

Standardizing the Cretan Protolinear Syllabary

Evangelos C. Papakitsos

University of West Attica, Greece
email: papakitsev@sch.gr

Abstract

The three Aegean scripts of Minoan Crete, namely Linear A, Linear B and Cretan Hieroglyphics, had been developed during the 2nd and 3rd millennium BCE. Each script has the form of a syllabary, because their signs mostly render a syllabic phonetic value of the pattern consonant-vowel, therefore named syllabograms, in the Eteocretan language. It has been suggested that all three syllabaries evolved from a common ancestor, which has been called the Cretan Protolinear syllabary. This common ancestor has been reconstructed, having as a main feature that every syllabogram depicts a culturally common and/or important object in a simplified/abstract manner. The Cretan Protolinear syllabary practically contains all the common or not syllabograms of the Aegean scripts, which are formally designated by a number, often different for the same sign in different scripts. This formal designation is arbitrary, often confusing and therefore does not facilitate the memorizing of signs. Since Cretan Protolinear syllabary has not been standardized yet, the present paper proposes a method of unified designation for its syllabograms, based on the conventional grid of syllabic values that is commonly used in the related international bibliography to describe the individual Aegean scripts, by following a standard alphabetic order.

Keywords: Aegean scripts; Cretan Protolinear; Eteocretan language; Minoan civilization; syllabary; archaeolinguistics

1. Introduction

During the 2nd and 3rd millennium BCE in Minoan Crete, three syllabaries had been developed, called so because most of their signs ("syllabograms") render a syllabic phonetic value of the Consonant-Vowel (CV) pattern (e.g., DA, PE, TI, etc.). These syllabaries are parts of the Aegean scripts (Davis 2010) and include Cretan Hieroglyphics (henceforth CH), Linear A (henceforth LA) and Linear B (henceforth LB), with the latter being the only one that has been indisputably deciphered, conveying the oldest known form of Greek language, conventionally called Mycenaean Greek (Ventris & Chadwick 1953). Considering CH as merely the ornamental and ritual version of the Aegean scripts (Papakitsos & Kenanidis 2016), LA conventionally comprises around 100 syllabograms (Christidis 2010: 80-81) and LB comprises 88 syllabograms (Hooker 2011: 84), regarding two of them (*34/*35) as the mirror images of a single one (Papakitsos 2018a).

It has been firstly proposed by Willetts (1977: 100) that all three syllabaries (CH, LA and LB) evolved from a common ancestor: the Cretan Protolinear syllabary (henceforth CP). This notion (i.e., the existence of a protolinear script of some form) is also indirectly found elsewhere (Tsikritsis 2006). Originally, CP had been reconstructed by Kenanidis (1992), who released the final and augmented version, latter on (Kenanidis 2013). Subsequently, CP comprises 120 syllabograms, having 116 of them positively identified and the rest 4 uncertain (Fig. 1). The main feature of CP is that every syllabogram depicts a culturally common and/or important

object, in a simplified/abstract manner for facilitating faster writing (compared to a hieroglyphic script) and easy recognition by anyone (Papakitsos 2018b). The phonetic value of every syllabogram corresponds to the whole name of the depicted object, according to the rebus principle (Fischer 2004: 34-40), in the Eteocretan language, spoken by this predominant ethnicity of Minoan Crete.

B 84	HT 122 b	B 88	HM 204 Nodule	Pre-cuneiform KIB or <i>swastika</i>
				
(a)	(b)	(c)		(d)

Figure 1: The four uncertain syllabograms of CP (Kenanidis 2013).

The syllabograms of each Aegean script are formally designated by a number. LA and LB share 82 pictorially similar or identical syllabograms (Tsikritsis 2006). Some of them are designated by the same number, while others don't, without considering various misconceptions or differences in pronunciation or identification. For example: the designation of syllabogram AB 53 denotes that exists both in LA and LB, although it is found only in LA (Papakitsos & Kenanidis 2018); the syllabogram B 43 is also designated as AB 28 in LA (Kenanidis & Papakitsos 2018a); the syllabogram B 8 is also designated A 52 and many more such cases can be found (Papakitsos & Kenanidis 2015). Moreover, all of them (common to both LA and LB, or not) are also present in CP. Therefore, a unified designation of the syllabograms of CP is imperative for ensuring its standardization, in the suggested manner that will be described in this work.

