] Similarly, Semitic writing also experienced a gap between proto-Canaanite to Hebrew and from Nabatean to Arabic.[40] Some authors suggest that such a 'silent' period in the archaeological record would have taken place in the early stages of alphabetic Greek as well. That is the case of Ghinatti,[41] who proposes a coexistence of alphabetic Greek and Linear B, since, he argues, the Phoenician expansion began in the 12th century BC and the Homeric poems would have been written down around the 9th or 8th century BC. However, without further support from other sources, these dates are placed subjectively and, what is more, they are too late to argue for that coexistence since the last surviving documents in Linear B are dated to the 13th century BC.

Nonetheless, it is evident that an explosion of visible writing in the Mediterranean happened around the 9th–8th century BC, even for those cultures that had a silent period.[42] This means that, since the archaeological record does not offer an absolute date, but merely a *terminus ante quem*, then we have to find alternative ways to reconstruct the chronology of early alphabetic writing in Greece. Other methodologies, however, have not produced a widely accepted outcome either. Among them the most popular has been the palaeographic analysis of letter shapes in Greek and West Semitic inscriptions. Nevertheless, by comparing the dates of inscriptions that bear similar letter shapes, some have argued for a date in the 8th or late 9th century BC,[43] while others have proposed on the same grounds dates as high as the 12th century BC.[44]

This palaeographic method has, therefore, shown to be unsuccessful,[45] for different scholars have argued for unrelated dates while studying the same material. This is due to the highly subjective nature of this methodology and the questionable dating of West Semitic inscriptions.[46] These dates are still debated and most of them rely on palaeographic arguments rather than archaeological, thus building a circular argument. The problems do not stop here, since these scholars can only rely on attested shapes, which probably offer a fragmented picture.[47] Moreover, most of the scholars using palaeographic arguments do not take into account the complex reality

[39] Steele 2019b, 76–83.
[40] Naveh 1988, 86; 1991, 150.
[41] Ghinatti 2004a.
[42] Waal 2018, 107 ff.
[43] Carpenter 1933, 10–15; 1938, 66; Amadasi Guzzo 1991, 304; Swiggers 1996, 268; Krebernik 2007; Papadopoulos 2016, 1245.
[44] Or even earlier according to Ullman 1934, 380. Also supporting the 12th-century transmission is Naveh 1973; 1997, 185, and following him Konishi 1993.
[45] On the problems of the palaeographic method cf. Luria 1967, 135 f.; Wachter 1989, 22; Waal 2018, 89–92.
[46] See the discussion in Sass 2005, 14 ff.
[47] Ruijgh 1997, 552f.

of the epichoric alphabets in the Greek territories,[48] falling again into the trap of 'the Greek alphabet' as a unitary entity.

In order to base the higher dates on more stable ground, Naveh started to compare other elements in the writing practices (*i.e.* writing directions, word dividers, etc.) of Semitic and Greek peoples. He concluded that the Greek boustrophedic style could only have been learned from proto-Canaanite, since Phoenician is only written dextroverse.[49] Marek, on the other hand, argues that the evidence for boustrophedic writing in proto-Canaanite is dubious[50] and a possible solution is proposed by Sass, who believes that this practice could have been introduced from the Hittite hieroglyphic writing through Phrygian.[51] Waal has adopted Naveh's methodology concerning the comparison of writing practices and suggests that the same word dividers can be seen in proto-Canaanite and Greek, thus the high date could still be maintained.[52] Although it is true that some similar solutions can be seen in both systems, I believe that we should treat this kind of statement with caution. The reality is that the Greek picture is very complex, for not all scripts used dividers. Moreover, in those alphabets that have them, their use is not systematic, and they come in different shapes, which shows that these could have been developed independently.

Other attempts to date the transmission have been based on linguistic arguments. Even though linguists claim that these are more objective than palaeography, they have not been successful either. The debate arose with a series of articles and responses led by Ruijgh and Slings, who based their arguments on phonological changes in Phoenician and Greek and their written representation. Ruijgh points towards a date around 1000 BC[53] with the following arguments, as summarised by Slings:

> a. The Greek reflexes of the Phoenician letter tsadē show that this letter was taken over from Phoenician at the time when Greek still possessed the consonant cluster /ts/, both at the beginning and in the middle of the word. At any rate at the beginning of the word, this cluster had disappeared from most dialects before 800;
> b. The choice for the Phoenician letter ḥet, rather than hē, to render Greek /h/, shows that the latter was still a strong /h/, whereas one of the earliest Greek inscriptions proves that it was a weak /h/.[54]

According to Slings, san and sampi, the two possible descendants of ṣade, show that the date should be closer to 800 BC. On the one hand, san does not render /ts/ clusters and therefore cannot be used to argue for an early date. On the other, he

[48] The most notable exceptions to this are Jeffery and Johnston 1990; Guarducci 1995.
[49] Naveh 1991, 148.
[50] Marek (1993, 31) argues that boustrophedic writing in proto-Canaanite is only attested in one dubious inscription.
[51] Sass 2005, 147 n.242.
[52] Waal 2018, 95 f.; cf. also 2019.
[53] Ruijgh 1997, 1998.
[54] Slings 1998, 642.

states that sampi does not originate in Phoenician, but was added later to represent a second more recent wave of /ts/ clusters, rather than the 'older ts' that had already disappeared by the time of the earliest inscriptions. As for the use of a letter derived from Phoenician ḥeth <𐤇> to render /h/, Slings argues that it would be the natural choice since the softer laryngeal he <𐤄> was a better option for /e/.

The debate, however, was left open due to the lack of agreement concerning the validity of the specific arguments and the different interpretations of the data. Only recently new voices have been included in the discussion, mainly to criticise Ruijgh's position.[55] In any case, the dates offered by both parts of the argument should be taken cautiously, for phonological processes can only offer a relative chronology, especially when these are happening during a 'silent' period. Therefore, the linguistic methodology cannot solve the question either.

Finally, there are those who prefer to give a plausible date to Herodotus' account of Kadmos' introduction of the alphabet. Harland suggested that this would have happened in the 9th century,[56] while Mavrojiannis opts for an earlier date, around the 11th or 10th century.[57] Other researchers base the date of the transmission of the alphabet in relationship with the Homeric poems. Thus Teodorsson argues that, if Homer wrote down his epics around the first half of the 8th century,[58] then the alphabet must have been created around 50 years earlier.[59] All of these dates based on literature seem to be assigned quite arbitrarily, even though they respect the *terminus ante quem* set by the epigraphical evidence.

The issue goes further; it is not only about the date when this happened, but also how fast the process was. The most popular theory claims that the creation of the alphabet took place in one point in time and in a specific place.[60] The scholars who follow this approach stress that the similarities in the local alphabets cannot be explained by close contacts only and so they necessarily had to share a common model, or *Uralphabet*, created at some point and later transformed to produce the local scripts.[61] Although this paradigm might account for the shared characteristics, it does not solve the issue of the differences seen in these alphabets, such as the choice of sigma-san and crooked vs. straight iota or idiosyncratic shapes like Corinthian beta 𐌡 or Sicyonian epsilon 𐌇.

Another problematic matter that palaeographers struggle with particularly is that some Greek letters seem to be based on early Semitic forms, while others seem

[55] Teodorsson 2006, 171; Janko 2017, 145.
[56] Harland 1945; also Garbini 1996, 44.
[57] Mavrojannis 2007, 300.
[58] Following the date proposed by Powell 1991a, 20.
[59] Teodorsson 2006, 170.
[60] Jeffery and Johnston 1990, 6; Millard 1991, 113; Powell 1991a, 10–12; 1991b, 359; 2009, 231, 240; Guarducci 1995, 67 f.; Swiggers 1996, 268; Ghinatti 2004a, 29; Sass 2005, 150 f.; Krebernik 2007, 121; Luraghi 2010, 72; Oikonomaki 2012, 96; Wachter Forthcoming.
[61] On script reforms see Wachter 1989; 2006; Forthcoming.

closer to recent ones. This has led academics to propose other models of transmission, such as a long period of experimentation before Greek writing became independent from Semitic.[62] In this case, we should be looking for two different dates: that of the introduction of Semitic writing in Greece and that of the 'independence' of Greek writing.[63] On the other hand, Bernal prefers to see a transmission in waves with several adaptations of Semitic letters overtime.[64] These two models are not incompatible and we could also think of a long experimentation or gestation period during which multiple waves of transmission could have happened.[65]

To sum up, the current evidence does not allow us to reach an agreement on the date of creation of the 'Greek alphabet'. Once again, this is not only a matter of lack of evidence, but is also caused by the methodological flaws mentioned earlier: the simplification of a historical process into a mere event and the conception of the Greek alphabets as a unity. Although scholars who propose a long period of formation or several waves of transmission may be closer to understanding the complexity of the development and spread of a writing system in Antiquity, they are still trying to find a solution for the 'Greek alphabet' and 'its variants'. As mentioned earlier, that progress cannot be made while we think of the epichoric alphabets as part of an entity – the 'Greek alphabet' – that did not exist at the time.

1.3 Model

The script taken as a model for the creation of the Greek alphabet is probably the least debated question of all. This is because Herodotus' famous passage shows that Greeks were aware, even in ancient times, that the origin of their alphabet lays in the Phoenician script.[66] Still, this information should be treated with caution. We should not forget that this account is conflated with mythological figures, such as the hero Kadmos, and that the term 'Phoenicians' used by the historian might encompass other populations of the Levant as well, *e.g.* the Aramaeans.[67] In fact, both Phoenician and Aramaic scripts could have been used as a model; as descendants of proto-Canaanite writing, they were graphically very similar – mostly distinguishable through dialectal features – around the time of the alphabetic explosion in the Eastern Mediterranean. For this reason, scholars have tried to find other methods to try and elucidate which script was used as a model by the Greeks, and whether there were any intermediaries in the process.

[62] McCarter 1974, 68; 1975, 121; Waal 2018, 98.
[63] For McCarter (1975, 121) this would be ca. 800 BC.
[64] Bernal 1987; 1990, 89; Luraghi Forthcoming.
[65] Konishi 1993, 104.
[66] This happens generally in all literary traditions on the subject, cf. Ghinatti 2004a, 27; Schneider 2004.
[67] The term 'Phoenicians' is a later Greek construct and we do not know what they called themselves. Cf. Garbini 1996, 45; Burkert 2004, 18; Powell 2006, 28; 2009, 230; Krebernik 2007, 124. According to Carratelli 1976, 8, Herodotus' 'Phoenicians' seem to come from Tyre and Sidon. About this issue and the unsuitability of the term 'Phoenician script' see Lehmann 2019, esp. 72–84.

One of the main differences between Phoenician and Aramaic writing is the use of *matres lectionis* (henceforth ML). In specific contexts, Aramaic would employ signs that normally render consonants to represent long vowels, whereas in Phoenician the use of ML is almost non-existent.[68] The similarity in shape and values of Aramaic ML and the Greek vowel letters has been brought forward as a supporting argument for the influence of the former on the latter.[69] Nevertheless, others believe that a Phoenician model is still possible and that the signs used for the vowels in Greek could be explained by the 'closeness' of the sounds of Phoenician gutturals with the Greek vowels.[70]

Another methodology used to identify the Semitic model-script is the comparison of letter names. Most agree that the Greek denominations point towards a Phoenician origin,[71] although it has also been argued that they have Aramaic elements.[72] However, this is not a reliable approach. At least in the case of the Greek letters, we have reason to believe that the names we know for them today might not have been the ones that they used in the earliest stages.[73] As for the Phoenician names, we should not forget that they were reconstructed from the Hebrew tradition in Christian times.[74] Thus, this methodology should be abandoned, as we are not certain that the names assigned traditionally to these letters were the ones used at the time of transmission.

Further terminology related to writing practices has also been scrutinised and seems to suggest a Phoenician origin: Herodotus himself explains that this is the reason why the letters are called 'Φοινικήια γράμματα'; in Crete φοινικαστάς was the term used for 'scribe' and φοινικάζειν was his main activity,[75] whereas in other islands a scribe was referred to as φοινικόγραφος.[76] Such terminology, attested from the 5th century BC, clearly stresses the fact that the prototype they used was Phoenician.[77]

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[68] Naveh 1997, 62; Röllig 1998, 363. ML in Phoenician is only seen in the transcription of foreign names (Krahmalkov 2001, 16 f.; Willi 2005, 167; Luraghi Forthcoming).

[69] Segert 1963, 52; Garbini 1996, 45; Amadasi Guzzo 2000, 239; Woodard 2019.

[70] Jeffery and Johnston 1990, 22; Thomas 1992, 55; Brixhe 2007a, 284; Oikonomaki 2012, 94.

[71] Einarson 1967, 1–4; Marek 1993, 57; Naveh 1997, 183; Ruijgh 1997, 557 ff.; Tropper 2000; 318 f.; Krebernik 2007, 146; Lemaire 2008, 52; Willi 2008, 414.

[72] Garbini 1996, 45 interpreted that the final -a in the names of the letters is the Aramaic article. Against this Segert 1963, 52; Bernal 1990, 125 f.; Naveh 1997, 183 and also cf. the previous footnote.

[73] Names changed according to dialect and also through time, cf. Wachter 1991, 51–53; Willi 2008, 402–405.

[74] Willi 2008, 406 f.

[75] The traditional transcriptions <ποινικαστάς> and <ποινικάζειν> mimic the lack of graphic distinction between /p/ and /p^{h}/ in the Cretan alphabet, a matter that shall be explored later in §5.8.1. For these terms and their relationship with the scribal domain see Jeffery and Morpurgo Davies 1970; Edwards and Edwards 1977.

[76] *IG* XII.2 96, 97.

[77] Some scholars have interpreted this insistence on the Phoenician origin of their alphabet as evidence that they were aware of other writing systems (Teodorsson 2006, 169; Voutyras 2007, 268; 2012, 87 f., following Klaffenbach 1957, 32). On the other hand, Bourogiannis 2018, 236 prefers to think that the Phoenician is the only script with which Greeks were familiarised. Other terms do account for an Eastern origin, but not necessarily Phoenician, that is the case of the name δέλτος for the writing tablet or βύβλος for papyrus scrolls. Cf. Masson 1967; Thomas 1992, 57; Marek 1993, 36; Burkert 2004, 20. A

Yet again, the problem remains: who are these 'Phoenicians'? Could this term include Aramaeans as well? Since the writing practices of both peoples are so similar – except for a more consistent use of ML by Aramaeans – perhaps it is not such an important task to identify whether it was one, the other or both that served as models for Greek writing. Given the ambiguity, it is probably best to refer to this model as Northwest Semitic (henceforth NWS) writing.

Palaeographers have also tried to pin down what style of NWS writing Greeks could have taken as model for their alphabets. Some scholars advocate a cursive model – which would match with a transmission through trade (see §1.4 below) – whereas others see more parallels in the lapidary style.[78] Once more, some letters seem to support the former side of the discussion, while others are evidence for the latter. However, given the constraints of the palaeographic method, there seems to be no answer for this debate at present.

Although the NWS model is usually taken for granted, we must not rule out the possibility of intermediaries in the transmission. One of the most popular theories is that of the mediation of Cypriot scribes in the conception of the Greek alphabetic system. Woodard, who argues for this thesis on linguistic grounds, has become a strong voice in this side of the discussion.[79] One of his main arguments is based on the use of a single grapheme for the representation of consonant clusters, such as <𐠎> or <𐠋> for /ks/. According to him, this shows that the 'adapter(s)' must have known of the existence of signs for /ksa/ and /kse/ in the Cypriot syllabaries and, therefore, independently of the place of adaptation, they must have been literate in this writing system. Nevertheless, this and other of Woodard's arguments are easily countered through internal processes in specific Greek alphabets, for we must bear in mind that not all of them follow the same solutions for every sound.[80] Furthermore, the fact that this incomplete series does not have correspondence in Cypro-Minoan writing, and that these signs only appear later, seem to indicate that it was probably the Greek alphabets that influenced Cypriot writing in the creation of these signs and not the other way around.[81] Nonetheless, if it were true that scribes literate in Cypriot syllabic writing were involved in the process, a further question remains unanswered: why would they create a new alphabetic writing system instead of just spreading the Cypriot syllabic – already used to notate Greek – across Greek-speaking territories?

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thorough discussion of these and other terms related to writing can be found in Heubeck 1979, 153–159.

[78] For a cursive model: Johnstone 1978; Bourogiannis 2015, 168; 2018, 241. Cursive Aramaic was proposed by Segert 1963, 49 f. Lapidary style is supported by Naveh 1973, 6; Signes Codoñer 2010, 289.

[79] Woodard 1997; 2000; 2019; Forthcoming. This idea is followed by Casabonne and Egetmeyer in Borgia *et al.* 2002, 179–181 and by Papadopoulos 2017, 101. On the other side, not against Cyprus as a place, but against the Cypriots as creators of the Greek alphabet, is Teodorsson 2006, 172.

[80] Cf. §5.9.

[81] Personal communication from Philippa M. Steele. For further linguistic arguments brought forward by Woodard see his works referenced in n. 79 above.

The Phrygians have been included recently into the equation, after the new radiocarbon and dendrochronology dates of the inscriptions from Gordion revealed that they are earlier than the first Greek alphabetic texts.[82] This data opens a new possibility, that Phrygian could be the model-script for the Greek alphabet and not the opposite way, as was often considered.[83] The Phrygian vowels, which are very similar to those used in some of the Greek epichoric alphabets, play an important role in this debate. In this regard, Papadopoulos suggests that the vowels for Greek and Phrygian were adapted at the same time.[84] Problems, however, arise when considering the consonants, for Phrygian does not use zeta, theta, san or qoppa, all of them present in Greek writing and derived from Semitic prototypes. Thus, it seems very unlikely that Phrygian could have been the model for the Greek alphabets.[85] Instead, it was either derived from Greek,[86] or both scripts were created in close collaboration.[87]

Those linguistic arguments should be analysed more carefully in the context of the Greek epichoric alphabets. While they might be true for specific scripts – *e.g.* those that use straight iota and sigma but not san, like Phrygian – they are problematic when trying to make these linguistic comparisons taking the Greek epichoric alphabets as a unity. This debate should instead follow a new direction by taking into account which alphabets are closer to Phrygian and assessing how they influenced each other. Afterwards, we might consider whether that influence is found or not in other Greek alphabets. In the same way, we could evaluate influences from other writing systems in different epichoric alphabets, for it would not be strange to think that each Greek-speaking area would experience influences from different sources. This would help us reassess under a different light – one that acknowledges the individuality of each epichoric script – whether these and other marginal theories, like the Eteocretan[88] or Philistine[89] mediation, can be understood in the framework of the epichoric studies.

1.4 Earliest use

Among the many questions raised by scholars concerning the coming of the alphabet to Greece we find that of the reason why Greeks needed or wanted to adapt an alphabetic

[82] See n. 36 above.
[83] In fact, some scholars want to see an inland route for the spread of alphabetic writing that would connect the Levant with the Eastern Aegean through Cilicia and Phrygia in Anatolia (Borgia *et al.* 2002; van Dongen 2013), with the addition of Cypriot intervention in the case of Casabonne and Egetmeyer (Borgia *et al.* 2002, 179). For other academics supporting the inland route see Bourogiannis 2015, 161, n.14.
[84] Papadopoulos 2016, 1239; 2017, 101.
[85] This was proposed by Borgia *et al.* 2002, 179–181.
[86] Duhoux 2010, 113; Janko 2017, 153; Woodard Forthcoming.
[87] Brixhe 2004, 284, contra Brixhe 1995. Krebernik 2007, 116 f. is undecided. For literary and archaeological sources for the Phrygian-Greek contact see Papadopoulos 2017, 102 f.
[88] Duhoux 1981.
[89] Niesiołowski-Spanò 2007.

writing system. The debate grew when Powell suggested in several publications,[90] following Wade Gery's theory,[91] that it was the desire of writing down epic poetry that led them to create a fully alphabetic system with vowels. Very few have followed their view,[92] and most scholars have criticised the idea that the writing of poetry might have been the initial use of alphabetic Greek.[93] Although Powell reaches his conclusion through an analysis of inscriptions, it is very obvious that he considers only those that support his point and omits or diminishes the importance of those that do not serve his purposes. This is what happens in the case of most ownership inscriptions, which he encompasses under the category of 'short inscriptions' and suggests that because of their brevity they cannot be used in this kind of analysis. He also omits from his account some long prose texts, like the fragments of legal inscriptions from Dreros. Furthermore, he even rejects that perishable materials could have been employed for other types of texts, even though there is plenty of evidence supporting this:[94] ancient accounts report that the laws of Draco and Solon were written on wood;[95] the terms for perishable writing tools, like the wax tablet (δέλτος), come directly from the Semitic influence;[96] it is often assumed that parchment was already used by Phoenicians from at least the 9th century BC;[97] and Herodotus mentions that Ionians had been using 'skins' as a writing support 'since ancient times'.[98]

The most popular counter-thesis is that the primary functions of writing were practical, such as trade transactions, administrative texts or personal documents. Its use for literature would come later.[99] This thesis is supported mainly by historical arguments, for we know that trade was an activity shared by Semitic and Greek peoples, especially in those settlements where contact between them has been demonstrated in the archaeological record.[100] This means, however, that we have to admit the existence of writing on perishable materials for these purposes, for there is no clear evidence of trading documents until the 6th century BC.[101]

Another interesting suggestion, although without many followers, is that the contact of Greek populations with Semitic writing happened in sanctuaries.[102] This is a plausible interpretation considering that the Phoenician and Aramaic inscriptions

[90] Powell 1988; 1989; 1991a; 1991b; 2006.
[91] Wade-Gery 1952.
[92] Konishi 1993; Krebernik 2007.
[93] Ruijgh 1997; Wachter 2006, 39; Oikonomaki 2012, 94; Elvira Astoreca 2021.
[94] Cf. Heubeck 1979, 153–159. The matter of the vowels, which is his other big argument, will also be discussed and rejected in Chapter 4.
[95] Stroud 1979.
[96] Masson 1967.
[97] Teodorsson 2006, 182.
[98] Hdt.5.58.3.
[99] Ruijgh 1997, 537; 1998, 661; Teodorsson 2006, 170–174; Bourgignon 2010b, 8.
[100] Ruijgh 1998, 660; Ghinatti 2004a, 33; Oikonomaki 2012, 95.
[101] Burkert 2004, 20.
[102] Willi 2005.

that have been found in Greek contexts all come from such settings.[103] A similar proposal was put forth by Bourogiannis,[104] who highlighted the importance of sanctuaries in the transmission of writing as centres of contact between different communities – and even peoples of different ethnicity. In support, he argues that the uses we see in the earliest inscriptions, such as writing names, ownership statements and dedications, are in close connection with the religious and trading activities happening in these enclosures.[105] Although Willi's and Bourogiannis' interpretations seem quite reasonable, they assume that the documents that they analysed to reach this conclusion were actually written with the sole purpose of being deposited in the sanctuary where we find them. However, it is still possible that some of the inscriptions could have been made in a completely different context to serve other purposes and were only dedicated later.

The most recent contextual analysis on archaic Greek epigraphic material is that of Węcowski.[106] Through the study of the texts found in the earliest inscriptions, he suggests that, together with the commercial use, the Greeks developed an innovative application of writing around the symposium and other aristocratic activities.[107] According to him, it is precisely this new use on sympotic objects that makes these samples of writing archaeologically visible, breaking the 'silent' period in the Aegean. Nonetheless, this is the opposite mistake to that of Willi and Bourogiannis; Węcowski is omitting the fact that some of the inscriptions bearing names or ownership statements could have been made in the sanctuary in order to be dedicated, rather than in the symposium. In any case, these theories are not exclusive but complementary, as religious and sympotic activities seem to be recurring contexts where writing is used, so they might both be catalysts of the expansion of visible writing in the Aegean.

Analysing the earliest uses of writing is a way of looking at the socio-cultural structures that allowed the spread of writing in Greece. Some scholars go even further and try to reconstruct what social groups could have been agents in the transmission of Semitic writing in Greece. For Węcowski this was enabled by the control of long-range trade enjoyed by aristocrats.[108] Várhelyi agrees that this international trade would have helped in the development of trademarks first and then other forms of writing. Thus merchants would have been the main actors in the transmission of the alphabet to Greece.[109] Once introduced, potters would have become important agents in the spread of writing throughout Greece, as exemplified by potters' marks.[110] Finally,

[103] For Phoenician and Aramaic inscriptions found in Greek contexts see Amadasi Guzzo 1987; Bourogiannis 2015.
[104] Bourogiannis 2015, 167.
[105] Bourogiannis 2015, 128.
[106] Węcowski 2017.
[107] Although the idea of the sympotic context was mentioned in Thomas 1992, 58, she did not elaborate it further.
[108] Węcowski 2017, 322.
[109] Várhelyi 1996, 33.
[110] Papadopoulos 2017, esp. 96–104.

another social group proposed as the point of contact and transmission of Semitic writing to Greece are soldiers, specifically mercenaries who worked for the Assyrian kings.[111] Within that context, the mixture of NWS peoples, Greeks and Cypriots could have enabled the adoption and adaptation of a NWS script.

The analysis of the archaeological and social contexts of inscriptions is a recent approach that, as shown here, offers helpful insights into the early stages of writing in Greece and could even give us a hint of other possible uses of writing that have not been preserved.[112] This new development is able to emerge thanks to modern editions which tend to give more information concerning the excavation and archaeological context of the inscribed object itself. It also responds to the current trend towards multidisciplinary studies that brings together different methodologies and fields. Such is the nature of the CREWS project: archaeologists, philologists and anthropologists focusing on disparate historical and geographical points are gathered in the project and its events to discuss, among other things, the social context of writing. The popularity of these seminars, conferences and publications suggest that this approach will continue and expand in the near future, resulting in a change in our understanding of ancient writing cultures.[113]

1.5 Other related questions

Apart from the questions concerning the birth of the Greek alphabet, there are other issues that should be considered when approaching the early stages of this writing system. In this respect, a popular topic is the relationship between the introduction of alphabetic writing in Greece and the recording of the Homeric epics, and whether we can date the latter if we have a chronology for the former. Several scholars have engaged in this long-running debate concerning the dates of these two events and how they relate to each other.[114] It is true that the texts of some early inscriptions suggest that the Homeric tradition was already well established in the Greek population. Nonetheless, it is not possible to assess with the current evidence whether it was written or oral at that time, or if there is any connection at all between the date of the first Greek inscriptions and the recording of these poems.

Another important matter is whether one considers that the Greeks, by adopting Semitic writing and including letters for the vowels, created a new type of writing system never used before: the alphabet. Our perception on the accomplishment of Greek alphabetic writing may change depending on how we categorise Semitic writing: if we consider it to be a consonantal alphabet or abjad

[111] Luraghi Forthcoming; Woodard Forthcoming.
[112] As Cornell (1991) suggests for Latin and Etruscan epigraphy.
[113] Cf. Boyes, Steele and Elvira Astoreca, 2021.
[114] Heubeck 1979; Powell 1991b; Konishi 1993; Ruijgh 1997; Walter-Karydi 1998; Cassio 1999; Mazarakis Ainian 2000; Panayotou 2000; Sherratt 2003; Ghinatti 2004a; Teodorsson 2006; Krebernik 2007.

the underlying change from Semitic to Greek is more subtle than if we consider Semitic writing to be syllabic.[115] Scholars supporting the latter case often claim that Greeks invented not just a new kind of writing system, but also a powerful democratising and civilising tool to be spread in the western world.[116] These ideas, however, are deeply biased by Hellenophilia and Eurocentric views. In the coming chapters, I will present two arguments against these assumptions: (1) that we do not have any certainty that the Greeks created the fully vocalic alphabet, (2) that Greek alphabetic writing should not be considered typologically different to Semitic writing.

Other approaches that have emerged in recent decades are concerned with the social context of writing.[117] These scholars have addressed a variety of topics: socio-cultural uses of writing in Greece, population groups that could read and write, the tension between literacy and oral tradition, the aesthetic aspects of writing, and even issues of personhood and agency. These new studies offer a fresh perspective on the epigraphic material originating from Greece. Through interpretations that go beyond the text and include contextual information of these inscriptions or even use disciplines outside of Classics – *e.g.* anthropological theories – they try to reconstruct the socio-cultural environment in which alphabetic writing thrived in Greece.

To expand more on this issue, we could benefit from a thorough analysis of the ancient literary sources. So far scholars have focused on the accounts that mention the origins of the Greek alphabet,[118] but less has been done on the conception of writing by Greek authors, despite having philosophical, literary and linguistic sources that could increase our knowledge in this respect.[119]

1.6 New perspectives

This bibliographic review has shown how the study of early Greek alphabetic writing is still alive as a discipline and that our understanding of the issue can be expanded if we move from the traditional questions into new perspectives, such as those promoted by the CREWS project. Previous scholarship on the origins of

[115] Whether abjads should be considered an alphabetic writing system or their own type of writing system is still debated and will be discussed in Chapter 2. For Semitic writing as a syllabic system see Gelb 1969, 147–153; Swiggers 1984; Powell 2009. Some recent discussions on the topic can be found in: Gnanadesikan 2017; Boyes and Steele 2019, 2 f.

[116] This is the so-called 'literacy thesis' which started with the publications of Goody and Watt 1963 and Havelock 1982. For a more detailed discussion on this theory see Boyes and Steele 2019, 8 f.

[117] Cf. Stoddart and Whitley 1988; Harris 1989; Thomas 1992; 1994; Várhelyi 1996; Whitley 1997; 2021; Binek 2017; Papadopoulos 2017; Pappas 2017; Węcowski 2017; Elvira Astoreca 2021.

[118] Cf. n. 9 above.

[119] An example of a philosophical text about writing Pl.*Phdr*.275a, a dramatic example can be found in A.*Pr*.460–1 (see other sources in Torrance 2010), and linguistic explanations of writing, *e.g.* in D.H.*Comp*.14.1–15.59 and D.T.9.1–17.2.

the Greek alphabet does not seem to have reached any firm conclusion agreed by all academics in the field about any of the aspects concerning the coming of alphabetic writing into Greece: questions such as when, where, how, why or from what model, are still unanswered. One of the biggest methodological problems when approaching the matter is the epigraphical evidence for early Greek alphabetic writing. It is very fragmentary, problematic and, in the case of some inscriptions found during the early 20th century and before, very poorly studied or with questionable criteria.

Nevertheless, recent archaeological campaigns in Geometric and Archaic sites have brought to light new early alphabetic inscriptions which have been published in great detail, *e.g.* the epigraphic material from the sanctuary of Kommos in Crete,[120] the sanctuary of Apollo Daphnephoros in Eretria[121] and the so-called *Ypogeio* in the Euboean colony of Methone in Pieria.[122] The importance of these *corpora* lies not only on the novelty of the inscriptions and their early date, but also on the detailed information regarding the archaeological and material contexts of these inscriptions. This allows us to analyse them from a completely different approach based on writing practices, materiality and context behind the inscriptions. This new methodology offers a new perspective that sees Greek alphabetic writing as a comprehensive phenomenon which brings together more aspects than just a script.

This kind of interdisciplinary analysis would help us to get closer to some of the questions that previous scholarship has failed to address, as is the case of the *argumentum ex silentio*. If we are to reject it, as I have argued above, we have to face the problem of the absence of that evidence during the period of invisible writing, however long this might have been. The reality is that earlier pots from Greek workshops are not inscribed and it is very difficult to argue that this lack of inscriptions is due to chance. In fact, the questions that we should be asking are: what provoked this change? Why did Greeks start writing on pottery and other non-perishable materials? What is the cultural background that allowed this shift in their writing practices? Are they mimicking other neighbouring cultures or are they creating their own practices? The only way we can tackle these questions is through a deeper analysis of the samples of visible writing using new approaches, such as those proposed by the social archaeology of writing, and comparative studies of writing cultures that are connected to Greece in some way.

Another issue that has been pointed out in this bibliographic review is the seemingly contradictory information offered by previous scholarship that could mostly be due to the approach towards Greece as a unified territory with some local variations. The reality, however, seems to be the opposite: different territories closely connected to each other through geographical, linguistic, ethnic and perhaps

[120] Csapo *et al.* 2000.
[121] Kenzelmann Pfyffer *et al.* 2005.
[122] Besios *et al.* 2012; Strauss Clay *et al.* 2017.

identity bonds.[123] Thus, we might want to reconsider to what extent this idea of Greece as a unity is a later construct fed by scholars and modern Greek identities. Nevertheless, as the reader can see, terms such as *Greece* and *Greek* are used in this book, mainly to keep clarity at all times. Here the term 'Greece' will be used to refer to the geographical framework where the Greek language is spoken, while 'Greek' will be employed for those Greek-speaking communities who dwell in it and for their shared – but regionally diverse – language. This includes different populations living in the southern Balkan peninsula, the Peloponnese, islands in the Aegean and Ionian seas, some territories in Asia Minor and *Magna Graecia*.[124] Even though I might use these terms for clarity and cultural reasons, the independence and particularities of these Greek communities will be acknowledged at all times and considered fundamental in order to understand the spread of literacy in this part of the Mediterranean.

In terms of writing at least, there seems to be a close connection between the different Greek-speaking areas, but also a consciousness of their distinctiveness.[125] More importantly, there is a willingness to maintain these distinguishing characteristics, given the considerable number of epichoric alphabets seen from the 8th century and until the Ionic system prevails all over the Greek territory around the 3rd century BC. This makes it difficult for the researcher to find a unique and comprehensive solution for the origin of 'the Greek alphabet', especially since such a thing did not exist in archaic Greece. Instead, we should talk about several alphabets for the Greek language. I believe that the future of the study of early Greek alphabetic writing relies on this epichoric perspective that is clearly lacking in most of the works mentioned so far. It is important to leave behind the idea of a unified Greece and the need that scholars, and particularly philologists, have shown to find the first and single source of 'the Greek alphabet'.

The epichoric approach, which researches the distinguishing characteristics of local alphabets individually, was first applied to writing in Kirchhoff's pioneering work[126] and followed in the invaluable research of Jeffery and Johnston[127] and

[123] Malkin 2003.

[124] The situation of Cyprus within Greece is a highly controversial issue given its high degree of autonomy at the time despite their shared language. In this book, however, since the focus is on alphabetic writing, Cyprus will not be discussed, as the syllabic system used in the island is completely independent from the Greek alphabets and there are no alphabetic inscriptions in Greek clearly produced there during the chronological framework of this study. From the inscriptions in the database used for this survey, only one was found on Cypriot soil (Karageorghis and Masson 1965, 10 no. 1), but its writing and the ware of the supporting vase clearly indicate an Attic origin.

[125] An inscription with two abecedaria, one Corinthian and one Euboean, found in Cumae (*LSAG* 130.2 = *LSAG* 239.2) shows how they are aware of the existence of different scripts for the Greek language and is evidence of a curiosity to compare them, cf. §3.3.4.

[126] Kirchhoff 1826.

[127] Jeffery and Johnston 1990.

Guarducci.[128] The last two are of special importance in any modern study on the archaic Greek alphabets and here they will be crucial points of reference. Nevertheless, I feel that a reassessment of these palaeographic studies is necessary for several reasons. (1) The majority of the inscriptions available when these publications came out belong to the 6th and 5th centuries, when writing is more widespread and the epichoric alphabets seem to have reached a stable form. This makes their results unsuitable for this work, which focuses on the earliest samples of writing in Greece. (2) The new epigraphical evidence retrieved since the publication of these books not only allows such a study, but also gives us the opportunity to expand the evidence that they offered. (3) These palaeographic works are based on a selection of inscriptions, whereas modern digital tools allow us to perform a comprehensive analysis from databases that include all available inscriptions and with the potential of being constantly updated. (4) Their methodology does not go deep enough into the linguistic characteristics of these alphabets and makes their comparison somewhat difficult.

This book intends to be that reassessment of previous scholarship that will revise our knowledge of the earliest stages of the archaic Greek alphabets while looking at the epigraphic evidence from a different point of view. I will not follow the palaeographic approach used in previous studies, but rather apply a new kind of survey based on grapholinguistics and specifically comparative graphematics. This methodological framework will implement the epichoric approach and hope to offer new insights on the study of early Greek alphabetic writing.

[128] Guarducci 1987; 1995.

Chapter 2

A linguistic analysis of the early Greek alphabets

Although the works of Jeffery and Guarducci gave a significant boost to the study of the Greek epichoric alphabets, as mentioned above, their methodology can still be improved. The palaeographic approach followed by them has failed to explain aspects that are vital for the understanding of these local writing traditions. This is because the main categorisation that they use is by letter, analysing and discussing the different possible shapes for each one. Such is the palaeographic method that has prevailed in the study of the epichoric alphabets.[1] However, this methodology comes with serious limitations.

These works often take the *koine* alphabet as the model for their categorisation instead of identifying graphemes and then analysing their allographs. Thus, in Jeffery's analysis, we can see within the same alphabet that epsilon has the variants <𐌴> = ε1 and <𐌹> = ε3, while <𐌹> = ι1, <𐌠> = ι2 both represent iota.[2] In this case, the two different shapes for iota are clearly distinct signs, while those for epsilon may be the product of writing trends or even a choice of the writer but still identifiable as the same letter. Therefore, there is no differentiation between separate graphemes and allographs of a grapheme, and so distinct shapes and various handwritings are treated in the same way, which does not help in establishing the graphematic characteristics of these alphabets.

Another problem lies in the fact that the numbering system is not maintained throughout Jeffery's work, but is reset for each area. For example, α1 in Attica is horizontal <𐌰>, while α1 in Euboea is upright <𐌀>. Moreover, they do not provide a way to account for shapes that are used for different sounds depending on the alphabet, *e.g.* <𐌛> being /g/ in Argos and /l/ in Corinth. This obviously complicates the comparison between several local writing traditions.

Another significant limitation of this methodology is that it has problems representing graphic solutions other than a single grapheme. As an example, we can see how these authors categorise the digraphs used for the aspirates and stop+sibilant

[1] This model can be seen in Immerwahr 1990, xxii–xxiii; Jeffery and Johnston 1990; Guarducci 1995, 132.
[2] These examples are taken from the Attic alphabet as represented by Jeffery and Johnston 1990, 66, fig. 26.

clusters as a kind of shape in the table, when these digraphs specifically show the absence of a dedicated single letter for the clusters within the epichoric alphabet. This is the case of xi and psi, not present in the Attic script, but listed under these letters as <Χ⸗> and <Φ⸗>. Other digraphs, however, are not represented in their accounts, *e.g.* <Ε⸗Ι> and <Ο⸗Υ>, used for /e:/ and /o:/ after the monophthongisation of /ei/ and /ou/. It is not possible to reflect this use within the categorisation devised for their tables because these sounds are not represented with a single letter in the Ionic alphabet, which they use as a model. Not to mention that this method does not record where a sound lacks graphic differentiation within an alphabet, *e.g.* the use of <Ε> for both /e/ and /ɛ:/ in the early stages of many Greek alphabets, or <Ϲ> for /p/ and /p^{h}/ in Cretan.

Failing to convey this information means not identifying deep connections between Greek alphabets that go beyond the shapes of the letters, *i.e.* those that are rooted in the grapholinguistic features of these alphabets. Thus, while the present study is heavily dependent on the epichoric approach taken in those previous palaeographic works, it intends to apply a new methodology based on a linguistic perspective that considers the way in which each sound is represented, rather than the graphic variants of the letters. In this way, it is possible to make an analysis at the level of the writing system that points towards relationships among Greek alphabets that cannot be identified through a palaeographic study.

Although the phonetic values of the different signs have been used previously by linguists as an argument to explain the expansion and creation of alphabetic writing in Greece, there is no systematic study that comprises all available inscriptions.[3] Therefore, this study aims to expand and reassess the knowledge of the field, not only by adding new inscriptions found in recent decades, but by being the first comprehensive study of all epigraphical evidence for these epichoric alphabets. Unlike previous works that could only rely on a selection of the most relevant inscriptions, this study is based on a digital database that gathers all early alphabetic inscriptions and that records the representations used for the sounds of the Greek dialects in each and every text.[4] Thus, it provides a complete catalogue of the different grapheme-phoneme (henceforth graphematic) relationships seen across the Greek territories and provides quantitative data for their analysis in the coming chapters.

This data will be used within a methodological framework that applies the latest trends in theoretical grapholinguistics to the study of the early Greek alphabets, which provide a fresh outlook for the study of the epichoric alphabets. Specifically, I will conduct a comparative study of these alphabets using the methodology of 'comparative graphematics', which can be defined as the comparison of the mechanisms in which different writing systems represent linguistic units or structures.[5] This theoretical

[3] See for example Bernal 1987; Brixhe 1991; Ruijgh 1997; 1998; Slings 1998; Woodard 2000.

[4] This database was originally created for the thesis on which this book is based and can be accessed here: https://doi.org/10.17863/CAM.48105.

[5] While this definition is my own, Weingarten 2013 was the first to define the procedures used in this methodology.

framework and the data provided by the database will serve as the main pillars of the analysis and comparison of the distinct notation systems seen across Greek-speaking regions. In addition, these notation systems will also be compared with those of other contemporaneous alphabetic writing systems in the Mediterranean, like those for the NWS languages and other North-Eastern Mediterranean (henceforth NEM) alphabets like those for Phrygian, Eteocretan and Etruscan. This will show connections that go beyond the Greek alphabets and that are common to other writing systems of the Mediterranean during the explosion of alphabetic writing during the Iron Age.