2. The context

There is no indication survived of a standard order, in which LB syllabograms were learned (*abecedarium*), although there are very few tablets that may indicate the existence of such an order (Palaima 2011: 51), comparable to the Japanese *iroha* of kana writing (Ruipérez & Melena 1990: 110). Their observed sequence of syllabograms DI-WE SI-PO-RO TI-MI-TO [QO-RE] denotes a rather prosodic nature of order than, e.g., a phonetic one (DA DE DI DO DU etc.). In this respect, it was early realized (before the decipherment of LB) that the enumeration of Sir Arthur Evans was arbitrary (Palaima 2011: 45, 52) and not helpful in the deciphering process. Alice E. Kober and Emmett L. Bennett Jr. had been two of the most influential scholars in the decipherment progress of LB (Judson 2017). The former suggested an enumeration (i.e., order) based on the frequency of syllabograms (seen in Olivier 1986: 380), because this would be helpful in the deciphering process. The latter proposed an enumeration based on the gradual pictorial complexity of the syllabograms' shape, from the simpler to the more curvilinear ones (Bennett 1947: 20), which eventually has become the standard one (Palaima 2011: 50, 53). A similar notion applies to LA, as well.

Regardless of how helpful the standard enumeration of LB's syllabograms was before and for deciphering this script, nowadays it is not helpful at all for having the script memorized by anyone, as it is evident by all the presentations of both LA and LB scripts (Younger 2017). These presentations are based on a grid (Table 1). Namely, a table where every row contains those

syllabograms having the phonetic value of the same initial consonant (e.g., DA, DE, DI, DO, DU, etc.) and every column contains those syllabograms having the phonetic value with the same closing vowel (DA, JA, KA, MA, NA, etc.). The very first row contains the syllabograms having the phonetic value of a single vowel. The rows are arranged according to the standard order of the Latin alphabet: {D, J, K, M, N, P, Q, R, S, T, W, Z}.

Table 1: Fragments of LB grid from Melena (2014).

	A	E	I	O	U
ø	08	38	28	61	10
D	01	45	07	14	51
J	57	46		36	
K	77	44	67	70	81
M	80	13	73	15	23
N	06	24	30	52	55
P	03	72	39	11	50
Q	16	78	21	32	81
R	60	27	53	02	26
S	31	09	41	12	58
T	59	04	37	05	69
W	54	75	40	42	
Z	17	74		20	

Considering the nowadays standard alphabetical order of presenting the syllabograms, it is evident that the corresponding enumeration (seen in the cells of Table 1, e.g.: DA = 01) offers nothing for memorizing or designating them. Therefore, a new enumeration is required for designating the syllabograms of CP, based on the common, easily recognizable and memorized alphabetical order.

3. The standard

When the final version of CP was published by Kenanidis (2013), the arrangement of syllabograms was presented through a grid, without suggesting though an enumeration other than the conventional ones of LA/LB (Table 1). In this CP grid, the order is the following:

- for vowels (columns) {a, i, e, i, o, u};
- for consonants (rows) {q, c, ŋ, t, d, n, p, b, m, j, r, l, w, h, š, s, θ/z}.

Regarding the vowels, it is observed that {ɪ} (*schwa*) is placed second, inserted between {a} and {e} compared to the conventional grid (Table 1). Regarding the consonants, the sequence is not compatible with the conventional one, either.

The proposed herein CP grid (Table 2) is normalized according to the conventional one, for facilitating memorizing and comparison. There are also the following notational changes and remarks:

- {ɪ} is written as {ə} for avoiding confusion with {i}, especially in the uppercase form that is used, being placed 6th after the standard five vowels;

- after {ə}, the columns are occupied by supplementary/irregular combinations of phonemes, according to the initial consonant;
- {ŋ} is written as {ġ}, being placed in the position of {g} for notational convenience (it can be also written so, without any chance of confusion with anything else);
- {c} corresponds to the conventional syllabograms of the {k}-set;
- {š} corresponds to the conventional syllabograms of the {z}-set of LB, therefore occupying the standard position of {z} and written so;
- the Greek {θ} (*theta*) is placed last;

The columns are numbered from 1 to 0 and the rows from 00 to 17. In the cells, the corresponding phonetic value (and name) of the CP syllabograms is placed. The asterisk (*) denotes the speculated phonetic values of the four uncertain (and very rare) syllabograms, which must have been obsolescent very early.