Such a study will shift the attention towards the relationship between the graphemes and the phonemes represented in these alphabets, allowing a comparison at the level of the writing system and thus assessing how different Greek-speaking communities in the Mediterranean adopted alphabetic writing and devised solutions to record their own dialects. By doing so, we will be closer to a more accurate description of what early alphabetic writing looked like in Greece, offering new questions and insights that will re-examine the way in which we have conceptualised the epichoric alphabets and the questions around the coming of the alphabet to Hellenic soil.

2.1 Theoretical framework

Previous works following the epichoric approach refer to the varied writing traditions found in archaic Greece as 'the local scripts'.[6] However, they do not clarify their definition of 'script', probably because their authors did not think of the linguistic implications of using such a term or perhaps due to the inconsistent use of this and other terms in the study of writing systems;[7] 'writing system', 'script' and 'orthography' are sometimes used interchangeably, while 'grapheme' and 'allograph' are understood in different ways depending on the author and discipline.[8] Having a unified terminology and theory applicable to as many writing systems as possible is vital, not just to understand each other's arguments, but to make sure that we describe them objectively, not biased by our alphabetic/phonographic literacy.[9] Therefore, one of the aims of this book is to frame these so-called 'local scripts' within the current trends in grapholinguistic theory, but to do so, it is important to define the terminology that will be used throughout the text and to understand how writing systems work.

[6] Jeffery and Johnston 1990; Luraghi 2010; Forthcoming.

[7] Meletis (2020, 2) mentions that advancements on grapholinguistic theory are often disregarded by other disciplines, especially within Linguistics.

[8] Cf. Henderson 1985; Meletis 2020, §2.2.1.

[9] This phonographic bias comes from the Saussurean view that writing is necessarily the representation of speech and is still followed by some scholars (Bloomfield 1955; de Saussure 1983; DeFrancis 1989; Daniels 1996; Robertson 2004). Further references to such authors can be found in Houston 2004, 44 and Powell 2009, 17 f. On the other side stands a growing group of scholars who prefer an inclusive definition of writing that embraces non-glottographic systems, semasiography and 'proto-writing' (Gelb 1969; Haas 1976; Sampson 1985; Harris 1986; 2001; Boone 2004; Powell 2009).

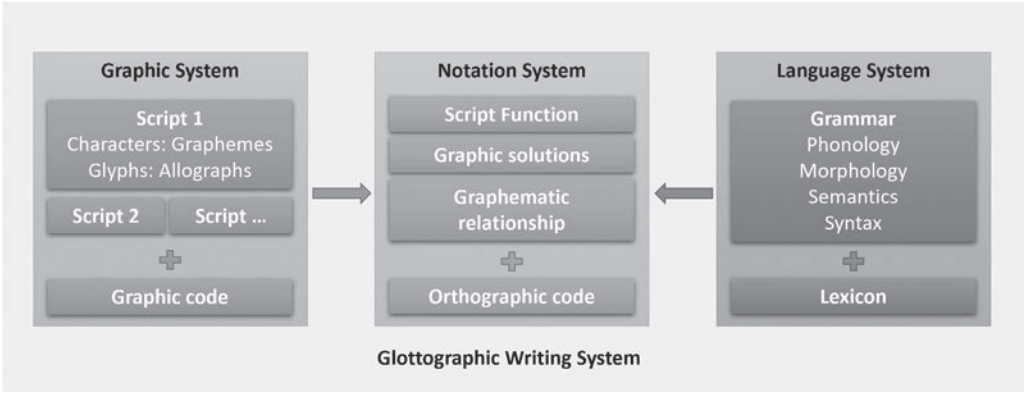


Figure 2.1: Diagram of the elements in a glottographic writing system.

During the last decade, writing systems have been conceptualised as the interplay of multiple modules, where the graphic and linguistic elements of the system are seen as discrete but interacting pieces.[10] A glottographic writing system – *i.e.* one used to represent a spoken or signed language – consists of two main modules: the graphic and language systems. The former deals with the visual aspects of writing, while the latter refers to the language that will be represented in a given writing system; when combined together, they result in a third module that I called the notation system, which we could define as the result of encoding the language through the graphic system (Figure 2.1).

Under such a framework, a script is but one of the elements that play a part in the graphic side of writing. It can be defined as an abstract notion that consists of the collection of characters that, once applied to a language system, fulfil a specific function, such as the representation of phonemes, morphemes, syllables, punctuation, numbers, etc. In addition, these characters may take several shapes – due to the use of specific fonts, styles or handwriting – that are still recognisable as having the same value; these are called 'glyphs' in typographic terms and belong to that same script.[11] However, we must bear in mind that a single writing system can use more than one script, as will be discussed below, and that these follow a 'graphic code': a set of directions or tendencies that limit the graphic system and affect the arrangement of characters in space (*e.g.* orientation, direction, spacing) or the interaction of the scripts and signs in the graphic sphere (*e.g.* location of diacritics).[12]

The elements of the graphic system, however, cannot function in isolation, since the characters are graphic units that do not have values by themselves; without

[10] Neef 2012; 2015; Elvira Astoreca 2020, §2.1; Meletis 2020 ch.2, esp. 20 f.; Salgarella 2020 §1.3.2.3.
[11] This typographic terminology (characters and glyphs) is the one followed in Neef 2012; 2015.
[12] These graphic elements also receive the names macroscopic catenation and planar arrangement in Sproat 2000, 34–66.

the language system they are just lines without meaning. See for example how the character |2| of the so-called Arabic numeric script means 'two units' in a mathematical sense, but it can also be read as 'two' when applying the English language or 'dos' in Spanish. This demonstrates how a specific script can be shared or transmitted across writing systems when different language systems are applied to them. Most importantly, it is an excellent example to show how the language and graphic systems are combined to produce the notation system. Language provides the characters with value and gives a function to the script. In each script, the value of its characters will be taken from one of the categories of the language system, *e.g.* a phonological script encodes phonemes, while a logographic or ideographic one is based on lexical items. In this way, the language system has provided function to the scripts and can also establish the possible contexts of use for each one. In a glottographic writing system the types of characters that we will find are called 'graphemes', independently of the type of information encoding (*e.g.* phonemes, syllables, morphemes, lexical items, etc.). Similarly, for this kind of writing glyphs are preferably called 'allographs'.[13]

Although 'grapheme' is a term usually applied to phonographic writing systems, given its similarity with the term 'phoneme', I prefer to see the grapheme as a graphic unit without a specific value, transforming into a phonogram or a morphogram, for example, depending on the value that a specific language system applies to it. This connection between the character and the specific linguistic value that it receives will be referred to as a 'graphematic relationship'.[14] The more popular term 'letter' will be used here to refer to the result of that relationship, *i.e.* a specific grapheme attached to a concrete phonetic value, *e.g.* the letter called 'Corinthian beta' is the grapheme |𐌁| with the value /b/.[15]

Other elements of the notation system are the 'graphic solutions' and the 'orthographic code'. The former is the name that I gave to the strategies seen in a given writing system to record the linguistic units attached to a given script. While most of the time each linguistic value will have its own grapheme, sometimes a script does not offer enough characters to cover all of the necessary values, and thus other solutions are found for their representation. In the case of the Greek alphabets, we will see three different methods for phoneme representation: its own grapheme, a digraph, or no graphic distinction, *i.e.* sharing a grapheme with a similar sound. Finally, the 'orthographic code', sets directions and limitations for the combinations

[13] For this grapholinguistic terminology see Henderson 1985; Sampson 1985, 25; Rogers 2005, 10 f.

[14] Following Neef 2012 and 2015.

[15] This term is normally associated with alphabetic systems only and it does not apply for signs like diacritics or punctuation (Sampson 1985, 22). Altmann (2008, 149) and Meletis (2020, 88, §2.2.2) prefer the opposite definition: grapheme as a sign with a specific value and letter as having multiple or no value. To represent these elements in text, I will employ the symbology used in Neef 2012; 2015 and followed in Elvira Astoreca 2020 and Meletis 2020: graphemes and characters between two straight bars |𐌀|, allographs and transcriptions of inscriptions inside angle brackets *e.g.* <𐤀> or <𐌀>. References to letters appear named and without marking symbols, *e.g.* 'aleph 𐤀.

of characters and scripts of a system and, as such, it restricts what Neef called the 'graphematic solution space'[16] and creates more or less transparent orthographies.[17] I would argue that the establishment of such a code is one of the necessary tasks of the language system when acting over the script in a writing system.[18] It is obvious how these rules are imposed by the language and not by the script itself; see for example how each language has its own capitalisation rules or how Spanish and Italian may share most of the elements of their scripts, but their orthographic codes – and other elements of their writing systems – are different: *e.g.* the sequences <ze> and <zi> are not rare in Italian, whereas in Spanish words <z> is only combined with <a>, <o> and <u>.[19] Thus, the term 'orthography' cannot be used interchangeably with 'writing system' as Sproat suggests,[20] but is rather a discrete element of the latter.

This idea of separating the graphic from the linguistic elements of the writing system is crucial when trying to understand processes of adoption and adaptation of a script, for it means that, while a script is language-independent and can be borrowed across writing systems, the writing system itself is tied to a specific language and how its speakers use the available graphic elements for its representation. See, for example, how Atatürk's reform of Turkish writing involved changing the Persian script for another based on the Latin alphabet or how Greek speakers in the Mycenaean palaces adapted the Linear A syllabary, used for a language still undeciphered, to notate their own.[21] Both examples illustrate how a script is borrowed and then adapted to write down a language from a completely different family – which is a remarkable endeavour indeed – but this phenomenon can also be found within communities speaking closely related languages. If we think of the Romance languages, for example, we can see a clear relationship between their writing systems and that of their ancestor, Latin. However, those systems have developed in various ways; some have included extra signs – *e.g.* Spanish eñe Ñ, which nowadays is not conceptualised as N with a diacritic, but rather a completely separate letter that is present in the alphabetical sequence – and speakers of different languages use the same sign with different values – *e.g.* <j>/<J> can represent /ʒ/ (French, Portuguese, Catalan, Romanian), /x/ (Spanish) or /j/ (Italian).

Perhaps one could see similarities between this comparison of Romance writing systems and the graphic variety seen in archaic Greece: many characteristics are shared, but some signs have different values depending on the area, and one can also

[16] 'A possible spelling of a specific phonological representation is any spelling that allows the systematic derivation of its phonological form. The set of possible spellings is what I call the "graphematic solution space" for a given phonological representation' (Neef 2012, 223 f.).

[17] Although the term transparent is preferred to describe orthographies (Sproat 2000, 6), this can also be referred to as orthographic depth (Rogers 2005, 275).

[18] For Neef 2015, 715–718 and Meletis 2020, 28 f. orthography is an optional module.

[19] The sequences <ze> and <zi> in Spanish writing are only allowed in lexical borrowings such as zen or zigzag, but do not apply for native words.

[20] Sproat 2000, 25.

[21] About the adoption of the Linear A script in Mycenaean Greece see Salgarella 2020.

find others that are specific to a given region. However, there is a huge difference at first sight: while the Romance languages are seen as clearly independent, in Greece these local variants are still recording the same language, just distinguished by some dialectal traits. Should we then see it as the same language system but with different scripts like the Turkish example? Surely the reader will also see that there is an abyss between the radical change of script promoted by Atatürk and these epichoric alphabets that share multiple characteristics and that are being used synchronically across various Greek-speaking regions.

Another way of conceptualising these local alphabets could be as multiple scripts applied simultaneously to the same language system. A multiscriptal writing system, Linear B, had already been used for the Greek language; it comprised a syllabic, but also a logographic script, both with distinct functions, but used in combination following specific guidelines. A similar situation is found in Japanese, where its four scripts – two syllabic (katana and hiragana), one morphemic (kanji) and one alphabetic (rōmaji) – are used in specific contexts.[22] Nevertheless, the main difference between these systems and the epichoric alphabets is that while the former can use multiple scripts within the same text, the latter are not combined systematically but are rather tied to a specific geographical area and used autonomously. Moreover, when used in conjunction, this is done as an exercise of digraphy or even an identity mark that intends to indicate the specific characteristics of those scripts.[23] Perhaps this might be closer to the digraphic situation in Modern Greek, where the traditional alphabet shares space with *Greeklish*, an adaptation of the Latin script to represent the Greek language created for computing purposes and nowadays used extensively throughout digital media.[24] Still the situation in archaic Greece would be multigraphic rather than digraphic, and the important part played by geography and local identities suggests that perhaps this is not the best description of the nature of these alphabets.

Clearly, it is not an easy task to classify the so-called 'local scripts' within the current grapholinguistic theoretical framework. At first sight, they do not seem different enough to be catalogued as distinct writing systems in graphic terms and they all represent the Greek language but, at the same time, the use of these regional alphabets is not similar to that seen in multiscriptal writing systems. Therefore, I propose here that a deeper grapholinguistic study is needed in order to understand the intricacies of the graphic diversity seen in the earliest stages of alphabetic writing in Greece. Previous works on the epichoric alphabets were mostly interested in their graphic elements – more specifically in the synchronic and diachronic variations in sign shapes – and only touched upon their connection with the language system superficially and following questionable criteria. I want to move from a purely graphetic to a graphematic analysis, looking at the values of the signs seen in early

[22] For Japanese as a mixed system Sampson 1985, 172–193; further examples of multiscriptal or complex writing systems can be found in Coulmas 2003, 168–189.
[23] See for example the Corinthian and Euboean abecedaria in §3.3.4.
[24] A survey on the history and use of Greeklish can be found in Androutsopoulos 2009.

Greek alphabetic writing and how these are used to build a notation system for the different dialects. In particular, this study will follow an onomasiological approach starting, in Saussurean terms, from the *signifié* (in this case the phonemes) and search for the *signifiant* (the graphic solutions and graphemes used to represent them).[25] This implies that in some cases a discussion of orthography will be necessary, as in the case of digraphs, for example. Nevertheless, it is not the main objective of this book to analyse in detail the orthography of the Greek alphabets, which means that issues like the diphthongs will not be explored in full. Moreover, it will be an exercise of comparative graphematics,[26] since the objective is to compare the strategies used in different Greek-speaking communities to represent their dialects.

2.2 Graphematic data on the epichoric alphabets

In order to carry the comparative graphematics study on the early stages of the epichoric alphabets, I used the database created for Elvira Astoreca (2020), which gathers all available 8th- and 7th-century[27] inscriptions known to date that show alphabetic writing for the Greek dialects. While there is a chronological limitation to the database in order to cover early alphabetic writing only, it has no geographical constraints, and includes inscriptions from mainland Greece, the Peloponnese, the Aegean and Ionian islands, the Italic peninsula, Sicily and Al Mina (in the Levantine coast).[28] Nevertheless, I will also comment on later inscriptions from Jeffery and Johnston (1990) and Guarducci (1995) in the coming chapters to cover gaps of information and to compare the findings in this data with later tendencies.

Only some inscriptions were not included in the database out of doubt that they might not be alphabetic writing strictly speaking. This is the case of signs that might be symbols rather than letters, including crosses that may well be a chi in some Greek alphabets, or, precisely, a cross with a symbolic meaning; the same way as a circle could be an omicron or just a circle when it appears as a single sign. Although it could be argued that these can also be interpreted as writing, the doubt that these may not belong to the realm of alphabetic writing, since they might not be representing a phoneme, is the main reason to exclude them given the importance of the analysis of phonetic values in this dissertation. Other inscriptions that have been excluded from the database are the abecedaria in the so-called Fayum tablets. This decision was taken because of the ongoing debate about the dating and the authenticity of these

[25] de Saussure 1983; Weingarten 2013, 19 f. Also called 'graphophonemic approach' by Swiggers 1991, 115.
[26] Cf. Weingarten 2013.
[27] All dates are BC, unless specified.
[28] The database accounts for 69 different places of origin. Although there are some inscriptions that were found on Cypriot, Macedonian and Egyptian soil (Karageorghis and Masson 1965 150.1, *LSAG* 77.10a, b, d), they have been confidently interpreted as being of Athenian origin on archaeological and palaeographical grounds: these are texts on SOS amphorae (an Attic ware) and the shapes match what is found on other Athenian inscriptions.

documents, which will be discussed in §3.3.1. This makes a total of 714 inscriptions from all across the Greek-speaking world believed to belong to the chronological framework of this study.

These were retrieved from multiple sources. The starting point was the 2nd edition of Jeffery's *LSAG*, since it is the most important collection of archaic Greek inscriptions known by 1990, and completed with Guarducci's *EG* I. Although the usefulness of these books cannot be denied, the material had to be completed with inscriptions from other sources for multiple reasons. The aforementioned works comprise a selection of texts and, as already mentioned, most of them belong to the 6th and 5th centuries BC. This means that the total number of inscriptions that could be retrieved from these publications does not offer a complete view of the epigraphic material from the time period that concerns us. Furthermore, new documents have been found since they were published; thus, other collections and corpora of inscriptions of archaic sites excavated both before and after their publication have also been examined closely and the relevant inscriptions were included in the database. To complete it, the Searchable Greek Inscriptions database of The Packard Humanities Institute was consulted so as to find any other inscriptions within journals and major epigraphic collections (*e.g. AEph*, *BCH*, *IG*, etc.).[29]

Although the date was an important criterion in the addition of inscriptions to the database, it is undeniable that there are multiple difficulties in the reconstruction of their chronology. The inscriptions included here have been dated by the ceramic type of their supporting materials, the archaeological context where they were found or palaeographic characteristics of the text. Even though many times the methodology used for their dating is not specified, it can be easily inferred which is favoured: palaeographic works such as *LSAG* or *EG* tend to give a chronology through palaeography, while archaeological records like those of Methone or Hymettos, for example, assign it based on the archaeological context and ceramic types. However, all these methodologies have their own problems.

Dating by archaeological context, though perhaps more reliable than other methods, offers only a *terminus ante quem*, since the object and inscription could have been made long before their deposition in the place where archaeologists found it. Even if the period of manufacture is narrowed down through the ceramic type, it must not be forgotten that both dates are actually relative and could be moved forwards or backwards in time. In fact, according to new studies of dendrochronology and radiocarbon in other places of the Mediterranean, some would like to suggest that the absolute chronology for the Geometric period should be extended, starting already in the mid-10th century BC.[30] Although this change in date would not influence the Late Geometric period, which is the earliest included here, it demonstrates that the

[29] A full account of all sources and the system used to reference them can be found in Elvira Astoreca 2020 §2.2.1.

[30] Janko 2017, 148 f.

absolute chronology of these periods is still a matter of discussion. Therefore, dates given in years deriving from relative chronologies might be a matter of confusion if they are revised in the future.

On the other hand, dating through palaeography can help narrow down when an inscription was written, but is even more unreliable than archaeological chronology. The inscriptions considered in this study do not provide any absolute dates in their texts. Therefore, we can only speak of tendencies occurring and changing over broad periods of time (*i.e.* centuries). The problem of a chronology based on palaeographic features relies on the risk of falling into a circular argument, and their dogmatic transmission through the work and words of palaeographers and other scholars who repeat their assumptions. Moreover, we must not forget that palaeographic dates are ultimately based on those assigned archaeologically to the artefacts.

Although it cannot be denied that the dates given to the inscriptions are not completely reliable, it is important for the present study to attempt to identify which inscriptions belong to the earliest attested phases of Greek alphabetic writing, albeit cautiously. Thus, while the database follows the chronology given by the editions and collections of inscriptions as a criterion to include or exclude certain inscriptions, given the debatable nature of the dates, I will not try to analyse the progression of the linguistic elements within the two centuries considered here. They will be treated here as almost synchronic tendencies that can be identified within the first two centuries of visible Greek alphabetic writing and, in some cases, compare them with those seen in later archaic inscriptions from the 6th and 5th centuries BC.

Those later texts will also help to fill in the gaps of the current data, which sometimes does not offer enough evidence to get the whole picture for each and every epichoric alphabet. We must bear in mind that many texts are not preserved in the archaeological record because of various reasons and thus the available evidence only represents a portion of what writing must have meant in Late Geometric and Archaic Greece. In fact, several documents clearly suggest that perishable materials were used as writing support from an early date.[31] Nevertheless, even if we obviously lack information, the available texts will prove to be of interest to this study and to offer refreshing insights.

What is especially interesting from the database is not only that it is a comprehensive compilation showing all inscriptions know to this date, but that it gathers the linguistic information necessary for the comparative graphematics analysis. Following the onomasiological approach, the database has a column for each sound (or group of sounds) clearly identified for the Greek dialects, including one for signs with unknown or uncertain values and another for signs other than phonemic ones, which in this case are word dividers only. In the rows, a numerical code shows what signs render each value in a given inscription.

[31] This evidence was discussed in §1.4.

Deciding on the set of phonemes that needed to be recorded in the database and discussed here was quite a problematic task, since we are dealing with different dialects that may not have the same repertoire of phonemes or perhaps decided not to give a graphic representation to all of them. However, these complications make their study vital, as it will allow us to approach how the Greek populations developed their own alphabets in a way that fits what they considered to be the needs of their spoken language, while making it understandable.

Table 2.1: Vowel system.

Vowels
/a/-/a:/
/e/
/e:/
/ɛ:/-/æ:/
/i/-/i:/
/o/
/o:/
/ɔ:/
/u/-/u:/-/y/-/y:/

The choice of phonemes follows the IPA conventions and nomenclatures and is mostly based on the Classical Attic Greek model (with few additions, *e.g.* /w/).[32] This decision was based on the fact that it has more phonemes than most other dialects,[33] it is the most studied and it offers the largest amount of evidence, thus it is the one we know best. The values considered as a result can be seen in Tables 2.1 and 2.2. Although, as will be explained below, not all dialects fit the model set out by the Attic system perfectly, their phonemes were sorted as closely as possible within the classifications of the database and, in the analysis here and in the following chapters, all of the characteristics of these dialects have been accounted for in detail.

A complex issue when building the linguistic database was the division of the vowel sounds. Since the aim of this section is to see the graphic solutions devised for the different phonemes, both long and short variants are considered together for those that never had a long vs. short graphic distinction; that is the case of /a/-/a:/, /i/-/i:/, /u/-/u:/ and /y/-/y:/. Moreover, these last two groups are also part of the same column, since the same shapes – nos. 58 ᛦ and 59 ᛪ (cf. Table 2.3) – are used for /u(:)/ and /y(:)/.

The mid long vowels, however, have been a major issue in the elaboration of the linguistic dataset, given the fact that not all dialects seem to follow the same results after the phonetic processes that created the Greek long-vowel system *i.e.*, compensatory lengthenings (CL) and vowel contractions (VC). While some dialects seem to resolve these processes in long vowels with a closed sound quality /e:/ and /o:/, in contrast with the more open long vowels inherited from Common Greek /ɛ:/ and /ɔ:/ – these are dialects with a *mitior* vowel system – others do not make this differentiation and have open /ɛ:/ and /ɔ:/ in all cases – the *severior* vowel system. In the middle stand those dialects in which the result of CL1 and CL2 is of the same quality as the inherited long vowels, whereas CL3 and VC result in a closed long

[32] Following mostly Allen 1987 and van Emde Boas *et al.* 2019.

[33] It is non-psilotic and therefore keeps the initial aspiration /h/ and as a dialect with a *mitior* vowel system it has different phonemes resulting from compensatory lengthenings and vowel contractions and therefore has a differentiation /e:/ vs. /ɛ:/ and /o:/ vs. /ɔ:/ (see discussion below).

Table 2.2: Consonant system.

Consonants	
Nasals	/m/ /n/
Liquids	/l/ /r/
Approximant	/w/
Voiceless glottal fricative	/h/
Sibilant	/s/
Voiced stops	/b/ /d/ /g/
Voiceless stops	/p/ /t/ /k/
Aspirated voiceless stops	/p^h/ /t^h/ /k^h/
Consonant clusters	/ps/ /ks/ /dz/

vowel – also referred to as a 'medium' vowel system.[34]

Del Barrio Vega offers a reasonable explanation for this situation.[35] She argues that the different vowel systems show stages of the same process, completed in some of the dialects and not in others. This process, she argues, starts with a close-mid long vowel as a result for all processes (CL1–3 & VC).[36] Then, over time, the close-mid long vowel merges with the inherited open-mid long vowel. This process would be repeated every time a CL or VC happens in those dialects with a *severior* system. Thus, the dialects of the 'medium' type would show that middle step, where the long vowels of CL1 and CL2 have already merged with the primary long vowels, but the new long vowels of more recent processes, like VC and CL3 have not yet. The Cretan dialect is vital for the elucidation of this process, since it shows an evolution from 'medium' to *severior*, accomplished in the 5th century BC at the latest, according to the change in the graphic representation of these sounds.[37]

All this means that, within the same word, the results of the aforementioned processes could be pronounced /e:/ or /ɛ:/ and /o:/ or /ɔ:/ respectively depending on the dialect and the date; not to mention that Naxos, Andros, Amorgos and Keos are thought to keep the pronunciation [æ:] for inherited and CL1 /a:/,[38] and the possibility that the mergers of /e:/ with /ɛ:/ and /o:/ with /ɔ:/ may not have happened at the same time in a specific place.[39] The complications that this represents for the database are obvious, since it should take account of the results of each process in every dialect at a specific time. Moreover, those results may be objects of new processes that might be happening at the time that concerns us here in some places, but maybe not in

[34] For this terminology see del Barrio Vega 1998, 257–259.
[35] del Barrio Vega 1998.
[36] Except in those dialects where CL1 is not completed and do not lengthen the vowel, but rather geminate the consonant, *i.e.* Thessalian and Lesbian (Bartoněk 1966, 62).
[37] del Barrio Vega 1998, 264; Thompson 2006.
[38] Bartoněk 1966, 106; Thompson 2006, 89 f.
[39] See for example how in Cretan the merger of /o:/ and /ɔ:/ happened earlier and in analogy /e:/ and /ɛ:/ merged later (Thompson 2006, 96).

others. Consequently, in order to make the information manageable for the database, I followed the traditional classification of dialects according to their *mitior,* 'medium' and *severior* vowel systems and the results theorised for the aforementioned processes in each of these groups as explained by Bartoněk and del Barrio Vega.[40] In the case that this decision causes the appearance of contradicting evidence, this should be interpreted as an opportunity to revisit and reassess our previous assumptions on the vowel systems of the Greek dialects.

Although the consonantal sounds were less problematic, they did not come without complications. One important decision was to include a separate category that would account for the use of qoppa. Therefore, one column records examples of /k/ before back vowels, while the other represents /k/ followed by other phonemes. The former, however, also includes two examples where there is a consonant between /k/ and the back vowel: λεϙτοις (*LSAG* 94.7) and Ϙλ̣οπετιον<ο>ς (*LSAG* 77.10a).[41]

Another issue that needed to be dealt with were the Cretan examples for aspirated consonants, such as Παιδοπίλας instead of Παιδοφίλας in *LSAG* 468.8a and πόρος *i.e.* φόρος in *LSAG* 315.10.[42] These, as will be explained later, are instances of a lack of graphic distinction between /p/ and /p^h/, rather than the absence of the latter phoneme in the Cretan dialect.[43] As such, these are included under /p^h/ and discussed in §5.8.1.

Also the representation of /dz/ and its inclusion within the consonant clusters was another problematic point. As will be explained in §5.9.3, the reconstruction of its pronunciation is not an easy task, since it might be realised as an affricate [d͡z] and at some point it also undergoes a metathesis to /zd/. However, these two phenomena may not be pandialectal.[44] Therefore, I chose to use /dz/ as a representation that can account for the multiplicity of realisations that it can take, knowing that it is not a faithful description of its pronunciation in each and every dialect. This should be unproblematic from a graphematic point of view since the sign used for the representation of these sounds |I| is very stable across alphabets.

Finding a way to represent the basic shapes found in the inscriptions that avoids the problems mentioned in the assessment of previous studies on the epichoric alphabets was certainly challenging as well. Since there has been no previous analysis of these scripts that discriminates basic shapes and their allomorphs, this was an important part of the preliminary research. Once this was done, a numeric code was applied to the basic shapes in order to identify where these appear within the corpus and what

[40] Bartoněk 1966; del Barrio Vega 1998.

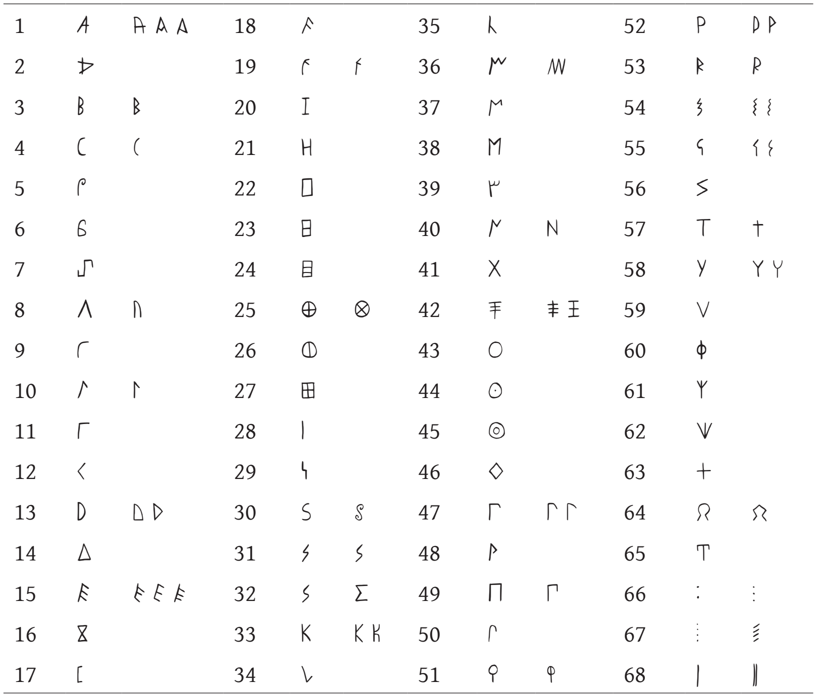
[41] All transcriptions of the texts in the traditional Greek alphabet appear without accentuation since it is not marked in the original texts and in some of the dialects in question correct accentuations are still debated. Instances of qoppa followed by a back vowel with a consonant in between are discussed in Méndez Dosuna 1993, 100.

[42] Cf. πόραι instead of φόραι in *IC* IV 80.

[43] See §5.8.1. Guarducci 1995, 182; Méndez Dosuna 2007, 447.

[44] For detailed references see §5.9.3.

Table 2.3: Codes for the significant shapes considered here and their allomorphs.



sound they are representing in each text. This allows us to identify the different values applied to the same grapheme or the use of different graphemes for the same value depending on the epichoric alphabet. While this numeric code will be referenced where this makes the argumentation easier to follow, I generally prefer to show the specific shapes visually with a digital font created for this purpose which will also help to show more faithful transcriptions of the texts. Table 2.3 shows the complete list of all shapes considered here (as they would appear on a text written from left to right) and the numbers applied to them.[45]

Since graphic variations are a matter of palaeographic studies and the present discussion is more interested in seeing relationships between phonemes and their graphic representation, it was vital to identify when a given sign could be interpreted as an allomorph or as a completely separate character. Therefore, my intention was to assign a number to each of the basic shapes that will help in the identification of graphematic relationships in the coming chapters. That meant following criteria that are not only graphic but also graphematic and creating thus an artificial, but useful, grouping of shapes that could be identified as representing the same sign.

[45] Since the same shape may be used for two different phonemes depending on the alphabet, it was not possible to follow a strict alphabetic order (based on the order of the Ionian alphabet), but it was kept whenever possible.

However, on multiple occasions, recognising allomorphs is a highly subjective judgement, especially when the users of these alphabets cannot be interviewed. Although I recognise that some of the decisions may come down to that subjective opinion (perhaps one could see a clear distinctiveness between the allographs in nos. 25 ⊕ ⊗ or 52 Ρ Ρ Ρ, for example), I tried to devise some objective criteria to make the classification as reasoned and useful for the linguistic analysis as possible.[46]

Given the nature of the present survey, criteria such as the length of the strokes or their rounded or straight features and even extra strokes – which may be of great importance to palaeography – are not adopted here for the purpose of distinguishing significant shapes. These are taken as characteristics of allomorphs instead. For example, epsilons with different lengths in their vertical stroke (Ε Ε Ε Ε) are all listed under no. 15; the same situation applies to nos. 42 (Ξ Ξ Ξ), 49 (Γ Π) and 57 (Τ Τ). Nos. 3 (Β Β), 13 (D Δ), 52 (Ρ Ρ) and 53 (Ρ Ρ), among others, have both the rounded and angled version of the same letter. Also no. 54 (Σ) has two variants (Σ Σ), one with an extra stroke, the other rounded. In my opinion, these features do not distinguish letters, but rather how the writer wishes or has learnt to perform them. This is corroborated by the appearance of more than one allomorph in the same site or even the same inscription.

Thus, the criteria adopted for classifying a separate significant shape, and so assigning it a number, are:

a) The change of shape is so noticeable that the sign may not be recognised as the same letter.
b) A minor change in the shape may entail a change in phonetic value in one of the alphabets.

An example of the first criterion are the different shapes to write /b/ (nos. 3–7: Β C Γ Ϭ ⅃Γ), which are clearly distinct and not necessarily recognisable by readers of different epichoric alphabets as being the same letter.[47] The second principle was created for cases in which the palaeographic criteria that were discarded above may have an influence on the phonetic value applied to the sign. This happens, for example, with mu, where the five-bar mu can only render /m/, but if the sign has four bars instead of five, especially when the fourth stroke is of the same length as the first (no. 38 Μ), it could be either mu /m/ or san /s/ depending on the alphabet. Since the second phonetic value cannot be applied to <Μ>, they have been categorised as different basic shapes. The same happens with no. 56 ≶, which could have easily been included among the allomorphs of no. 31 (ϟ ϟ). However, while the shapes in 31 can be used for /i/ or /s/ depending on the alphabet, no. 56 ≶ is attested as /s/ only.

46 Interestingly, Meletis (2020, §2.2.2) came up with similar criteria for defining a grapheme, which means that those used here make the current basic shapes as close as possible to what we could interpret as graphemes and therefore extremely useful for a graphematic study.

47 Although see abecedarium in §3.3.4.

Table 2.4: Shapes and their possible phonetic values.[48]

1	𐌀	a, a:	18	ᚨ	w	35	ᛚ	l	52	P	r
2	ᐅ	a, a:	19	ᒋ	w	36	M	m	53	R	r
3	B	e, e:, ɛ:, b	20	I	dz	37	M	m, s	54	ϟ	i, i:, s
4	(	p, p^h, b, g	21	H	e, ɛ:, h	38	M	m, s	55	ϟ	i, i:, s
5	ᒋ	b	22	▯	h	39	M	m	56	Σ	s
6	Ϭ	b	23	⊟	e, ɛ:, h	40	N	n	57	T	t
7	⎍	b	24	⊟	h	41	X	k^h, ks	58	Y	u, u:, y, y:
8	Λ	g, l	25	⊕	t^h	42	Ξ	ks, dz	59	V	u, u:, y, y:
9	Γ	p, p^h, g	26	Φ	p^h, t^h	43	O	o, o:, ɔ:	60	Φ	p^h
10	ᛚ	p, g, l	27	⊞	t^h	44	ʘ	o, o:, ɔ:, t^h	61	Ψ	k^h, ps
11	Γ	p, g	28	|	i, i:	45	◎	ɔ:	62	Ψ	?
12	<	g, WD	29	ᛋ	i, i:, n, s	46	◇	a, a:, o	63	+	k^h
13	D	d	30	S	i, i:, s	47	Γ	p	64	Ω	o, o:, ɔ:
14	Δ	d	31	ϟ	i, i:, s	48	ᚦ	p	65	T	?
15	ᚱ	e, e:, ɛ:	32	ϟ	i, i:, s	49	Π	p, p^h	66	:	WD
16	⧗	e	33	K	k	50	ᒋ	p	67	⋮	WD
17	[	w	34	ᒪ	l	51	ϙ	k	68	|	WD

Even with these guidelines, some of the decisions taken when assigning the numbers may be judged differently by the reader. I would like to comment here on some of these difficult decisions and give arguments for them. The shapes in nos. 1 𐌀 and 2 ᐅ, both used exclusively for /a/, may have been included in the same category if we argue that <ᐅ> is just the horizontal version of <𐌀>. A reader accustomed to a vertical <𐌀> would have probably been able to recognise it by context, but I decided to list them separately, since the resemblance of the horizontal alpha with the Semitic 'aleph has been used as an argument for the antiquity of some inscriptions, *e.g.* in the Dipylon oinochoe. By giving it a separate number, it is easier to analyse whether it appears in other inscriptions as well and compare the data for vertical and horizontal alphas and therefore assess whether they should be considered as representing the same grapheme or not. The same happens with no. 29 ᛋ, a representation of /n/ closer to the Semitic nun. Although it looks similar to no. 31 ϟ, there is a slight change in the angle of the strokes, besides the fact that the latter is never used to represent /n/. These were the reasons for assigning distinct numbers to these shapes.

Another differentiation based on a change of angle is that of nos. 10 ᛚ and 11 Γ. While <Γ> has a completely horizontal stroke, it appears diagonally in <ᛚ>, thus making the sign more similar to a Phoenician pe. In fact, <ᛚ> can be seen with the

[48] The abbreviation WD stands for 'word divider'.

value /p/, while <𐌓> never renders this sound. The difference between <|> under 28 and 68 <|> is, however, subtler. The latter appears as a long vertical stroke, normally longer than the rest of the letters. It works as a divider in some alphabets where the shorter no. 28 | does not exist and the phoneme /i/ is represented with crooked iotas, like nos. 30 𐌉 or 31 𐌊. Finally, I would also like to comment on the choice of joining <𐌓> with <𐌑> under no. 49 instead of with what seems to be its rounded version in no. 50 𐌒. This decision was a matter of how distinguishable these three signs were. Many times, the shorter vertical stroke of <𐌓> goes lower down, almost resembling <𐌑> and it is not easy to tell when the intention of the writer was to make one or the other. Nevertheless, I could not join no. 50 𐌒 with them for, in this case, the stroke is always short, and the sign cannot be identified with the shape <𐌑> under no. 49.

Based on the information gathered in the database, the whole repertoire of signs and phonetic values assigned to them is shown in Table 2.4. The most evident issues that it shows are the multiplicity of values that can be assigned to the same shape in some cases and sometimes quite different in sound quality, compared to the stability of others, always used to represent the same sounds. However, it is also noticeable how a single value can be rendered by different shapes. This is exactly why a comparative graphematic analysis survey is necessary to understand what is the specific set of signs available to each Greek-speaking community and how the characteristics of these so-called ‘epichoric scripts’ are adapted in order to represent their respective dialects.

Chapter 3

Greek alphabetic scripts

Following the theoretical background outlined in the previous chapter, one of the basic elements of a writing system is the script. I have defined it as a set of graphemes available for a writing system to use. These are only graphic elements void of any linguistic value until these are employed by a specific notation system. It is vital, therefore, to study it and its components, *i.e.* the graphemes, before one can proceed to the graphematic analysis. This is not an easy task, however, in the study of the Greek epichoric alphabets, especially in their earliest stages.

The kind of epigraphic documents available to us for such analysis are abecedaria: inscriptions that show the sequence of letters that comprise the alphabetic script. These inform us about the repertoire of graphemes available for a specific script; the order in which they are traditionally taught; and, if studied diachronically, how the alphabetic sequence is being passed on from generation to generation, and the reforms applied to it. Therefore, the reason to include a chapter on abecedaria is twofold: to analyse the scripts that form the basis of the graphematic analysis to follow, to the extent that the epigraphic documents permit, and to see the reforms that are happening in different Greek-speaking areas to identify the diversity of repertoires available.

3.1 The analysis of abecedaria

Abecedaria, as mentioned above, provide information concerning the graphic side of the graphematic relationship. They show what the literate individual considers to be the repertoire of graphemes that form the alphabetic script and which are available for them to use in writing. This means that we should approach this kind of document in a different way than we would for any other act of writing, like writing a name or producing a sentence, since there is a significant formal difference.

An abecedarium is a written representation of the alphabet and therefore it is part of the graphic aspect of writing without the language system coming into play. In contrast, other kinds of written production show a practical use of the script and so they belong to the functional aspect of the script, *i.e.* the writing system. While the

latter is affected by the language system and shows the functions and values applied to the script and its components, in the abecedarium none of these are present. The only aspect of the writing system covered in these documents is the script and not even the phonetic values of the signs have any relevance in the sequence.[1]

The absence of this connection between the language system and the written abecedaria is easily seen in those that keep 'dead letters': letters that have fallen out of use in practical writing but still appear in the alphabetic sequence. This means that these are graphemes without value, although they might have had it in earlier times or in another writing system that used the same script.[2] Therefore, they cannot be categorised as proper letters – for they lack a phonetic value – but as void graphemes, available in the script although not used in practical writing.

As will be seen below, abecedaria are highly conservative and reforms that modify the sequence might take generations to materialise. This is so because of the importance of the alphabetic sequence in the learning process to become literate. The order of the sequence, which is fixed by tradition, is transmitted faithfully through the generations, probably by means of memorisation and recitation.[3] This recitation and the fact that the names of the letters tend to be associated with their phonetic values as a mnemonic aid are the only links of abecedaria with a given writing system. The text itself, however, is still independent from the language.

The important role of the recitation of the alphabet as a method for learning to write is evidenced by the literary sources. It was still relevant in the times of Dionysus of Halicarnassus, who describes it in this way:

> τὰ γράμματα ὅταν παιδευώμεθα, πρῶτον μὲν τὰ ὀνόματα αὐτῶν ἐκμανθάνομεν, ἔπειτα τοὺς τύπους καὶ τὰς δυνάμεις, εἶθ' οὕτω τὰς συλλαβὰς καὶ τὰ ἐν ταύταις πάθη, καὶ μετὰ τοῦτο ἤδη τὰς λέξεις καὶ τὰ συμβεβηκότα αὐταῖς, ἐκτάσεις τε λέγω καὶ συστολὰς καὶ προσῳδίας καὶ τὰ παραπλήσια τούτοις· ὅταν δὲ τὴν τούτων ἐπιστήμην λάβωμεν, τότε ἀρχόμεθα γράφειν τε καὶ ἀναγινώσκειν, κατὰ συλλαβὴν <μὲν> καὶ βραδέως τὸ πρῶτον· (D.H.*Comp*.25.249–257)
>
> When we are taught to read, first we learn by heart the names of the letters, then their shapes and their values, then, in the same way, the syllables and their effects, and finally words and their properties, by which I mean the ways they are lengthened, shortened and scanned; and similar functions. And when we have acquired knowledge of these things, we begin to write and read, syllable by syllable and slowly at first.[4]

However, this method of learning was criticised by Quintilian:

---

[1] The idea that abecedaria are not affected by language can also be seen in Wyatt and Edmonson 1984, 163; Woodard 2014, 176. Nevertheless, there are others that believe that the order follows a principle of 'maximum separation', in which the signs with close phonetic values will be placed separated within the sequence, cf. Watt 1987; 1989.

[2] Against this idea see Ghinatti 2004b, 46 f.

[3] Lejeune 1983, 7; Jeffery and Johnston 1990, 3; Pandolfini and Prosdocimi 1990, 222; Woodard 2014, 164 f.; Wachter Forthcoming.

[4] Ed. and trans. by Usher 1985.

> Neque enim mihi illud saltem placet, quod fieri in plurimis video, ut litterarum nomina et contextum prius quam formas parvoli discant. Obstat hoc agnitioni earum, non intendentibus mox animum ad ipsos ductus dum antecedentem memoriam secuntur. Quae causa est praecipientibus ut, etiam cum satis adfixisse eas pueris recto illo quo primum scribi solent contextu videntur, retro agant rursus et varia permutatione turbent, donec litteras qui instituuntur facie norint, non ordine: quapropter optime sicut hominum pariter et habitus et nomina edocebuntur. (Quint.*Inst*.I.1.24–25)

> At any rate, I do not like the procedure (which I see is very common) by which children learn the names and sequence of the letters before their shapes. This is an obstacle to the recognition of the letters, since they do not when the time comes pay attention to the actual outlines, because they follow the promptings of their memory, which runs ahead of their observation. This is why teachers, even when they think they have sufficiently fixed the letters in a child's mind in the order in which they are commonly first written, next reverse this, or muddle it up in various ways, until the pupils come to recognize the letters by their shape and not by the order in which they come. It will be best therefore for them to be taught the appearance and the name side by side: it is like recognizing people.[5]

It is fairly evident from these passages that the alphabetic sequence is given a special importance in the learning process, which is one of the reasons why it is so difficult to modify it. Thus, it can be passed over intact not only through generations but also across cultures.

Although I have argued that abecedaria are so conservative that they may not necessarily show the synchronous reality of a writing system, these texts are of great importance to analyse the development of a script. This can be identified throughout the several reforms that are seen in the alphabetic sequence and that show the established changes in practical writing. According to Wachter,[6] these reforms can be of three types: addition, reduction and reinterpretation (or *Additionsreform*, *Reduktionsreform* and *Funktionsreform*). While the first two – the inclusion or elimination of a sign in the sequence – do act at the level of the script, the *Funktionsreform*, in contrast, is actually a reform of the writing system since it involves a change in the value given to a specific sign. For this reason, the latter will not be discussed in this chapter.

Tracking the first two types of reforms will help us to identify when a script is differentiated from another without going into the level of the writing system. This is particularly important when considering the transmission of a script from one writing system to another. This would appear to be the case for the Etruscan abecedaria, which for a century did not undergo any reforms and were thus formally undistinguished from contemporary Greek abecedaria. For this reason, they will be added to the discussion below as they provide an interesting insight for the situation of the Greek scripts.

[5] Ed. and trans. by Russel 2001.
[6] Wachter 1989, 24 f.; Forthcoming, 26 f.

3.2 Etruscan abecedaria: a case study on borrowing and reforms

Etruscan abecedaria are especially interesting since they seem to show the different stages of borrowing and appropriation of a foreign writing system, specifically Greek, and thus they may serve as a parallel useful to analyse the borrowing from NWS to Greek and to identify script reforms present in the alphabetic sequence. However, some of the earliest Etruscan abecedaria (7th century BC) show little or no variation when compared to Greek writing. The fact that these documents contain signs that were never used in Etruscan writing, and that its characteristic letter 8 has not yet been included in the alphabetic sequence, shows that these abecedaria do not reflect any reforms to adapt the script to the Etruscan language. The absence of these reforms in the alphabetic sequence is enough reason to raise the debate of whether we should consider these to be still purely Greek abecedaria or if they are already Etruscan. In fact, the most famous Etruscan abecedarium – that found in an ivory model of a writing tablet from Marsiliana d'Albegna (*ET* AV 9.1) – is sometimes described as Greek.

The text in this tablet is considered by many the model for early Etruscan abecedaria, even though one can see that the signs match graphically with Greek epigraphic samples. This has led some scholars, such as Grenier,[7] to consider that this is purely a Greek abecedarium: 'L'alphabet au contraire [to the manufacture of the object, which is oriental] est purement grec. [...] C'est un alphabet grec parfait qu'il nous faut prendre comme tel.' Jeffery[8] prefers to include it in a section of non-Greek inscriptions and Lejeune[9] believes that this is the most ancient Etruscan abecedarium. This confusion has been provoked by the shapes of some letters that do not correspond to that seen in Etruscan inscriptions,[10] and by the appearance of some dead letters within the abecedarium. Most importantly, the sequence set by the document from Marsiliana is followed by all other Etruscan abecedaria from the 7th century with minor variations where these are present.[11]

Lejeune was also intrigued by the nature of these abecedaria and whether they should be considered Greek or Etruscan.[12] He proposed a solution that tried to combine the differences and similarities between both traditions. He was the one to differentiate two linguistic aspects involved in these documents: formal and functional. From a formal point of view, Lejeune considers that Euboeans and Etruscans share a common abecedarium, as they use the 'même répertoire de

Table 3.1: The sequence of the Marsiliana abecedarium.

[7] Grenier 1924, 13.
[8] Jeffery and Johnston 1990, 240 f. Followed by West 2015, 62.
[9] Lejeune 1983, 10.
[10] See Pandolfini and Prosdocimi 1990, 197 ff.
[11] Cf. *ET* AT 9.1, Cr 9.1, Fa 9.1, Ve 9.1, Ve 9.2, Ve 9.4 and Vt 9.1.
[12] Lejeune 1983.

signes, rangés dans le même ordre'. From a functional point of view, however, they must be Etruscan as these signs are used in a different way in their language. What Lejeune identified as formal vs. practical is what here I have defined as the script vs. the notation system. While no reforms seem to have taken place in the script level – for the letters are the same as we would expect in a Greek abecedarium – the writing system is different since the language system to which the script is applied is different.

Although Lejeune seems very sure of the Euboean model for the Etruscan abecedaria,[13] this is not unproblematic, for they bear signs of unclear origin or coming from separate Greek traditions. The Euboean model would account for the fact that |𐌘| renders /k^{h}/ instead of /ps/ and the interpretation of |𐌗| – /ks/ in some 'red' scripts[14] – as a sibilant in Etruscan writing.[15] This could be supported by another 7th-century Etruscan abecedarium (*ET* AT 9.1) in which this sign is substituted by an extra sigma. Moreover, the five-stroke mu 𐌑 in these abecedaria is also favoured by Euboean sites and their colonies, *e.g.* Eretria, Cumae, Methone, Pithekoussai. Following this theory, it is possible to interpret the closing sequence as the typical red alphabet ending in xi-phi-chi <𐌗𐌦𐌘>.[16]

However, treating the abecedarium as purely Euboean leaves the window-shaped sign <𐌇> without an explanation. Its position in the sequence suggests that it is related to a 'dark blue' xi inherited from NWS samekh, thus clashing with the idea of a 'red' model.[17] Unfortunately, this is a dead letter in Etruscan writing, so there is no further information concerning its possible original value.[18] Its appearance in other abecedaria does not shed any light on the matter either. Other alleged Greek abecedaria in which this sign occurs are very problematic and in Etruscan it appears either in this position or in the place of heta <𐌄>, probably due to the similarity between their shapes.[19] Also the presence of both sigma and san and their use in practical writing for the Etruscan sibilants have been problematic points in the identification of the possible model for Etruscan abecedaria. As will be shown later, however, this should not be an impediment for the Euboean origin since sigma users tend to keep both letters in their alphabetic sequences. This means that san

[13] Also supported by Jeffery and Johnston 1990, 80.
[14] See the explanation on Kirchhoff's coloured alphabets on p. 2 and Figure 1.1 on p. 3.
[15] In modern editions of Etruscan texts this sign is transcribed as a sibilant with the value /s/. In practical writing this graphematic relationship is only seen in Caere and Veii. Cf. Woodhouse 2005; Meiser *et al.* 2014, bd.1, 25 f.
[16] This order is seen in a Boeotian abecedarium, cf. §3.3.6, and in other Etruscan abecedaria as well *ET* AV 9.1, Cr 9.1, Ve 9.1 and Ve 9.2. Exceptions are *ET* AT 9.1, where <𐌗> is replaced by <𐌔> and *ET* Ve 9.4 that ends in chi-phi <𐌘𐌦>.
[17] Ghinatti (2004b, 45) argues that this would be in fact a 'blue' abecedarium rather than 'red' one.
[18] Nevertheless, in modern editions of Etruscan texts this sign is transcribed as a sibilant, cf. Meiser *et al.* 2014, 25 f.
[19] See §§3.3.1 and 3.3.2 and *ET* Fa 9.1. Nevertheless, the sign is used in an inscription from Sabinia possibly with the value of a sibilant (Cristofani 1997, 73).

could have been transmitted from one writing system into another even if it was a dead letter in the former.

In any case, two things are evident: the influence from the Greek scripts and the absence of modifications to the model. The presence of several dead letters indicate that no *Reduktionsreform* has happened yet, but there are no traces of additions to the sequence either. We are facing an early stage in which the borrowed script has not been modified and when Etruscans follow it faithfully in practical writing as well, only with minor adaptations to their language: san and sigma are used for different sibilant sounds, |K| represents /k/ rather than /g/ since the latter does not occur in Etruscan, and they use the digraphs <FH> and <HF> for /f/ before |8| is introduced.[20] It is not until the 6th century BC that the first reforms happen. By then, the dead letters are no longer included in the abecedaria and the northern and southern scripts are differentiated. An *Additionsreform* happens in the late 6th or early 5th century BC when letter 8 is included in the alphabetic sequence.[21] Once the reforms are performed, we can consider these scripts to be fully independent from the Greek ones.

Considering this, we might want to examine what Greek abecedaria can show us in this respect. Through identifying the sequence and the reforms that they have undergone, it should be possible to establish the composition of the Greek scripts and identify where these stand in comparison with other Greek and NEM alphabets.

3.3 Abecedaria for the study of the Greek alphabets

The material available for the study of Greek alphabetic scripts is scarce and does not come without its problems. Since we are dealing with several scripts, ideally, we would have examples of abecedaria for each one. However, this is not the case and, what is more, it is especially difficult to find complete abecedaria for the earliest stages of Greek alphabetic writing. All the Greek abecedaria dated before the 6th century BC appear on fragmented pottery or are incomplete because their writers preferred to record just the first few letters of the alphabet. This means that we do not have evidence for the complete alphabetic series for at least the first two centuries of Greek alphabetic literacy.

The following pages show several documents available for the reconstruction of the alphabetical sequence of the Greek scripts in the 8th and 7th centuries BC in chronological order. However, some later abecedaria will appear in the discussion for the sake of comparison and to fill in the gaps of earlier material.

[20] Wachter 1987, 23; Bagnasco Gianni 1996.

[21] For a full description of the reforms in the northern and southern Etruscan alphabets see Pandolfini and Prosdocimi 1990, 11–17.

3.3.1 The Fayum tablets

Although many researchers have cast doubt on the authenticity of these three tablets because of their uncertain provenance and their acquisition on the black market of antiquities, some still consider the Fayum tablets as valid evidence in the reconstruction of the earliest sequence of the Greek scripts.[22] They seem to show multiple abecedaria that run until tau, leading to the conclusion that they should be dated to the 9th century, before other letters were added to the alphabetic sequence.[23] Such an early dating is disputed by other scholars, who see later letter shapes and therefore prefer to think that this is a later copy of an early abecedarium.[24] Given that there is no archaeological context for these tablets, their dating is still uncertain despite the fact that they have been confirmed to be authentic ancient documents.[25] Hence, I will not consider their texts to be early alphabetic sequences and they are discussed here just as a point of comparison with other abecedaria.

Even if we were to consider the tablets to be as early as some scholars argue, there are still problems with their interpretation as a collection of abecedaria. The letters are often misplaced if we consider the 'canonical' order, although the expected sequence does appear in a few instances.[26] We might think, then, that the author knew the canonical sequence and that these 'anomalies' could have been done on purpose. If this is the case, then it is difficult to maintain the position that these are true abecedaria. The only alternative interpretation in the scholarship to date, however, is that of Ghinatti, who proposes that these sequences show the rotation of 22 members – thus the absence of any letter after tau – in an association for religious or political events, or else a magical text.[27]

Whatever the case, the doubts surrounding the nature of this document and its date and the rotating elements make it an unreliable source for the study of the Greek alphabetic sequence. Nevertheless, I will comment briefly on the lines that show the 'canonical' order.

According to the shapes seen in the tablets, the sequence (from right to left) would be as shown in Table 3.2.[28] This sequence is almost identical to that seen in the earliest Etruscan abecedaria. Some of the characteristic signs of the Etruscan documents can also be seen here: the appearance of digamma <𐌅>; the five-stroke mu <𐌌>, common in areas of Euboean influence; the window-shaped sign <⊞> discussed

[22] Heubeck 1986; Woodard 2014.
[23] Woodard 2014. Other early dates (8th or 7th centuries BC) are supported by Heubeck 1986 and Ghinatti 2004b, 57.
[24] Brixhe (2007b, 31) dates the copy around the 3rd or 4th centuries BC.
[25] See the details of its scientific examination in Scott 2014. For scholars who previously argued that this document was a forgery see *SEG* 55.1860; Powell 1991a, 31, n.83; Lazzarini 1998, 61.
[26] See Woodard 2014, ch. 4.
[27] Ghinatti 2004b, 55. For the Fayum tablets as a magical abecedarium see Heubeck 1986; Woodard 2014. Magical functions are attributed to other abecedaria elsewhere. Cf. Velaza 2003, 954–957; de Hoz 2014, 193 ff.
[28] Cf. Heubeck 1986, 15.

Table 3.2: The alphabetic sequence of the Fayum tablets.

𐤕 𐤔 𐤒 𐤑 𐤌 𐤍 𐤏 𐤇 𐤎 𐤋 𐤊 𐤉 𐤈 𐤆 𐤅 𐤄 𐤃 𐤂 𐤁 𐤀

Figure 3.1: Daphnephoros 60.03. Drawing made after Elvira Astoreca 2020, fig. 3.1.

in the following section; and the presence of both san <𐤑> and sigma <𐤎>. The main differences would be the shapes of iota <𐤉> and nu <𐤍>[29] and the downward looking lambda <𐤋>, which faces upward <𐤍> in Etruria.

As mentioned before, however, we should not draw any conclusions from this document as long as we are not sure about its date or its nature. Therefore, it will not be taken here as evidence, but as a point of comparison with other abecedaria.

3.3.2 The earliest abecedarium in Eretria?

Although the following inscription (Figure 3.1) has been treated thus far as an abecedarium, I would argue that this categorisation is highly dubious. The editors of the corpus from the sanctuary of Apollo Daphnephoros in Eretria have read the text on this 8th-century sherd as:

(<)]⊞oπ̣[

This interpretation understands the document as a sinistroverse abecedarium with the letters xi, omicron and pi.[30] Nevertheless, this reading entails three assumptions:

1. The reading direction is right to left.
2. The vertical stroke in the left side belongs to a pi.
3. The sign in the right side represents the letter xi.

The first assumption cannot be proven since the signs, as they appear on the sherd, are symmetrical and do not offer any indication regarding the reading direction. The second assumption cannot be refuted without a proper autopsy of the object. While in the photograph there seems to be no trace of a second stroke due to the damage on the top left, the drawing in the *prima editio* shows a diagonal stroke running from the top of the sign, thus interpreting it as <𐤍>, a pi closer in shape to NWS pe 𐤐.[31] However, that stroke could be part of any other letter with a long vertical first stroke

[29] Cf. Brixhe 2007b, 29.

[30] Kenzelmann Pfyffer *et al.* 2005, 60. Followed by Dubois 2014; Marchand 2014, 68; West 2015, 61; Papadopoulos 2016, 1241; Bourogiannis 2019, 161 f.

[31] Kenzelmann Pfyffer *et al.* 2005, 60 no. 3.

and a second diagonal one and no connections in the middle or lower parts of the sign (*e.g.* gamma <𐌂>/<𐌋>, mu <𐌌>, nu <𐌍>). Nevertheless, there is also the possibility that, even if the object is examined again, the damage may not allow for a proper interpretation of the sign.

Most interesting is the appearance of the window-shaped sign |⊞|, which has a difficult interpretation. Its reading as xi is probably motivated by its appearance in the position of that letter in the abecedaria from Etruria and in the Fayum tablets. It has been interpreted as a variation of the NWS samekh 𐤎 with vertical strokes on the sides.[32] Nevertheless, this is the first and only evidence of this sign in Euboea[33] and, given that it is dubious as an abecedarium, it is difficult to tell to what letter this would correspond. Furthermore, it is also important to bear in mind that this shape renders the value /t^{h}/ when it appears in Greek writing other than abecedaria.[34] As discussed in the previous section, Etruscan does not offer any help in this respect since this sign is not used outside of abecedaria.

A possible interpretation of this sign being an instance of squared theta in this specific inscription is supported by further evidence in the Greek-speaking communities. Another example of square theta appears in the recently found abecedarium from the Barako hill in Attica, where all round letters appear in their squared versions.[35] Moreover, even in the corpus of this particular sanctuary, we see a theta that is not perfectly round in Daphnephoros 75.64.

Thus, the interpretation of this text as an abecedarium seems to be done out of a desire to fill in a 'missing link' in the attestations of the alphabetic sequence. Such a reading would make the connection between Euboea and the Etruscan abecedaria, which show <⊞> in the position where xi is expected. If this is so, the Euboeans, often thought to be the first Greeks to use an alphabet, would have transmitted this sign to the Etruscans. Moreover, this would be the oldest abecedarium in the area, if not the oldest in Greek epigraphy (if the Fayum tablets are discarded). Nonetheless, for the reasons presented above, I will not consider this document as a valid abecedarium for this study.

3.3.3 The Athenian Agora abecedarium

A loomweight from the Athenian Agora (*Ath. Ag.* A1) dated to the 8th century BC appears to be inscribed on one of its sides.[36] Even though the text of this inscription is not completely clear, it is more likely to be a real abecedarium than the previous inscription. At least alpha and beta are clearly visible in the top right corner and the next sign seems to be a gamma. Apart from these three letters, no relevant information can be drawn from this document.

[32] Brixhe 2007b, 30.
[33] Dubois 2014.
[34] See §5.8.2.
[35] Langdon 2005, 176.
[36] Brann 1961, R22; Powell 1991a, 154.

Brann refers to this document as an 'abortive' abecedarium, as the rest of the strokes seem to be random instead of continuing the alphabetic sequence.[37] Powell also suggests that the writer may only have known the letters up to delta and then tried to imitate the rest of the signs with random strokes.[38] Nevertheless, it is difficult to ascertain just from the images whether the reading difficulties are due to an inexperienced hand or to the erosion of the object.[39]

3.3.4 Two abecedaria from Cumae

The bottom of an oenochoe from early 7th-century Cumae (*LSAG* 239.02) shows two abecedaria (Table 3.3) and an Etruscan text.[40]

The abecedarium below, running dextroverse, presents the alphabetic sequence up to zeta. This one is difficult to identify with a specific epichoric alphabet, since most of the signs are widespread throughout most of Greece, but given the status of Cumae as a Euboean colony, it has been suggested that it corresponds to the script of Euboea.[41] However, an Etruscan origin has also been argued,[42] as both alphabets share many signs. The only letter that could narrow down the possible origin of the script is <□>, only seen as a heta in Sicilian Naxos. The metropolis of both of these colonies is Chalcis, so we could presume that the scripts used in these three places are related.

Above this abecedarium and separated with a horizontal stroke we find another one. The signs in it, however, suggest that one should be careful when trying to match the script with the place where it is found, for it has a Corinthian beta 𐌑. Although it has been argued that this text runs from beta to zeta, I think that more probably it was written after the other abecedarium and in a reversed order: from zeta to beta. That way, the writer makes sure that both zetas meet at the same point. Read like that, in a sinistroverse direction, it is possible to explain why digamma and gamma look to the left. Furthermore, this difficult exercise of writing the abecedarium backwards may explain the absence of epsilon from this sequence.

In this abecedarium, the shape of delta is almost identical to that of heta without the middle stroke and gamma looks similar to a tailless rho. These mistakes are probably the result of trying to write the alphabetic sequence backwards together with the difficulty of writing in a second script. This is clearly an exercise of digraphy,[43] for

Table 3.3: Two abecedaria from LSAG 239.02.

𐌆𐌄□𐌇□𐌉	
𐌀𐌁𐌂𐌃□𐌅□𐌉	

[37] Brann 1961, 156.
[38] Powell 1991a, 154.
[39] Cf. photograph in Brann 1961, pl.23 R22.
[40] Powell 1991a, 156; Arena 1994, 113 ff.; Dubois 1995, 36–40.
[41] Powell 1991a, 156.
[42] West 2015, 61.
[43] Luraghi Forthcoming, 44.

there is no apparent reason to think that the two abecedaria were written by different hands. Surely, the closeness of the Corinthian colony of Syracuse is related to this example of digraphy. This means that Greek populations using different scripts very probably kept written communication and to do so they learnt each other's scripts, instead of trying to build a unified one. That knowledge of multiple scripts is translated into inscriptions like this one, which acknowledges and compares the differences of two distinct Greek scripts used for separate dialects of the same language.

3.3.5 Three abecedaria from Hymettos

Within the corpus of inscriptions from Mt. Hymettos there are three that can be catalogued as abecedaria, all dated in the 7th century BC.[44] Hymettos 17.20[45] shows two abecedaria in a fragmentary state due to the damage of the object. The visible signs are: <𐌁𐌇𐌃𐌅>. The specific shape of the gamma <𐌇> has been interpreted as Euboean or Boeotian.[46] Nevertheless, if we see it as an allograph of |Λ|, then it would correspond to the grapheme normally used in Attica. The writing is clearly made with difficulty, which led Langdon to think that this was made by a pupil following the first line written by his teacher.[47] The other sequence, however, seems to be done with a struggle as well.

Another abecedarium (Hymettos 18.21), although preserved completely, is formed only by the first three letters of the alphabet: <𐌀𐌁𐌇>.[48] We find here again the same shape of gamma as in the previous inscription, which, I believe, should be unproblematic. The horizontal alpha seems to have been written like that because of the *ductus* followed, rather than as a conscious choice in contrast with horizontal alpha (cf. §4.1.1).

Finally, another abecedarium on a broken sherd (Hymettos 18.22) shows only three letters due to the damage: <𐌅𐌌𐌌>.[49] Unfortunately, as happens with the other abecedaria from Mt. Hymettos, it does not offer much information about the Attic script, except for the upright looking lambda as opposed to the downward gammas both of which are commonly seen in Attic inscriptions. Sadly, no characteristic or innovative elements can be analysed from these fragmentary texts.

3.3.6 The Samian abecedarium

The closest we can get to a complete abecedarium before the 6th century BC is the one found on a cup from the Samian Heraion (*LSAG* 471.1a, ca. 660).[50] Although

[44] Langdon 1976, 17 f. Other documents originally interpreted as abecedaria by Langdon cannot be considered as clear examples: Hymettos 18.23–26.
[45] Powell 1991a, 153.
[46] Langdon 1976, 17 ff.
[47] Langdon 1976, 17 ff.
[48] Blegen 1934, 15 nos. 10 and 17, fig. 5; Powell 1991a, 152.
[49] Powell 1991a, 153.
[50] *EG* I 265.7; Powell 1991a, 157.

Figure 3.2: Samian abecedarium (LSAG 471.1a). Drawing from Elvira Astoreca 2020, fig. 3.2.

Table 3.4: The reconstructed sequence of the Samian abecedarium.

(<) 𐅀𐅁𐅂𐅃𐅄𐅅𐅆[ηθ]𐅇𐅈[𐅉?νξ]𐅊𐅋𐅌[Ρ?]𐅍[Τ?]𐅎𐅏+𐅐𐅑𐅒?

the damage on the object makes it impossible to know the shape of some signs, the appearance of the so-called 'supplemental letters' makes this abecedarium of particular importance (Figure 3.2, Table 3.4). We could say that this abecedarium shows the sequence that will later become the *koine* Greek alphabet, although with some signs that will be eliminated before that happens: digamma, qoppa and sampi. This Samian abecedarium is of special interest since it shows significant differences with the Semitic scripts and with the other Greek and Etruscan documents analysed here.

The presence of digamma in this abecedarium is worth noting, since in the Eastern Greek variant it is only used as a numeral but considered to be a 'dead letter' in linguistic terms.[51] It has been argued that the reason why this dead letter is maintained in the alphabetical sequence is because it was used in the Milesian numeral system[52] and this position could be reinforced by the interpretation in *LSAG*, where Jeffery even reads a sampi after the omega. There is, however, one later Samian inscription that uses a digamma as a letter,[53] which could mean that at this stage it was not a dead letter after all. Even if it was, we would expect it to be kept in the sequence, not only because of its numeric value, but also because a reform of the script might not take place until some time after the letter has fallen out of use – as seen previously in the Etruscan abecedaria.

Another noteworthy feature of this abecedarium is the sequence pi-qoppa-rho-sigma. San is missing between pi and qoppa and it is not present in another position, which implies that it has been removed from the sequence or that it was never adopted for this script, since this letter was never used in Samian writing. Instead, only sigma

[51] Powell 1991a, 157.
[52] Powell 1991a, 157.
[53] Diehl 1964, 537–542, no. 31, fig. 19.

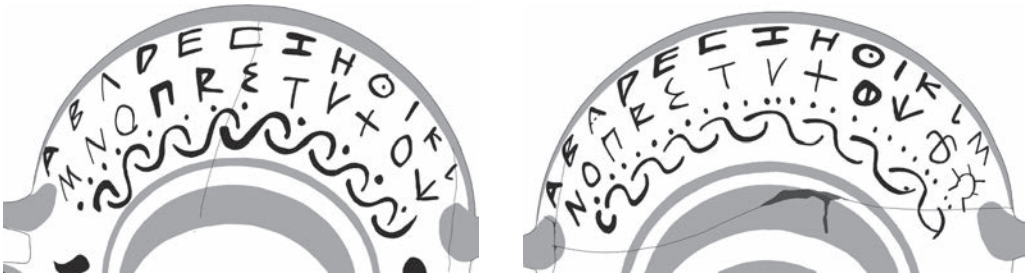


Figure 3.3: Boeotian kylix with abecedaria (LSAG 95.20). Drawings made by the author after Elvira Astoreca 2020, fig. 3.7.

appears, between rho and tau. We also find qoppa within this sequence. This is not surprising, as there are other instances of the use of qoppa in the Ionic Dodekapolis.[54]

The most interesting part of the abecedarium, however, comes after tau. In this last part of the inscription, we see the letters that were added to the ones present in the Semitic script and that characterise this abecedarium and the script behind it. Ypsilon is present in this sequence and followed by phi <ϕ> and chi <+>, the latter in the shape of a cross. A trident-shaped psi <ϒ> and omega <Ω> appear immediately after. This must be one of the earliest attestations of the latter[55] and its presence invites us to presume that the sign expected after zeta is not a heta but an eta, *i.e.* with the value /ɛ:/ in practical writing. Other inscriptions found in the Samian area corroborate this, since they show |Ⅎ| and |Ⅎ| for the phoneme /ɛ:/ and |Ω| for /ɔ:/.[56] Finally, a broken sign closes the sequence. Due to the remaining strokes and its position it has been interpreted as sampi. This extra supplemental is not seen in any other Greek abecedarium since this letter was only used among the Ionians and probably related to other Anatolian writing systems such as Phrygian.[57]

A later abecedarium where the supplemental letters play an important part can be seen in a Boeotian kylix of the 5th century BC (Figure 3.3).[58] This vase shows two almost identical abecedaria. The shapes of the letters and their order are exactly the same in both cases, with the only difference that one of them has two more signs than the other. Although these signs are a *hapax* and thus unknown to us, they have been interpreted as psi and omega given their place in the abecedarium and the similarity between the last sign and the letter omega. This is Vottéro's reading following Kalinka's,[59] and he adds that this is a consequence of the introduction of the Ionian alphabet in Boeotia.[60] Nevertheless, some of the signs in the abecedarium

[54] See *LSAG* 342.31 from Miletos and 344.53 from Ephesos.
[55] Powell 1991a, 157.
[56] See §§4.2.1 and 4.2.2.
[57] Cf. Brixhe 1983, 114. The uses and implications of this letter are discussed in §5.5.
[58] *LSAG* 95.20; Vottéro 1996.
[59] Kalinka 1892. Followed also by West 2015, 63 f.
[60] Vottéro 1996, 161.

do not match this explanation. There is no other sign for xi than |+| and so |Ψ| must necessarily be chi, which would mean that this is a red alphabet, exactly like the other abecedarium on the vase. The solution that I propose is that the two unknown signs are filling the space that was left after writing the abecedarium in a *horror vacui* reaction. By comparing the layouts of both abecedaria, it can be seen that the first abecedarium perfectly fits the space available, while the other would leave a blank space, thus ruining the harmony of the decorations. Therefore, the two extra signs are an aesthetic resource to prevent this from happening and cannot be taken as evidence for the expansion of the Ionic script in Boeotia.[61] Even though it could be argued that the last sign might be inspired by the shape of omega, this only shows that the painter may have known the letter, rather than its adoption in the local writing and even less its inclusion in abecedaria.

3.3.7 Fragmented abecedarium from Penteskouphia

Among the ceramic plaques of Proto-Corinthian style found in Penteskouphia there is one with an abecedarium inscribed (*IG* IV.1.333). Although it is not complete due to damage of the object, we can see the running sequence from epsilon to tau without gaps (Table 3.5). Interestingly, this abecedarium starts with <𐌇>, which in Corinthian is used to render /e:/, whereas /e/ is represented with |𐌄| instead.[62] Unfortunately, there is no other evidence that would indicate that having <𐌇> before <𐌉> was the norm in Corinthian abecedaria. Even in the Corinthian abecedarium from Cumae seen above no |𐌇| or |𐌄| appears.

Another peculiar characteristic of this abecedarium is the sibilant. Although sigma does not appear, for it is not present in Corinthian writing, san appears in its place, instead of the position seen in Etruscan alphabetic sequences between pi and qoppa.[63] This is not a rare phenomenon and can be seen in later abecedaria, like the one in Troilos' aryballos,[64] an abecedarium from Metapontion[65] and another from Poseidonia.[66]

It is interesting to compare these examples with the Barako abecedarium (Table 3.6).[67] Although this one seems to have been produced in 6th-century Attica,[68] it still keeps both letters in the same order seen in Etruscan abecedaria. This implies that there was no reform in Attica that excluded san from its alphabetic sequence, even though it is never used in practical writing. As we would expect in an abecedarium from Attica, xi and psi are absent, as opposed to the additional consonants for the aspirated stops,

[61] Vottéro 1996.
[62] See §§4.1.2 and 4.2.3.
[63] This was also noted by Piérart 1991, 568. Jeffery was wrong to transcribe the san as a sigma (Jeffery and Johnston 1990, 404 pl.20 no. 16) and this mistake is followed by West 2015, 63.
[64] Ghinatti 2004b, 38 f. = *LSAG* 440.19, early 6th century BC.
[65] Ghinatti 2004b, 49 f. = *LSAG* 261.19, early 5th century BC.
[66] Ghinatti 2004b, 51 = *EG* 113.5, early 6th century BC.
[67] *SEG* 55.83; Langdon 2005; West 2015, 58.
[68] Langdon 2005, 179.

Table 3.5: The sequence of the Penteskouphian abecedarium.

]ƎꟻIB⊕ϟKΛMΝOΓΞϘPMT[

Table 3.6: The sequence of the Barako abecedarium.

ᒣOϤMΛKI⊞BIꟻƎΔΛ8A

Φ+ʎTϟꟼϘM

which are present following the order chi-phi. The sequence <Xφ> appears in other documents, such as the Etruscan and Boeotian abecedaria, although in those cases they represent xi-phi. In the Samian abecedarium, where <X> is also chi, the letter appears after phi. A possible explanation could be that Attic and Boeotian abecedaria share the same characteristics on the graphic side, while the values applied to the signs in practical writing have been left in the background. This is another supporting argument for the absence of interference from the language system in the alphabetic sequence.

3.4 The Greek reforms?

Most of the early Greek abecedaria seen above provide very little information about the alphabetic sequence of each Greek script that we know of, especially when compared to the Etruscan abecedaria which have been preserved in a much better condition. However, from the few letters still visible in the Greek abecedaria and through the comparison with the Etruscan ones, it is possible to reconstruct some of the reforms that the Greek scripts experienced in their earliest stages.

When compared to an idealised NWS model (Table 3.7), the Greek scripts have made the following reduction reforms:

Samekh.[69] This letter has been passed on to some of the Greek scripts, while others eliminated it from their sequence. A couple of strokes are seen in the Samian abecedarium right before omicron and it is also seen in Penteskouphia, both with the shape <Ξ>. It appears in a window shape <⊞> in the Etruscan abecedaria. In contrast, the Boeotian and Barako abecedaria lack this letter. In the Greek areas where <Ξ> is included in abecedaria, we also see it used in practical writing with the value /ks/, whereas the abecedaria that do not have it are late and from sites that use other graphic solutions for /ks/. For this reason, it is difficult to tell in the latter case whether the reform had already happened in the earliest stages or if it was removed later from those scripts that did not use it.

Ṣade. This letter was kept in the form of san <M> in some alphabets, while others preferred to use sigma for the sibilant. In both cases, it is often seen in the alphabetic

[69] On the correspondence between NWS sibilants and Greek letters zeta, xi and sigma see §5.5 below.

Table 3.7: The Northwest Semitic script.

'aleph		waw		kaph		'ayin		šin	
beth		zayin		lamedh		pe		taw	
gimel		ḥeth		mem		ṣade			
daleth		ṭeth		nun		qoph			
he		yodh		samekh		reš			

sequence. Etruscan abecedaria kept it and it was not eliminated in the 6th-century abecedarium from Barako, even though this letter is not used in the Attic script. It also appears in the abecedarium form Penteskouphia, although in the position of sigma. It was removed (if ever adopted) already in the 7th century in Samos, and at least before the 5th in Boeotia.

Šin. From this Phoenician letter will derive sigma. The latter is the only letter for a sibilant sound present in the Samian and Boeotian abecedaria. It appears with san in the Fayum tablets, the Etruscan abecedaria and that from Barako. From the documents analysed here, it is only eliminated from the abecedarium from Penteskouphia, where it is substituted by san.

Those are the reductions visible in the 7th-century abecedaria. Although in the Boeotian cup we can see that qoppa has also been removed, it is present in all of the early abecedaria and therefore it has not been included within the early reforms. The case of digamma is quite special, because it is kept even in the 6th-century abecedaria in areas where it is becoming or has become a 'dead letter' (7th-century Samos and 6th-century Attica). In some cases, this might be explained through its use as a number in the Milesian numerical system, but wherever these numerals are not used the reason to keep digamma could be the conservatism of the alphabetic sequence.

Furthermore, the inscriptions analysed in this chapter show several additions to the model provided by the Semitic scripts. All of them appear closing the alphabetic sequence.

Ypsilon. It is present in all abecedaria and effectively used in all forms of alphabetic Greek writing. Other related writing systems such as Phrygian and Eteocretan show this letter in their practical writing and it was also transmitted to Etruscan. It is probably one of the earliest reforms to the NWS sequence, but we should be cautious about ascribing it to Greek populations. This issue will be explored further in the following chapter.

Phi. It is present in all of the abecedaria that run all the way to the supplemental letters. Nonetheless, it is not always placed in the same position. It is seen after ypsilon only in the Samian abecedarium. In the others, it appears after |Χ| or |+|,

which corresponds to xi in the Boeotian abecedaria and chi in Samos and Barako. The Etruscan documents include it after |Χ|. This seems to be a Greek addition to the sequence, since Phrygian lacks it altogether and it is unlikely that Eteocretan 𐌦 is related to phi, but rather to qoppa 𐌠.[70] Nevertheless, as we shall see in chapter 5, this innovation is not shared by all Greek alphabets.

Chi. It appears after phi in the sites where /k^{h}/ is represented by |𐌚|, *i.e.* the Boeotian and Etruscan abecedaria. In the Samian sequence it appears after phi with the shape <+>, whereas in the Barako abecedarium <Χ> is placed between ypsilon and phi. As with phi, chi seems to be a fully Greek addition that spreads around most Hellenic populations. The differences in shape and position, however, seem to point towards separate traditions concerning the letters representing /k^{h}/ and their inclusion within the alphabetic sequence.

Psi. This addition is only visible in the Samian sequence. In the areas where the other abecedaria come from, practical writing shows no examples of a single grapheme to represent /ps/; instead, we find digraphs, which are not included in the alphabetic sequence. Therefore, this is an addition exclusive to specific Greek populations.

Omega. The situation with omega is the same as with psi. Hellenes from other areas did not use this letter and therefore it is only added in the Samian abecedarium. Again, this is an innovation that is not widespread in the Greek territories.

Sampi? It is likely that the last sign in the Samian sequence is part of letter sampi. If that is the case, this is the only abecedarium that shows this letter and therefore it is a local addition. It could be inspired by a similar sign used in other Anatolian writing systems.

Even though the evidence is scarce, it clearly shows that, compared to the Etruscan abecedaria, these Greek documents belong to a more advanced stage in the development of the script. They all exhibit reforms that entail independent changes when compared with the NWS sequence. Unfortunately, in many cases it is not possible to verify whether these reforms were first made in a Greek context or not since no abecedaria have been found for other related Mediterranean alphabets like Phrygian or Eteocretan. In some cases, however, it is possible to identify elements that seem to be Greek innovations: phi, chi, psi and omega are only seen in Hellenic contexts until some of them are transferred into Etruscan writing.

These abecedaria are also evidence for the diverse repertoires seen across the Greek territories. In each of these sequences different reforms can be identified,

[70] This is discussed further in §5.7.3.1.

which make the scripts distinct from each other already at this early date. Moreover, these changes seem to happen at different times depending on the area *e.g.*, while the 6th-century abecedarium from Barako (Attica) keeps sigma and the 'dead' san, the Samian 7th-century sequence has already removed the latter, while adding other signs not seen in the Attic alphabet. This means that each region will have a particular set of graphemes available for them to use in practical writing, which will translate into individual graphic solutions, graphematic relationships and orthographic traits. All these will be explored in the following chapters.

Chapter 4

Vocalic notation in the epichoric alphabets

The assessment of the vocalic notation in the Greek alphabets is of special importance since it is the main difference between the NWS abjads and those writing systems that are arising in the Mediterranean for non-Semitic languages around the 8th and 7th centuries BC. As mentioned earlier, Greeks are often credited with the invention of vocalic notation and thus with the creation of a new typology of writing system, the alphabet. Let us consider first whether this is a valid claim in grapholinguistic terms.

As seen in the previous chapter, the changes seen at the level of the script when comparing Greek abecedaria to the NWS sequence included just a few *Additionsreformen* of which only one, ypsilon, is present in all scripts to represent a vocalic sound, and another, omega, is only seen in one script. This means that most of the vowel signs are created through changes at the graphematic level – or *Funktionsreformen* in Wachter's words – that implied the application of a vocalic sound instead of a consonantal one for some of these signs; not to mention that some of these were already used with a vocalic value in NWS writing systems.[1] So are these graphematic reforms and the new systematic use of vowel notation enough to talk about a new typology of writing system?

Gelb and Powell argued that NWS writing – though they specifically mention Phoenician – should be envisioned as a syllabic system where signs represent CV syllables without specifying the vowel.[2] However, the use of some consonantal signs to specify vowels in some contexts suggests that this is not so and that graphemes in NWS writing render phonemes,[3] as they do in Greek alphabets. A very different situation is seen in the case of the adaptation of the Phoenician script by Iberian populations, who did assign syllabic values to some of the Phoenician consonantal

[1] NB Aramaic ML.

[2] Gelb 1969, 220 ff.; Powell 1991a, 238–245. This responds to an evolutionary conception of the development of writing systems, where logographic systems would be the most primitive, giving way to syllabaries which would finally derive in alphabets, cf. discussion in Boyes and Steele 2019, 3 ff.

[3] See discussion in Gnanadesikan 2017, who uses the term 'segment' instead of 'phoneme'.

signs, thus creating a semi-syllabary.[4] As opposed to this, in the case of the Greek alphabets we cannot really argue for a system typologically different to NWS writing, for the only changes are the specific phonemic values applied to the signs and the use of a full vocalic notation. Therefore, the fact that the so-called 'abjads' do not write – or write few – vowels is a matter of a more obscure orthography than that of alphabets with full vocalic notation but not a deeper typological change.