Table 2: The standard grid of CP syllabograms.

	1	2	3	4	5	6	7	8	9	0
00	A	E	I	O	U	Θ				
01	BA	BE	BI	BO	BU	BΘ				
02	CA	CE	CI	CO	CU	CΘ	CWE	CWO	*CƏZΘ	
03	DA	DE	DI	DO	DU	DΘ	DWE	DWO	*DALA	*DILE
04	ĠA	ĠE	ĠI	ĠO	ĠU	ĠΘ				
05	HA	HE	HI	HO	HU	HΘ				
06	JA	JE		JO	JU	JΘ	JAW			
07	LA	LE	LI	LO	LU	LΘ	LJA	LJO		
08	MA	ME	MI	MO	MU	MΘ				
09	NA	NE	NI	NO	NU	NΘ	NWA			
10	PA	PE	PI	PO	PU	PΘ	PETE			
11	QA	QE	QI	QO	QU	QΘ	QWO	*QIBI		
12	RA	RE	RI	RO	RU	RΘ				
13	SA	SE	SI	SO	SU	SΘ				
14	TA	TE	TI	TO	TU	TΘ				
15	WA	WE	WI	WO		WΘ				
16	ZA	ZE	ZI	ZO	ZU	ZΘ				
17	ΘA	ΘE	ΘI	ΘO	ΘU	ΘΘ				

The standard designation of CP syllabograms, proposed herein, consists of the following marks:

- Initially the letter {P}, denoting the Protolinear script, compared to the conventional {A}/ {B} for LA/LB respectively.
- Then, two digits follow, denoting the row of the syllabogram and the initial consonant of its phonetic value.
- Finally, the last digit denotes the column of the grid that corresponds to the closing vowel of the sign's phonetic value or the irregular combination of phonemes.

For example, syllabogram DA is designated as P031 instead of A30/B01 (its conventional designation in LA/LB respectively). Therefore, the enumeration refers directly to the cell of the

corresponding syllabogram in the CP grid (Table 2). Indirectly, additional information can be added in the form of subscript uppercase letters, which may denote variants of signs in different Aegean scripts or even different forms of the same sign in a single script. For example, syllabogram NE (actually, syllable /ne/) can be found as three sign-variants in LA, seven in LB and at least one in CH (Kenanidis & Papakitsos 2018b: 24-25). Consequently, the LA's signs can be designated as P092_A, the LB's as P092_B and the CH's equivalent as P092_H. This extension is useful merely for classification purposes, because the signs of different variants depend on the handwriting of individual scribes and therefore cannot be found in the same piece of text (only a single variant can, usually).

Subsequently, the list of CP syllabograms will be briefly presented, designated according to the proposed herein method (Table 2). The brief description includes the depicted by each syllabogram object and a commentary, wherever necessary, merely for reference purposes:

P001 A depicts the double axe, symbol of the supreme deity A(n) of the Minoans (Kenanidis & Papakitsos 2015).

P002 E depicts a mansion (Kenanidis & Papakitsos 2015).

P003 I depicts any kind of low plant (Papakitsos 2018b).

P004 O depicts the head of a carnivorous animal, primarily a lion (Kenanidis & Papakitsos 2018d).

P005 U depicts the head of an elephant with proboscis and tusk (Papakitsos & Kenanidis 2015).

P006 Θ depicts a forearm (Kenanidis & Papakitsos 2015; 2018a).

P011 BA depicts a rattle (Papakitsos 2018a).

P012 BE depicts a sickle (Papakitsos 2018a).

P013 BI depicts a plant of reed (Papakitsos 2018a).

P014 BO depicts a ladder (Papakitsos 2018a).