Still, we should consider whether the systematic notation of the vowels – in contrast with ML, which only appears in specific contexts – was an innovation introduced by Greeks or not. Many have argued that this is so and that the similarities in the letters for the vowels across epichoric alphabets are so significant that these must have a common origin. Furthermore, they passed on this vocalic notation to other populations around them, like Phrygians, Eteocretans and Etruscans. Recent epigraphic discoveries, however, suggest that the same letters used for vocalic notation in these alphabets already existed before the earliest visible samples of Greek writing. This is the case of the inscribed flask from Osteria dell'Osa and the re-dated palaeo-Phrygian texts from Gordion.

In 1991, a new inscription dated ca. 775 was found in the necropolis of Osteria dell'Osa.[5] It appeared on a flask that was left as a votive in the grave of a cremated woman. The origin of the flask is not completely clear since there are no parallels for its shape, but it is most probably a local production even though the woman buried here is thought to be a foreigner.[6] The text is often read as <EYΛIN> and connected with the Greek word εὔλινος.[7] Looking at the photographs and drawings, however, I do not agree with this interpretation, but would rather read <EFIN> or <EKIN>, if we are to find the correspondence with Greek letters.[8] Still, there is nothing to suggest that we should try to link the text to the Greek language. The inscription looks as if it was written before firing the clay and thus, if we believe the object to be of local production, then the inscription must be as well. Whether the text is in a local Italic language or in whatever language this 'foreign lady' spoke is unknown to us. What cannot be contested is that, if we compare the text with the Greek vocalic letters, epsilon and straight iota are already present in this inscription. This might be evidence against the long-held assumption that the alphabet, and therefore vowel letters, arrived in the Italic peninsula through the Greeks and then the Etruscans. On the contrary, this text

[4] Ruiz Darasse 2019, 200–3.

[5] *Prima editio* Bietti Sestieri *et al.* 1991, 83–88; further commentaries can be found in Bietti Sestieri 1992; Ridgway 1996.

[6] About the typology and possible origin of the flask see Ridgway 1996. He also mentions that the deposit looks unusual when compared to the local burials. He proposes that the woman buried here might be a foreigner and recalls how Euboeans deceased at Pithekoussai were also cremated (Ridgway 1996, 90–92).

[7] Bietti Sestieri *et al.* 1991, 84; Ridgway 1996, 92 ff.

[8] Photographs and drawings of the inscription can be found in: Bietti Sestieri *et al.* 1991, 84–85, fig. 6a–d; Bietti Sestieri 1992, fig. 3a.270; Ridgway 1996, 88, fig. 1.1.

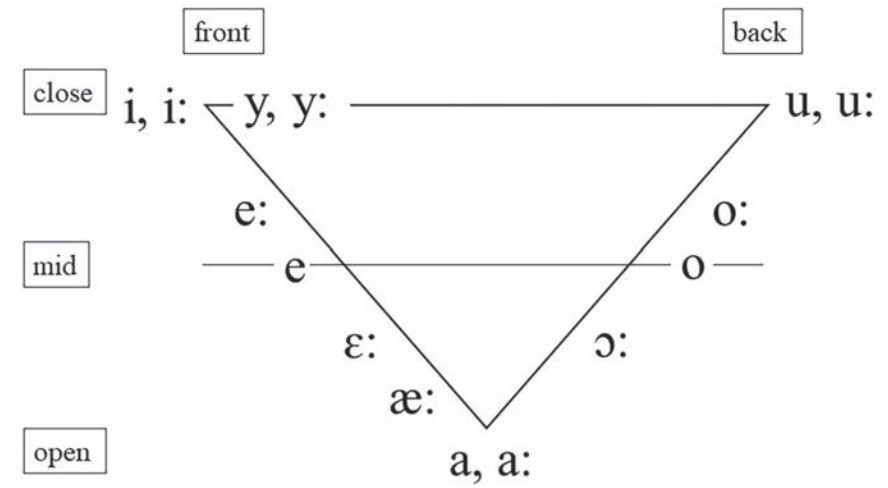


Figure 4.1: Triangle of the vowels discussed in this chapter.

shows that these are already in use at least one quarter of a century before the earliest Greek inscriptions.

In Anatolia, with the new chronology of the Cimmerian invasion at the city of Gordion, those inscriptions contextualised immediately after the destruction layer (G104, 237 and 249) are now dated in the early 8th century BC,[9] as is the inscription from Osteria dell'Osa. Together they provide early evidence for the vowels 𐌀, 𐌄, 𐌉 and 𐌏. It is noteworthy that both texts show straight iota, as some of the Greek alphabets that we will analyse below (see §4.1.3). Other texts that are contemporaneous with the earliest Greek inscriptions (G105–109) show the four vowels mentioned above and also 𐌕.[10]

These inscriptions call for caution when considering what innovations are undoubtedly Greek. The present chapter will reassess this by analysing the graphematic relationships seen for the Greek vowels in the earliest stages of the different epichoric alphabets. These will be laid out in a series of tables heading each section, where all the representations identified for a given value are shown with the code assigned to them in the database and ordered from most to least common. These also show information concerning the number of inscriptions and sites where the sign is attested with the value in question.[11] In this way, it will be possible to analyse and identify different traditions and reforms in the vocalic notation of these alphabets.

[9] Inscriptions can be found in Brixhe and Lejeune 1984; an explanation of the chronology is in Brixhe 2002, 26.

[10] Brixhe and Lejeune 1984; Brixhe 2002, 26.

[11] Signs that appear facing opposite the reading direction of the text or upside-down are recorded with an asterisk (*); here they appear in separate columns to show which signs also have orientation flexibility (Database last checked in July 2020).

Moreover, these will be compared to other tendencies seen across the Mediterranean through the comparison with NWS, palaeo-Phrygian and Eteocretan, thus considering where the epichoric alphabets stand in the broader picture of alphabetic writing in the Mediterranean.

4.1 Short vowels

All short vocalic phonemes – /a/, /e/, /i/, /o/ and /u/ or /y/ (Figure 4.1) – are effectively represented and distinguished in the Greek alphabets. They all take distinct graphemes that differentiate them from the rest of the short vowels of a different quality, although as mentioned in §2.2, at least some of these graphemes render long vowels as well. These long vowels that never had a graphic distinction from their short counterparts are considered in this section as well.

4.1.1 /a/ and /a:/

The notation of /a/ in the Greek alphabets is one of the most stable and widespread graphematic relationships (Figure 4.1). Its most popular sign |𐌀| – with its allomorphs <A>, <Α>, <Α> – is seen across all scripts and is known as the letter alpha. This stability in the graphematic relationship |𐌀|-/a/ seen in the Greek alphabets has been the strongest argument for the monogenesis of the Greek scripts. This argument rests on the fact that the Semitic consonantal value assigned to ’aleph 𐤀 is not far from the vocalic one used systematically in other Mediterranean alphabets. Jeffery suggests that perhaps the glottal stop sound could be interpreted as /a/ by Greek speakers and hence the vocalic value that will spread across alphabets.[12]

The only variations to this grapheme-phoneme relationship are some isolated cases where the orientation of the sign changes, where perhaps |ᐅ| could be interpreted also as another allograph of alpha. Nevertheless, here it appears as a distinct sign so that it can be accounted for since it has been used as an argument for the antiquity and closer relationship of certain Greek inscriptions with Semitic writing. Even so, it is facing the opposite direction if we compare to the Semitic 𐤀.[13] In fact, this is a very marginal grapheme in Greek epigraphy. It is only seen in the Dipylon Oinochoe (*LSAG* 76.01, ca. 725) <ΓᐅΝΤΟΝᐅΤᐅΛΟΤᐅΤᐅΓᐅՏΙΚՏ> παντōν αταλōτατα παιζε̄ι, in Hymettos 18.21[14] and in a sherd from Pithekoussai (*EG* 225.5, 8th century) <Γᐅ>.

There is also one example where alpha is inverted pointing downwards |∀|. This happens in *LSAG* 88.22, an aryballos of unknown origin dated ca. 650: <∀Γ∀ՏΙΛΕϜΟ> Αγασιλε̄ϝο.[15] Finally, the use of a rhomboid shape |◊| as /a/ in one of the abecedaria

[12] Jeffery and Johnston 1990, 22.

[13] Jeffery and Johnston 1990, 23; Guarducci 1995, 89. It is also worth noting that there is an example of upright ’aleph in a Proto-Canaanite inscription from Sechem (Naveh 1997, 26, fig. 18).

[14] Abecedarium discussed in §3.3.5.

[15] Euboean sites have been suggested as possible origins. Jeffery and Johnston (1990, 88) believe it is Eretrian, while Lejeune (1945, 103) acknowledges the Boeotian making of the object – copying the Proto-

Table 4.1: Representations of /a/, /a:/.

	1. 𐌀	2. 𐌁	1*. 𐌄	46. 𐌆
No. of sites	56	3	1	1
Total inscriptions	368	3	1	1

from Hymettos (17.20), seems to be a mistake from a non-experienced hand, given that the rest of the letters are also written with difficulty.

All of these leave us with quite a unified picture for the phoneme /a/ that uses mostly the grapheme |𐌀|, attested in almost all Greek-speaking communities, with just a few exceptions. Moreover, this stability continues later in time.[16] Therefore, we might conclude that the different variations of the signs for /a/ are a matter of palaeography and that the basic shape – an angle with a line crossing it in the middle – is shared not only between Greek alphabets, but also other related alphabets, *e.g.* Phrygian and Eteocretan.

4.1.2 /e/

The most extensive grapheme for /e/ is |𐌄|, with its allomorphs <𐌄>, <𐌇> and <𐌅>. Again, these come from a Semitic consonant, he 𐤄, that lost its consonantal value when transmitted to other Mediterranean alphabets. However, there are two cases of sign choices specific to certain scripts: Corinthian 𐌇 and Sikyonian 𐌆 (Table 4.2).

In the sites in the area of Corinthia and the Corinthian colony of Corfu, a completely different grapheme |𐌇|, and its allograph <𐌉> render /e/. While this grapheme is normally associated with /b/ in other alphabets, in the Corinthian settlements another sign is used for that sound |𐌚|. Although |𐌄| is also used within this alphabet, in fact it renders the long vowel /e:/ instead. It is not easy to reconstruct how these signs of the Corinthian script came to have such different values to those seen in other parts of Greece. A possibility is that Corinthian beta was created first, allowing |𐌇| to be available for another value. In fact, if we look back at the Corinthian abecedaria shown in §§3.3.4 and 3.3.7, we can see that <𐌚> appears in the second position, where we expect the sign for /b/, whereas <𐌄> stands before digamma. Thus, Jeffery interprets that |𐌇| must have been added to the end of the Corinthian alphabetical sequence with the other additional letters.[17] Unfortunately, we have no evidence of what the sequence would have looked like after tau and it is not possible to corroborate that. However, this suggests that while |𐌚| and |𐌄| are part of the original Corinthian script, |𐌇| is part of an *Additionsreform*. It was probably during that reform that the vocalic

Corinthian style – although the dialect and script seem from Chalkis to him.

[16] Jeffery and Johnston 1990, 23.

[17] Jeffery and Johnston 1990, 116 f.

Table 4.2: Representations of /e/.

	15. 𐌄	3. 𐌇	21. è	16. 𐌇	23. 𐌄
No. of sites	55	6	1	1	1
Total inscriptions	266	71	2	1	1

values /e/ and /e:/ were assigned to |𐌇| and |𐌄| respectively, even though they were conscious of the consonantal value |𐌇| in other alphabets.[18]

The shape |𐌇| with the value /e/ appears in an inscription found in Delphi attributed to a Sikyonian (*LSAG* 143.2, 7th century?) following the reading <𐌔𐌇𐌚𐌉𐌊𐌏𐌌𐌅𐌏𐌌> Σεϙυϝονιιος. This graphematic relationship seems to be specific to this site and was in use until the second quarter of the 5th century.[19] There are two other instances of this sign, but of unclear value. *LSAG* 143.1 from Sikyon (ca. 650–640?) is too fragmented to assess clearly the value of the sign. The same shape is found in a 7th-century law from Dreros, *LSAG* 315.1a-h, where it seems to be some sort of dividing sign that marks the end of a paragraph,[20] and therefore not related to the Sikyonian letter. No other Greek or related alphabets present this graphematic relationship and thus its origin is obscure. Sikyonians probably created this original sign after trying to find a grapheme for /e/, just as the Corinthians did. According to Jeffery, it might be the result of modifying Corinthian |𐌇| to avoid confusion between signs for /b/ and /e/, since Sikyonians used the former shape for the consonant, whereas |𐌄| renders /e:/ following the Corinthian fashion.[21]

|𐌇| and |𐌄| are exceptional in their use for /e/. Both <𐌄> and <𐌇> appear as /e/ in two inscriptions from Aeolian Larissa (*LSAG* 361.a-c, 7th century?): <Ạ[.]ΛΝΑΗΑΗ> Ạ[θ]αναηαη, but <ΚΕ> ανεθε̄]κε and <ΤΑΝΔΕ> τανδε. The interpretation of <𐌇> as /e/ in the first form seems justified by the forms Θηοδδ̄ρος instead of Θεοδδ̄ρος, also found in the area, and Αθαναε in Myrina.[22] The interchangeability of both graphemes seems to be characteristic of this area, and in this specific case it might respond to a pronunciation of the diphthong [aę̯] < /ai/, for which probably both |𐌄| and |𐌇| seemed suitable.[23] In a similar fashion, |𐌄| is used for /e/ in an inscription from Damarionas in Naxos. In this 7th-century epitaph (*LSAG* 466.C) we find <𐌌𐌄𐌓𐌏[.]𐌄𐌉𐌄𐌌> μηπο[ι]εσεν, when we would expect to see μ'εποιεσεν after the elision of epsilon in με.

[18] This can be seen in the double abecedarium from Cumae discussed in chapter 3. Cf. Luraghi 2010, 74 f., who also points out that the palaeographic development of Corinthian |𐌇| is related to that of beta in other alphabets; Jeffery and Johnston (1990, 114 f.) believe that the Corinthian grapheme is derived from |𐌄|, and so do Guarducci (1995, 171) and Woodard (2019, 102). Kretschmer (1894, 34) thinks it is derived from Phoenician 𐤇.

[19] Jeffery and Johnston 1990, 138; Guarducci 1995, 335.

[20] Jeffery and Johnston 1990, 308; Steele 2019a, 138.

[21] Jeffery and Johnston 1990, 138; Guarducci 1995, 335; Luraghi 2010, 84.

[22] Blümel 1982, §27. This site in the island of Limnos is compatible with Larissa in terms of dialect.

[23] Blümel 1982, §27; Brixhe 1991, 319. Cf. the form Αθαναιαι elsewhere.

The confusion of <𐌇> and <𐌇> for /e/ seems to be part of a common scribal mistake in the Cycladic area, especially in the 6th and 5th centuries. This mistake was probably triggered by the dialectal features of these islands that may be shifting the pronunciation of their short and long vowels.[24]

In summary, it seems that different areas are experimenting with the notation of /e/, even though there is a widespread common grapheme |𐌄|. These variations are accomplished either by using a completely different grapheme, such as |𐌁| or |𐌇|, or by using signs associated with /ɛ:/. While the latter might be done out of confusion because of phonological features in specific dialects, the former seem to be the result of a conscious choice of graphemes after an *Additionsreform*. This graphemic choice is, therefore, restricted to the area surrounding Corinth. Elsewhere, the graphematic relationship is stable, including the alphabets for Phrygian, Eteocretan, the inscription from Osteria dell'Osa and the later Italic scripts.

4.1.3 /i/ and /i:/

The case of the notation of /i/ is especially important, for it suggests the existence of two separated traditions in the writing of this specific sound; while some sites use |𐌉| – also referred to as straight iota – others show several zig-zag-shaped signs, the so-called crooked iotas (Table 4.3). Most importantly, these two traditions are also seen in related writing systems. Phrygian, for example, uses |𐌉| for /i/, as do peoples in the Italic peninsula from the times of the inscription from Osteria dell'Osa and also later in the Etruscan alphabet. On the other hand, Eteocretan has no such grapheme and, therefore, |𐌔| has been interpreted as its vowel /i/ following the tendency of their Cretan Greek neighbours.

Within the Greek alphabets, each of them follows one of the two traditions; there are no attestations of both in the same site (Figure 4.2). Only Kommos, in Crete, seems to be an anomaly, since the whole island uses crooked iotas only – even for Eteocretan – whereas straight iota happens repeatedly in this settlement. But this is not the only element of the inscriptions from Kommos that does not match the rest of the Cretan alphabets. In fact, this site offers a special corpus of inscriptions that seem to show multiple origins from within the island and across the Aegean, probably due to the commercial activity of the site.[25] For some of them a Euboean origin has

Table 4.3: Representations of /i/ and /i:/.

	28. 𐌉	32. 𐌊	30. 𐌔	31. 𐌋	31*. 𐌚	30*. 𐌕	32*. 𐌘	29. 𐌌	54. 𐌗	54*. 𐌙	55. 𐌖
No. of sites	41	8	6	9	5	5	2	1	1	1	1
Total inscriptions	153	68	52	17	12	6	3	1	1	1	1

[24] Cf. Gomis García 2018, 75 and 79.

[25] See discussion in Bourogiannis 2019, 155–157; Steele 2019a, 140–142. About the commercial nature of the site see Muñoz Sogas 2017.

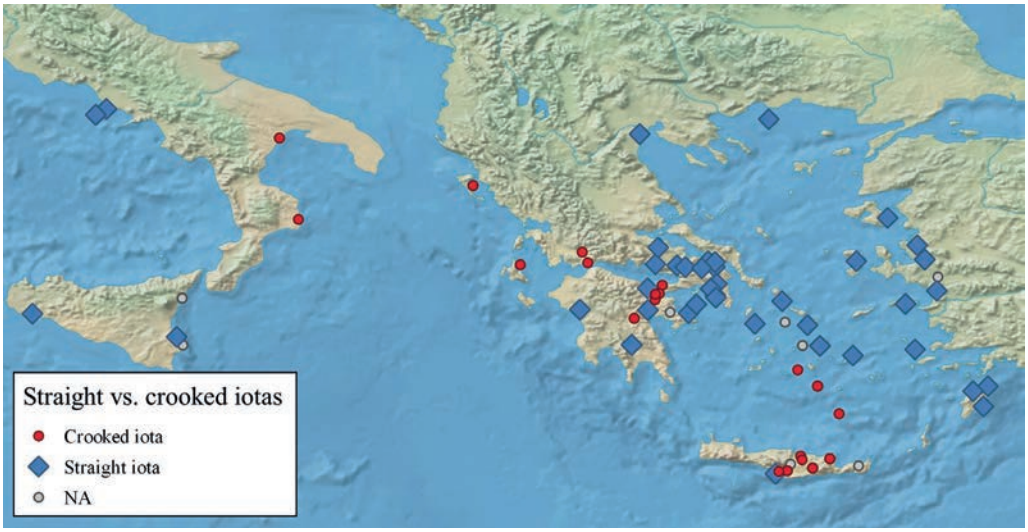


Figure 4.2: Geographical distribution of crooked and straight iotas.

been put forward,[26] supported by the presence of the five-stroke mu |𐌌| and |𐌡| for /w/. These traits, however, are found in other alphabets as well – most notably in Cretan – and are not conclusive. On the other hand, the presence of |𐌄| for /ɛ:/ and downward lambda Λ may point towards Cretan alphabets. Nonetheless, there are other signs of uncertain value that are completely foreign to the island, such as |𐌗|, |𐌦| and |𐌕|. All of these elements may be explained better through a connection with Asia Minor, or at least a combination of inscriptions from Cretans, eastern Ionians and maybe Euboeans as well.

A zig-zag sign <𐌎> with uncertain value appears in an inscription from Smyrna (Smyrna 40.2, 8th century?), where straight iotas are used systematically. However, the reading of the sign in this inscription as sigma seems implausible. The text <𐌚𐌌𐌎>, may be interpreted as either]ɛ̣μς. or]ɛ̣μι.[27] However, the combination μσ within a word or in a word boundary seems unlikely and it could not be read in the opposite direction, since |𐌚| never appears reversed. So the reading]ɛ̣μι. is preferred if this is to be Greek. Therefore, it should be either an import from elsewhere in Greece – Thera and Gortyn are places where this kind of mu and iota are seen in early inscriptions – or an early Lydian inscription, as suggested by Jeffery.[28]

Even without these exceptions, there seems to be no straightforward geographical distribution of the two traditions at first sight (Figure 4.2), although eastern sites do seem to prefer straight iota. If compared to the distribution of the Greek dialects,

[26] Csapo *et al.* 2000.
[27] Jeffery 1964, 40.
[28] Jeffery 1964, 40.

Table 4.4: Representations of /i/ and /i:/ (except |||) according to site.

Achaia	𐌣 𐌡 𐌠	Crotona	𐌠	Perachora	𐌣
Acrocorinth	𐌢	Dreros	𐌔 𐌢 𐌣	Phaistos	𐌣
Aetos	𐌠 𐌤	Eltynia	𐌔	Sikinos	𐌣 𐌡
Afrati	𐌔 𐌢	Gortyna	𐌔 𐌢	Thera	𐌔 𐌢 𐌣 𐌡 𐌤 𐌠 𐌦
Anaphe	𐌣	Knossos	𐌔	Thermon	𐌣
Corfu	𐌦 𐌣	Metaponto	𐌡 𐌠	Unknown	𐌣
Corinth	𐌠	Molykreion	𐌠		
Corinthia	𐌠	Penteskouphia	𐌠 𐌤		

the correspondence is not perfect either. Sites where Doric dialects are spoken tend to have crooked iotas, but this is not so everywhere, *e.g.* straight iota is present in Argolis, Lakonia and Rhodes. Nevertheless, no Ionian settlement uses a crooked iota. This suggests that there could have been an initial dialectal distribution, where Ionians – in a closer geographical connection to the Phrygians and the Italics – used straight iota in opposition to the Dorians, who preferred the crooked signs for /i/, like the Eteocretans. The Italic colonies also respect these dialectal tendencies, as seen in the use of crooked iotas in Achaean colonies, but straight iotas in the Euboean and Megarian ones. Nevertheless, the Dorians living in neighbouring areas or in close connection with Ionians, may have taken writing from them and so adopted straight iotas instead.

There are also some interesting issues concerning the graphic features of this letter. As seen in Table 4.3, wherever straight iota is used it is always the same grapheme, which even lacks allographic variations. The sites where crooked iota is used, however, show a broad sign choice, each with a set of allomorphic writings. Moreover, these can appear reversed in comparison to the reading direction of the text and take many shapes even within the same site. It is especially remarkable that in the 16 inscriptions from Thera, eight variants for /i/ have been found (Table 4.4). This instability also happens in the sites where these shapes are used for /s/.[29] According to Jeffery this might be so because the number of strokes for this sign was not fixed,[30] but neither is its orientation.

While the crooked iotas are thought to be signs derived from a cursive version of Semitic yodh 𐤉,[31] the origin of straight iota is unclear. It is believed that this was an innovation made by populations using sigma,[32] since all the shapes used for crooked iota may have the value /s/ in other alphabets.[33] Therefore, this new simplified sign

[29] See §5.5.
[30] Jeffery and Johnston 1990, 29 and 34.
[31] Jeffery and Johnston 1990, 29.
[32] Jeffery and Johnston 1990, 30; Guarducci 1995, 95.
[33] It could be that these two letters, crooked iota and sigma, at some point started to develop their shapes

avoids the confusion between the two letters. Even if that was the initial idea behind the creation of this grapheme, the evidence seems to suggest that this innovation might not be Greek.

As already mentioned, straight iotas are seen in the early 8th century BC in the Italic peninsula and Phrygia before visible writing appears in Greece. It is still unclear where or how this letter originated, but a palaeographic variant of Semitic yodh has been put forward as a possible model for the straight iota.[34] On the other hand, Brixhe argues that the straight iota might have been a Phrygian creation since writers of this language needed a sign not only for /j/, but also for the vowel /i/. So while they kept the crooked shape for the consonant, a new sign was devised for the vowel.[35] Adiego, however, rejects this theory alleging that the Phrygian yod is only seen from the 6th century onwards and that in earlier inscriptions straight iota covers the sound /j/ as well.[36] In Greek, this sound is almost completely lost, only identifiable as a glide, as in the inscription *LSAG* 143.2, <ΜΞϘΥϜΟΜΙΙΟΜ> ΣεϙυϜονιιος, where the second iota represents [i̯].[37]

However, there must have been some alphabet that, at some stage, was able to differentiate both crooked iota and sigma, as we see these two letters in the Dipylon Oinochoe.[38] To do this, a distinct shape of sigma |Σ|, not seen elsewhere, is used to distinguish /s/ from |Ϟ|-/i/. Unfortunately, no other Greek alphabet has these two letters in its repertoire and so its origin cannot be completely ascertained.[39] In the rest of the Greek alphabets, crooked iota is never seen with sigma, although straight iota might appear with san.[40]

However the two variants may have originated, the fact is that, by the time we find visible writing in Greece, two well established traditions are set in place for the notation of /i/. While straight iota is systematically used in Aeolic and Ionian sites, crooked iotas are preferred in Doric settlements with a few exceptions. These two traditions are being transmitted across alphabets, not only for the Greek language, but for others as well. In this respect, it is very different to the situation analysed for /e/, in which some areas made conscious graphemic choices that

in parallel, as Luraghi proposed for beta and 'Corinthian epsilon' (Luraghi 2010, 74).

34 Isserlin 1991, 288.

35 Brixhe 1991, 352 ff.; 2007a, 280 f.

36 Adiego 2018, 149.

37 Further examples of iota as a glide can be found in Woodard 2019, 94.

38 NB that this inscription is later than that of Osteria dell'Osa (Johnston 2003, 263) and the Phrygian inscriptions from Gordion (Brixhe 2007a, 280).

39 Apart from crooked iota, <Λ> for /l/ suggests a non-Athenian hand, as Jeffery maintains (Jeffery and Johnston 1990, 65); contra Wachter 1989, 23. However, her theory of a writer from Posideion – *i.e.* Al-Mina – (Jeffery and Johnston 1990, 16) is unverifiable, for the script used there is completely unknown to us.

40 This happens in *LSAG* 143.2 mentioned above; in Argos (*LSAG* 168.3 and 168.4, both 7th century) <ΓΕΡΙΚΑΛΛΕΜ> περικαλλε̄ς <ΕΔΕΜΕΓΟΙΕΗΟΑΡΓΕΙΟ>]με̄δε̄ς εποιε *h*ο αργειο[ς (my own reading based on the drawings from Homolle 1909, 8–9, figs. 8 and 9); Megara Hyblaea (*LSAG* 459.24a, 7th century) <ΗΕΡΟΙΜΙΘΕΟ> *h*ε̄ρο̄ισι θεο[ις; and in one of inscription of unknown origin found in the Argive Heraion (*LSAG* 150.11, first quarter of the 7th century) <ΧΟΜΗΕΜΙ> χωση εμι?.

distinguished them from neighbouring alphabets. In contrast, iota is most likely adopted either straight or crooked by each alphabet, without performing a later graphematic reform.

4.1.4 /o/

|○| is the most popular sign used for /o/ and is seen throughout all Greek territories. In addition to this shape, we can find dotted omicron |⊙| in Eretria (Daphnephoros 66.26, first half of the 8th century), Thera (*LSAG* 323.3, 7th century?) and Anaphe (*LSAG* 324.26, 7th century?) with the same value. In Thera |⊙| as /o/ is an exception seen in *LSAG* 323.3 <𐤅𐤕𐤅⊙𐤊𐤉𐤇𐤓> Ετεοκλης. In the rest of the inscriptions /o/ is rendered by |○|, while |⊙| is used for /ɔ:/.[41] The case of Anaphe is discussed below (see §4.2.2). The rhomboid shape |◇| seems to be a squared variant of |○|, since it is seen in places that normally use |○|-/o/.[42] Finally, |Ϙ| is found in Thasos (*LSAG* 307.61, last quarter of the 7th century). This phenomenon is discussed in §4.2.2 because of the further implications of this sign in the graphic representation of long vowels.

In general, |○| as /o/ is a stable grapheme-phoneme relationship, with very few exceptions (Table 4.5). Rhomboid omicron can be interpreted as an allomorph of the same grapheme. Dotted and not dotted could probably be considered variations on the same sign in some places, while in Thera the central dot does represent a phonemic distinction.[43] The only place that seems to show a real deviation from |○|-/o/ is Thasos, where |Ϙ| renders /o/ and /ɔ:/, while |○| is used for /o:/, contrary to the tendency seen in the rest of Greek populations.[44]

Table 4.5: Representations of /o/.

	43. ○	44. ⊙	46. ◇	64. Ϙ
No. of sites	58	3	3	1
Total inscriptions	309	3	3	1

4.1.5 /u/, /u:/ and /y/, /y:/

As mentioned in the previous chapter, ypsilon should be considered an *Additionsreform*. Even if the shape can be related to Semitic waw 𐤅, it is included at the end as an extra to the NWS alphabetic sequence. Nonetheless, this is one of the most stable letters across Greek alphabets. The choice of signs for its representation

[41] There is only one exception, see n. 83 below.
[42] The inscriptions that show this sign are Hymettos 28.79, *LSAG* 131.5 and 198.3, all dated around the 7th century.
[43] See §4.2.2
[44] This is expanded in §§4.2.2 and 4.2.4. This phenomenon is also attested in later inscriptions from Paros, its metropolis, cf. Jeffery and Johnston 1990, 294; Guarducci 1995, 158–164.

Table 4.6: Representations of /u/, /u:/ or /y/, /y:/.

	58. 𐌕	59. 𐌖
No. of sites	34	13
Total inscriptions	108	23

is impressively low (Table 4.6): only |𐌕|, with its allomorphs <𐌕>, <𐌕> and |𐌖|. Thus, the two possible shapes are quite similar in graphic terms: they both show an angle looking upwards, either with or without an additional stroke running downwards. Moreover, it is quite common to have the two signs in the same site, which suggests that they are probably seen as optional versions of the same letter. This stability continues later in time as well.[45]

The phonetic values behind this letter are more complicated to interpret. The signs |𐌕| and |𐌖| were used for both /u/ and /u:/ and in the case of dialects that experienced the shift /u/ > /y/,[46] these render /y/ and /y:/. This phonetic difference, therefore, does not seem to affect their representation and so we can conclude that this is a very stable letter; it is seen as |𐌕| everywhere in the Greek-speaking world for both /u/ and /y/. Moreover, this graphematic relationship |𐌕|-/u/ is seen as well across other writing systems, for it is present in Phrygian and supposed for Eteocretan as well.

The wide spread of this letter makes it difficult to assess its possible provenance. In NEM alphabets, it appears in early palaeo-Phrygian inscriptions and possibly also in the Osteria dell'Osa inscription.[47] If we suppose that ypsilon and digamma are doublets from Semitic waw, then its origin might be already in the use of the latter as ML.[48] However, it is unclear where or when the division into two distinct letters would have taken place.

4.2 Long vowels

Although this section is entitled 'long vowels', the signs discussed here are not meant to distinguish these vowels from others because of their length, but out of a divergence in their sound qualities. In fact, all the writing systems that recorded the Greek language have shown that quantity ambiguity was never problematic in Greek writing. This applies to both the syllabic writing systems, like Linear B and the Cypriot syllabaries, and to the Greek alphabets as well. In the case of

[45] Jeffery and Johnston 1990, 35.
[46] This happened with Attic-Ionic dialects, except for Euboea, cf. Bartoněk 1966, 110–120; Threatte 1980, 23 and 261; Allen 1987, 66 ff.; del Barrio Vega 1990. For a new interpretation of the process see Méndez Dosuna Forthcoming, where he suggests that the fronting /u/>/y/ is a feature of Proto-Greek and that a secondary backing /y/>/u/ took place in several ancient dialects.
[47] I have rejected such a reading at the beginning of this chapter.
[48] Cf. Rosén 1984, 227; Röllig 1998, 366; Woodard 2019, 94 and 96.

the latter, this ambiguity can be seen in the vowels that never had short-long graphic distinction and in the alphabets that did not have specific graphemes for any long vowel.

The three vowels that never had a graphic distinction for their long counterpart are /a/-/a:/, /i/-/i:/ and /u/-/u:/ or /y/-/y:/. Therefore, all the graphic considerations that have been mentioned above apply to both short and long vowels in these cases. In what remains of this section, however, I will consider the notation of the following long vowels: /ɛ:/ (or /æ:/ in some dialects), /e:/, /ɔ:/ and /o:/.[49] These vowels were chosen because they do not show consistent graphic solutions across the Greek alphabets and I will analyse here those seen for each of these long vowels. As will be shown in the following sections, the notation of these sounds is of special importance since they constitute innovations seen in Greek writing only; other neighbouring writing systems do not use distinct letters for long vowels.[50] Furthermore, it is specific to certain dialects and sites only and does not apply to all Greek alphabets or long vowels. Therefore, this will be a distinguishing feature that differentiates the vocalic notation systems of the Greek alphabets.

Tracing the representation of long-closed vowels /e:/ and /o:/ is of special interest here, since works like Jeffery's and Guarducci's do not offer exhaustive information concerning the issue. This is so because they take the *koine* Ionic alphabet as a model from which to compare the others. As this alphabet does not have a distinctive grapheme for the long-closed vowels, but uses the digraphs <ει> and <ου> instead, these are left out from the palaeographic tables. Nevertheless, these phonemes are present in many Greek dialects and their forms of representation bring interesting insights into the graphic solutions and graphematic relationships found across the Greek alphabets, as well as the dating of the phonological processes that produced them.[51]

4.2.1 /ɛ:/ and /æ:/

The most common tendency is not having a graphic distinction between /e/ and /ɛ:/. In total, 24 sites show no distinction compared to 20 that use specific graphemes for /ɛ:/ (Table 4.7). Two different graphemes are seen in the sites that do not have a graphic distinction: |𐌑| or |𐌚|. In all cases, these are also the graphemes used for /e/. In the areas that have a distinguishing sign for this phoneme, |𐌄| is by far the most popular, although we also find |𐌇|.

It is clear and evident from Figure 4.3 that around the 8th and 7th centuries BC, distinct graphemes for /ɛ:/ can only be found in the islands of the Aegean and Asia Minor. There are some sites that may show some inconsistencies in this

[49] See Figure 4.1.

[50] Eteocretan shows |𐌄| for /e:/ only in a late text (PRA3) from the 3rd century BC (Duhoux 1982, 75–79 and 166 f.), probably out of influence from the Cretan or even the *koine* alphabet.

[51] Only Cyrenaean and Central Cretan lack long-closed vowels in all contexts, cf. Bartoněk 1966, 73 f.

Table 4.7: Representations of /ɛː/.

	23. 𐌇	15. Ε	3. Β	21. Η
No. of sites	14	19	5	6
Total inscriptions	62	45	43	9

Figure 4.3: Geographical distribution of the graphic solutions for /ɛː/.

respect, since their texts have both |Ε| and |𐌇| in contexts where a long vowel is expected. In Aigiale (Amorgos)[52] and Naxos[53] the inscriptions show examples of the distinction between primary or inherited /ɛː/-|Ε| and a secondary long vowel produced by the closing of inherited and CL1 /aː/,[54] which had a different pronunciation, /æː/, and was represented by the grapheme |𐌇|. Therefore, what seemed an inconsistency in the database because of the formatting, is in fact a graphematic relationship that is specific to these dialects, where two different sounds are distinguished graphically.

This phenomenon is attested in Nikandre's inscription (*LSAG* 303.2, third quarter of the 7th century). In this text, both <Ε> and <𐌇> appear in contexts where a long vowel is expected:

[52] *LSAG* 304.15, first half of the 7th century: <Δ𐌇ΙΔΑΜΑΝΙ [...] ΠΑΤΕΡ> Δηιδαμανι [...] πατēρ.
[53] *LSAG* 303.2, 304.3, 304.8, all dated in the second half of the 7th century: <ΚΑΣΙΓΝΕΤ𐌇> κασιγνēτη, <ΕΥΘΥΚΑΡΤΙΔ𐌇Σ:ΜΑ:ΝΕΘΕΚΕ> Ευθυκαρτιδης | μ'α|νεθēκε, <ΠΕΝΤΕϘΟΝΤΑ> πεντēϙοντα.
[54] Bechtel 1924, §6; Buck 1955, §8; /ā̈/ Lejeune 1949, 7–9 and 1972, 235; /œː/ Ruijgh 1997, 570 f.; /æː/ Thompson 2006, 89 f.

→[55]

<ΝΙΚΑΝΔΡ⊟ΜΑΝΕΘΕΚΕΝ⊟Κ⊟ΒΟΛΟΙΙΟΧΕΑΙΡ⊟ΙϘΟΡ⊟ΔΕΙΝΟ
ΔΙΚ⊟ΟΙΟΝΑ⊟ΣΙΟΙΕ⊟ΣΟΧΟΣΑΛ⊟ΟΝΔΕΙΝΟΜΕΝΕΟΣΔΕΚΑΣΙΓΝΕΤ⊟
Φ⊟ΡΑ⊟ΣΟΔΑΛΟΧΟΣΜ>

Νικανδρη μ' ανεθēκεν *h*(ε)κηβολōι ιοχεαιρηι ϙōρη Δεινο|δικηο τō Ναhσιō εhσοχος αλ(λ)ηōν Δεινομενεος δε κασιγνēτη | Φhραhσō δ' αλοχος μ[ην?]

In this text, |Ε| is used in <ΑΝΕΘΕΚΕΝ> ανεθēκεν for /e/ and inherited /ɛ:/ from PIE *eh$_1$.[56] It is also present in <ΚΑΣΙΓΝΕΤ⊟> κασιγνēτη, where the last vowel is an example of /æ:/ from proto-Greek /a:/ written <⊟>, as in <ΝΙΚΑΝΔΡ⊟> Νικάνδρη[57] and <⊟Κ⊟ΒΟΛΟΙ> *h*(ε)κηβολōι[58]. In this last example, however, the initial <⊟> may represent the aspiration or even the group /he/.[59]

It is evident how these islands have a slightly different system in place when compared to the most eastern sites and the southern Aegean. Their distinction is not between /e/ and /ɛ:/, as happens in the eastern settlements. Here, the inherited long vowel /ɛ:/ is assimilated with /e/ in the graphic record, therefore appearing as |Ε|. What is actually being distinguished with another grapheme is /æ:/, a secondary long vowel produced by the closing of inherited /a:/. Nonetheless, the phonetic and graphic distinctions did not last long, for in later inscriptions |⊟| and |H| render inherited /ɛ:/ and /æ:/ from /a:/. This suggests that the two sounds have then merged in /ɛ:/.[60]

In Thera we also find both |⊟| and |Ε| for /ɛ:/. However, the choice of graphemes does not seem to have any structure. |⊟| appears in the names in -κλης, -ρης and -γενης,[61] <ΜΑΛ⊟ϘΟΜ> Μαληϙος (*EG* I 532.5, second half of the 7th century), <ΕΥΜ⊟ΛΟΜ> Ευμηλος (*IG* XII 3.540, late 8th century) and the verb <⊟ΜΙ> ημι (*LSAG* 470.A, third quarter of the 7th century). The latter is a clear example of /ɛ:/ as a result of CL1 in the 'medium' vowel system of this dialect. This result, however, is not consistently rendered by |⊟|, as seen in *EG* I 352.5 <ΠΕΡΑΣΕΥΜ> Πēραιευς.[62] Other instances of |Ε|

[55] The original inscription is written in boustrophedon starting from left to right and the last line faces upside down in comparison with the other two. These characteristics have been homogenised in the transcription which reads from left to right only.
[56] τίθημι from PIE *d^{h}eh$_1$ and aorist θῆκε < *d^{h}eh$_1$-k-et (Beekes 2010, 1482 f.); *dheə$_1$ in Chantraine 2009, 1078.
[57] Cf. Νικάνδρα in *LGPN*.
[58] Cf. ϝεκαβολōι in Boeotian *LSAG* 94.01.
[59] Specifically about Nikandre and the dialectal features seen in the inscription see Lejeune 1949; Levin 1970; Jeffery and Johnston 1990, 291; Guarducci 1995, 154–156; Gomis García 2018, 70.
[60] A deeper study of the phonetic and graphic phenomenon of the open front vowels in the Cyclades can be found in Gomis García 2018, §§11.5.2.1 and 21.2.1.1.
[61] *EG* I 352.5 (second half of the 7th century) <ΠΡΟΚΛ⊟Μ> Προκλης, <ΟΡΘΟΚΛ⊟Μ> Ορθοκλης; *IG* XII 3.536 (late 8th century) <ΕΝΠ⊟ΕΡ⊟Μ> Ενφερης, <ΕΝΠΕΔΟΚΛ⊟Μ> Ενπεδοκλης; *IG* XII 3.767 (late 8th century) <Κ⊟ΑΡΜΟΓΕΝ⊟Μ> Κhαρμογενης; *LSAG* 323.1aii (late 8th century?) <ΘΑΡ⊟Μ ΑΝΑΜΙΚΛ⊟Μ> Θαρης, Ανασικλης; *LSAG* 323.3 (7th century?) <ΕΤΕΟΚΛ⊟ΙΑ> Ετεοκληια instead of Ετεοκλεια by analogy with the male Ετεοκλης (Bechtel 1923, 524).
[62] From πείρω < *per-i̯e/o (Beekes 2010, 1164).

Figure 4.4: Inscriptions from Mt. Hymettos with eta. From left to right and top to bottom: Hymettos 15.9, 27.73, 15.3 and 13.2. Drawings made by the author after Elvira Astoreca 2020, fig. 4.5.

for /ɛ:/ are *EG* I 352.5 (second half of the 7th century) <ΡΕΚΜΑΝΟΡ> Ρε̄κσανωρ[63], *IG* XII 3.540 (late 8th century) <ΟΡΚΕΜΤΑ> ορκ*h*ε̄στα[ς] and *LSAG* 323.1ai (late 8th century?) <ΤΕΔΕ> τε̄δε.

The map (Figure 4.2) shows how in mainland Greece and the Italic peninsula the norm is having the same grapheme for both /e/ and /ɛ:/, with one exception at Mt. Hymettos. In general, the inscriptions from this site – dated in the 7th century – follow the tendency of the rest of Attica (<Ε> for /e/ and /ɛ:/), as can be seen in the inherited /ɛ:/ of the ανεθε̄κε inscriptions (15.11–17.18), in the endings -ε̄μος and -ε̄ς for masculine proper names in 22.36,[64] <ΤΛΕΣΙΑΣ> Τλε̄σιας in 22.37[65], <ΤΕΝΔΙ> τε̄νδι 23.49 and <ΗΕΡ> 41.173 for Ηε̄ρ[ακλε̄ς or Ηε̄ρ[οος.[66] The sign <Η> is, nevertheless, seen in three inscriptions where apparently it is rendering /ɛ:/: 13.2, 15.9 and 27.73 (Figure 4.4).[67] In the case of <ΣΗΜΙΟΙ> Σημιο̄ι (13.2) – if we follow Langdon's reading[68] – it is a secondary /ɛ:/ from /a:/, while <ΗΡΑΚΛΗ> *h*ε̄ρακλη[[69] (15.9) suggests that we are dealing with secondary /ɛ:/ from VC in the case of the second <Η>, while the first one could be a primary /ɛ:/ or even /hɛ:/,[70] depending on the interpretation of the text. Finally, 27.73 is too fragmentary to be of much use in this discussion, but the position of <Η> after delta suggests that it should be treated as a vowel and not an aspiration.[71]

These inscriptions have been interpreted by Langdon as evidence for a very young script that is not yet fully established and so it shows considerable variations in

[63] From the aorist form ῥῆξαι of ῥήγνυμι < *ureh$_1$ǵ (Beekes 2010, 1282) or *wrēg- (Chantraine 2009, 938) and therefore an inherited /ɛ:/.
[64] <Ν[...]ΔΕΜΟΣ> Ν[ιφο]δε̄μος / Μ[ενε]δε̄μος; <ΛΕΟ[...]ΔΕΣ> Λεο[φρα]δε̄ς.
[65] See *LGPN* Τλησίας.
[66] Readings by Young 1940, 3.
[67] Hymettos 15.3 is also thought to show an eta, but the sign is too fragmented to be sure and thus it was not included in this discussion.
[68] Langdon 1976, 13 no. 2.
[69] My own reading after an autopsy of the inscription. Cf. *h*ε<ρ>ακλη[εει or *h*ε Ακλη[in Langdon 1976, 15 no. 9.
[70] Young 1940, 6. This phenomenon is well attested throughout Greece, see Nikandre's inscription above and Sturtevant 1940, 32; Brixhe 1991, 321; Wachter 1991, 55–57; Gomis García 2018, 70.
[71] The inscription is read from left to right, making the first line <ΕΔΗ>]ΕΔΗ. Since delta cannot be the end of a word in Greek, with most probability <Η> is not an initial aspiration, but a vowel.

the lettering and admits influences from other scripts, in this case Ionic.[72] Threatte proposes another explanation for the use of |Ͱ|-/ɛ:/ before the Eucledian reform in Attica; these inscriptions from Hymettos were actually written by non-Athenian hands.[73] While the other two inscriptions are not conclusive in this respect, the use of <Λ> for /l/ in 15.9 supports Threatte's view and could easily indicate a writer coming from the Aegean Islands or Asia Minor, since that shape is not used for /l/ in any other inscription from Hymettos, where |Λ| always renders /g/.[74] However, narrowing down the origin of the individual(s) who could have written these etas is more difficult.

The only places where /l/ has been attested with the shape <Λ> in the corpus used here are Lakonia and Olympia, which should be discarded for the lack of graphic differentiation between /e/ and /ɛ:/. Therefore, we may look at areas where /l/ is written |ʌ|, since it is still a downward lambda, the opposite version of |ν|. This letter is attested together with |Ͱ| as /ɛ:/ in Naxos, Chios, Ephesus and Samos, places where evidence for |Λ|-/l/ is also found in later inscriptions.[75] To narrow it even further, we might want to take the shape for /s/ in Hymettos 13.2 <{>, which, outside of this site, is only seen together with |Ͱ| as /ɛ:/ in Samos. Given the fact that this island is the only place where the three letters are attested outside of Hymettos, it seems probable that this could be the place of origin for both inscriptions, although other Ionian settlements cannot be discounted.[76]

With the interpretation of these pre-Euclidean etas in Mt. Hymettos as the result of eastern Ionians, the general picture then emerges without any exceptions. By the 7th century BC, graphic differentiation of /e/ and /ɛ:/ is present throughout the islands of the Aegean (except the Cyclades) and in Asia Minor, while the western alphabets of mainland Greece and the Italic peninsula keep a single grapheme for both sounds. The Cyclades, however, follow a different tendency, where a distinction is made with /æ:/ rather than /ɛ:/.

This situation does not correspond to geographical distribution only, but it is connected to psilosis and the use of |Ⱨ| and |Ͱ| for the initial aspiration /h/ in western alphabets. Psilosis is a dialectal feature seen in the eastern settlements and characterised by the loss of initial aspiration. This affects the way in which the Semitic letter ḥeth and/or Greek heta are understood in these areas. We should bear in mind that the shapes of both eta and heta are derived from Semitic ḥeth  and, therefore, these come as part of the basic alphabetic sequence transmitted throughout Greece;

[72] Langdon 1976, 42 f.
[73] Threatte 1980, 42. Langdon seems not to consider this possibility, since he believes that the sanctuary was used by the dwellers of the Athenian plane (Langdon 1967, 7 f.).
[74] In the two instances where its value is not completely sure (Hymettos 13.1, 27.67), it is most likely /g/ as well.
[75] Jeffery and Johnston 1990, 289 and 324.
[76] The Heraion in Samos could lure in citizens from other islands and we might be lacking evidence from other Ionian settlements, so the evidence is not conclusive.

the position of eta/heta in abecedaria confirms this. Since the consonantal element is absent in psilotic dialects, however, the grapheme is available for a vocalic e-sound.[77]

Nevertheless, the use of |𐌇| in the Cyclades for the values /h/, /æ:/ and /he/ complicates the picture and raises two questions:

1. Was the vocalic value for this grapheme originated in the Cyclades, the southern Aegean or Asia Minor?
2. Why is the vocalic value different in the Cyclades?

With the current state of the evidence, we can confirm that the use of such a sign with a vocalic value is a Greek innovation; no other communities use it in this way at that point in time.[78] The origin of this novelty, however, is more difficult to ascertain. Following the theory of the change of value from /h/ to /ɛ:/, three possible scenarios appear. The first sees a chain effect, where the consonantal/syllabic letter could have been transmitted from western Greece to the Cyclades, taken a vocalic value there and later transmitted to the psilotic dialects, keeping its vocalic value only. A second option is that the Cyclades take this multiple use directly from a Semitic source and, again, once it is transmitted to the eastern Aegean only the vocalic value remains.[79] Another possibility is that the Cyclades, standing in the middle, receive influences from both western and eastern alphabets; hence the multiple values for this grapheme. Of course, there is still a fourth, less likely option, especially unpleasant for those supporting the monogenesis of the Greek alphabets: the possibility that these areas developed their vocalic, consonantal or mixed values for this grapheme independently.

Nevertheless, if we accept that eta in the Cyclades and the psilotic dialects is related, how can we account for the different uses of this letter in those areas? This can be easily explained by the fact that the development of vowel /æ:/ from Proto-Greek /a:/ is a feature that, at the time, applied only to the Cycladic dialect. In others the merger between the closing of /a:/ and /ɛ:/ – that, as discussed above, will come later in the Cyclades – seems to have taken place already. Thus, whether the letter eta originated here and was then transmitted to speakers of psilotic dialects or the other way around, the uses of letter eta in Cycladic writing and the eastern alphabets clearly respond to a difference in their phonological repertoires: <𐌇> for /ɛ:/ vs. <𐌊> for /e/ in eastern dialects and <𐌇> for /æ:/ vs. <𐌊> for /ɛ:/ and /e/ in the Cyclades.

4.2.2 /ɔ:/

Contexts for this sound are less attested than those for the open-mid-front vowel /ɛ:/ (Table 4.8). The map (Figure 4.5) shows that, in addition to the smaller amount

[77] Jeffery and Johnston 1990, 28; Ruijgh 1997, 568.

[78] The sign is completely absent in Phrygian. In Eteocretan it will appear only in late texts, see n. 50 above. Etruscans adopt the western consonantal value /h/.

[79] Woodard (2019, 104–107) argues that the values of this letter seem to imitate the use of he 𐤄 as ML in Aramaic.

Table 4.8: Representations of /ɔː/.

	43. Ο	64. Ϙ	44. ʘ	45. ◎
No. of sites	19	2	2	1
Total inscriptions	49	8	6	5

Figure 4.5: Geographical distribution of the graphic solutions for /ɔː/.

of evidence, fewer communities practice graphic differentiation for the vowel /ɔː/ than they do for /ɛː/. Mainland Greece and the settlements to the West follow the same tendency as they did with /ɛː/, using the same grapheme as that for the short mid-vowels. But the islands of the Aegean and the eastern settlements do not follow a unified pattern in this case.

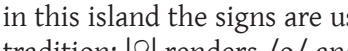
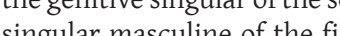
In Asia Minor we have evidence of |Ϙ| and its allograph <ϘΟ> used for /ɔː/ in Smyrna and Samos. The sign is a new creation, probably originated in the area of Asia Minor.[80] It is a modification of omicron and, as an *Additionsreform*, it appears at the end of the alphabetic sequence attested in Samos.[81] This new letter, omega, is used in all Ionic and Doric settlements in Asia Minor.[82]

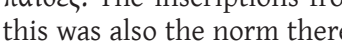
[80] Jeffery and Johnston 1990, 38; Guarducci 1995, 101.
[81] 'A doublet formed from O by breaking the circle' (Jeffery and Johnston 1990, 38); cf. Guarducci 1995, 101. See the abecedarium in §3.3.6.
[82] The evidence from the Aeolic settlements of Asia Minor is too scarce to corroborate whether omega

This distinction is also practised with other shapes derived from |○| in some islands of the Aegean. |⊙| for /ɔ:/ is seen in Thera and in Anaphe.[83] The latter case, however, cannot be argued as being a clear instance of graphic distinction. The only archaic inscription from this island, *LSAG* 324.26 (7th century?), does not seem to have a consistent use of the sign:

Αγρυ{λ}<τ>ιῶν τονδε τον θῶρον εποιη[σα][84]

At the start of the inscription all instances of both /o/ and /ɔ:/ are written <⊙>, while the last two examples of /o/ are rendered by <○>. This could always be an epigraphic matter and the dot might have been erased through erosion; but, in any case, it seems that there is no actual distinction between /o/ and /ɔ:/ since they are both written as <⊙> in the first half of the inscription. Unfortunately, there are no other inscriptions that can confirm the values applied to these signs.

In Crete, only Afrati shows a graphic differentiation of this phoneme. Here, the sign |◎| is used for /ɔ:/ systematically in the inscriptions on bronze armours, *e.g.* Hoffmann 1972.M1  ο Ευκλωτα.[85] The rest of the sites show no graphic distinction for /ɔ:/: Dreros *BCH* 70.600.4 (7th century)  ος,  διδῶι; Gortyna *IC* IV I.21 (second half of the 7th–early 6th century)  ανποτερῶς.[86]

The peoples of Thasos also practised a clear graphic distinction for /ɔ:/. However, in this island the signs are used in the opposite way compared to the eastern Ionian tradition: |Ω| renders /o/ and /o:/, while |○| is used for /ɔ:/. This use can be seen in Glaucos' memorial inscription (*LSAG* 307.61, last quarter of the 7th century),[87] where the genitive singular of the second declension /o:/ is rendered by <Ω>, but the genitive singular masculine of the first declension in the Ionic dialect /ɔ:/[88] appears as <○>:  Γλαυρῶ, τῶ Λεπτινεω, οι Βρεντεω παιδες. The inscriptions from Paros (*i.e.* Thasos' metropolis), seem to suggest that this was also the norm there at the time and until the 5th century BC.[89]

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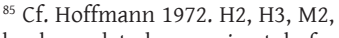
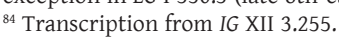
was used, but judging from *LSAG* 361.1f (Larisa, 6th century)  Θεοδῶρος, it seems that it was not the case. For |H| rendering /e/ in Larisa, see §4.1.2.

[83] Its use in Thera seems systematic, cf. *EG* I 352.5 (second half of the 7th century), *IG* XII 3.536, 540 (both late 8th century), *LSAG* 323.1ai (8th century), 470.A (third quarter of the 7th century). Only one exception in *EG* I 350.3 (late 8th-early 7th century)  for K*h*ιρῶν.

[84] Transcription from *IG* XII 3.255.

[85] Cf. Hoffmann 1972. H2, H3, M2, M5, M7, M8, M9, M10. All inscriptions from Afrati mentioned in this book are dated approximately from the third quarter of the 7th century to early 6th century.

[86] Cf. *IC* IV I.1, 3, 4, 8, 9, 10, 13, 14 and *LSAG* 315.1a-h, all dated around the second half of the 7th century. For later evidence of |◎|-/ɔ:/ see Thompson 2006, §4.

[87] Cf. *SEG* 14.565; Pouilloux 1955.

[88] Buck 1955, §41.4.

[89] Cf. Commentary on *LSAG* 305.25 in §4.2.4; Jeffery and Johnston 1990, 289; Guarducci 1995, 158–164; Gomis García 2018, 85–7.

The graphemes used suggest that the peoples of Paros and Thasos were aware of the eastern Ionic convention, but the reason why they used them in the opposite way is unclear. It has been proposed that Parians imitated the Dorians from Melos and Cnidos in this use, although in those islands |○| for /ɔ:/ is only attested later. In these sites, however, the sign used for /o/ was |Ↄ|, which in Paros represented /b/. Therefore, Parians decided to take the shape |Ϙ| from the Milesians, who were close allies.[90]

The rest of the Ionic islands show evidence of no graphic distinction for /ɔ:/ and they will not adopt it until the 5th century BC.[91] This suggests that eastern Greeks sought the distinction of /ɛ:/ earlier than they did for /ɔ:/. In fact, there are no sites where /ɔ:/ has a distinct grapheme, but /ɛ:/ does not. This might have been because the presence of |𐤇| in the early sequence enables its use as a vocalic sign for /ɛ:/ in the psilotic dialects, as was argued earlier. Since there is no sign to mark that difference between /o/ and /ɔ:/, then an *Additionsreform* was necessary to create such a sign.

4.2.3 /e:/

Contexts where we expect /e:/ are scarcely attested and, in most cases, they show no graphic distinction between /e/ and /e:/. Thus, the most popular sign for this phoneme is |𐤄| (Table 4.9). The sites that show evidence of the lack of graphic differentiation at this time are Euboea and its colonies, Kalapodi in Phthiotis, Asia Minor, Crete and Thera.

Nevertheless, out of the 64 examples of /e:/-|𐤄|, 43 would count as being a graphic distinction from /e/; this is the case of the Corinthian sites, where |𐤄| renders /e:/, while |𐤅| represents /e/ and /ε:/. This is the only area where a unique grapheme is used to distinguish this phoneme. Since Corinthian |𐤄| is used for both the ancient diphthong /ei/[92] and the result of contractions and CL in /e:/, we can assume that the monophthongization of /ei/ to /e:/ has already taken place in the area.[93] Nevertheless, the situation in Penteskouphia is quite complex. Although the majority of the plaques from the sanctuary follow the tendency established for Corinthia (40 out of 48 |𐤄| = /e:/), there are five inscriptions that show <𐤅> for /e:/[94] and three with a digraph <𐤅𐤉> for /e:/.[95] In all cases, these are representing the diphthong in the theonym Ποτειδάν.[96] We might

[90] Jeffery and Johnston 1990, 294; Gomis García 2018, 86.
[91] Jeffery and Johnston 1990, 290.
[92] See the form <ΠΟΤ𐤄ΔΑΝ> Ποτειδαν repeated multiple times in the Proto-Corinthian plaques from Penteskouphia (*IG* IV 1.210–345).
[93] Cf. <𐤄ΜΙ> ειμι in *IG* IV 1.326 and 327. Kretschmer 1894, 35; López Eire 1970, 26; Lejeune 1972, 229.
[94] *IG* IV 1.216 (could be the first grapheme of the diphthong represented by <𐤅𐤉>), 237, 264, 265, 277.
[95] *IG* IV 1.224, 270, 272.
[96] The plaques should represent the same phonological stage since they are found within one deposit and all show a Proto-Corinthian style. Thus, they should all belong to a similar date (Bookidis 2002, 253). Therefore, these inconsistencies could show an ongoing change either on the graphic or the phonological level.

Table 4.9: Representations of /e:/.

	15. 𐌄	15+28. 𐌄𐌉	3. 𐌇	3+32. 𐌇𐌉	3+31. 𐌇𐌅	15+31. 𐌄𐌅
No. of sites	16	6	1	1	1	1
Total inscriptions	64	11	5	3	1	1

assume then that <𐌇𐌉> is an attempt to write down the ancient diphthong, while those instances written with <𐌇> are cases of no graphic distinction between /e/ and /e:/. The digraph is nonetheless seen in Corfu for /e:/ as the result of e+e contraction,[97] suggesting that it could still be another solution to /e:/ after the monophthongization, instead of a representation of the diphthong.[98]

We might also want to see evidence for the monophthongization of /ei/ in the representation of /e:/ with a digraph. This use is seen in Attica, Boeotia, Thasos and Selinunte.[99] Only one of these examples is not an instance of the verb εἰμί, the late 8th-century Theran *IG* XII 3.543, where <𐌏𐌐𐌊𐌇𐌄𐌔𐌕𐌀𐌔> ορκ*h*ειται shows the use of the digraph <𐌄𐌔> for /e:/, instead of the usual <𐌄>-/e:/ that we see in the island: *IG* XII 3.536 (late 8th century) <𐌐𐌏𐌐𐌊𐌄𐌕𐌏> ϙωρκ(*h*)ētο, *LSAG* 323.4 & 470.A <𐌄𐌓𐌏𐌔𐌄> εποιē, both late 7th century.[100]

Those instances that show the digraph in the verb εἰμί, however, are somehow problematic. If we look at later evidence, we see that <𐌄𐌉𐌌𐌉> is a common form in Attic inscriptions of the whole archaic period, whereas <𐌄𐌌𐌉> is actually quite rare.[101] Moreover, the digraph is only seen in other results of CL and vowel contraction much later and scarcely. Therefore, these examples of εἰμί should not be taken as the result of 1CL since they might represent a real diphthong out of analogy with the second person singular εῖ or the verb εἶμι.[102]

This makes the Corinthian and Theran examples the only certain evidence for the sound /e:/. Despite their scarcity, these examples offer an interesting insight on the date of the monophthongization of /ei/, which is highly debated and normally considered much later.[103]

[97] *LSAG* 234.9 (last quarter of the 7th century): <𐌇𐌓𐌏𐌅𐌇𐌅> επoιει.

[98] Kretschmer (1894, §16) believes that Corfu has already abandoned the use of |𐌄|-/e:/ by the time of the earliest inscriptions and use the digraph <𐌇𐌉> instead, while the Corinthians keep the use of the single grapheme.

[99] This might indicate that their metropoleis, Paros and Megara Hyblaia and possibly also Megara, could have this use as well. In this corpus /e:/ is not attested for those sites, but it appears in an inscription from Megara Hyblaia dated in the 6th century: *EG* I 315.6 <𐌄𐌉𐌌𐌉> ειμ[ι] and 317.8 <𐌄𐌉𐌌𐌉> ειμι.

[100] Cf. Bechtel 1923, 523 f.

[101] Threatte 1980, 176 f.

[102] Sturtevant 1937, 150; Threatte 1980, 176 f. In the case of εἶμι there is a PIE diphthong from *$h_1$ei- (Beekes 2010).

[103] At least the orthographic reform in Athens does not happen until the late 5th century BC (Sihler 1995, §76.a; van Emde Boas *et al.* 2019, 10) or even later ca. 350 BC (Threatte 1980, 299).

4.2.4 /o:/

As shown in Table 4.10, this corpus offers only a few examples of this phoneme. Luckily, these are spread out across many sites. Thus, we can see that the general tendency across Greek sites is to use no graphic differentiation between /o/ and /o:/, even in sites where /o/-/ɔ:/ or /e/-/e:/ distinction is used. This lack of graphic distinction explains why |𐌏| is the most widespread sign for this phoneme. Also |𐌚| comes as no surprise, since in Thasos this is the grapheme used for both /o/ and /o:/, as was mentioned earlier, and therefore it cannot be considered as a form of graphic distinction.[104] This use is attested also in an inscription ca. 650 BC from its metropolis, Paros, found in the Delian Artemision (*LSAG* 365.25a). According to Guarducci, here the ending <𐌇𐌋𐌒> -ηγō can only be the genitive form of a name in -ηγος, and therefore an instance of /o:/.[105] This will be the norm in Paros until the 5th century BC with very few exceptions.[106]

The shape |𐌟| is seen in one inscription from Methone (Methone 437.4, late 8th–early 7th century) where this sign seems to render /o:/, if we understand <𐌈𐌊𐌟> as a genitive. However, we cannot talk about a real graphic distinction of this phoneme in this case, since the other instances of /o:/ from the site – also in genitive endings – clearly show <𐌏> as /o:/.[107] Thus, the tendency seen in all Euboean sites and their colonies is followed in this case as well; for there is no graphic distinction for any of the long vowels in these areas.

The only clear example of an inscription that distinguishes /o:/ graphically is Menekrates' tomb in Corfu (*LSAG* 234.9, last quarter of the 7th century). In this text, both /o/ and /ɔ:/ appear as <𐌏> (*e.g.* <𐌏𐌋𐌁𐌕𐌏> ōλετο), while /o:/ from the contraction of o+o after loss of intervocalic sigma is systematically rendered by <𐌏𐌖>: <𐌇𐌖𐌚𐌏𐌖> *h*υιου, <𐌃𐌀𐌌𐌏𐌖> δαμου. This inscription distinguishes only long-closed vowels but not long-open, as can be seen from the previous examples and supported by the forms <𐌁𐌓𐌏𐌚𐌁𐌚> εποιει and <𐌓𐌐𐌀𐌇𐌚𐌌𐌁𐌋𐌁𐌍> Πραξιμενēς. Therefore, it follows the western tendency of not distinguishing the long-open, but it includes an innovation, the use of digraphs for both long-closed vowels. We might think then that the monophthongization of /ou/ has happened in this area by the last quarter of the

Table 4.10: Representations of /o:/.

	43. 𐌏	44. 𐌟	64. 𐌚	64*. 𐌒	43+58. 𐌏𐌖
No. of sites	23	1	1	1	1
Total inscriptions	37	1	1	1	1

[104] See §4.2.2 for the explanation of this phenomenon in Glauco's inscription (*LSAG* 307.61).
[105] Guarducci 1995, 159 f., no. 5.
[106] Gomis García 2018, 94 f.
[107] This is the case of Hakesandros' inscription (Methone 339.2) <𐌇𐌀𐌊𐌈𐌚𐌀𐌍𐌃𐌓𐌏𐌈𐌍> *h*ακεσανδρō ēμ[ι and also Methone 350.7, that could also be an ownership statement with εἰμί, <𐌏𐌈𐌍>]ō ēμ[ι. All inscriptions from Methone are dated between the late 8th and the early 7th century BC.

7th century, if we follow Jeffery's dating of this inscription.[108] It is noteworthy that in Corfu only digraphs are used for the long-closed vowels, contrary to the tendency in Corinthia, where at this point we can find a specific grapheme for /e:/ and no graphic distinction for /o:/.[109]

We can conclude, therefore, that except for Menekrates' tomb – if we want to keep Jeffery's dating – there is no graphic differentiation between /o/ and /o:/ in early Greek alphabetic writing. In addition, we may assume that the monophthongization of /ou/ is happening later than that of /ei/, since there are no other cases of /o:/ using a digraph or of the diphthong /ou/ with a single grapheme. The evidence from Corinth suggests that this process closed in the area around the 7th–6th centuries BC.[110]

4.3 Some considerations on the notation of the vowels

4.3.1 The vocalic letters as a Greek invention

As mentioned earlier, the systematic notation of vowels is the main difference between Greek and NWS writing systems and, as such, it has received a considerable amount of attention in previous scholarship. However, we should not forget that this is not only true of Greek, but of all NEM writing systems that appeared around the same time. I have claimed that, at least in grapholinguistic terms, this apparently new way of writing does not respond to the creation of a new typology of writing systems, as argued by scholars following evolutionary theories, but to a change in the orthographic trends of these alphabets. So, we still need to ask ourselves: was this change promoted by Greek speakers?

One of the most notable theories around the creation of full vowel notation is that of Wade-Gery and followed by Powell.[111] They believe that not only are vowel letters a Greek invention, but also that these were created in order to record Homeric poetry. This assumption rests on the fact that Greek poetry is based on the rhythm created by the moraic nature of its syllables, which can be long or short, and therefore vowels are needed to mark the rhythm. This reasoning, however, is flawed in many ways. Principally, because vowels are not the only markers of syllable length,[112] but most importantly, because the letters used to render vowels in Greek writing do not mark length.

Following what has been discussed in the previous section, the signs for long vowels present in some Greek alphabets do not represent a difference in quantity, but a difference in quality of sound. These long vowels have a more open or close

[108] Jeffery and Johnston 1990, 234 no. 9.
[109] No graphic distiction of /o:/ in Corinthian is seen in Penteskouphia, *e.g. IG* IV 1.326: <𐌊𐌌𐌏𐌄𐌌𐌊>]ιμō ειμι.
[110] Lejeune 1945, 108; López Eire 1970, 27.
[111] Wade-Gery 1952; Powell 1988; 1989; 1991a; 1991b; 2006.
[112] The basic rule of classification of syllable length in Greek is the following: 'A syllable is long if it is "closed" (*i.e.* ends with a consonant), or if it contains a long vowel or diphthong. Otherwise it is short' (West 1982, 8).

quality compared to their short counterparts and, wherever this difference is not present – *i.e.* /a/-/a:/, /i/-/i:/ and /u/-/u:/ or /y/-/y:/ – we see no graphic differentiation between long and short vowels. This argument is reinforced by the examples of interchangeability of |𐤄| and |𐤇| seen in §4.1.2, explained by the collapse of open- and close-long into a mid long vowel with the same sound quality as /e/.[113] Therefore, Greeks do not seem to have any issues with quantity ambiguity, as shown by the alphabets that do not have any kind of graphic distinction for the long vowels and also by the syllabic systems for the Greek language (Linear B and the Cypriot syllabaries) that have a 5-vowel representation system.[114]

Moreover, there is no clear reason why we should think that Greeks created vocalic notation for the alphabetic writing system. Earlier inscriptions in Phrygian and the unknown language in the Osteria dell'Osa inscription have a similar graphic vocalic system in place before any visible writing appears in Greece. It is still a pending task to solve the genealogy of these systems and the Greek alphabets – if this is possible at all – before we can assess which one had letters for vowels first. In any case, we still have to account for the use of partial vocalic notation in NWS writing as well.

In Aramaic, this system consists of the notation of long vowels, mainly in final positions, using signs that serve a consonantal value elsewhere: he 𐡄, yodh 𐡉 and waw 𐡅.[115] It is certainly telling that at least he and waw became the model for the graphemes |𐤇| and |𐤉|, used as vocalic signs in the NEM alphabets. However, these signs are used to render short vowels, and in some instances long vowels as well, by the time visible writing starts to appear for the NEM alphabetic writing systems. This implies that, if Aramaic ML was the model used for the vowel signs, at least one important orthographic reform has happened during the adoption of NWS writing by NEM peoples but before the earliest inscriptions appear. This reform consists of the systematic use in any position of the aforementioned signs for both long and short vowels. It also comes with an added graphematic reform in which other Semitic consonantal signs are used for the remaining vowels: 'aleph 𐡀 for /a/, /a:/ and 'ayin 𐡏 for /o/, /o:/ and in some alphabets /ɔ:/.[116]

These reforms raise the question of whether a Greek alphabet, or any other related writing system, had a period of imitation of the Aramaic orthography[117] or even the Phoenician, which does not use ML.[118] Unfortunately, there is no clear evidence of any of these two possibilities, either complete absence or partial vowel notation

[113] This phenomenon can also be appreciated in the long back vowels in Cretan, cf. Thompson 2006, 97.
[114] Cf. Woodard 2019, 92.
[115] For a reconstruction of how Aramaic ML could have been a model for the vocalic notation system in the Greek alphabets see Woodard 2019, esp. 96 for a summary of the functioning of Aramaic ML.
[116] Perhaps 'aleph was also transmitted with a vocalic value, since it is seen for /a:/ in the transcription of a non-Phoenician name in the inscription for king Kilamuwa in Cyprus (Tropper 1993, 170 f.).
[117] Cf. Gelb 1969, 182; Isserlin 1983, 1991.
[118] Naveh 1997, 62; Röllig 1998, 363. This is only seen in the transcription of foreign names (Krahmalkov 2001, 16 f.; Willi 2005, 167; Signes Codoñer 2010, 253; Luraghi Forthcoming).

in Greek writing.[119] This scenario is highly improbable and, if it ever happened, it must have been for a very short period of time. This is due to the large amount of linguistic information offered by Greek vowels and necessary for an effective written communication, *e.g.* phonological, morphological, syntactic and, most of all, semantic information.[120] I do not rule out, however, the possibility of Greek communities or individuals that could write in a Semitic language and writing system before applying the principles of alphabetic writing to their own language. Nevertheless, once this is adapted for Greek, full vowel notation becomes necessary.

This need responds to some of the characteristics of Indo-European languages. One of these factors is the appearance of vowels in word-initial position, something that does not happen in Semitic languages.[121] Most importantly, lexical morphemes in the latter are formed by consonants, whereas in Greek and other Indo-European languages, both consonants and vowels bear basic semantic information needed to recognise morphemes.[122] In fact, there are cases where two different lexical morphemes are differentiated with one vowel only, *e.g.* ἄρχομαι and ἔρχομαι. This is the main reason why Greek peoples needed a vowel notation system that differentiates vowel sound quality.

Nevertheless, we cannot be completely certain that the letters used for short vowels in Greek are their own innovation and we should still consider the possibility of an intermediary (or intermediaries) between NWS writing and the epichoric alphabets. The latter scenario is clearly reinforced, at least in the case of some of these alphabets, by the earlier appearance of straight iota in Phrygian and in the Italic peninsula.

However, in the analysis carried out in this chapter one can identify some innovations only seen in Greek vocalic notation. The use of |𐤄| and |𐤇| with a vocalic value is one of them, even though these signs have a Semitic counterpart and are transmitted in the Greek alphabets within the original alphabetic sequence, as is illustrated by their position in abecedaria. Nonetheless, the use of these graphemes in related writing systems is not attested until later and their use to represent a vowel seems to be restricted to the islands of the Aegean and Asia Minor. This use is probably enabled by the absence of initial /h/ in the psilotic dialects of these areas, producing thus a *Funktionsreform* that allowed the use of the grapheme with a vocalic sign. However, as mentioned earlier, there is always the possibility that the ambivalent use given to this sign in the Cyclades comes first, perhaps inspired by

[119] I consider the inscription without vowels from Eretria (Kenzelmann Pfyffer *et al.* 2005, 76 f. no. 66) to be most probably Semitic and not an example of a Greek name without vowels (Elvira Astoreca 2021). Also the examples of omitted vowels in Wachter 1991 cannot be interpreted as evidence from a previous system with none or partial vowel notation, cf. Wachter 1991, 71–74.
[120] Cf. Elvira Astoreca, 2021.
[121] Voegelin and Voegelin 1961, 61.
[122] De Kerckhove 1988, 155.

the use of another Semitic letter, he 𐤄, as ML in Aramaic.[123] Hence this innovation corresponds only to a *Funktionsreform* originated in an indeterminate spot in the Aegean or Asia Minor.

The signs for /ɔ:/, on the other hand, reveal local innovations that happened independently in several Greek-speaking communities. Some of them decided to create a sign for such a sound and modified |○| in different ways for this purpose. It is noticeable that eta is present in all these alphabets, which creates an imbalance in the vocalic notation system and prompts the addition of a letter for /ɔ:/. The distinct graphemes, however, suggest that their creation may have been done independently in some of these sites. Later in time another innovation would follow, and that is the use of digraphs for the close-mid vowels. As discussed above, this must be quite a recent development and one that is restricted to specific areas. In fact, not all Greek alphabets share these innovations and there are still some (like Euboean, possibly Attic and Boeotian?) that do not use any of them. This suggests that some alphabets feel comfortable with the ambiguity in the representation of these sounds provoked by the 5-vowel representation system, while others do have a wish to distinguish them in writing.

4.3.2 Vowel signs as an argument for monogenesis

The analysis in this chapter has shown multiple examples of vocalic letters that show a stable graphematic relationship, not only across the Greek alphabets, but also in Phrygian, Eteocretan and in the Italic alphabets. These stable vocalic letters are mainly alpha, epsilon – although with a few localised exceptions – omicron and ypsilon. The stability of these letters in this wide geographic context is present from the earliest alphabetic inscriptions. For this reason, it has been used repeatedly as an argument for the monogenesis of the Greek alphabets. Scholars supporting this theory argue that the similarities in the letters for the vowels are so significant that they cannot be explained by close contacts, but that they must derive from the same *Uralphabet*, *i.e.* a single source of creation for the Greek alphabets.[124]

If that is the case, then we should hypothesise an *Uralphabet* for all NEM alphabets, including Phrygian, Eteocretan, Etruscan and the writing system used in the mysterious inscription from Osteria dell'Osa. Even if this unique source – the 'proto-North-Eastern-Mediterranean alphabet' – ever existed, it would not be easy to reconstruct with the current evidence what it looked like and where or when it was used. A more fruitful pursuit, in my opinion, would be to analyse and compare those notation systems that are visible to us and that undoubtedly show that vocalic notation is a widespread innovation in the area by the time visible writing starts to appear.

From the study carried out here, it is evident that vocalic notation has spread around the NEM alphabets with a set of core letters that are shared among them:

[123] Woodard 2019, 104–107.
[124] See §§1.1 and 1.2.

mainly alpha 𐌀, omicron 𐌏, ypsilon 𐌕 and, to some extent, epsilon 𐌄 as well. However, when looking at the differences between alphabets we may also see reforms such as Corinthian |𐌁| and Sikyonian |𐌇| for /e/, the use of |𐌅| for /eː/ in Corinthia and the different signs for /ɔː/ such as |𐌐|, |𐌒| and |𐌚|. These are clear local independent graphematic reforms. In these cases either sounds shared across dialects bear characteristic shapes in specific areas or a different phonetic value is assigned to widespread graphemes.[125]

How can we then interpret those letters that expanded throughout multiple alphabets but still are not shared by all? The case of eta is singular, but easy to explain. The signs |𐌇| and |𐌇| are clearly part of the core alphabetic script in all alphabets, but they are interpreted as a vowel, a consonant or both depending on the dialectal traits of the area. The representation of /i/ and /iː/, however, shows a different picture. The distribution of straight and crooked iotas suggests that these are two separated traditions that are expanding throughout the NEM and that this is not a secondary reform replicated across alphabets, but that for most of them the use of one or the other is being inherited through the adoption of another alphabet. This implies that there are two branches of core letters spreading in the NEM: one with straight iota and sigma for the sibilant, the other with crooked iota and san.[126]

The existence of two branches of core letters already rules out the possibility of a 'unified' Greek alphabet that has a unique point of transmission. On the contrary, at least two different – although not completely unrelated – alphabetic traditions are present in the Aegean and the NEM by the time of the earliest Greek inscriptions. Unfortunately, it is not possible to identify when, where or how these were developed since they are already in place by the time of the explosion of visible writing in the NEM.

4.3.3 The different vocalic notation systems in the Greek epichoric alphabets

Looking at the differences that concern the vocalic notation systems, we see that reforms are not exclusive of the graphic side of the writing system, *i.e.* the script. In fact, in the notation of long vowels, it is easily recognisable how the vocalic notation systems actually work differently for several Greek alphabets. The most evident difference lies in the use of multiple graphic solutions for the notation of the vowels /ɛː/, /æː/, /eː/, /ɔː/ and /oː/. Although it is important to bear in mind that not every dialect has all of these sounds, they all have at least one long mid-front and one long mid-back vowel. Some alphabets do not distinguish these graphically from their short

[125] There are also orthographic reforms, which are isolated at this stage: the use of the digraphs <𐌄𐌉> and <𐌁𐌉> for /eː/ and <𐌏𐌕> /oː/, cf. §§4.2.3 and 4.2.4.

[126] Some exceptions could be those alphabets that show straight iota and san. Perhaps in these cases we are facing a conscious secondary reform in which one of these two letters was changed to imitate nearby alphabets. In this corpus, san and straight iota are attested in Aegina, Argos, Megara Hyblaia and Sikyon, sites that are surrounded by some alphabets using straight iota with sigma and others with crooked iota and san, so contamination from both traditions should not be discarded.

counterparts /e/ and /o/, others use or create a distinct grapheme for at least one of these sounds and others use digraphs for the close-mid. As discussed above, even when one solution is adopted, it is not used in the same ways in all alphabets. See for example how |𐌄| is used for /æ:/ – *i.e.* the closing of /a:/ – in the Cyclades, whereas the same sign represents both primary and secondary /ɛ:/ in Asia Minor and Crete. Similarly, |𐌇| is used in Corinth for /e:/, while other areas use a digraph to distinguish this sound from /e/ in writing.

Another aspect of the difference in the Greek vocalic notation systems lies in the fact that the sounds that are being distinguished graphically vary across alphabets. In Euboea and its colonies, for example, they have a system that keeps five graphemes for all vowels. Therefore, the open-mid and close-mid long vowels are not distinguished from their mid short counterparts even though presumably Euboeans had a system of 7 long vowels in their phonology, like the rest of the Ionic dialects. Both long open-mid vowels (/ɔ:/ and /ɛ:/) have graphic differentiation in Asia Minor and Afrati,[127] while other sites in Crete only do that for the front open-mid /ɛ:/. Graphic distinction of /ɔ:/ and /æ:/ (but no /ɛ:/) happens in Paros and Thasos; in Naxos this is only for /æ:/. Inscriptions from Corfu show distinct graphemes for both close-mid (/e:/ and /o:/), but no open-mid vowels, whereas Corinthian texts only distinguish /e:/. It is noteworthy that there is no alphabet that shows a graphic distinction for the back close-mid /o:/ or open-mid /ɔ:/ only, or that distinguishes both sets of open- and close-mid vowels.

This means that these innovations happened independently and speakers in each area tailor their writing to fit their specific dialectal needs. In the case of the Cycladic islands, the use of eta to mark their most characteristic dialectal feature is obvious. The opposition /ɛ:/-/æ:/ brings phonological and etymological information, but it is rather superfluous for the understanding of the text, since no semantic information is at play here. This means that the purpose of this letter is to highlight this idiosyncratic element of their dialect. Nevertheless, this does not happen everywhere, as seen in the lack of graphic distinction for all the long vowels in Euboean writing. The reasons why Euboeans decided not to distinguish these vowels is unclear, but it is evident that they felt comfortable with this ambiguity. This is possible because the semantic processing is not endangered by this ambiguity in most cases, unlike in the hypothetical case of Greek writing without vowels, which does involve a loss of semantic information. It is, however, undeniable that the vocalic notation system used in Euboean was clearly not made to fit their Greek dialect and is most probably taken from elsewhere. In other regions, writers tried to make vocalic notation more closely suited to their dialects using the innovations mentioned before.

It is therefore evident from the study carried out in this chapter that throughout Greece the vocalic systems are different both in phonological and graphematic terms. This means that the underlying language system is different and consequently the

[127] Possibly in Thera as well, but the evidence presented here is not clear.

writing system is different as well. But as shown here and in the previous chapter, both the script and the writing system as a whole have undergone independent reforms in each of the alphabets used for the Greek language. For this reason, epichoric alphabets should be seen as independent entities. They deserve to be analysed as separate writing systems, each with its unique characteristics and reforms. Thus, we should not only compare them with other alphabets for the Greek language, but also place them within the ecology of alphabets in the ancient Mediterranean.

Chapter 5

Consonantal notation in the epichoric alphabets

Continuing with the analysis carried out in the previous chapter, this chapter will explore the consonantal notation in the epichoric alphabets following the same layout for the data and discussion. On this occasion, however, the reader might notice that many of the letters are shared across NWS, Greek and other NEM alphabets. This does not come as a surprise since their sounds have very close points of articulation in all these languages and so their adaptation is not problematic. This does not mean that there will not be a place for different traditions and local developments. In fact, the Greek dialects have some sounds that are not shared with their neighbours, like the aspirated voiceless stops. Moreover, some of the alphabets use single graphemes as an innovative solution for specific consonant clusters. Special emphasis will be given to those areas where differences emerge and reassess how these have been used in order to categorise the epichoric alphabets into larger groups.