P015 BU depicts the standard dress of the men in Minoan Crete, along with the relevant part of the body, namely the buttocks and upper thighs (Papakitsos 2018a).

P016 BΘ depicts a plant of wheat (Kenanidis & Papakitsos 2018a).

P021 CA depicts either the clay token for a sheep or the wheel of a chariot (Papakitsos & Kenanidis 2015).

P022 CE depicts a sheaf of reaped cereals/reeds (Papakitsos 2018b).

P023 CI depicts the measuring cup that was the monetary unit of the Minoans (Kenanidis & Papakitsos 2015).

P024 CO depicts the head of a cow (Kenanidis & Papakitsos 2018d).

P025 CU depicts a flying bird (Kenanidis & Papakitsos 2018d).

P026 CΘ depicts the symbol of greatness (Kenanidis & Papakitsos 2018a).

P027 CWE depicts a bow (Kenanidis & Papakitsos 2017a).

P028 CWO depicts a fish (Kenanidis & Papakitsos 2017a).

- P029 *CƏZƏ depicts perhaps a working craftsman in LB (Fig. 1a), pronounced /cəʒə/ (Kenanidis 2013).
- P030 *DILE probably depicts a ladle (Fig. 1b), perhaps also pronounced /dili/ or /dele/, meaning “unique” (Kenanidis 2013).
- P031 DA depicts the main branch of a trunk (Kenanidis & Papakitsos 2015).
- P032 DE depicts the furnace of a metal-worker or an ingot of non-precious metal (Papakitsos & Kenanidis 2016).
- P033 DI depicts the cereal emmer (Papakitsos 2018b).
- P034 DO depicts the cereal barley (Papakitsos 2018b).
- P035 DU depicts the head of a donkey (Kenanidis & Papakitsos 2018d).
- P036 DƏ depicts a torch (Kenanidis & Papakitsos 2018a).
- P037 DWE depicts the head of a wild boar (Kenanidis & Papakitsos 2017a).
- P038 DWO depicts a pair of scales implying a talanton (Kenanidis & Papakitsos 2017a).
- P039 *DALA probably depicts a type of crown with crest (Fig. 1c), either in LB (B 88 / P039_B) or in CH (HM 204 Nodule / P039_H) (Kenanidis 2013).
- P041 ĞA depicts a box (Kenanidis & Papakitsos 2018b).
- P042 ĞE depicts the human leg(s) (Kenanidis & Papakitsos 2018e).
- P043 ĞI depicts a wild tree (Kenanidis & Papakitsos 2015).
- P044 ĞO depicts a snake (Kenanidis & Papakitsos 2018d).
- P045 ĞU depicts a pair of eggs/testicles (Kenanidis 2013).
- P046 ĞƏ depicts a pair of eggs/testicles in CH (P046_H; Kenanidis & Papakitsos 2018a; but see also P045) or a young man/lad (P046_B / B 84; Kenanidis 2013).
- P051 HA depicts the head of a buffalo (Papakitsos & Kenanidis 2015).
- P052 HE depicts an eye (Kenanidis & Papakitsos 2018c).
- P053 HI depicts a writing tablet (Kenanidis & Papakitsos 2017b).
- P054 HO depicts a woman’s breasts (Kenanidis & Papakitsos 2017b).
- P055 HU depicts a panoply (Kenanidis & Papakitsos 2018e).
- P056 HƏ depicts a fruit, probably an apricot (Kenanidis & Papakitsos 2018a).
- P061 JA depicts a bundle of canes bound at its two ends (Kenanidis & Papakitsos 2015).
- P062 JE depicts a master/boss (Kenanidis & Papakitsos 2018c).
- P064 JO depicts an adze (Kenanidis & Papakitsos 2018b).
- P065 JU depicts the head of a goat (Kenanidis & Papakitsos 2018e).
- P066 JƏ depicts the delineation of a city (Kenanidis & Papakitsos 2018a).