5.1 Nasals

5.1.1 /m/

Mu is a stable letter across alphabets for Greek, Phrygian, Eteocretan and Etruscan languages that uses a single grapheme as a graphic solution. It has spread all over the NEM with minor variations. The sign choice seen in this case does not offer significant differences in shape, just some disparity in the number and length of the strokes (see Table 5.1). Since the origin of these signs appears to be Semitic mem 𐤌, Jeffery suggests that |𐌌| was an older shape that turned into a four-bar mu during the process of transmission.[1]

In Crete, Thera, Sikinos and probably also in Eteocretan, the use of |𐌌| for /m/ could be understood as a way to differentiate it from san |𐌑|-/s/, and probably also in Eteocretan. However, this is not true either for the rest of the sites that have |𐌌| for /m/, or for all the places that use san. |𐌌| is preferred in Euboea and its colonies,

[1] Jeffery and Johnston 1990, 31.

Table 5.1: Representations of /m/.

	37. 𐌌	36. 𐌍	38. 𐌌	39. 𐌍
No. of sites	28	16	16	1
Total inscriptions	104	50	27	1

where the sibilant is represented by sigma. Elsewhere |𐌌| and sometimes |𐌌| are the signs employed for /m/, even in areas that take san.

An exception to these two trends would be |𐌍|, seen in an inscription from Methone (337.1, late 8th–early 7th century). This shape also has a Semitic origin and can be recognised, for instance, in the mem of the Phoenician-Luwian bilingual inscription of the king Azatiwada from Karatepe.[2]

5.1.2 /n/

The representation of /n/ is one of the most stable throughout the Greek alphabets (Table 5.2). They all use a single grapheme for this phoneme, specifically |𐌍| and its variant <𐌍>, which derive from Phoenician 𐤍. Moreover, /n/ is also the only phonetic value assigned to this grapheme, making it a one-to-one correspondence in the Greek alphabets, Phrygian, Eteocretan and Etruscan. Only in two cases we see it retroverse in comparison to the reading direction (*LSAG* 131.6 ca. 650 and *LSAG* 439.Aa, first half of the 7th century), showing the stability of the sign. Only in one inscription (Hymettos 27.72, 7th century) it is seen as |𐌇|, a shape close to the lettering of the Karatepe bilingual, for example.[3]

This shows that the representation of both nasal consonants had widely spread around Greece, Phrygia, Etruria and the non-Greek peoples of Crete with very little variation, especially in the case of /n/. It is noteworthy that this letter is present as early as the inscription from Osteria dell'Osa (ca. 775) discussed in the previous chapter.

Table 5.2: Representations of /n/.

	40. 𐌍	40*. 𐌉	29. 𐌇
No. of sites	53	2	1
Total inscriptions	275	2	1

5.2 Liquids

5.2.1 /l/

While all Greek scripts use a single grapheme for /l/, the choice of signs can be categorised in two groups: those where the second stroke looks downward – |𐌋| <𐌋>,

[2] Cf. Çambel 1999, pl. 7–19.
[3] Cf. Çambel 1999, pl. 7–19.

Table 5.3: Representations of /l/.

	10. 𐌋	34. 𐌛	8. 𐌋	35. 𐌊	34*. 𐌓
No. of sites	30	19	3	2	1
Total inscriptions	96	51	4	4	1

|𐌋| <𐌛> and |𐌊| – and where it looks upward |𐌛| (Table 5.3, Figure 5.1). The latter type can be seen in Attica, Boeotia, Lokris, Euboea (and its colonies) and northern Crete, and sometimes can be seen facing opposite the reading direction, therefore following the Semitic use of the sign 𐤋.[4] Downward looking lambdas are seen elsewhere in the Peloponnese, Molykreion, Thermon, the Aegean islands, southern Crete and Syracuse. Nevertheless, the shape |𐌊| is exclusive of Argos and Kalymnos which could have had a close relationship between them.[5] This one was probably created in order to differentiate it from gamma, which is attested in Argos as <𐌋>.[6]

In some of the sites mentioned above, however, both types are seen in the epigraphic record. This happens in Ithaka and Hymettos. Downward looking lambda is an exception in Hymettos. It appears in the inscription Hymettos 15.9, which, as argued above (see §4.2.1), was written in the Ionic alphabet. In each of the two inscriptions from Ithaka, we find a different type of lambda. *LSAG* 233.1 (ca. 700?) has upward lambdas in <𐌀𐌛𐌚𐌌𐌕𐌀> μ]αλιστα and <𐌘𐌚𐌛𐌏> φιλο[ς, whereas *LSAG* 234.2 (second half of the 7th century) has downward lambda in <𐌊𐌀𐌋𐌚𐌊𐌋𐌄𐌀𐌌𐌉𐌏𐌚𐌀𐌌𐌄> Καλικλεας ποιασε. Judging from a later inscription ca. 550 (*LSAG* 234.3), the upward lambdas could be the exception in Ithaka that will later show a script compatible with the Achaian.[7]

In the case of lambda, we see two different traditions in the graphematic choice. There seems to be an ordered geographical distribution to them. Attica, Boeotia, Euboea and its colonies use the upward lambdas, as happens in Phrygian and Etruscan, while the Peloponnese, Aegean islands and Asia Minor employ the downward lambdas, which are the most extended. Crete has its own division: upward lambdas in the northern sites (including Eteocretan) and downward lambdas in the south. Moreover, we see a sign choice that is specific to a certain script and that is the Argive lambda 𐌊, also seen in Kalymnos.

5.2.2 /r/

Again, we find a simple grapheme with two possibilities of sign choice (Table 5.4). The most widespread sign for /r/ is |𐌐| – with its variants <𐌑 𐌒> – following the shape of the NWS 𐤓. It already appears in the earliest palaeo-Phrygian inscriptions (G-105, early 8th century) and in Eteocretan as well. In some places we find this shape together

[4] This is seen in Hymettos 22.37 <𐌕𐌓𐌄𐌊𐌀𐌊> Τλῆσιας.
[5] Jeffery and Johnston 1990, 354 believe that the two alphabets are closely related.
[6] See §5.6.3.
[7] Jeffery and Johnston 1990, 230 f.

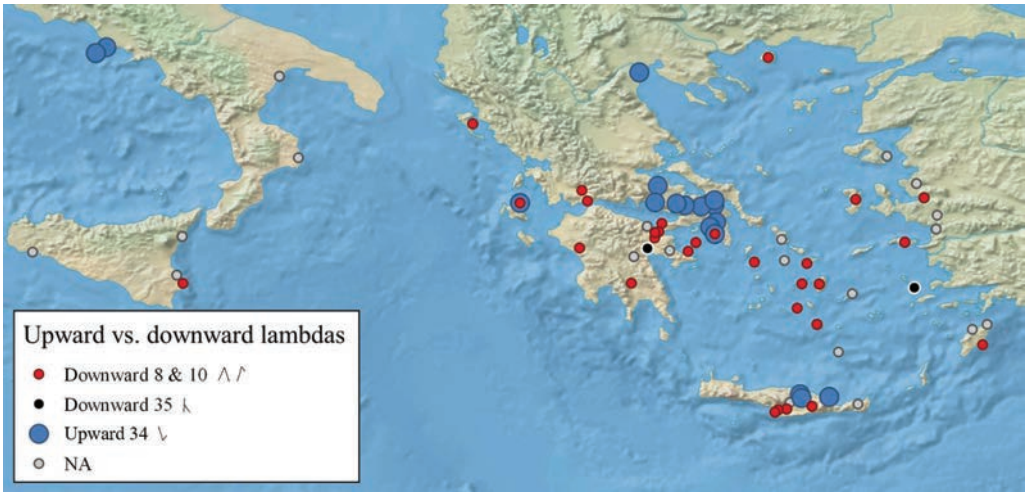


Figure 5.1: Distribution of the different representations of /l/.

with another one, which includes an extra stroke |𐤓|, and its rounded variant <𐤑>. These sites are Megara Hyblaea, Mt. Hymettos and Naxos. Tailed rho appears on its own only in Sicilian Naxos.

This is therefore a stable letter that seems to be developing another variant with another stroke, which will spread to more sites in the coming centuries. This new sign was a way to distinguish the shape <𐤑> from delta <𐤃> and even pi <𐤐>.[8] This innovation will specially spread around the Italic peninsula.

Table 5.4: Representations of /r/.

	52. 𐤓	53. 𐤒
No. of sites	46	4
Total inscriptions	180	4

5.3 Approximant /w/

Wherever digamma is still present, this is represented by a grapheme, |𐌅| being the most commonly used (Table 5.5). This shape is also present for /w/ in Phrygian and Eteocretan. In Etruscan, however, this sign represents /v/. The graphs |𐌚| and <𐌛> are exclusive to Gortyna, where they are attested in 10 inscriptions, although it is also found together with |𐌅| in four instances. The origin of these signs is still debated, given that the West Semitic waw 𐤅 is more clearly related to the shape of ypsilon, although its position in the alphabetic sequence and sound are shared with digamma.

[8] Jeffery and Johnston 1990, 34.

Table 5.5: Representations of /w/.

	18. 𐌅	19. 𐌆	17. 𐌂
No. of sites	27	1	1
Total inscriptions	59	10	1

Figure 5.2: Sites with attestations of digamma.

While Jeffery[9] argues for a cursive waw as the model used to create these shapes with a later parallel development with epsilon, McCarter believes that epsilon or Semitic he are behind the signs of digamma.[10] Guarducci prefers to think that the different shapes used in Greek areas are produced in a linear development: 𐌆 > 𐌅 > 𐌂.[11] However, that last sign appears already on a late 8th-century inscribed clay ball from Eretria (Andriomenou 1981.234): <𐌅𐌅𐌂𐌀⊕𐌅𐌏𐌔> ευϝαθλος.

The presence of digamma in writing (Figure 5.2) can therefore be ascertained for Crete, mainland Greece and the Greek-speaking communities of the Italic peninsula,[12] whereas the Cyclades and Asia Minor do not offer any attestations of digamma except for <𐌅> in the Samian abecedarium. It is important to bear in mind, however, that the absence of this letter does not necessarily imply that its use has been dropped. Thus, we should assess first in which cases this letter might be 'dead' and where it is absent owing to lack of contexts where this letter is expected. Early loss in all positions seems to happen in the Ionic of Asia Minor and the Doric of Thera and Anaphe.[13] In the Cyclades, this letter is rare and presumably it was already

[9] Jeffery and Johnston 1990, 24 f.
[10] McCarter 1975, 94, followed by Woodard 2010, 30; 2019, 94.
[11] Guarducci 1995, 92.
[12] The Chalkidian colony of Rhegion also seems to have kept word-initial digamma, cf. Bechtel 1924, 39.
[13] Bechtel 1923, 522; 1924, 39; Buck 1955, 46.

lost in all contexts, although two isolated examples, one in an abecedarium, are found later.[14] In two areas the evidence is not conclusive: Rhodes[15] and the Aeolian of Asia Minor.[16]

In subsequent centuries, the sound /w/ will disappear in all contexts and so will the letter digamma. Only in the diphthongs with second element /u/ is there a remnant of the ancient semi-vowel represented with the letter ypsilon.[17]

5.4 Voiceless glottal fricative /h/

The sound /h/ had already been lost in several Greek dialects prior to the earliest attestations of alphabetic writing in Greece. These are called psilotic and include East Ionic, Lesbian, Cretan and Elean.[18] In others, this sound appears in the form of an initial aspiration.[19] The most popular shape used for this sound |⊟| corresponds to NWS ḥeth. The other signs, clearly derived from the same source, seem to be used interchangeably as variants of this grapheme, as they are seen together in the same sites. This letter will be known as heta – as opposed to vocalic eta – when these signs are representing a consonantal sound (Table 5.6).

Mt. Hymettos offers a considerable variety of shapes for /h/ in its inscriptions, all dated in the 7th century: |⊟| in Hymettos 17.13 <⊕ƐKƐ⊟O> ανε]θε̄κε *h*ο[,[20] |H| in Hymettos 41.173 <HƐP> *h*ερ[οος (?) – the only attestation in this corpus of this sign with a consonantal value instead of a vocalic one – and |目| in Hymettos 18.27 <目O⩘Γ ƐPƐΛPAΦ⩘ƐΜ>] *h*οσπερ εγραφσεν [. The latter is also attested in one inscription from Thebes (*LSAG* 94.2, first quarter of the 7th century?). Finally, the sign |□| for the initial aspiration is seen in Sicilian Naxos and Cumae. It is worth mentioning that in Naxos |⊟| is used for both /æ:/ and /h/[21] – even in the digraph <Φ⊟> in <Φ⊟PA□⩘O> Φ*h*ρα*h*σο̄ (*LSAG* 303.2, third quarter of the 7th century) – while |□| appears only within the digraphs <□⩘> and <□⩘> with the value /ks/.[22] It is clear, then, that <□> is always part of a digraph and cannot account for a simple aspiration in the island, since there is an obvious graphic differentiation of the fricative /h/ as |⊟|. This is probably caused by a distinct pronunciation, perhaps a fricative realisation [x] of /kʰ/ before the sibilant.[23] Therefore, these cases have not been counted as examples of /h/ here.

[14] Gomis García 2018, 65 and 175.
[15] Bechtel 1923, 619 f.
[16] Although it is clearly lost word-internally, there is no evidence to assess its loss or presence in word-initial position (Blümel 1982, 80 and 85).
[17] Some examples of digamma as second element of a diphthong can be found in Woodard 2019, 97.
[18] Woodard 2004, 658.
[19] In this section only instances of word-initial aspiration are considered. The aspirated consonants are discussed below in a separate section.
[20] Also in Hymettos 13.1, 23.47, 23.48, 25.55, 25.60, 27.66 and 32.114.
[21] Contra Ruijgh 1997, 568 and 586, who believes that Naxian |⊟| renders /æ:/, while |□| is used for /h/.
[22] Cf. *LSAG* 303.2 and <⊟O ΜA□⩘IO⩘> in *LSAG* 304.3 (fourth quarter of the 7th century). See §5.9.2.
[23] Slings 1998, 655.

Table 5.6: Representations of /h/.

	23. 日	22. □	24. 目	21. H
No. of sites	23	2	2	1
Total inscriptions	37	2	2	1

Other instances where the sign |日| seems to have a syllabic value /he/ or /hɛː/ have been discussed in §4.2.1.

As for related writing systems, Phrygian and Eteocretan do not have such a sound and therefore lack this letter, while Etruscans do use it for /h/ as well. Thus, although the appearance of the letter heta depends on the phonetic characteristics of each area, all the dialects and languages that do have this sound in their repertoires show a uniform picture in the use of this specific letter.

5.5 Sibilant /s/

The graphic solution for /s/ is the same in every Greek alphabet: there is a distinct grapheme in all scripts. However, one of the most problematic issues in archaic writing in Greece concerns the signs used for the sibilant (Table 5.7).[24] These can be categorised into two traditions. One of them uses zig-zag shapes, that is the letter sigma (Table 5.9). The other renders the sibilant with the letter san (Table 5.10), graphically more similar to the letter mu.

The appearance of these two tendencies is probably linked to the variety of sibilant sounds, and therefore sibilant letters, present in the Semitic alphabets and their reduction to a unique sibilant in the Greek ones. Thus, while some alphabets take sigma, whose shapes derive from Semitic šin 𐤔, others will use san, with an origin in Semitic ṣade 𐤑.[25] As this section will show, both traditions present several problems that are difficult to clarify.

The sigma may be the letter with the broadest variety of signs. There are seven shapes to choose from with several allographic variations (Table 5.8). Moreover, these can appear facing towards or against the reading direction, or even both in the same inscription.[26] These phenomena are not exclusive to the Greek alphabets, but are also found in Phrygian and will be transmitted to the Etruscans as well.[27]

[24] This table uses the data relating to sigma or san when they appear on their own as graphemes, not when they are part of digraphs. For those cases see §5.9.

[25] Jeffery's theory of confusion of the Phoenician sibilants (Jeffery and Johnston 1990, 25–27) is rejected here since it is unnecessarily complicated; I prefer to see no confusion in the transmission of the sibilants into the Greek scripts. A detailed explanation is found below in this section.

[26] This can be seen for example in *LSAG* 76.09e (7th–early 6th century) <ΓΙϟΙϟΡΑΤΟϟ> Πισισ<τ>ρατος; *LSAG* 304.3 (last quarter of the 7th century) <ΜΑ□ϟΙΟϟ> Να*h*σιος; *LSAG* 94.2 (first quarter of the 7th century?) <ϜΙϟϜΟΔΙϘΟϟ> ϝισϝοδιϙος.

[27] Graphic variation for the sibilant is already seen in the earliest palaeo-Phrygian inscriptions (G 105–9

Table 5.7: Representations of /s/.

	38. M	31*. ϟ	31. ϟ	32. ξ	32*. ϟ	54. ϟ	55. ϛ	29. ϛ	37. ϻ	30. ϛ	55*. ϡ	38*. ϻ	56. ϡ	56*. ϡ
No. of sites	27	13	14	11	7	4	4	2	2	2	1	1	1	1
Total inscriptions	134	36	30	21	9	7	4	3	2	2	2	1	1	1

Table 5.8: Signs and allomorphs for sigma.

Signs	*Allomorphs*
29 ϛ	
30 ϛ	
31 ϟ	ϟ
32 ξ	Σ
53 ϟ	ϟ ϟ
54 ϛ	ϛ ϟ
55 ϡ	

This broad repertoire of shapes is seen not only across scripts, but even within the same sites (see Table 5.9), and it is rare to find just one sign used for the sibilant within a single site. This fluctuation is also present, though to a lesser extent, in the case of those scripts that – while using |M| for /s/ – render /i/ with the same set of graphemes that other areas use for sigma.[28] Although it seems that there are places with preference for a specific shape (either in one direction or the other), in general they all appear mixed and those sites that have more instances of /s/ in their inscriptions show a greater variety. Even within the same inscription one can see different shapes for sigma together.[29] This probably means that the sign variation in the case of sigma is not meaningful and that this is just a very flexible letter that gives freedom to the writer since there is no risk of confusing it with another letter.[30]

Jeffery tried to explain the instability of this sign claiming that the number of strokes that a sigma could show was not fixed.[31] The only point they have in common is their basic zigzag shape.[32] Moreover, the writer could make the strokes straight or round and change the orientation of the sign, as it can be seen from all the variants. It is precisely this flexible basic form that enables the freedom in strokes and orientation for this specific letter and not, as Powell suggested, that the direction of the signs in early Greek writing is unimportant.[33]

in Brixhe and Lejeune 1984); for Etruscan see for example Buonamici 1932, tav.XI fig. 18, tav.XIX fig. 29 and tav.XXI fig. 34.

[28] See §4.1.3.

[29] Some examples are *LSAG* 94.2 in n. 26 above, Hymettos 13.1 (7th century) <ιϟϛ>]ιες and <ϟΔϼϟϟϻ> εδρασεν; Smyrna 47.1 (late 7th century?) <ϟϼΤ⊟ϛ> <ϟϼιϛΤϟι>]αρτης | αριστει[.

[30] Only with crooked iota, but such a letter is not present in the alphabets of sigma users. The only example that we have of a text using both sigma and crooked iota is in the Dipylon Oinochoe, where they have very stable shapes – <ϛ> for /i/ and <ϟ> for /s/ – to avoid confusion.

[31] Jeffery and Johnston 1990, 29 and 34.

[32] McCarter 1975, 87.

[33] 'It appears that the adapter and his followers did not regard the direction of the sign as essential, nor regard the signs as figures which can face only forward or back, as did the Phoenicians and later Greeks'

Table 5.9: Sites using sigma for /s/.

Origin	𐌎	𐌑	𐌔	𐌓	𐌒	𐌍	𐌌	𐌐	𐌏	𐌖	𐌗	*Total*
Aegina				1	2							3
Aigiale								1				1
Athens	1		6	5	3	1	1					17
Attica			2	4								6
Boeotia					3	1						4
Chios				1								1
Cumae			1	1	1							3
Ephesos			1									1
Eretria		1	1		1		3					6
Ialysos			1									1
Kythnos				1								1
Lakonia			2									2
Lefkandi			1		1							2
Methana			1									1
Methone in Pieria			1	1		1	1					4
Mount Hymettos	2	1	9	12	5	3			2			34
Mytilene					1							1
Naxos			2	2								4
Pithekoussai			1	5		1						7
Samos					2							2
Selinunte					1							1
Sicylian Naxos								1				1
Smyrna			1	1		1	2					5
Tanagra					1							1
Thasos								1				1
Thebes				1		1		1				3
Unknown				1						1	1	3
Total	3	2	30	36	21	9	7	4	2	1	1	116

The situation in the areas that use san is completely different. The graphematic relationship |𐌌|-/s/ is present in all the alphabets that had san as the letter to render the sibilant, therefore showing an impressive stability, especially in comparison with

(Powell 1991a, 32). This flexibility, however, only happens with specific graphemes. See, for example, how |𐌚| always appears following the orientation of the text, even if it would still be recognisable if reversed, cf. §4.1.2.

Table 5.10: Sites using san for /s/.

Origin	ᴹ	Ϻ	Ϡ	*Total*
Achaia	1	2		3
Acrocorinth		1	1	2
Aetos		2		2
Afrati		10		10
Argos		3		3
Corfu		4		4
Corinth		6		6
Corinthia		1		1
Crotona		1		1
Dreros	1	6		7
Eltynia		1		1
Gortyna		31		31
Kalymnos		1		1
Knossos		1		1
Megara Hyblaea		1		1
Metaponto		1		1
Molykreion		1		1
Penteskouphia		41		41
Perachora		2		2
Phaistos		1		1
Prinias		1		1
Sikinos		1		1
Sikyon		1		1
Syracuse		1		1
Thera		11		11
Thermon		1		1
Unknown		1		1
Total	2	134	1	137

sigma. The shape <Ϻ> is used in most instances, although it can be found with a shorter last stroke <ᴹ> as well, despite its similarity with mu.[34] There is also one example of san upside down in *LSAG* 131.6 (ca. 650?) <ΟᴧϐWϐΠΟᴹΤΟϺ> ōλεσε ποντος.

[34] This happens in Arena IV.114.89 (second half of the 7th century) <ΚΡΑΙΑϟᴹΕᴹΕᴹ> Κραṭαιμενῆς and in *BCH* 70.602.5 (7th century) <ΟΡΚϟΟϟᴹϟ> ορκιοισι.

Table 5.11: Jeffery's confusion theory.

Phoenician value	*Phoenician name*	*Greek name*	*Greek value*
𐤆 /z/	zayin	san	Ϻ
𐤑 /t͡s/	ṣade	zeta	Ι
𐤔 /ʃ/	šin	xi	Ξ
𐤎 /s/	samekh	sigma	ϟ

Given the possibility to play with the orientation of san, we should consider whether it could be a rotated version of four-stroke sigma.[35] Herodotus himself seems to perceive both letters as the same when he says about the Persian names that they all end in the same letter, called san by the Dorians and sigma by Ionians:

> τὰ οὐνόματά σφι [...] τελευτῶσι πάντα ἐς τὠυτὸ γράμμα, τὸ Δωριέες μὲν σὰν καλέουσι, Ἴωνες δὲ σίγμα. (Hdt.1.139)
>
> their names [...] all end with the same letter – the one the Dorians call 'san' and the Ionians 'sigma'.[36]

This idea could be supported by the Proto-Corinthian abecedarium from Penteskouphia (*IG* IV.1.333) and a later one from Metapontum (*LSAG* 261.19, ca. 475–450?) that show san in the place of sigma. The evidence from earlier centuries, however, suggests very strongly that sigma and san are two distinct letters that followed very separate paths. Perhaps it was only later that people using different alphabets started to think of them as being the same letter with disparate names.

Although, as mentioned above, ṣade and šin are often considered the models for san and sigma respectively, the origins of the Greek sibilant letters are not entirely clear. In fact, Jeffery finds problems in explaining the transmission of the four sibilant letters of Phoenician into the Greek alphabet because their names in both systems do not seem to match. She proposes the relationships of names between the Phoenician sibilants and several Greek consonants seen in Table 5.11.

On this basis, she proposes that the adaptation of these Semitic letters into Greek is based on two points of confusion: the values and names of zayin-ṣade and of šin and samekh. Her thesis, however, is unnecessarily complicated and also based on letter names which, as explained in the introduction to this monograph, is very problematic as a methodology.[37] If we ignore the names of the letters and look at the graphemes

[35] Although NB that the orientation <ϟ> is never seen among san users.
[36] Ed. Wilson 2015b; trans. Waterfield 1998.
[37] Other authors have also tried to develop their own theories on the names of the sibilants without success: Powell (1991a, 34 f.) believes that the name 'san' derives from 'samekh'; Woodard (2010, 31) suggests that the Phoenician name for šin would have been in fact 'san'. Other scholars who convincingly argued against the 'confusion theory': Lejeune 1972, 88 f.; Brixhe 1991, §2.5; Guarducci 1995, 98 f.; Ruijgh

instead, a perfect correspondence can be drawn in this way: zayin-zeta, samekh-xi, ṣade-san, šin-sigma. This distribution is in fact supported by the alphabetical order both in Semitic and in the Greek alphabets.

This complicated picture results from the transmission of the multiple Semitic letters for their four sibilant sounds into languages with fewer sibilants; in the case of Greek there is only one sibilant phoneme /s/ with a voiced realisation [z] in specific contexts. This means that the rest of the Semitic sibilant letters experience necessarily some kind of reform, either their elimination or a change in their values. The case of samekh and zayin will be discussed later in §§5.9.2 & 5.9.3 respectively. The other two Semitic letters, ṣade and šin, would have been the models for the two letters that represent the sibilant in the Greek alphabets, *i.e.* sigma and san. However, in order to get to this situation, at least one of two reforms need to have happened: a *Funktionsreform* where the value /t͡s/ of ṣade is substituted by /s/ and a *Reduktionsreform* that eliminates one of the two redundant sibilants.

The first reform need not have happened in the alphabets that use sigma only. Those could have already discarded the use of original ṣade out of lack of a /t͡s/ sound. Nonetheless, in san-using alphabets this change of value has necessarily happened so as to render /s/ and discard šin instead. It seems, however, that not all alphabets performed a *Reduktionsreform* of either of the two letters, even if at least one of them was not used in practical writing. Looking back at the abecedaria discussed in Chapter 3, we find three different scenarios:

1. Abecedaria with sigma and san, each in their expected positions compared to the West Semitic sequence. This is seen in Barako and Etruria.
2. Abecedaria with sigma only. It appears in its expected position. This is seen in the Samian and Boeotian abecedaria.
3. Abecedaria with san only. It appears in the position of sigma. This happens in the abecedarium from Corinth and, as mentioned above, a later abecedarium from Metapontion.

Abecedaria that have san only in its expected position and no letter in sigma's place are not attested. Nevertheless, it would be unwise to draw conclusions since the evidence that we rely on is already scarce. Abecedaria of type 1, however, do show that at least some sigma users did adopt an alphabetic sequence that had both letters, sigma and 'dead san', and kept them separately following the NWS order. This suggests that these were envisioned as two different letters rather than one letter with two graphemic variants, not to mention that each of them would have a distinct Semitic model.

The nature of this choice between san and sigma is, nevertheless, debated. There is no clear answer to what the motivation was to choose one or the other

1997, 561–564; Woodard 1997, 137–188.

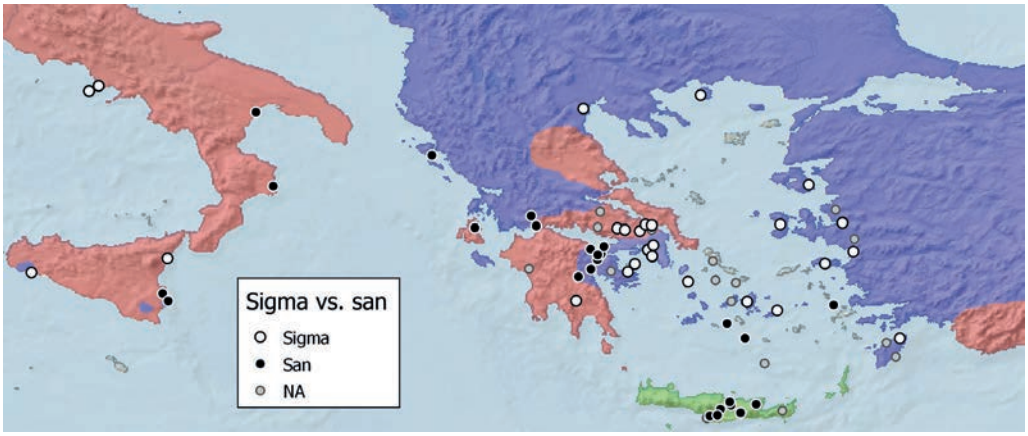


Figure 5.3: Distribution of the use of sigma and san.

in practical writing in such a stable way, as there is no script actively using both of them. The geographical distribution does not necessarily explain this issue, even though san seems to be used in Crete (including Eteocretan), the Doric Cyclades and most Peloponnesian and related alphabets: those of the Achaian colonies, Corfu and Kalymnos. On the other hand, sigma is present in Asia Minor, the Ionic Cyclades, Attica, the Saronic gulf, Boeotia, Euboea and its colonies, and Lakonia. It is especially noticeable that the two traditions for /s/ do not follow Kirchhoff's categories, since sigmas are seen in alphabets of all kinds except for the green alphabets, whilst san appears in all except for the light blue. Thus, red and dark blue alphabets choose between the two letters freely. This indicates that Kirchhoff's categories are not followed by letters apart from the so-called supplemental consonants.

One of the possible explanations for this choice of letters is based on graphic arguments. The letter san would appear in those scripts that kept the crooked iota in order not to confuse the signs for /s/ and /i/ and so discarded the sigma.[38] Then we could similarly argue that the sigma users rejected san out of similarity with mu. Nevertheless, san users seem to have no problem differentiating both signs, even when using a four-stroke mu. Moreover, this would not explain the situation of the scripts that use straight iota and san.

As it can be inferred from the map (Figure 5.3), the two traditions are never mixed within the same site in Greece and they seem to follow very similar patterns to those of straight and crooked iotas; the latter matches the areas with the use of san, while the former are seen with sigmas. There are marginal cases, however, of sites where san appears with straight iota.[39] The opposite, crooked iotas with sigma, is only seen

[38] Ruijgh 1997, 564.
[39] See §4.1.3 n. 40.

in one inscription, the Dipylon Oinochoe.[40] This means that the graphic argument does not justify all cases of choice between san and sigma.

Other explanations offered rely on phonetic grounds. Jeffery argued that the two letters correspond to a difference in pronunciation, where sigma would be chosen in those dialects where the sibilant is voiceless /s/ and san in dialects with a voiced sibilant /z/.[41] However, this would mean recognising two branches of Doric dialects with two distinct sibilants, since Rhodes and Lakonia use sigma instead of san. This is where Jeffery's argument fails, since it is precisely in Lakonia and other sigma using areas where there is a predisposition for a voiced realisation [z] of the sibilant /s/ in more contexts.[42]

Another proposal is based on the argument that san originally had a different phonetic value: the outcome of phonetic changes of labiovelar consonants and consonant clusters resulting in a sibilant sound.[43] This argument, however, is based on evidence from the 5th and 4th centuries BC with origins in areas where san is not present and other graphemes are used for this result, mainly Arcadian 𐌍 and Eastern Ionian 𐌕, otherwise known as 'sampi'.[44] Even though it has been argued that these signs and 𐌌 would share an origin in NWS ṣade,[45] I would argue that the developments of san and sampi cannot be equated. While san is clearly part of the original sequence transmitted from NWS writing, sampi is a newly created letter tailored for the needs of phonological outcomes in specific dialects. Moreover, this letter appears at the end of the Samian sequence as the last addition to the alphabet (even later than the letters for consonant clusters and /ɔ:/),[46] where it has a clear connection with contemporaneous reforms happening in Anatolian writing such palaeo-Phrygian |𐌕| or |𐌔| for /t͡s/.[47]

Ruijgh prefers to think that the original value of san could have been /t͡s/ and its name *tsan, closer to the emphatic sibilant of Phoenician. This cluster is simplified into /s/ later, so the graphic differentiation becomes obsolete and san is available for each script to choose whether to keep it for the sibilant or not. This takes us back to the graphic argument. It is not until a secondary /t͡s/ appears as the outcome of local sound changes that it is necessary to find new graphic solutions such as creating the letter sampi or using other existing graphemes in certain alphabets, as happens with |𐌉| in Crete.[48] Although this approach accounts better for the separate trajectories of san, sigma and sampi, it still raises questions. If these alphabets at some point used both san

[40] See §4.1.3 for more details.
[41] Jeffery and Johnston 1990, 33.
[42] Woodard 1997, 175 f.
[43] Lejeune 1972, 89; Woodard 1997, 181.
[44] See Lejeune 1972, 89 n. 3.
[45] Bernal 1990, 108 ff.
[46] Slings 1998, 645.
[47] Brixhe 1982; 1995, 111; 2007a, 281. In addition, Adiego (2018, 149) argues that these shapes are derived from 𐌕, as does Brixhe (1991, 325; 1982, 235), or even as a symmetric version of 𐌓/𐌑.
[48] Bernal 1990, 648 f.; Ruijgh 1997, 564 f. Further examples and interpretations on letter sampi can be found in: Genzardi 1987; Striano Corrochano 1989a; 1989b; del Barrio Vega 1990; Slings 1998; Dubois 2017.

and sigma until one of them became redundant, why are there no examples whatsoever of confusion between the two letters or sites where these are used interchangeably?

Hypothesising that san would have had an original /t͡s/ value in Greek is a dangerous step since there is no clear evidence to support this. The earliest inscriptions show, however, that by the time of the explosion of visible writing there are two strong traditions already in place. These transcend the Greek alphabets and apply also to other NEM alphabets of the time, with the exception of Etruscan, which will use both letters to differentiate two distinct sibilant sounds. Nevertheless, none of the explanations offered above seem satisfactory: they do not follow Kirchhoff's pattern, dialectal or geographical divisions, and the graphic and linguistic arguments are not fully supported by the evidence. Although there is evidently a close connection between the choice of san and sigma, the use of straight or crooked iotas and the shapes used for the latter and sigma, the distribution of these letters is rather complex and cannot be pinned down easily to a specific pattern.

5.6 Voiced stops

5.6.1 /b/

Even though /b/ is represented as a single grapheme in all the Greek alphabets, the broad sign choice seen for this phoneme demonstrates how very different shapes, apparently unrelated to each other, can be used for the same sound (see Table 5.12).[49] However, these are not the only signs known for /b/. Other shapes appear in later

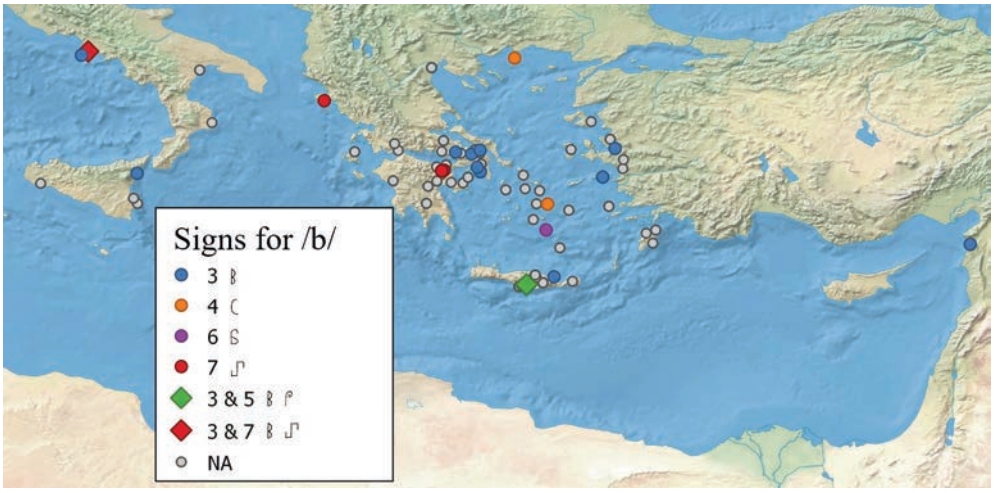


Figure 5.4: Distribution of the different signs used for /b/ according to the origin of the inscriptions.

[49] Cf. Jeffery and Johnston 1990, 23, who think that these signs derive from the same basic shape, a 'stem with curled ends'.

Table 5.12: Representations of /b/.

	3. 𐌁	5. 𐌐	7. 𐌃	4. 𐌂	6. 𐌆
No. of sites	13	1	4	2	1
Total inscriptions	19	11	9	3	3

inscriptions and are not attested in the corpus used here.[50] In some cases this corresponds to an evolution later in time (Theran beta), but it could always be that some of those signs have been lost owing to chance. The latter situation is evidently probable when we look at the high number of places where no /b/ has been attested (Figure 5.4), and it is also supported by the numbers of /b/ found elsewhere (Table 5.13). The only places where we have more solid numbers are Gortyna, Mount Hymettos and Penteskouphia. Nevertheless, later inscriptions confirm the tendencies seen here. The only place where no /b/ has been attested for its epichoric script whatsoever are the Ionian islands.[51]

The most common and most extensive of the signs for /b/ is |𐌁|. It is found in the earliest inscriptions from Attica, Boeotia, Euboea, the Euboean colonies of Italy and Sicily, and Ionia. The inscribed skyphos found in Al-Mina is probably imported from Attica or Aegina and its inscription could have been written in its place of origin.[52] Therefore, we can see a clear geographical distribution of this shape throughout central Greece, Ionic Asia Minor and the western Euboean colonies. According to later inscriptions, the sign is maintained in those areas and is also seen in the Doric Hexapolis.[53] Moreover, this is the shape seen in related alphabets such as Phrygian and Etruscan. In Eteocretan, however, this sign may represent a slightly different sound.[54]

The Ionic islands of the central and northern Aegean seem to follow their own tendency. |𐌂| is attested for /b/ twice in Naxos and once in the Parian colony of Thasos. At least in Paros this sign will be used until the 5th century BC, while other Cycladic islands start introducing the use of |𐌁|.[55] |𐌐| is only attested in Gortyna, where we also find two inscriptions where /b/ is represented as <𐌁>.[56] Later evidence confirms that in Gortyna both shapes could be used for /b/ until the 5th century BC.[57] Their Theran neighbours use |𐌆| instead, a shape that is taken as the closest to the Semitic

[50] See the complete repertoire in Jeffery and Johnston 1990, 23.
[51] Jeffery and Johnston 1990, 230; Guarducci 1995, 273 f.
[52] Boardman 1982.
[53] Jeffery and Johnston 1990, 345.
[54] /w/ or the second element of a diphthong according to Duhoux 1982, 158.
[55] Gomis García 2018, 65.
[56] *IC* IV I.8 <𐌉𐌄𐌁𐌇𐌕𐌏𐌍> λεβητον; *IC* IV I.21 <𐌉𐌄𐌁𐌇𐌕𐌀𐌌> λεβητας, both dated around the second half of the 7th to the 6th century BC.
[57] Jeffery and Johnston 1990, 308.

Table 5.13: Attestations of signs for /b/ according to site.

Origin	3. 𐌁	4. 𐌂	5. 𐌐	6. 𐌂	7. 𐌛
Al-Mina	1				
Athens	1				
Boeotia	1				
Corfu					1
Corinth					1
Cumae	1				1
Dreros	1				
Eretria	1				
Gortyna	2		11		
Mount Hymettos	5				
Naxos		2			
Penteskouphia					6
Pithekoussai	1				
Samos	1				
Sicylian Naxos	1				
Smyrna	2				
Tanagra	1				
Thasos		1			
Thera				3	

beth 𐌁.[58] Finally, |𐌛| happens in the area of Corinthia (Corinth and Penteskouphia) and in the Corinthian colony of Corfu.[59] Here, the use of |𐌛| as /b/ is clearly related to the use of |𐌇| for /e/ and /ɛː/.[60]

An important issue to discuss here is why precisely /b/ has such a variety of sign choices. It does not respond to any dialectal needs, for their use is systematic in all alphabets for /b/; only its graphic shape changes. According to Luraghi, these sign choices respond to a desire to distinguish alphabets in a visual and straightforward way. Moreover, this identification could happen easily in an abecedarium only by writing down the first few letters.[61] Judging from the double abecedarium from Cumae discussed in §3.3.4, it is true that both are easily recognisable.

[58] McCarter 1975, 78. Nevertheless, from the 6th century, they used a different sign for /b/. See Jeffery and Johnston 1990, 308.
[59] Later evidence shows that Megara has a very similar sign to that of Corinthia, cf. Jeffery and Johnston 1990, 132. Other regions of the Peloponnese have their own signs, like Kleonai and Argos, or use |𐌇| like Sikyon, Eastern Argolid, Lakonia, Messenia, Arcadia, Elis and Achaia.
[60] See §§4.1.2 and 4.2.1.
[61] Luraghi Forthcoming.

We should not underestimate the prevalence of |𐌁| in comparison with the rest of the signs, especially since its shape looks far from the original NWS beth 𐤁. Other signs are very localised exceptions that can sometimes be seen together with the common shape |𐌁|, *e.g.* in Gortyna. Therefore, this case seems similar to that of /e/, which also had some localised sign choice, while most of the alphabets used a common grapheme.

5.6.2 /d/

The two shapes used for /d/, |𐌃| and |𐌃| – with variants <𐌃> and <𐌃> – seem to have spread all around Greece (Table 5.14, Figure 5.5). However, |𐌃| and its allomorphs appear more often in the mainland,[62] although they are also seen in Naxos, Samos and Crete, whereas |𐌃| is generally preferred in the Aegean islands and Asia Minor, but also in Attica, Aegina, the area of Corinthia and its colony Corfu, Thermon and Cumae. Nevertheless, delta cannot be thought of as a distinguishing letter, since the two shapes are used interchangeably in several sites. Thus, we could consider that they were probably envisioned as versions of the same letter, in which case it could be a very stable one across all the Greek alphabets. It is also seen in other

Table 5.14: Representations of /d/.

	14. 𐌃	13. 𐌃
No. of sites	28	21
Total inscriptions	150	39

Figure 5.5: Distribution of the different shapes for /d/.

[62] <𐌃> and <𐌃> are often considered as mainland forms, cf. Jeffery and Johnston 1990, 24; Guarducci 1995, 90.

contemporaneous Mediterranean alphabets, like NWS daleth 𐤃, Phrygian <𐌃>/<𐌛> and Eteocretan <𐌃>/<𐌛>.

5.6.3 /g/

Although the letter gamma is not attested in many sites at this early date (Figure 5.6), it is evident that /g/ has not come to a unified representation for the different Greek alphabets. The graphic solution is the same across all of them, a single grapheme. The signs chosen, however, differ as seen in Table 5.15, but can be grouped in four categories:

1. *Koine*[63] gamma: 𐌂
2. Those that can be confused with lambda: 𐌋 𐌛 𐌝. Clearly connected to NWS gimmel 𐤂
3. Those that can be confused with pi: 𐌂 𐌓
4. Lunar shape (could be confused with Cretan pi or Naxian beta): 𐌒 𐌜

Table 5.15: Representations of /g/.

	8. 𐌋	11. 𐌂	10. 𐌛	4. 𐌒	12. 𐌜	9. 𐌂	9*. 𐌓	10*. 𐌝
No. of sites	7	8	8	2	2	2	1	1
Total inscriptions	34	13	12	5	3	2	1	1

Figure 5.6: Distribution of the different signs for /g/.

[63] The term *koine* refers to the fact that this is the shape that prevails once the Ionic alphabet is adopted as the standardised form of the Greek alphabet.

The first option, |Γ|, is the shape that will prevail in the later standardised form of the Greek alphabet; it can be found in Samos, the southern Cyclades, Argos, Boeotia and the Euboean colony of Methone. It is also the shape used in Phrygia. In some of these sites it can be seen together with gammas of the type 2 above, which share shapes with the downward looking lambdas. The two variants are found together as /g/ in Argos, Thera and Methone. The other instances of type 2 gammas appear in Attica, the Cyclades, Crete (for both Greek and Eteocretan), Thasos and Lesbos. Especially in the south of Crete, it might seem that this type of gamma looks too similar to their downward lambdas. Here, however, the two signs are clearly distinguished by the length of the last stroke: |Λ| = /g/ and |Λ| =/l/.

Even though |Ր| could probably be seen as a rounded version of |Γ|, it is important to make a distinction between them since |Ր| can have the value /p/ in other alphabets, while |Γ| does not. This third type of gamma is found in Ephesus, Penteskouphia and Cumae. In Corinth it appears only once against four examples of lunar gamma Ↄ. The fourth type of gamma with a lunar shape is attested only in Corinthian populations (including the colony Corfu). The creation of this sign allowed for a clear distinction between gamma and lambda and its evidence is more widespread in later centuries. Megara, Sycion, Elis, Arcadia and the Euboean colonies are some of the areas where this shape will be attested later.[64] In fact, from the latter it would be transmitted to Etruria, and from there the model for the Latin C and later G followed.

All of these shapes, however, do not look so dissimilar, especially after seeing the signs used for /b/. They could have developed easily through palaeographic variations of |Γ| or |Λ|. Only lunar gamma seems to be slightly divergent, although its angular version <〈> could have appeared in the same way as the other gammas and only then would the round one emerge. It is still interesting that most of these signs are found in other alphabets with a different value. Perhaps this happened by chance or it could be that the several shapes of gamma were influenced by those letters. In any case, it seems that this is a matter of palaeography rather than graphematics.

5.7 Voiceless stops

5.7.1 /p/

The different signs used for /p/ are, in general, very similar to each other (Table 5.16). The exception of |Ↄ| used in Phaistos and Gortyna is noteworthy.[65] However, in the latter, |Ↄ| for /p/ is only attested four times, while it is more common to find |Ր| (14 times). |Γ| also appears once in this site. It is easy to see how changes from a basic shape could have produced the different signs used for this sound. Therefore, it can

[64] Guarducci 1995, 90.

[65] NB that this sign is used for /b/ in the Cyclades and /g/ in the Corinthian alphabets.

Table 5.16: Representations of /p/.

	49. 𐌐	47. 𐌓	9. 𐌓	50. 𐌑	4. 𐌂	48. 𐌟	10. 𐌑	11. 𐌓
No. of sites	32	14	2	7	3	2	1	1
Total inscriptions	107	26	15	10	8	2	1	1

be said that generally this letter is stable across alphabets. This includes the Phrygian alphabet, that uses |𐌐| for /p/.[66]

5.7.2 /t/

Tau is a surprisingly stable letter (Table 5.17), showing a perfect one-to-one correspondence between the phoneme /t/ and its grapheme |𐌕| – with a variant <†> – throughout all the Greek-speaking populations and the Phrygian and Eteocretan alphabets.

Table 5.17: Representations of /t/.

	57. 𐌕
No. of sites	46
Total inscriptions	234

An example of the simplification of geminated -ττ- can be found in *LSAG* 76.6a (last quarter of the 7th century), where <𐌍𐌄𐌕𐌏ϟ> stands for Νέττος. It is not rare, however, to see this orthographic treatment of the geminated consonants in archaic writing.[67]

5.7.3 /k/

5.7.3.1 Kappa

|𐌊| – and its variants <𐌋 𐌉> – for /k/[68] is another very stable correspondence (Table 5.18), seen across all Greek scripts, Phrygian, Eteocretan and Etruscan.[69] The letter is already present in the earliest palaeo-Phrygian inscriptions (G-104, 237) from the layer immediate to the Cimmerian destruction. Therefore, the relationship between |𐌊| and /k/ is perfectly stable across alphabets. However, it is not possible to talk about a completely one-to-one correspondence between phoneme and grapheme, since this sound can also be rendered by |𐌒|.

[66] Brixhe 1983; Brixhe and Lejeune 1984.
[67] Ruijgh 1997, 564 n.72.
[68] These are examples of <𐌊> in front of the vowels /a(:)/, /e(:)/, /ɛ:/ and /i(:)/ and consonants followed by those vowels. Cases with the vowels /o(:)/, /ɔ:/, /u(:)/ and /y(:)/ and consonants followed by them are considered in the subsection below.
[69] The Greek and Etruscan alphabets assign the value /k/ to multiple graphemes, possibly in Eteocretan as well (see following subsection), whereas Phrygian has a one-to-one correspondence between |𐌊| and /k/.

Table 5.18: Representations of /k/ before non-back vowels and consonants not followed by a back vowel.

	33. K
No. of sites	37
Total inscriptions	160

5.7.3.2 Qoppa

Although the distinction between kappa and qoppa is not strictly graphematic, but rather orthographic, as will be explained in this section, its distribution is of interest to see the appearance and extension of graphic reforms. Therefore, the information concerning the contexts in which we could expect to see qoppa has been recorded in the database in order to see which sites and regions do have a kappa-qoppa differentiation and which ones lack the latter even in the earliest stages of visible writing.

The origin of this letter can be traced back to two distinct letters with contrasting phonemes in NWS: kaph 𐤊-/k/ and qoph 𐤒-/q/. In Greek, qoppa appears wherever /k/ is followed by: /o/, /o:/, /ɔ:/, /u/, /u:/, /y/ or /y:/. It is also used in cases where a consonant is present between /k/ and those vowels, as in <𐌋𐌊𐌒𐌕𐌏𐌉> (*LSAG* 94.7, last quarter of the 7th–first half of the 6th century) and <𐌒𐌋𐌏𐌍𐌊𐌕𐌉𐌏𐌌𐌑> (*LSAG* 77.10a, late 7th–early 6th century). This evidence is contradictory to the long held belief that qoppa responds to an allophonic pronunciation of /k/ before back vowels,[70] since there is no reason to think that the front vowel /y(:)/ or a consonant would trigger that same allophone of /k/.[71] Thus, even though this use might have roots in the phonology of the Greek and NWS dialects, it has been turned into an orthographic convention by the time of the earliest inscriptions.[72] This mostly orthographic trait is also seen in Etruria, where qoppa is used whenever the back vowel /u/ follows, but the letter C is preferred before front vowels and consonants.[73]

As seen in the map and the table below (Table 5.19, Figure 5.7), the use of qoppa is quite extensive throughout the Greek-speaking populations and is attested in many different sites. Only in Penteskouphia we see both letters in contexts where qoppa could appear. Kappa is found only once in front of /ɔ:/ *IG* IV 1.226 <𐌃𐌏𐌓𐌊𐌏𐌓𐌌𐌀𐌌𐌁𐌈𐌁𐌊> Δορκōν μ' ανεθ̄εκ[ε, although in the remaining nine instances of such a context qoppa is used.[74] Only two areas in the Peloponnese – Lakonia and Olympia – and three

[70] Rosén 1984; Allen 1987, 17; Brixhe 1991, 336–344.

[71] Qoppa before /y/ is attested in 6th-century Athens: 𐌒υδιμαχος (*Ath. Ag.* D12), 𐌒υτ[ρας (*Ath. Ag.* K2).

[72] Cf. Méndez Dosuna 1993.

[73] This is part of the so-called kacriqu rule, that distributes the three Etruscan graphemes for /k/ depending on the following letter: k before a, c before e, i and consonants, and q before u. Nevertheless, there are exceptions to this distribution, see Bagnasco Gianni 1999, 327 f.

[74] Cf. *IG* IV 1.210, 233, 265, 301, 317, 319, 322, 325, 329, and in the abecedarium *IG* IV 1.333. Given the attachment that Corinthians had towards letter qoppa (see n. 77 below), perhaps we could interpret that this was the name of someone from another region in the Peloponnese where qoppa was not used

Table 5.19: Representations of /k/ before back vowels or a consonant followed by a back vowel.

	51. 𐤒	33. K
No. of sites	31	6
Total inscriptions	64	8

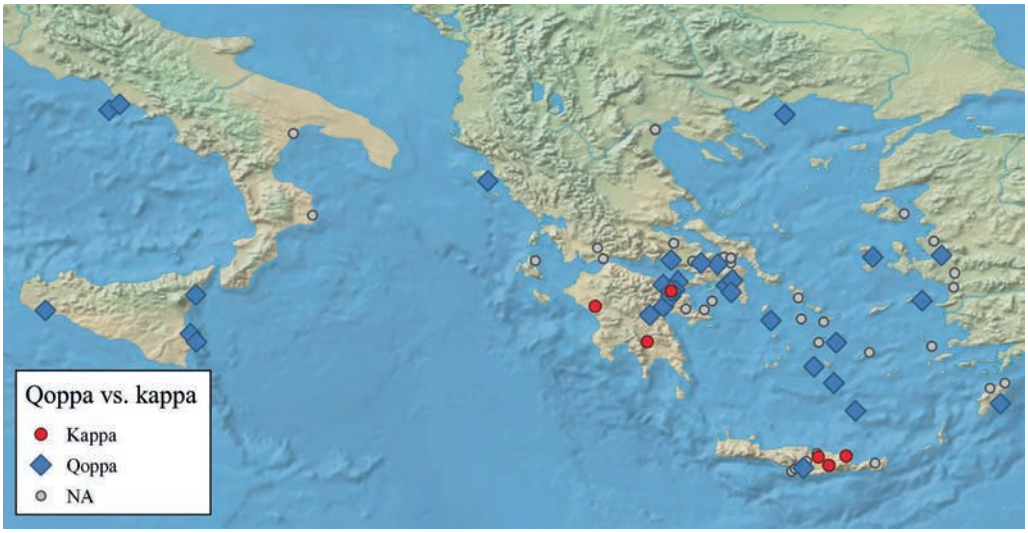


Figure 5.7: Distribution of the use of kappa and qoppa for /k/ before back vowels or a consonant followed by a back vowel.

sites of Crete – Afrati, Dreros and Eltyna[75] – show systematically the letter kappa in contexts where qoppa is expected. It is noteworthy that the Eteocretan neighbours of these northern Cretan sites do use a sign |𐤒|, which has been interpreted as the representation of either /pʰ/, /k/ or /kʷ/.[76]

This situation changed around the mid-6th and mid-5th centuries BC, when the use of qoppa started to be inconsistent and was completely lost in some places.[77] In the 5th century it was maintained in Argos, Corinth, Crete and Rhodes.[78] On the other

(personal communication from Dr Karin W. Tikkanen). Such an interpretation would imply that the personal name was adapted to the local alphabet of the offeror, while the rest of the text follows the scribal conventions seen at the rest of the inscriptions from Penteskouphia.

[75] Although not attested in the period covered in this dissertation, Praisos would be another place in Crete where qoppa is not used (Jeffery and Johnston 1990, 309).

[76] See Thompson 2018.

[77] Jeffery and Johnston 1990, 33 f.; Guarducci 1995, 98. Some sites keep it in the legends of coins, after they have been lost in other writing contexts, *e.g.* Corinth (Jeffery and Johnston 1990, 116) and Crotona (Jeffery and Johnston 1990, 249).

[78] Jeffery and Johnston 1990, 34.

hand, the areas that always had kappa in these contexts were Lakonia and Phokis.[79] However, |ϙ| appeared in abecedaria from Lakonia and its colony Taras,[80] meaning that at least they knew of the existence of this letter. This and the later tendency followed by the rest of the Greek alphabets suggest that this is a process of loss of a sign. We could assume that all Greek alphabets had this letter and that dropping its use might have been an innovation which would later spread to more areas, given that there was no phonetic reason to keep this sign.

Therefore, what we are witnessing is the loss of a sign, rather than a division of scripts that did not adopt this letter in the first place and those that did. This is interesting in terms of the spread of innovations across Greek alphabets. It is not possible to know for certain, however, whether there might be alphabets that never had such a letter.

5.8 Aspirated voiceless stops

The notation of the aspirated consonants will prove to be an important part of this chapter. Since NWS languages do not have aspirated stops, their scripts have restricted options to render such sounds. For this reason, Greek alphabets had to devise their own solutions for the notation of these consonants: the use of another grapheme from the NWS script, the creation of a new grapheme, digraphs and no graphic distinction between the voiceless stops and their aspirated counterparts. Some of the graphemes that appear in this section would be then transmitted to Etruscan. Phrygian, however, and presumably Eteocretan as well did not have these aspirated sounds and therefore do not need such letters. Thus, the notation of these sounds would be a purely Greek innovation.

5.8.1 /pʰ/

In the representation of /pʰ/ we see all the possible different graphic solutions mentioned previously (Table 5.20). Of these, the distinct grapheme is the most extended, which is always |ϕ|. Although this is a Greek addition in comparison to the NWS sequence, it has been argued that the design of the shape could derive from qoph 𐤒,[81] or maybe theta.[82] Perhaps the latter seems more probable when considering the two shapes used in Mt. Hymettos for /pʰ/: |ϕ| and |Φ|. The latter is also seen in Naxos (*LSAG* 303.1, 2, second and third quarters of the 7th century respectively) and Olympia (*IvO* 1, late 7th–early 6th century). Probably, we should consider both shapes as variations of the same grapheme given their graphic similarity and interchangeable use.

In the sites of Crete, however, there is no graphic differentiation between /p/ and /pʰ/ since each site shows the same grapheme that is also used for /p/: |Ϲ| in Phaistos,

[79] Jeffery and Johnston 1990, 33.
[80] See *LSAG* 202.66 and *LSAG* 284.15.
[81] Rosén 1984, 230 f.
[82] Jeffery and Johnston 1990, 36.

Table 5.20: Representations of /pʰ/.

	60. 𐤐	26. 𐤐	50+23. 𐤒𐤄	4. 𐤂	9. 𐤂	49. 𐤒
No. of sites	19	3	1	2	1	1
Total inscriptions	47	5	3	2	1	1

|𐌓| in Gortyna, |𐌒| in Prinias. The examples of this phenomenon found in the Cretan inscriptions included here are: <𐌀𐌚𐌋𐌏(𐌚)𐌀𐌌> Παιδοπιλας instead of Παιδοφίλας in *LSAG* 468.8a (8th–6th century?), <𐌄𐌒𐌏𐌓𐌏𐌌> επορος *i.e.* ἔφορος in *LSAG* 315.10 (7th century)[83] and <𐌀𐌍𐌓𐌏𐌕𐌄𐌓𐌏𐌌> ανποτερος for ἀμφοτέρος in *IC* IV I.21 (second half of the 7th–6th century).

The lack of graphic differentiation between these aspirated and non-aspirated consonants in these Cretan examples, however, should not be explained by the psilotic characteristics of its dialect.[84] If it were the case that the psilosis would affect the pronunciation of the aspirated consonants, we would expect /tʰ/ to be written with |𐌕| in Crete, which does not happen, but |⊕| is used instead. Moreover, other psilotic dialects, like the Ionic of Asia Minor, would not need graphic differentiation for the aspirated consonants. However, there we see distinguishing graphemes for such sounds. In fact, psilotic dialects do not lose the aspiration in the aspirated consonants and later evidence suggests that Cretan did go through psilosis, but not through a deaspiration of the stops, which is an independent process.[85] Therefore, the examples discussed above belong in this section rather than with /p/. Cretans simply used the same grapheme for both /p/ and /pʰ/, thus not making a graphic distinction of these two separate phonemes present in the Cretan dialect.

In Thera a different graphic solution is used for the aspirated stops; this and the other aspirated consonants are systematically represented with digraphs, in this case <𐤒𐤄>. For /pʰ/ then, the two solutions other than the unique grapheme are geographically restricted, and match perfectly with Kirchhoff's green alphabets. Nevertheless, there is an important distinction to make within the green alphabets as there are some that had no graphic differentiation and some that used a digraph.

Ruijgh is inclined to see a chronological development of the different solutions. He argues that all scripts would have followed initially the Cretan paradigm for the aspirated stops /pʰ/ and /kʰ/ (*i.e.* no graphic differentiation with the voiceless non-aspirated stops), since NWS does not have aspirated consonants and therefore there was no letter to represent such sounds in the Semitic alphabetic sequence. Then Thera and Melos made the innovation of adding the sign of the glottal fricative to the voiceless stops to render their aspirated version. The rest of the scripts used a

[83] Cf. ποραι instead of φόραι in IC IV 80.

[84] Cf. 'The psilotic dialect of Crete used pi for phi' (Jeffery and Johnston 1990, 309).

[85] Woodard 1997, 144 contra Powell 1991a, 56. Cf. Hesychius' Cretan glosses ἀγλαφόρε (D 614), ἀποφλάσαι (D 6783), ἀφραττίας (D 8760) (Cunningham 2017). For the presence of /pʰ/ and /kʰ/ in the Cretan dialect see Thompson 2018, 30 n.1 and Bile 1988, 74.

newly created additional letter for these phonemes.[86] This contradicts Powell's theory of a unique creator who included all the additional letters and some scripts decided simply not to use them.[87]

Unfortunately, there is no evidence to support Ruijgh's idea of a chronological succession of the different solutions. It is evident, however, that three separate traditions were in place by the time of the earliest inscriptions and that they show how different alphabets are independently finding diverse solutions for the same problems.

5.8.2 /t^h/

This aspirated consonant is not as problematic as the other ones since the NWS script offered a grapheme to cover this phoneme, that of the emphatic ṭeth ⊕. Therefore, most of the Greek alphabets used this sign, already present in their inherited alphabetic sequence, to render /t^h/. Although there could be a choice between the signs used for this phoneme, their graphic traits are very similar, all bearing one of the two basic elements of the sign: a circle and/or a cross (Table 5.21). The most extensive one is |⊕| with its variant <⊗>.

The squared shape |⊞| is seen four times: while on some occasions out of difficulty of writing (*LSAG* 76.09d, Smyrna 43.28), for others it seems to be a choice of the writer (Hymettos 15.11, *IG* XII 3.540). It is worth mentioning that in previous studies, this sign is not included among the shapes of theta, but instead appears under the letter xi.[88] Since it appears repeatedly in Etruscan abecedaria in the position where we would expect xi,[89] Jeffery assumes that there was such a sign with the value /ks/ in Euboea,[90] even though she offers no local evidence for such a statement. The recently discovered 'abecedarium' from Eretria does show this sign, but, as argued earlier, its phonetic value cannot be ascertained.[91] In fact, /t^h/ is the only value known for this sign in Greek sites, while in Etruscan it is not used in practical writing and will disappear from the abecedaria in the 6th century BC.[92]

Going back to the other signs for the aspirated consonant, there is a version without the horizontal stroke |Ⓘ|, which is a mistake in *LSAG* 240.03 (second half

Table 5.21: Representations of /t^h/.

	25. ⊕	27. ⊞	26. Ⓘ	44. ○	25+23. ⊕⊟
No. of sites	30	4	2	1	1
Total inscriptions	119	4	3	2	1

[86] Ruijgh 1997, 559 f.
[87] Powell 1991a, 575.
[88] Cf. Jeffery and Johnston 1990, 29 and 32; Guarducci 1995, 94 and 96.
[89] Cf. *ET* AT 9.1, AV 9.1, Cr 9.1, Ve 9.1, 9.2, 9.4 and Vt 9.1. In others its position is next to <⊕> showing the graphic similarity between both signs, like in Fa 9.1 and Ve 9.3.
[90] Jeffery and Johnston 1990, 32 and 80.
[91] See discussion in §3.3.2.
[92] Lejeune 1983, 11; Pandolfini and Prosdocimi 1990, 11–17.

of the 7th century): <ΦVΦΛΟϟ> θυφλος for τυφλός, but <ΛΕϘVΘΟϟ> λεϙυθος. It is probably a confusion for |⊕| in *LSAG* 76.08 (last quarter of the 7th century) <ΦΥΛΑΤΡ> θυγατρ[ος. In *LSAG* 241.24 (second quarter of the 7th century?), the name of the potter <ΑΡΙϟΤΟΝΟΦΟϟ> is normally interpreted as Αριστονοθος,[93] although it has also been read as Αριστονοφος[94]. In *IG* IV 1.249 <ΑΝΒΘΒΚ> ανεθε̄κ[ε from Proto-Corinthian plaques of Penteskouphia <⊙> seems a mistake compared to the 49 instances where |⊕|-/t^h/ is found in the site.

Finally, Thera is the exception again with the digraph <⊕Η>. What is not clear is why they would use the sign for the aspiration when |⊕| already represents an aspirated sound. They probably added a pleonastic heta out of similarity with <ΠΗ> for /p^h/ and <ΚΗ>/<ϘΗ> for /k^h/.[95] A similar phenomenon is seen in *LSAG* 303.2 (third quarter of the 7th century) <ΦΗΡΑ□ϟΟ> Φ*h*ραhσō. Thus, with the exception of Thera, it seems that |⊕| and its graphic variants consistently represent /t^h/ across Greek alphabets.

5.8.3 /k^h/

In the case of /k^h/, we can see two possible graphic solutions: the single grapheme and the digraph (Table 5.22). The scripts using the former have some sign choice.

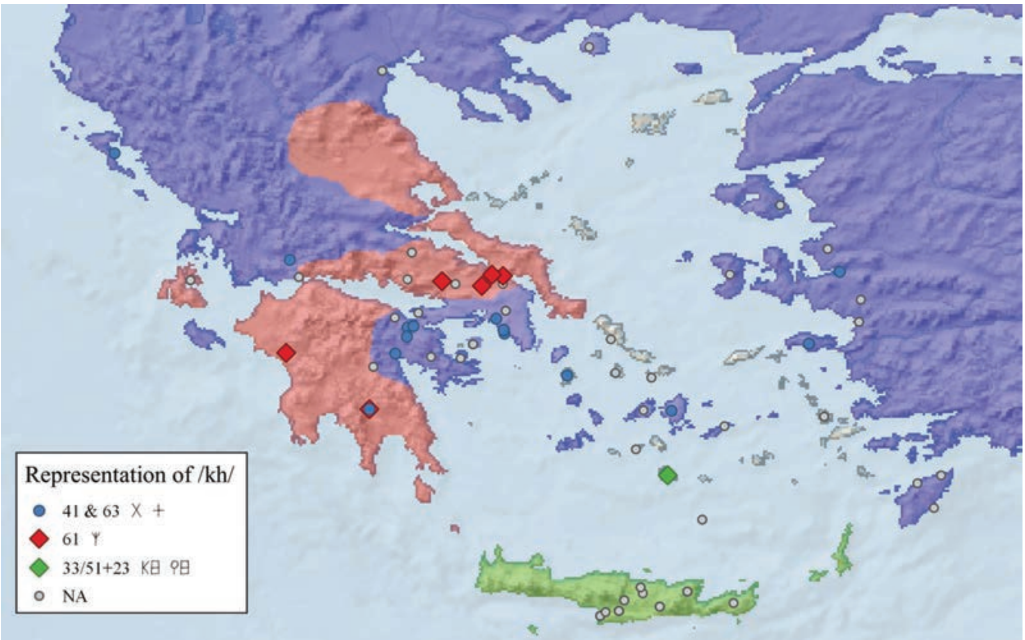


Figure 5.8: Distribution of the representations of /k^h/.

[93] Cf. *LGPN* and *SEG* 27.664, 29.946.
[94] Guarducci 1976.
[95] For Brixhe, this digraph suggests that theta could have been a doublet for tau (Brixhe 1991, 341; 2007a, 280).

Table 5.22: Representations of /k^{h}/.

	41. Χ	63. +	61. Ψ	33+23. ΚΒ	51+23. ΦΒ
No. of sites	14	4	6	1	1
Total inscriptions	23	7	7	5	2

|Χ| is clearly the most widespread shape for /k^{h}/, although unfortunately most of the sites do not have attestations of the recording of this phoneme at these early dates. A very similar sign |+|, is seen in Samos, Mt. Hymettos and an inscription from Corinthia. In Mt. Hymettos it appears together with |Χ|, this being the only site where a mixture of signs for /k^{h}/ is attested in this corpus. Perhaps the appearance of <+> both in Hymettos and Samos may be another piece of evidence for the close connection of the two sites.[96]

In contrast with the use of the cross-sign in Asia Minor, the Ionic islands and most of mainland Greece, we find |Ψ| localised around Euboea, Boeotia and Olympia (Figure 5.8). Although seemingly isolated, Olympia would continue using |Ψ| and so apparently did Lakonia and Messenia.[97] However, the two inscriptions from Lakonia with an attestation of /k^{h}/ in this corpus show contradictory uses of these shapes. *LSAG* 446.3a (second half of the 7th century) has a sign |Ψ| which, according to its Lakonian origin, should probably be interpreted as /k^{h}/, even though the text does not offer clear indication of how to read this sign.[98] On the other hand, the author of *LSAG* 198.3 (late 7th–early 6th century) seems to use |Χ|. While Jeffery reads *LSAG* 198.3(b) as Αυταρετος, I believe that the reading Αχραδαιος/Αχραδατος[99] is closer to the different drawings available for this inscription <𐌀𐌗𐌓𐌀𐌃𐌀𐌕◇ς>. Nevertheless, in later Lakonian inscriptions |Χ| is interpreted as /ks/, while |Ψ| is read /k^{h}/. It is worth mentioning that the sign |Ψ| may not be a completely Hellenic creation since some graphic variants of Semitic kaph show a similar shape.[100] Thus, this could be a case of a doubling of the NWS letter into kappa and khi by using two allographic variants from the original writing system.[101]

|Ψ|, normally seen as another version of |Ψ|, is only attested in single sign inscriptions – Daphnephoros 67.27 (second half of the 8th century), Kalapodi 295.10, 11 (both 8th century) – and therefore it cannot be ascertained whether it has a phonetic value in these cases (/k^{h}/ or maybe /ps/) or if it is just a sign

[96] See §4.2.1.
[97] Jeffery and Johnston 1990, 183; Guarducci 1995, 278.
[98] *LSAG* 446.3a (second half of the 7th century) <𐌃𐌄𐌉𐌌[.]𐌕𐌀𐌃𐌀𐌍𐌄⊕𐌄𐌊𐌄𐌑𐌘𐌀𐌋𐌉> Jeffery's reading: Δεινι[ς] ταδ' ανεθε̄κε χαρι[.].
[99] Hondius and Woodward 1921, 103 f., no. 26; *SEG* 2:82.
[100] Rosén 1984, 230.
[101] This is not an uncommon method to create a new letter. It is part of the possible adaptations in Adiego 2018, 145, 2b.

with another kind of meaning. However, in another inscription it is seen in the consonantal sequence that represents /ks/.[102]

As with the rest of the aspirated consonants, Thera has a digraph <𐤊𐤇>, which becomes <𐤒𐤇> in front of back vowels.[103] Although not attested in the earliest inscriptions, /k^{h}/ in Crete follows the tendency of /p^{h}/, *i.e.* it uses the same sign as the non-aspirated stop /k/, *i.e.* |𐤊| or |𐤒|.[104] This makes the geographic distribution of the two possible solutions the same as with /p^{h}/.

5.9 Consonant clusters

In the Greek dialects there are three consonant clusters that at some point were written through a single grapheme. These are a voiced stop + sibilant, /dz/, and at least two unvoiced stop + sibilant, /ps/ and /ks/. However, many alphabets represent these sequences of sounds by writing two graphemes, each rendering one of the elements in the cluster.[105] Thus, as happened with the letters for aspirated sounds, analysis of the notation of consonant clusters will reveal innovations that are specific to some Greek alphabets only.

5.9.1 /ps/

Although the sequence /ps/ is rarely attested in the earliest inscriptions, we can still see some variety in the graphic solutions devised for this cluster (Table 5.23). The most common are the two graphemes, which show some variety in terms of sign choice. The first element representing the stop is consistently rendered by the grapheme used for the aspirated consonant /p^{h}/, either by |𐤦| or |𐤟| in the case of Attica, Naxos and Cumae, and possibly also by |𐤓| and |𐤑| in Crete, given that the aspirated and non-aspirated voiceless stop do not have graphic differentiation in the Cretan sites. The sibilant element also follows the graphemic choice stated earlier:[106] while the sigma-using areas will show a sigma, san users will render the sibilant with san.

A few sites show a unique grapheme |𐤘| to represent this sound. It is found in Penteskouphia, Corinth and Samos. Probably in Phrygian this sign is used as well, although perhaps for the cluster /ks/ instead.[107]

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[102] *LSAG* 94.3c (7th century?) <𐤉𐤐𐤀𐤘𐤉𐤀𐤃> o]ιραχσιαδ[ας?

[103] Cf. *IG* XII 3.543 (late 8th century) <𐤀𐤌𐤕𐤖𐤟𐤒𐤇𐤟𐤌> Αστυοϙhος, *LSAG* 323.4 (late 7th century?) <𐤟𐤇𐤀𐤓𐤖𐤌𐤀𐤒𐤇𐤟𐤌> Θhαρ<ρ>υμαϙhος.

[104] Guarducci 1995, 182.

[105] In this case we cannot strictly talk about digraphs, since each grapheme represents one distinct sound.

[106] See §5.5.

[107] The value of this grapheme in Phrygian is unclear (Brixhe and Lejeune 1984, 282), although Lejeune (1978) proposes a cluster /ks/. It is present in one of the earliest inscriptions (G-249) as <𐤘>, but its value cannot be reconstructed.

Table 5.23: Representations of /ps/.

	61. ᛉ	60+31*. ΦΣ	60+31. ΦΣ	26+31. ⦶Σ	47+38. ΓΜ	9+38. ΓΜ
No. of sites	3	2	1	1	1	1
Total inscriptions	4	2	1	1	1	1

5.9.2 /ks/

The cluster /ks/ is rarely attested in the earliest inscriptions and we do not have any examples from Magna Graecia. However, the little evidence available shows a very interesting picture for the representation of this sound sequence (Table 5.24, Figure 5.9). An initial differentiation should be made between those alphabets in which the Semitic sibilant samekh Ξ is kept in the script and those where it is not. These

Table 5.24: Representations of /ks/.

	33+38. ΚΜ	42. Ξ	41. Χ	22+31. □Σ	22+31*. □Σ	22+32*. □Σ	32*+41. ìΧ	60+31*. ΧΣ	62+32. ΨΣ	63+32. +Σ
No. of sites	5	5	2	1	1	1	1	1	1	1
Total inscriptions	12	9	2	1	1	1	1	1	1	1

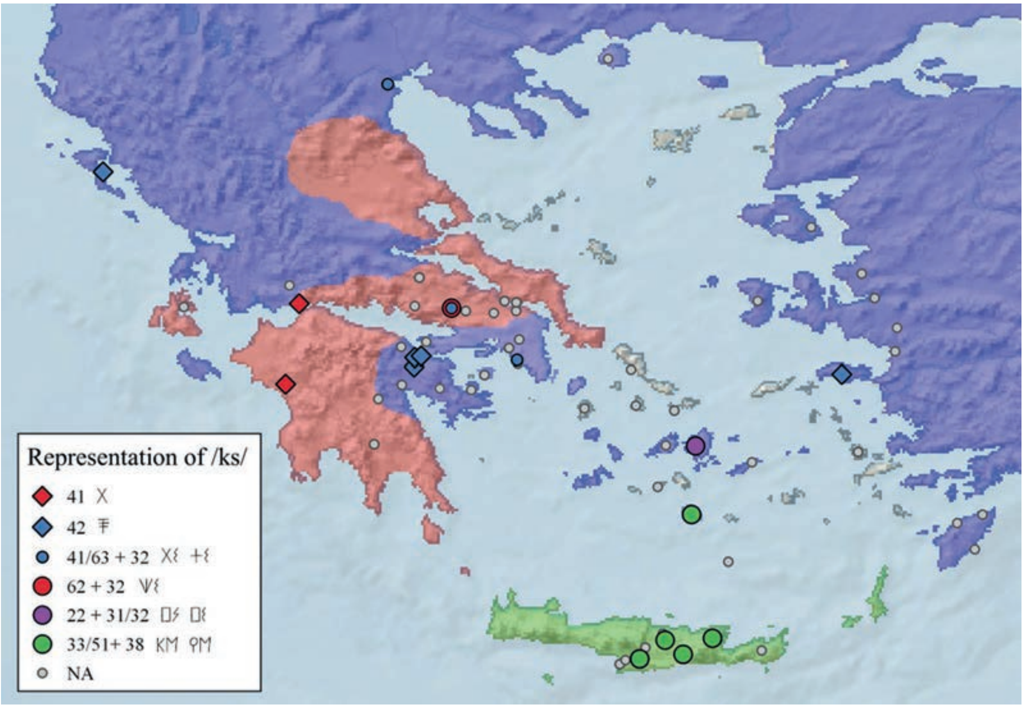

Figure 5.9: Distribution of the representations of /ks/.

two distinct traditions reveal that, while users of some alphabets chose to reassign the value of this grapheme, others decided to eliminate this letter from the alphabetic sequence. This was probably motivated by the fact that the sibilant sound was already covered either by sigma or san and therefore this extra sibilant seemed redundant. However, in areas where this grapheme was eliminated or not inherited at all, other solutions had to be devised for the representation of this cluster.

|𐌎| is attested in Corinth, Penteskouphia, Corfu and Samos. In Smyrna 43.27 (7th century?) its value is uncertain, but it is most probably also /ks/. In Eretria, however, it appears as a single sign in *AEph* 1983 180.177 (8th century) and therefore its value cannot be ascertained, but it could be a potmark from elsewhere or without a specific phonetic value.[108] In fact, we would not expect to find this grapheme for /ks/ in Euboea, for this sound is normally rendered by |𐌗| in the area. This is the additional grapheme used by some of the populations that do not take the samekh-shaped xi.

In this corpus, |𐌗| for /ks/ is attested only in Molykreion and Olympia. In two instances it is not possible to confirm whether this grapheme represents /ks/ or /k^{h}/. This happens in one inscription from Kommos (Kommos 120.40, 7th century) where it is part of a potmark and also in *LSAG* 356.1 (8th century?) <𐌐𐌏𐌑𐌀𐌐𐌏𐌇𐌌𐌉𐌐𐌖𐌍𐌗>, which could be read ϙοραϙō ημι ϙυλιχ[or ϙοραϙō ημι ϙυλιξ. The photographs of this inscription show that the following sign, fragmented by the damage of the cup, has a short horizontal stroke on top with a vertical stroke starting from its middle point, perhaps a zeta |𐌉|, which would make the last letter a xi. According to Jeffery, however, in the Rhodian alphabet we would expect /ks/ to be represented with a digraph <𐌗𐌊>.[109]

This takes us to the alternative solution for the representation of this cluster, the use of two graphemes. However, different sites choose different combinations of graphemes. These can be categorised in the following way:

1. 𐌊 + san is present in Cretan sites.
2. 𐌒 + sigma is exclusively found on Naxos. It has three variants depending on the orientation and number of strokes of the sigma.
3. 𐌗 + four-stroke sigma is attested in Attica, Methone and Boeotia.
4. 𐌜 + four-stroke sigma is seen only in Boeotia and apparently it is the common way to render /ks/ in the area.

The sibilant element does not present any problems; it varies between sigma or san depending on the grapheme used in the area for this sound; what changes in these categories is the element rendering the stop. Although writers from Cretan sites may seem to employ the non-aspirated voiceless stop /k/, as happened with /ps/, the

[108] Multiple examples of potmarks with such a sign can be found in Papadopoulos 2017.
[109] Jeffery and Johnston 1990, 347.

other Greek-speaking communities apply the grapheme representing the aspirated /k^{h}/.[110] The Naxian xi, however, is not easy to interpret. The grapheme |𐌇| is attached to a value /h/ in Sicilian Naxos and it also appears in an abecedarium from Cumae in the position of heta. In Naxos, however, the aspiration is systematically rendered by |𐌄|. It has been argued above that the appearance of |𐌇|, which is clearly not the representation of /h/ in these sequences,[111] is instead the result of a different pronunciation of /k/ in front of the sibilant: a fricative realisation [x].[112] Whichever might have been the real pronunciation of the first element, it is clear that Naxian writers felt that the grapheme for the glottal fricative was the best approximate spelling, in which case the sign |𐌇| is preferable in this sequence to avoid confusion. If |𐌄| has the values /h/ and /æ:/, a reader would probably choose the vocalic value when followed by a consonant, thus interpreting <𐌄𐌔> as /æ:s/. This is easily solved by making a modification to the first graphic element to make sure that it will be read as a consonant.[113]

The interpretation of option no. 3 cannot be the same for every area but depends on the value of the first element in each site. In the case of Attica, it is very clear how |𐌗| and |+| have the value /k^{h}/, since its use is systematic. Therefore, the grapheme for /k^{h}/ is employed again to form the representation of /ks/. On the other hand, the attestation of this sequence in Methone and in Boeotia is more controversial. The case of Methone can only be explained by later Euboean evidence since there is no other attestation of /k^{h}/ or |𐌗| at the site for the centuries included in this thesis.[114] Although there are no other examples of /ks/ in places of Euboean influence by the 7th century BC, later evidence suggests that |𐌗| is used with this value in the Euboean scripts,[115] whereas /k^{h}/ is written <𐌘> from the earliest inscriptions.[116] Thus, we should read the Methonean <𐌔𐌗> in <𐌔𐌗𐌙𐌌𐌉> (Methone 369.22, late 8th–early 7th century) as a case of pleonastic sigma in front of the xi.[117] This is also the case for Boeotian <𐌗𐌔>. |𐌗| is never used in the area with the value /k^{h}/, which is rendered instead by |𐌘|.[118] In fact, the usual way to write /ks/ in Boeotian is with the option no. 4, so technically it should be /k^{h}s/. <𐌗𐌔> appears only once in Mantiklos' inscription (*LSAG* 94.1, first quarter

[110] Ruijgh (1997, 565) interprets that this shows a pronunciation /k^{h}s/; cf. Sturtevant 1940, 91; Schwyzer 1959, 211.
[111] Contra Jeffery, who argues that this sequence represents /hs/ (Jeffery and Johnston 1990, 291).
[112] Slings 1998, 655.
[113] NB that |𐌇| was never used for vocalic values in any Greek alphabet, always as a glottal fricative.
[114] For an explanation of how Methonean writing is closely connected to Euboean, both in terms of dialect and script, see Méndez Dosuna 2017; Panayotou-Triantaphyllopoulou 2017; Woodard 2017.
[115] Jeffery and Johnston 1990, 79; Guarducci 1995, 217.
[116] See §5.8.3 and Figure 5.8 above.
[117] Méndez Dosuna 2017, contra Besios *et al.* 2012, who read σχ as a mistake for χσ.
[118] See §5.8.3 and Figure 5.8 above.

of the 7th century?), where <𐌚> denotes /k^{h}/ in <𐌚𐌀𐌓𐌉𐌞𐌕𐌕𐌀𐌍> χαριɛτταν, thus showing that the correct reading is not as χσ but as ξσ.[119]

5.9.3 /dz/

Despite the scarcity of examples for /dz/, the letter zeta is one of the few that gets close to a perfect correspondence in all the Greek alphabets, although with few exceptions (Table 5.25). It is mostly represented with the grapheme |𐌉|, derived from the Semitic 𐤆, which rendered [zd] or [dz].[120] Thus, this is the only consonant cluster using a unique grapheme in NWS writing that is transmitted as such to the NEM scripts.[121] Only one of the latter group, palaeo-Phrygian, does not use this letter.