- P067 JAW depicts the head of a hog, with alternative pronunciation /jow/ or /jou/ (Kenanidis & Papakitsos 2017a).
- P071 LA depicts a pouring vessel with a spout (Papakitsos & Kenanidis 2018).
- P072 LE depicts the sprout or new shoot of plants (Papakitsos & Kenanidis 2018).
- P073 LI depicts a man (Papakitsos & Kenanidis 2018).
- P074 LO depicts the head of a gazelle (Kenanidis & Papakitsos 2017b; Papakitsos & Kenanidis 2018).
- P075 LU depicts a ploughshare (Papakitsos & Kenanidis 2018).
- P076 LΘ depicts a spade (Kenanidis & Papakitsos 2018a).
- P077 LJA depicts a pair of wings (Kenanidis & Papakitsos 2017a).
- P078 LJO depicts a scorpion (Kenanidis & Papakitsos 2017a).
- P081 MA depicts the head of a male calf (Papakitsos & Kenanidis 2015).
- P082 ME depicts the symbol of the goddess that safeguarded every social institution (Kenanidis & Papakitsos 2018b).
- P083 MI depicts a woman's body in profile, without head and legs (Papakitsos & Kenanidis 2015).
- P084 MO depicts a walking bird (Kenanidis & Papakitsos 2018d).
- P085 MU depicts the head of a bovine animal (Kenanidis & Papakitsos 2018d).
- P086 MΘ depicts a ship (Kenanidis & Papakitsos 2018a).
- P091 NA depicts a column (Papakitsos & Kenanidis 2015).
- P092 NE depicts the holy libation vessel (Kenanidis & Papakitsos 2018b).
- P093 NI depicts the moon (P093_A, P093_B) and a gem (P093_H) in CH (Kenanidis & Papakitsos 2018e).
- P094 NO depicts a palm (Kenanidis & Papakitsos 2015).
- P095 NU depicts a yoke (Kenanidis & Papakitsos 2018b).
- P096 NΘ depicts a luxurious bed (Kenanidis & Papakitsos 2018a).
- P097 NWA depicts a specific gesture of the Minoans with the two arms crossed (Kenanidis & Papakitsos 2017a).
- P101 PA depicts a twig (Kenanidis & Papakitsos 2015).
- P102 PE depicts an ear (Kenanidis & Papakitsos 2018c).
- P103 PI depicts a sword/blade (Papakitsos & Kenanidis 2015).
- P104 PO depicts a vine/vineyard (Kenanidis & Papakitsos 2017b).
- P105 PU depicts all fruit-bearing trees (Kenanidis & Papakitsos 2015).
- P106 PΘ depicts a canal of irrigation (Kenanidis & Papakitsos 2018a).

- P107 PETE depicts the well-known Minoan sacred symbol, which is wrongly described as “bull horns” or “wings”; yet, it signifies a pair/completeness (Kenanidis & Papakitsos 2017a).
- P111 QA depicts a human face (Papakitsos 2018b).
- P112 QE depicts a place/land (Kenanidis & Papakitsos 2015).
- P113 QI depicts the head of a wild sheep (Papakitsos 2018b).
- P114 QO depicts the head of a bull in LB (P114_B; see also P117 QWO) and a mountain in the rest of the Aegean scripts (P114_A, P114_H; Papakitsos 2018b).
- P115 QU depicts an ingot of any valuable metal, mostly silver (Kenanidis & Papakitsos 2018c).
- P116 QΘ depicts the head of a fox (Kenanidis & Papakitsos 2018a).
- P117 QWO depicts the head of a bull, which in LB is used for syllabogram P114 QO (Kenanidis & Papakitsos 2017a).
- P118 *QIBI depicts two boards crossed, also found in Sumerian pre-cuneiform as sign KIB, or a *swastika* (Fig. 1d), meaning the favor/love of god (Kenanidis 2013).
- P121 RA depicts a chisel (Papakitsos & Kenanidis 2018).
- P122 RE depicts a boomerang (Papakitsos & Kenanidis 2018).
- P123 RI depicts any large flying insect (Papakitsos & Kenanidis 2018).
- P124 RO depicts a throne in LA (P124_A) and a grill with handles (P124_H) in CH (Papakitsos & Kenanidis 2018).
- P125 RU depicts a prop (Kenanidis & Papakitsos 2015).
- P126 RΘ depicts the flower of crocus (Kenanidis & Papakitsos 2018a).
- P131 SA depicts the stalk of linen (Papakitsos & Kenanidis 2015).
- P132 SE depicts a deer-horn (Kenanidis & Papakitsos 2015).
- P133 SI depicts the hide of an animal, stretched on a special wooden frame for tanning. (Kenanidis & Papakitsos 2018d).
- P134 SO depicts a human head (Kenanidis & Papakitsos 2017b).
- P135 SU depicts a threshing-floor (Kenanidis & Papakitsos 2018b).
- P136 SΘ depicts an elaborate hairdo (Kenanidis & Papakitsos 2018a).
- P141 TA depicts a kind of harp that was a common musical instrument of the Minoans (Papakitsos & Kenanidis 2015).
- P142 TE depicts the stalk of cereals (Papakitsos & Kenanidis 2015).
- P143 TI depicts an arrow (Kenanidis & Papakitsos 2015).
- P144 TO depicts an axe (Kenanidis & Papakitsos 2015).
- P145 TU depicts the most common type of vessel for storing liquids (Kenanidis & Papakitsos 2018b).
- P146 TΘ depicts the pudenda (Kenanidis & Papakitsos 2018a ; Papakitsos & Kenanidis 2015).

- P151 WA depicts a house (Kenanidis & Papakitsos 2015).
- P152 WE depicts a river (Papakitsos 2018b).
- P153 WI depicts a piece of meat with flesh and bone (Kenanidis & Papakitsos 2018d).
- P154 WO depicts a nanny (Kenanidis & Papakitsos 2018c).
- P156 WΘ depicts a phallus (Kenanidis & Papakitsos 2017b; 2018a).
- P161 ZA depicts a mace/club (Kenanidis & Papakitsos 2015).
- P162 ZE depicts a saw (Papakitsos & Kenanidis 2015).
- P163 ZI depicts a type of fishing net (Kenanidis & Papakitsos 2018e).
- P164 ZO depicts a spear (Kenanidis & Papakitsos 2015).
- P165 ZU depicts the interior of the body or “anything else” (Kenanidis & Papakitsos 2018e).
- P166 ZΘ depicts a small perfume bottle (Kenanidis & Papakitsos 2018a).
- P171 ΘA depicts a leaf, mainly of ivy (Papakitsos 2018a).
- P172 ΘE depicts the plant of a spicy herb, especially the rock samphire (Papakitsos 2018a).
- P173 ΘI depicts a grinding machine, yet meaning “flour” (Papakitsos 2018a).
- P174 ΘO depicts the teeth of a beast (Papakitsos 2018a).
- P175 ΘU depicts a blanket (Papakitsos 2018a).
- P176 ΘΘ depicts a plant of cumin (Kenanidis & Papakitsos 2018a).

In conclusion, the proposed CP grid (Table 2) is arranged equivalently to the conventional grids of LB (Hooker 2011; Melena 2014). Accordingly, the designation refers directly to this grid, by denoting the number of row (first two digits) and the number of column (third and last digit), which both correspond to specific phonemes (consonants and vowels) that make up the phonetic value of each syllabogram. In this manner of standardization, it is estimated that the CP syllabary will be memorized more easily, since the prime designation corresponds actually to the syllable and not to the sign itself, which may have many variants in the different Aegean scripts.

4. Epilogue

The CP script (thus, all the Aegean scripts) has a significant advantage of recognition and memorizing over other contemporary scripts: the name of each syllabogram closely denotes its phonetic value as well (e.g., TI = /ti/). Even in the case of some phonetic differentiations, the time elapsed since the actual usage of this script makes these minor changes manageable or insignificant, in terms of semantic interpretation. Other contemporary scripts do not offer such a convenience. For example, the Sumerian cuneiform sign named IGI is pronounced /lim/ (Kenanidis 2013: 123). The standardization of CP can be also proved useful for the computational treatment of the Aegean syllabaries, in the archaeolinguistic software applications that are developed nowadays (Chorozoglou et al. 2017; Kontogianni et al. 2017; Koukis et al. 2018; Papakitsos et al. 2018).

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