The sounds underlying this letter in the Greek dialects is, however, quite a complicated matter. This letter represents the result from different mergers and sound changes in each dialect and it is not possible to ascertain if it was actually pronounced as a cluster or as an affricate [d͡z] in each of them. Another issue is whether or not the metathesis /dz/ > /zd/ has already taken place and if it is pandialectal or restricted to certain dialects.[122] However, all of these issues do not affect the graphic representation of the letter with the sign |𐌉|, which is stable across alphabets and also through time. Other values assigned to this grapheme – such as Cretan and Achaian /t͡s/,[123] dental consonants in Arcadian and Elean[124] or the voiced sibilant [z] in front of voiced stops[125] – are not attested in this corpus.

There are two exceptions in this corpus where Ζεύς is written with <𐌎> instead of <𐌉>: *IG* IV 1.263 from Penteskouphia and *LSAG* 323.1b from Thera. In Penteskouphia this might be a graphic mistake given that this example is isolated and since |𐌎| is the grapheme that renders /ks/ in this alphabet. In Thera, however, the use of this grapheme for the initial consonant in Ζεύς is systematic. Unfortunately, this is the only context where zeta is expected in the inscriptions from the island.[126] This makes

Table 5.25: Representations of /dz/.

	20. 𐌉	42. 𐌎
No. of sites	8	2
Total inscriptions	19	2

[119] The reading xi with pleonastic sigma is supported by Guarducci 1995, 146 and Méndez Dosuna 2017, 254, contra *CEG* 326; Jeffery and Johnston 1990, 402; Ruijgh 1997, 576; and Vottéro 2002, 71. For more examples of xi with pleonastic sigma see Méndez Dosuna 2017, 249–258.
[120] Krahmalkov 2001, 21 f.
[121] NB that 𐌎 is originally a sibilant in NWS and is used as a consonant cluster by Ionians and Corinthians only.
[122] See discussion in Lejeune 1972, 113 f.; Brixhe 1991, 323; 1996, 94; Woodard 1997, 161–175.
[123] Brixhe 1982, 214 f.; Ruijgh 1997, 564.
[124] Jeffery and Johnston 1990, 28; Méndez Dosuna 1991–1993; Guarducci 1995, 92.
[125] Ruijgh 1997, 563.
[126] Jeffery and Johnston 1990, 317; Woodard 1997, 146.

it impossible to know whether this grapheme was used in all instances or whether it responds to a specific treatment in this phonological context.[127]

5.10 Some considerations on the notation of the consonants

Like the vowels, the notation of the consonants, especially those that are characteristic of the Greek alphabets, has also attracted the attention of scholars.[128] As happened with the vowels, however, many of the letters discussed above are common to all NEM alphabets; and what is more, they show a continuity from the NWS source. Those shared elements are evidence for the close connection of all these writing systems. In the following sections, however, I will comment further on those that suggest the appearance of independent developments in some Greek alphabets.

5.10.1 On the pronunciation of /ps/ and /ks/

When considering the sequences that render the consonant clusters, it was clear that the signs used to represent the first element were those of the aspirated consonants. The sounds behind these clusters, however, are normally interpreted as /ps/ and /ks/; this is mostly backed by the spelling pi-sigma and kappa-sigma in later Attic inscriptions. Thus, scholars have proposed different interpretations concerning the real pronunciation of these clusters, independently of whether they are represented by one or two graphemes.

Some scholars support that the spellings analysed above show that the first element was an aspirate and that these sounds should be /p^{h}s/ and /k^{h}s/, or that the stop element presented at least a mild aspiration.[129] Clackson argues that instead these are approximate spellings that could show a difference in the voice-onset time when these stops are followed by the sibilant.[130] Further proposals of this sort include the weakening of the stop or even an affricate realisation in such contexts.[131]

However, the special spelling <𐌟> of the Naxian alphabet reminds us that perhaps we should not try to find a unitary solution for all alphabets.[132] It could be the case that the pronunciation of these clusters differed in each dialect and that the several proposals mentioned could affect specific areas. In any case, those explanations that

[127] A possible explanation might be that it specifically represents the outcome of *dy- in the Theran dialect. Cf. *dyēus in Lejeune 1972, 112. Further examples in Greek texts can be found in Brixhe 1982. The use of this sign for /d͡z/ or perhaps /t͡s/ in Eteocretan could be related (Duhoux 1982, 165 f.).

[128] Cf. Kirchhoff 1826; Powell 1987; Ruijgh 1997; 1998; Slings 1998; Clackson 2002; Gomis García and Striano Corrochano 2017.

[129] Sturtevant 1940, 91; Schwyzer 1959, 211; Allen 1987, 60; Ruijgh 1997, 565; Hawkins 2012, §2.1.2.

[130] Clackson 2002.

[131] Lejeune (1972, 72) argues for the weakening, while Slings (1998, 655) supports a fricative realisation [x] of the stop in the sequence khi-sigma. Jeffery (Jeffery and Johnston 1990, 27) proposes a value /hs/ for the Naxian sequence <𐌟> and /k^{h}s/ for khi-sigma sequences.

[132] Gomis García and Striano Corrochano 2017, 33.

argue for an approximate notation, rather than a real aspirate + sibilant cluster, seem more plausible.

5.10.2 Solutions for aspirated stops and consonant clusters

As mentioned earlier, we can also see in the consonantal notation of the Greek alphabets some local innovations that do not affect other NEM writing systems. These are applied mostly in the representation of the aspirated stops and specific consonant clusters. However, it can be argued that the notation of such sounds with single graphemes was triggered by the existence of available signs in the original script transmitted from NWS into the Greek alphabets.

Such is the case of theta, which is not a supplemental letter, but part of that primary sequence as seen in Chapter 3. Its Semitic value /ṭ/, however, is not present in the Greek dialects, but perhaps it was discerned as close enough to /t^{h}/ and so it is used to render the latter instead.[133] Perhaps it is the existence of this letter in the inherited system that motivated the creation of other solutions for other aspirated stops. Only Cretans seemed to be comfortable with the ambiguity between the voiceless stops and their aspirated counterparts, since /p/ and presumably /k/ as well share their respective graphemes with /p^{h}/ and /k^{h}/. In Thera, writers prefer to use a digraph with second element |𐤇| for all three aspirates. For the rest of the Greek alphabets new graphemes were created and included in the alphabetic sequence to cover the other two aspirated consonants. Nevertheless, while phi is |𐤆| everywhere, there is a sign choice in the case of chi: |𐤉| appears in the so-called red alphabets and |𐤊| in light and dark blue alphabets.

A similar situation happens in the case of the consonant clusters. All alphabets share a sign already present in the inherited alphabetic sequence |𐤉| for the dental + sibilant. This letter, zeta, is used in some cases for /t͡s/ as well.[134] Some alphabets, which Kirchhoff categorised as dark blue, also used a pre-existing NWS sign |𐤎| for /ks/.[135] In those areas, another sign is added for /ps/ |𐤉| and perhaps also |𐤕| for /t͡s/. Meanwhile, those alphabets that do not have |𐤎| in their sequence needed to find other solutions for such a sound and for /ps/ and /ks/. In most areas, these sounds are represented with two letters that render each of the elements of the cluster. Another supplemental grapheme, however, was used in some red alphabets |𐤊|-/ks/.

There are some indications that the new graphemes for the consonant clusters could be more recent than those for the aspirated stops or, at least, that their transmission was slower. For example, in the Samian sequence the additional letters for the aspirates phi and chi appear right before psi, only followed by omega and sampi.

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[133] This use is found throughout all Greek alphabets with the only exception of Thera where we see the digraph <ΦΘ>.

[134] This happens in Crete (Brixhe 1982, 214 f.; Ruijgh 1997, 564 f.) and Arcadia (cf. Carbon and Clackson 2016, 140 f.)

[135] Its appearance in *LSAG* 323.1b <𐌎𐌚𐌉𐌌> and *IG* IV 1.263 <𐌎𐌘𐌉𐌌> for the theonym Ζεύς suggests that in some alphabets it could have been used for some other reflex as well, see n. 127 above.

In addition, throughout Greece, single graphemes are less common for consonant clusters than for aspirated stops. Perhaps this could correspond to the nature of these sounds: in the clusters there are two separated phonemes at play, whereas aspiration is a characteristic of a phoneme. However, the cases of digraphs in Boeotia and Methone, earlier interpreted as bearing pleonastic sigmas, could show a chronological development in which they are slowly being replaced by single graphemes.[136] In those alphabets, |𐌚| represents /k^{h}/ and thus |𐌧| has no specific value in principle. If they adopted the digraph <𐌧𐌢> through contacts with nearby light blue alphabets, at some point sigma would seem redundant and |𐌧| could be used as a single grapheme for /ks/. It is even more telling that these alphabets will continue to represent /ps/ by a sequence of two graphemes.[137]

The fact that |𐌚| is used for two different supplemental letters depending on the alphabet should not come as a surprise. It is not uncommon to make an *Additionsreform* by taking a grapheme from another alphabet and applying a different value to it.[138] Given that the sign could be identified with a palaeographic variant of Semitic kaph, it could be the case that it was taken by some 'red' alphabet as a doublet of kappa to cover its aspirated counterpart.[139] Once it was added to a Greek alphabet it could have been adopted by another through contact and applied another value /ps/, since /k^{h}/ is already covered by the sign |𐌧|.

It is also noteworthy that there is a clear link between the use of |𐌣| from NWS samekh for /ks/ and the addition of |𐌧| for /k^{h}/ and |𐌚| for /ps/. All Eastern Ionian and Corinthian alphabets show this correlation. It is users of other alphabets that do not have |𐌣| in their scripts which find different solutions for their aspirated stops and consonant clusters. That shows that there is clearly some relationship between the so-called dark blue alphabets. Nevertheless, as mentioned earlier, there are important differences between Ionians and Corinthians, mainly that the latter use san while the former have only sigma. This poses many problems for Kirchhoff's classification, which should be thoroughly reassessed.

5.10.3 Kirchhoff's coloured alphabets

Previous sections have shown that the usefulness of Kirchhoff's categories is very limited: only the evidence for the notation of /k^{h}/ fits the coloured maps. Although these categories are often used to describe the distribution of the graphemes and solutions for the aspirates and consonant clusters, this study has shown that the divisions should be thoroughly reassessed. Green alphabets, for example, are grouped

[136] Cf. ξ1, ξ2, ξ3 in Jeffery and Johnston 1990, 89.
[137] Cf. Jeffery and Johnston 1990, 79 f. and 89.
[138] Cf. Adiego 2018, 148.
[139] Naveh 1997, 184. Both tailless |𐌘| and tailed |𐌚| kaph are found in 9th-century Phoenician inscriptions in Greek-speaking contexts: without a tail on the bronze bowl from Tekke in Crete (Amadasi Guzzo 1987, 13–16) and with a tail in the Kilamuwa orthostat from Cyprus (Sass 2005, 25) and on another bronze bowl from the island (Steele 2019b, 75). For further examples in Semitic epigraphy see Sass 2005, 25.

together because of their lack of supplemental graphemes. However, Cretan and Theran alphabets have important differences in the notation of the aspirates: while Cretans do not have graphic distinction for /k^{h}/ and /p^{h}/, Therans represent systematically all aspirates with digraphs. Similarly, red alphabets use different solutions for /ks/ specifically: while Olympia and Molykreion have a single grapheme |Χ| for that cluster, in Boeotia and the Euboean colony of Methone they employ a sequence of two graphemes. This is not to mention that the elements of those sequences differ not only in the case of the red alphabets, but also in the light blue ones.[140]

In any case, categorising alphabets only through the supplementals is an oversimplification of the matter. Such classification cannot account for other distinguishing elements in those alphabets that may be important to interpret relationships among them. That is visible, for example, in the case of the dark blue alphabets, seen around Corinthia, its colonies and Asia Minor. As mentioned earlier, all these share the same graphemes for the notation of aspirates and consonant clusters. Nevertheless, they have a vital difference, the notation of the sibilant sound, and other local characteristics:

- In Corinthian alphabets, the uses of |Ϻ| for /s/ (although positioned in the place of sigma in abecedaria), |ᒧ| for /b/ and |𐌇| for /h/ in the consonantal notation. As for the vowels, crooked iota, |ᛒ| for /e/ and |ᛝ| for /e:/, which also indicates a graphic distinction of /e/ and /e:/.
- In Eastern Ionian alphabets, sigma for /s/ and |ᛒ| for /b/. Also, the use of straight iota and the graphic differentiation of long open mid vowels |𐌇|-/ɛ:/and |Ω|-/ɔ:/.

This situation raises many questions: were these alphabets closely connected during the introduction of the supplemental graphemes? If so, does the choice of san-sigma and the Corinthian beta happen afterwards? If not, are those supplementals just a secondary influence? It does not look so, since |Ŧ| must be part of the original script. Were then the other supplementals created in Asia Minor or in Corinthia? Could the position of san in the Corinthian abecedarium mean that they initially had sigma only and then consciously changed to san in a secondary reform? How can we reconcile all this with the presence of the two types of iotas? The present study has shown that the notation systems of the Greek alphabets display complex interactions that cannot be oversimplified if we are to identify relationships between alphabets.

The examples mentioned above show that Kirchhoff's categories are not suitable for the study of the epichoric alphabets, as many elements do not follow the coloured pattern: even those that are in principle the criterion for these divisions.[141] Moreover, it has been noted that approaching these alphabets only from the notation of specific phonemes tells us little about other similarities and differences seen in the rest of

[140] Cf. the two graphemes used in the Cyclades, Attica, Boeotia and Methone in §5.9.2.
[141] See, for example, Figures 5.3, 5.8 and 5.9.

the notation system. Here, I have illustrated the complexity of the distributions of graphematic relationships and the connections between Greek alphabets by looking closely at the notation of phonemes. Nevertheless, more can be done in the future to dilucidate, at least in part, further issues concerning the order and direction of influences. That should be done, however, not with the intention of understanding the characteristics of the 'Greek alphabet' in all its variants. On the contrary, these local alphabets should be approached as entities of their own right that deserve independent study. In that way, we could unveil the influences and relationships that each one had with other alphabets for the Greek language and other languages as well and thus, perhaps, understand better how alphabetic writing spread across the Aegean and the Mediterranean.

Chapter 6

Conclusions

6.1 Early alphabetic writing in Greece: a new approach

This research started from the need to update our knowledge on the earliest forms of alphabetic writing in Greece after the emergence of new epigraphic evidence and of digital tools that could contribute with objective quantitative data. Moreover, its aim was to contribute with a thorough grapholinguistic analysis on the notation systems seen in those documents following the methodology of comparative graphematics. This new approach towards the so-called 'local archaic scripts' arose from the lack of a comprehensive linguistic analysis of those alphabets.

I started by reviewing previous scholarship and in particular highlighting a number of flawed ideas and methodologies that have biased scholarship for decades. Researchers had previously focused their efforts on the big questions concerning the origin of 'the Greek alphabet' such as the date, place and manner in which this writing system was created. These pursuits, however, have proven numerous times to be fruitless and they will remain unanswered because of the fragmentary nature of the evidence and those flawed ideas that do not help in the search for answers. If we were to look for the birth of the Greek alphabet as a unified entity, we should probably be thinking of the emergence of the *koine* in the 3rd century BC. Before that point, what we find is a multiplicity of alphabets deeply rooted in geographical and identity bonds. Another aim of this monograph was precisely to claim the independence of these alphabets and to untie them from the idea that they are just elements of a higher concept.[1]

Fortunately, more recent research has focused on quite different approaches to the topic. Regionalism, based on the palaeographic studies of Jeffery & Johnston and Guarducci, is one of the basic concepts on which contemporary academics of archaic Greece base their work. Additionally, current scholarship is also concerned with the contextualisation of writing, not only within the ecology of Mediterranean

[1] In a similar fashion, the term 'Phoenician' has been repeatedly pointed out as a deeply flawed one, rooted in a Hellenic appellation that has no clear definition. For that precise reason, that denomination has been avoided here and I have preferred to talk about NWS populations and writing in general.

writing systems, but also within social practices and the material culture in which these alphabets are embedded. These are some of the important topics that the CREWS project addresses. As part of that, this monograph has tried to reassess the conception that we, as researchers, have of the nature of these regional alphabets and the connections that we can see among them and with other contemporaneous neighbouring writing systems from a linguistic perspective.

In parallel to the development of the studies on the epichoric alphabets, new disciplines such as grammatology and grapholinguistics emerged from the need for a theoretical background for the study of writing. Although they are not as mature as Linguistics, the application of these methodologies in the investigations of ancient writing is an important step forward. Within that theoretical framework, I presented a model of analysis that intends to describe and help analyse a wide range of writing systems. That this model is applicable to writing traditions very different from that of the epichoric alphabets is of extreme importance, as it shows that the explanation is not biased by the case study used here. An essential part of that model was the combination of a language system and a graphic system in order to devise a codification of linguistic elements with visual signs. One of the improvements that this theoretical model offers in comparison with previous ones is the recognition of complex writing systems that use more than one script, like Linear B, Japanese or Modern Greek. This brought interesting questions related to the archaic epichoric alphabets, since these are often referred to as 'scripts'. The model of the complex writing systems, however, did not seem to fit exactly the characteristics of these alphabets since they are used autonomously, rather than in combination. But, in principle, they do not seem to be separate writing systems, as they are used for dialectal varieties rather than distinct languages. How can we then categorise the epichoric alphabets? What is the best model to understand them?

The analysis in this book has been clearly directed towards answering this question because of its important implications. This takes us closer to understanding the nature of the epichoric alphabets in particular and encourages us to reconsider the terminology used to refer to them. If one follows the framework proposed here, then the difference between calling these alphabets 'local scripts' rather than 'writing systems' is surely significant. In the former case, it would imply that the regional varieties represent multiple scripts applied within the same writing system, whereas the latter would mean that the characteristic elements in these alphabets go beyond the level of the script, making them independent entities working with autonomous notation systems. We can only find the solution to this problem by looking at how the language and graphic systems interact in the local variants. Moreover, such a study could also change the way we conceptualise other writing systems in general, specifically in situations where these are clearly related to each other, but bear some characteristic elements. Modern alphabets derived from Latin are, *mutatis mutandis*, a good example of such a case, with the obvious difference that these are used to write multiple languages.

To clarify how the graphic and the language systems interact in each of the Greek local alphabets, it was necessary to look at as much evidence as possible, which was enabled by the digital database. Many difficult decisions were taken during the construction of that database, such as the identification of graphemes vs. allographs, the choice of phonemes represented in each column and even the reading of some inscriptions. Nevertheless, it has proven to be a most valuable resource because of the possibilities that it brings, like visualising the data in different ways to easily identify tendencies and exceptions, cross-searches, and the fast retrieval of data used to support the arguments presented in this book.

6.2 Scripts and notation systems of the Greek alphabets

The importance of the theoretical and methodological frameworks on which this research relies was demonstrated in the analysis of the Greek scripts in Chapter 3. Here, the difference between the terms 'script' and 'writing system' set out in the previous chapter was certainly helpful to understand the intricacies of abecedaria. That type of document shows characteristics that are not seen in practical writing, such as the strong traditionalism that makes it difficult to perform innovations on the sequence. This is shown with the presence of 'dead letters', which are also a good example of how the graphic module can work independently from the language module in this kind of written sample. Nevertheless, the abecedaria analysed in that section, which represent several areas of the Greek-speaking world, provide evidence of clear differences already at the level of the script. Ypsilon is the only reform, when compared to a NWS model, that can be assumed for every single Greek alphabet. Although phi was present in all the abecedaria included in that chapter, the fact that it is not used in Cretan and Theran writing might suggest it was not added to their alphabetic sequences. Unfortunately, there are no surviving abecedaria from these regions to ascertain this. Chi has the same problem and it also appears in different shapes and positions, which might mean that its addition happened independently in several alphabets. The rest of the *Additions-* and *Reduktionsreformen* identified in the Greek abecedaria are clearly specific to certain alphabets, such as the elimination of sigma, san or samekh-xi and the inclusion of additional letters not seen in other contemporaneous alphabets like psi, omega or even sampi.

Those independent reforms have important implications for the way we conceptualise the local alphabets in their earliest visible stages. As we saw in the Etruscan abecedaria, in the case of adapted scripts rather than newly created ones, the reforms differentiate one's script from the 'source' script, giving the newly formed one its own 'identity'. Thus, the adaptors gain ownership of the script. In the case that concerns us here, it is fairly evident that Greeks are not acting jointly in the reforms of their scripts; on the contrary, each area is making diverse modifications. This means that at least some Greek alphabets were autonomous already at the level of the script, without going into the graphematic analysis.

Another issue that was revealed through the comparison with Etruscan abecedaria is that reforms need time to settle in the alphabetic sequence, both in the case of *Additions-* and *Reduktionsreformen*. Given that the Greek abecedaria analysed in Chapter 3 show several divergences with the NWS scripts, we might assume that there is a long history of reforms in the transmission from NWS into the NEM alphabets. Unfortunately, the different stages in the process of adoption and adaptation cannot be traced owing to the lack of documents. These early abecedaria, however, provide evidence that reforms have already happened by the time of the earliest inscriptions. Moreover, we can say that they are already independent from any other script, either Greek or foreign, especially in the case of scripts bearing multiple local reforms, *e.g.* the Samian.

After the survey on the script reforms, it was easier to see the most evident local developments of the epichoric alphabets. The analysis of the graphematic relationships, however, revealed other characteristics that are specific to certain alphabets. A feature shared across Greek alphabets is the 5-vowel notation system: all of them have distinct graphemes to differentiate at least each of the 5 short vowels in the Greek language. Phrygian has this trait as well and so it seems that this might be an important characteristic of writing systems for Indo-European languages, as opposed to Etruscan, for example, which lacks the vowel /o/. Two problems still remain: where the 5-vowel notation system was created and how the distribution of straight vs. crooked iotas emerged.

Concerning the first issue, in my opinion, the identification of the alphabet that created the 5-vowel notation system is not as important as the development of the system itself. Unfortunately, once more there is no evidence that allows us to study this issue, as it is already in place in multiple writing systems by the 8th century BC. Nevertheless, there are hints that suggest that the process might have been more organic than hypothesised by some scholars.[2] Semitic ML looks like a good starting point for some of the vowel letters. In Aramaic, he 𐡄, yodh 𐡉 and waw 𐡅 were already used for the notation of long vowels in final positions. It would seem that these could be the models for letters epsilon, crooked iota and ypsilon. As for alpha and omicron, some scholars explain that these were adapted from the Semitic consonants ’aleph and ‘ayin to notate vowels through the acoustic similarity between the glottal stops /ʔ/ and /ʕ/ and the vowels /a/ and /o/.[3]

Indeed, this brings further issues: how did these become signs for both long and short vowels? Why did writers start to use them systematically in all contexts? As argued in §4.3.1, vowels in Greek and IE languages in general bear important semantic information needed for the correct understanding of a text and they play an important role in the lexemes, in contrast with the Semitic system of consonantal roots.[4] This

[2] See for example Powell’s theory of a single man as creator of the ‘Greek alphabet’ and vocalic notation (Powell 1991a, esp. 42 ff.).

[3] Perhaps ’aleph was also transmitted as a Phoenician ML, see §4.3.1, n. 116.

[4] NB also that in IE languages lexemes can start with a vowel, which does not happen in Semitic ones.

could be a major reason to adapt partial vocalic notation and use it in all contexts. In addition, since the examples where the length of the vowels plays a semantic role in IE are very scarce, quantity ambiguity is not a problem. Thus, these systems can use the same signs for short and long vowels without compromising comprehension.[5]

Another unanswered question concerning the 5-vowel notation system is how we can account for the distinction between crooked and straight iotas in the notation of /i/. It is certainly intriguing that the distribution is very well defined, as no site used a mix of both or changed from one to the other before the expansion of the *koine* alphabet. This seems to suggest that the use of one grapheme over another is part of a strong tradition, transmitted through inheritance in many cases. It is still unclear, however, how the two graphemic conventions arose and spread, although they are well established already in the 8th century BC, judging from early inscriptions like those of Osteria dell'Osa, the pre-Cimmerian inscriptions from Gordion and the Dipylon Oinochoe. Even though there seem to be dialectal and graphematic tendencies behind the distribution, neither of them comes without exceptions. All Ionian populations use straight iota and Dorians seem to have preferred crooked ones, but in Argolis, Lakonia and Rhodes they used the horizontal line. Similarly, crooked iotas are often related to the use of san, while straight iotas came together with sigma. Nonetheless, the Dipylon Oinochoe shows that it is possible to write crooked iota with a zig-zag-shaped sibilant. Moreover, some alphabets have straight iota with san, *e.g.* in Sikyon, Argos and Megara Hyblaia.[6]

Further differences appear when looking at the notation of the long vowels. In this case, one of the main issues to tackle is the difference in sound quality: the articulation of certain long vowels varies slightly in specific Greek dialects, sometimes in ways that we cannot appreciate through graphematic or orthographic traits. Nevertheless, here we have seen several characteristic developments, some of which do correspond to local pronunciations. That is the case of the Cycladic eta and its value /æ:/. There is a clear tendency to distinguish graphically the front-mid long vowels from their short counterparts earlier than the back-mid. In fact, in some alphabets the latter never developed its own characteristic solution. In other areas, they chose to differentiate the set of both front and back, although they choose whether to do that with the open-mid or with the close-mid only. Not only do they distinguish graphically different sounds, but they also devise distinct solutions, *e.g.* the grapheme |𐌇| for /e:/ in Corinthia with no distinction for /o:/, whereas its colony Corfu uses a digraph <𐌏𐌖> for the latter sound.

The disparity in the notation of the long vowels shows that these are clearly local developments that are happening independently in different Greek-speaking areas. Moreover, these are not being transmitted through inheritance – except perhaps in the

[5] Quantity ambiguity and its relevance in Greek morphology will be discussed further below.
[6] These issues have been discussed in §§4.1.3 and 5.5. For the mix of straight iota and san see esp. §4.1.3 n.40.

case of the colonies – but are writing reforms that are materialising after the complete adoption of the inherited script. An important question is what the motivations were for users of these alphabets to distinguish such sounds in writing, especially given that multiple writing systems for Greek and other IE languages have no problem with vowel length ambiguity. This is because the short-long contrast is not very productive in the semantic level. While the 5-vowel system is necessary to distinguish lexical stems in IE languages, this is enough to avoid semantic ambiguity. For that reason, many alphabets never had the need to distinguish long vowels graphically.

Despite the morphological role played by the short-long contrast in Ancient Greek, in the earliest inscriptions it hardly has any relevance: subjunctive forms are almost completely absent (/ɛ:/-/ɔ:/), 3rd declension nouns can be clearly understood without the graphic distinction (/ɛ:/-/ɔ:/) and the identification of 2nd declension endings (/o:/-/ɔ:/) or infinitives (/e:/) can be easily inferred from context.[7] In fact, looking at these morphological forms, it seems that there are more contexts of ambiguity for the back than the front mid long vowels. Since these morphological contexts are not very numerous in the earliest inscriptions and, whenever they appear, they show ambiguous orthography (*e.g.* genitive and dative endings of the 2nd declension in <O> or infinitives in <EN>), we can discard that morphology was the main reason behind the newly-created graphic distinction for these vowels. Should we then accept that the choice to distinguish these vowels in the graphic record is just phonological?

I have argued in Chapter 4 that the matter of the long vowels is not exactly about length, it is rather about the sound quality. Those vowels that only had a long-short contrast never used a graphic distinction, *e.g.* /a/-/a:/ is always alpha, /i/ and /i:/ iota and /u/-/u:/ or /y/-/y:/ ypsilon. On the contrary, the long mid vowels are slightly more open or close than their short counterparts (see Figure 4.1). Nevertheless, the phonological reasons are not enough to explain the emergence of new graphemes and digraphs for the notation of the long mid sounds. In fact, it is often admitted that regions that only had distinct graphemes for the short vowels or did differentiate only one or some of the long mid vowels also had a similar distribution of sounds in their phonetic repertoires. Therefore, writers and readers are still comfortable with this kind of phonetic ambiguity in writing. Why would they then include graphemes for the mid long vowels if they do not need this kind of disambiguation?

I would argue that, while there are phonological and morphological reasons for the distinction of such sounds, in origin this was a graphematic choice. The reanalysis of |h| as a vocalic letter in the psilotic dialects is clearly the initial trigger since this sign is available in the inherited script. As a consequence, all psilotic dialects have at least a distinct grapheme for /ɛ:/, whereas non-psilotic dialects tend not to have it.

[7] A clear distinction of these morphological forms seems more necessary in literary and legal texts. Perhaps this could be a linguistic reason for the Athenians to adopt the Ionic alphabet in the late 5th century BC.

Only the Cycladic alphabets will give |𐌇| a dual function for the consonant /h/ and the vowel /æ:/. It is the presence of the contrast /e/-/ɛ:/ in writing what will motivate the creation of new graphemes for /ɔ:/. The case of the notation of close-mid long vowels in the Corinthian and Corfiot alphabets is independent of this development, although their reasons to distinguish this set but not the open-mid are unclear. Do their dialects have an especially closed sound? Or could this have a graphematic origin as well? More evidence concerning the development of |𐌁| for /e/ and |𐌑| for /e:/ could perhaps clarify the situation. Unfortunately, we do not have any documents that can help in this matter.

Further problems arose when looking at the notation of consonantal sounds, even though many letters were stable across alphabets. Mu, nu, kappa and tau have a very small graphemic choice, if any, and show a clear continuity from the NWS to the NEM alphabets. Other consonants, however, still are part of the 'core' letters transmitted from NWS but are subject to some graphemic choice. We saw this phenomenon in the representation of /l/, /g/ and especially /b/. The variety of graphemes used in most of them can be easily explained through palaeographic developments, as Jeffery has done extensively in *LSAG*, and they clearly have their original models in NWS letters. The notation of /b/, however, is a very exceptional case. The most extensive grapheme across NEM alphabets is |𐌁|, a shape quite distant from Semitic beth 𐤁. Nonetheless, several Greek alphabets devised their own graphemes, which do not look alike: |𐌂| in the Ionic Cyclades, |𐌛| (used alongside |𐌁|) in Crete, |𐌆| in Thera and |𐌓| in Corinth. It is still unclear how or why these variants appeared and, most importantly, what makes |𐌁| the most widespread. What is obvious is that, for those alphabets that have their own grapheme for /b/, this becomes one of their most distinctive elements and one that is especially identifiable in abecedaria.

Another characteristic feature of these alphabets can be seen in the separate traditions in the elimination or use of certain letters transmitted from the Semitic sequence. That is the case of the samekh-xi |𐌎|, maintained in the alphabetic sequence of the Corinthian and Eastern Ionic alphabets and used mainly for the consonant cluster /ks/. The fact that these alphabets not only keep this grapheme in their scripts while others do not have it at all and, what is more, that the value assigned to it is the same shows deep connections between these two branches. Nevertheless, as was discussed earlier, this clashes with other important traditions seen in the NEM alphabets, such as the sigma-san choice and the straight vs. crooked iotas, which do not map exactly the distribution of the samekh-xi. Initially, the strong attachment to a specific tendency – given that these are rarely mixed and are part of the core letters – was interpreted as an indication that these could be inherited traits, rather than a secondary conscious reform. Nevertheless, it is not possible to argue for inheritance in all cases; otherwise there is no explanation for alphabets using san and straight iota, or for the presence of samekh-xi in alphabets with san+crooked iota, like those around Corinthia and Corfu, and in the Eastern Ionians, which have sigma and straight iota instead. Nonetheless, identifying which cases are due to inheritance and which

are secondary reforms is not feasible with the available evidence, since the earliest epigraphic documents show that these letters are already well established.

Developments, however, can be identified for other letters. That is the case of qoppa, which already in the earliest samples has disappeared in Olympia, Lakonia and Eastern Crete. In other areas it would slowly cease to be used in the following centuries. Therefore, the lack of qoppa in specific areas is not due to the inheritance of a sequence that did not have such a letter. On the contrary, this is part of the 'core' letters that are being transmitted across the entirety of the Greek alphabets. The Cretan alphabets provide the perfect example to support this argument. On this island, qoppa is absent precisely in the sites surrounding their Eteocretan neighbours, probably because in that writing system |ϙ| might have had a different value like /p^h/ or a labiovelar /k^w/ (§5.7.3). Nonetheless, this indicates that they did know the sign, but did not consider it useful for their own writing. Thus, we can conclude that in the areas where kappa appears in contexts where qoppa is expected, the latter was seen as a redundant letter that was discarded either at the moment of transmission or as part of a secondary reform.

The case of the so-called 'supplemental consonants' is very different, not only because here we see a case of *Additionsreform* rather than *Reduktionsreform*, but most importantly because these are local developments specific to certain Greek alphabets. The term in itself shows that we are not referring to the notation of aspirated stops and consonant clusters in general, but only to those alphabets that created or adopted distinct graphemes for at least one of the following sounds: /p^h/, /k^h/, /ks/ and /ps/. Other Greek alphabets show that it was not necessary to represent these sounds through single graphemes and so these are not performing a script reform, but are rather using different solutions for the notation of these sounds, like the use of a sequence for the clusters and digraphs or graphic ambiguity for the aspirates. Theta, zeta and samekh-xi, however, are not considered within the 'supplemental consonants', even if they represent sounds that belong to similar phonological categories than those of the added letters. On the contrary, these were part of the set of 'core' letters transmitted from NWS and across Greek-speaking populations. At some point, they have clearly gone through a *Funktionsreform*, as they did not represent the same sounds in Semitic writing. Nevertheless, while samekh was eliminated or even not inherited in many Greek alphabets, theta and zeta were kept in all of them with the same values and occupying the same position in abecedaria. Perhaps even phi was acquired through inheritance in many cases as well, given the long diffusion of the letter. It is not possible, however, to ascertain at what stage the reforms that produced these letters happened.

In any case, the Greek scripts already have at least one letter for an aspirated stop and another for a consonant cluster, so it should not come as a surprise that the users would want to complete these series with new graphemes. There is, however, another graphematic reason that could explain the emergence of

letters for the aspirated consonants in certain alphabets: psilotic dialects need a graphic solution other than digraphs. In their alphabets, |𐌇| already had a vocalic value and therefore could not be used as part of a digraph for an aspirated stop. That is why in psilotic dialects we find either no graphic distinction with their non-aspirated counterparts, as in Crete, or distinct graphemes for all aspirates, like in Asia Minor.

Once the letters for the aspirates started to emerge, some regions began to consider graphemes for the stop + sibilant clusters. In fact, here I have argued that there might be indications that these are a more recent development. This is understandable, since in an alphabetic system a sequence of sounds is more likely to be represented with a sequence of graphemes. Perhaps the newly added graphemes for the aspirates and the presence of zeta as a 'core' letter invited some populations to create these letters as well, making it again a development driven by graphematic reasons, rather than a real linguistic need. Several areas that would adopt this new solution, however, show sequences in their earliest written samples, which suggests the contact with other alphabets that made such an innovation could also be a source of inspiration for the creation of these letters. The fact that in the notation of aspirates and clusters the same graphemes appear albeit representing different sounds should be taken as evidence of these contacts. The adoption of graphemes across writing systems with changes in the values is not uncommon and, in this specific case, it can be easily explained through the graphematic relationships already present in each alphabet.

Actually, the distribution of these graphemes and their values is of special importance in one of the most influential categorisations for the epichoric alphabets: Kirchhoff's coloured map. However, here I have shown that these divisions are a simplification of the matter, where only the graphemes for /k^{h}/ fit, and even those have some contradicting evidence. Another problem with this categorisation is the complete neglect towards other types of solutions. Kirchhoff is not acknowledging that digraphs and sequences may have different configurations across alphabets, see for example how Attic and Naxian, both within the light-blue alphabets, use respectively <𐌗𐌎> and <□𐌎> for /ks/.[8] He even included Cretan and Theran within the same group, when the former does not have graphic distinction for the aspirates and the latter uses digraphs. Not to mention that, because it is focused on later developments, these divisions say nothing about the divergences seen within the core letters, which show connections between alphabets not seen otherwise.

If we look at the distribution of graphematic relationships in the notation of both consonants and vowels, we are left with a much more complex picture which is very difficult to interpret. In fact, graphemic choices, graphematic traditions and local developments do not follow the same pattern. It is almost as if some letters had their own history, independent from the rest. This intricate situation warns us against a

[8] <+𐌎> as /ks/ is found in Hymettos 25.54.

simplification of the transmission process in the case of writing systems. It is not always as linear and straightforward as we would want it to be, but is rather formed by layers of developments that can come and go in multiple directions.

Moreover, the notation of consonant clusters has revealed important issues concerning the variation of phonemic repertoires across dialects. In the analysis of the vowels, many scholars acknowledge the differences in sound quality found in certain areas owing to the diversity seen in their notation. Consonants, however, are considered for the most part equal in all dialects. The digraphs used for consonant clusters have shown that we should contemplate the possibility that there were allophonic variations and even different phonetic repertoires in the case of some consonants as well: some regions might soften the stop, others turn it into an affricate, some even might have an extra sound /t^{s}/. Unfortunately, the available evidence is not enough to reach a certain conclusion over how these might be pronounced in each dialect.

6.3 The epichoric alphabets as autonomous writing systems

The issues raised in the analytical chapters of this book are of vital importance, as they might change the way in which we conceptualise the Greek alphabets. Given that this typology of writing system is based on the notation of phonemes, if the phonemes vary across dialects, then we are facing a change in the language system. In addition, when each of these alphabets has a distinct set of graphemes in its script to represent a different phonetic repertoire, divergent graphematic relationships and orthographic codes will emerge, thus creating a separate notation system. Therefore, following the theoretical model set out in Chapter 2, we should consider the epichoric alphabets to be independent writing systems. A parallel example, as mentioned above, would be the alphabets derived from Latin. Although the differences in their language systems is much greater, these together with some minor changes in the script prompt the graphematic relationships, orthography and therefore the notation and writing system as a whole to become completely distinct in alphabets like the French, English or Finnish despite their common origin. It might seem that this is the case because the examples taken belong to several language families, but even Spanish and Catalan have enough structural differences to be considered separate writing systems. Thus, if closely related languages and scripts can develop their own writing systems, there should be no impediment for the Greek dialects to have done it as well, especially in a time when alphabetic writing was a novelty around the Mediterranean. Nevertheless, unlike the development of modern alphabets, which can be tracked through written records, it is difficult to tell when or how NEM alphabets emerged, were differentiated from each other or the directions of shared characteristics and developments.

In Chapters 4 and 5 we have seen examples of core letters shared across alphabets, letters that identify separate traditions and local innovations, and all of them were

already present in the earliest surviving inscriptions. These elements, however, should be considered to be more than characteristics of 'local scripts'. Especially if we consider that these alphabets bear different scripts, orthographies and notation systems applied to separate phonetic repertoires, then we can only conclude that these are independent writing systems. These were previously looked at as part of a unified entity or almost as variants derived from a standard form and it is perhaps because of that approach that the research questions mentioned in the bibliographic review are so deeply flawed. This new conception of the epichoric alphabets as independent writing systems could shape the way in which we approach the epichoric alphabets in the future. If we conceptualise them as separate entities we are more likely to look for the innovations in a specific alphabet, its connections with other neighbouring writing systems and the visible influences without extrapolating what we find to the whole of the Greek alphabets.

Moreover, we should think of these alphabets as having been independent for generations already at the times of the earliest samples of visible writing. The concentration of innovative traits seen in some alphabets clearly suggests that these are at an advanced stage of development, meaning that there must have been a long tradition of writing on perishable materials and that the adoption of alphabetic writing in these areas could be placed much earlier in time.[9] The Eastern Ionian and Corinthian alphabets in particular have the highest numbers of new graphemes specific to the Greek alphabets, whereas the Cretan and Theran alphabets show the fewest. This does not necessarily mean that alphabetic writing got to these areas later, but rather that the users of these alphabets are more reluctant to change. In any case, the fact that the innovations are localised shows once more that these alphabets are autonomous not only from NWS and other NEM alphabets, but also from each other.

Hopefully, future research on the epichoric alphabets will work towards a more individualised study of these writing systems. This means acknowledging their distinguishing characteristics and local reforms, while recognising that these are not isolated and may influence or be influenced by neighbouring alphabets whether these are for another Greek dialect or a different language. This calls for more specialised linguistic comparisons that look at specific alphabets instead of bringing together many of them. In this respect, the comparison of Corinthian and Eastern Ionian alphabets looks quite promising and so does the analysis of different writing traditions across Crete.[10] Interesting insights can also be drawn from the comparison of writing practices that go beyond the writing system, like the use of specific materials, tools, texts, etc. Such an analysis that brings together material culture, epigraphic and contextual information can show even more connections and innovations in the

[9] See §1.2 for examples of other writing traditions that have long periods of invisibility in the archaeological record although with a continuity in their literacy and a discussion on the evidence for the use of perishable writing materials in Greek-speaking communities at an early date.
[10] A good start can be found in Steele 2019a.

writing practices seen across the Aegean and the Mediterranean. This will help in the future to place each of these alphabets in their macro-context within the ecology of writing systems, not only of the Aegean, but of the ancient Mediterranean as a whole, and hopefully shift the focus of this research from 'the origin of the Greek alphabet' towards trying to find answers about the origin, development and evolution of each of the Greek alphabets.

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