

## **Pre-Hellenic Language(s) of Crete**

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Survey of the five corpora of pre-Hellenic Cretan inscriptions: date; type of documents; length of the texts; characteristics of the writings; main linguistics features; current state of the decipherments, linguistic interpretations and identifications; future of the research.

### **1. Introduction**

Although Crete is the largest Greek island (*c.* 8.314 km<sup>2</sup>), it is only the fifth biggest island of the Mediterranean. Crete is located at the nearly same distance of continental Greece and of Asia Minor (from which it is separated by the archipelagos of respectively the Cyclades and the Dodecanese). It lies a little further from the African coast of Libya and Egypt.

There are no sure traces of Cretan human settlement before the end of the Palaeolithic. It is only *c.* -6875<sup>1</sup>, when Neolithic begins in Crete, that population appears. Three millennia and a half later, at the beginning of the Bronze Age, *c.* -3375, a new culture begins its individualisation, which is commonly called Minoan — on the use of “Minoan” for the Cretan pre-Hellenic language(s), see §3.3.1; on the meaning of “pre-Hellenic”, see below. The name “Minoan” is modern and comes from the mythical Cretan king Minos.

From *c.* -2100 — -1900 (MM Ia), the Minoan civilisation exhibits a surprising sprout of writings, which is quite unusual for such a restricted area. Within about 500 years, there are not less than four different scripts known:

Cretan “hieroglyphics”  
Linear A

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<sup>1</sup>For the periods before the first millennium B.C., absolute dates are based on the archaeological stratigraphical context of the finds. They are taken here from Treuil 1989. They are always approximate. Moreover, they are regularly revised.

Writing of the Phaestos disk  
Writing of the axe of Arkalokhori.

None of those writings is alphabetic. They all contain syllabograms and have clear ideographic components<sup>2</sup>. Until now, it has not proved possible to find an extra-Cretan origin for any of them.

Linear A will give birth to a daughter-writing, Linear B, which has been successfully deciphered in 1952<sup>3</sup>. This great achievement proved that Linear B was a syllabary (of an open syllable type) used to write Greek. The Greek dialect written in Linear B has been conventionally called Mycenaean since then. Mycenaean Greek was imported in Crete by conquerors coming from continental Greece, and who controlled the island from c. -1450 on.

Since the Linear B texts are written in Greek, and are, moreover, of later date than the documents in the four other pre-alphabetic Cretan scripts, these latter may rightly be called pre-Hellenic, i.e. referring to tongues written and/or spoken prior to the oldest written example known of Greek<sup>4</sup>.

This article will be devoted not only to those four pre-Hellenic corpora, but also to a fifth one, dated of the first millennium B.C., alphabetically written, and called Eteocretan.

I will not study here the pre-Hellenic Cretan data known not by texts written at the time their language was still spoken, but only by a later, indirect tradition. These indirect data come from the Cretan onomastics and vocabulary. They rely on different methods of investigation than those used here.

I will first present the most reasonably secure elements (date, type of documents, length of the texts, characteristics of the writings, main evident linguistic features: §2). I will then describe today's state of their interpretation (§3). Finally, I will give my opinion on the future of the research in the field (§4)<sup>5</sup>.

<sup>2</sup>I call "ideographic" every sign of any script used to write a significant item (this includes diacritical marks like punctuation signs, etc.). This contrasts with "phonetic" signs, which write non significant items. I do not make any difference between the terms "ideogram", "pictogram" or "logogram".

<sup>3</sup>Ventris—Chadwick, 1973.

<sup>4</sup>A synonym for "pre-Hellenic" intended in this way could be "pre-Linear B", i.e. written and/or spoken prior to the texts written in Linear B.

<sup>5</sup>Hereafter, I will regularly use the name of the *scripts* (e.g. Linear A) as a conventional denomination for the *language* they used to write.

## 2. The facts

### 2.1. Cretan “hieroglyphic” script

#### 2.1.1. Selected bibliography

- a) *Edition*: Olivier — Godart 1996 (transnumerated edition: each “hieroglyphic” sign is transcribed by its conventional number; photographs and facsimiles; almost no archaeological details; unfortunately, the “total” index of the “hieroglyphic” signs is almost unmanageable). Although quite recent, this book is already to be completed by recent discoveries of new “hieroglyphic” texts.
- b) *Problems of decipherment, interpretation, linguistic typology, etc.*: Meriggi 1973; Olivier 1987, 1989, 1990, 1995, 1996; Pope 1968; Younger 1990.

#### 2.1.2. Short description

##### 2.1.2.1. Script and texts

The “hieroglyphic” Cretan script was until quite recently found nearly only in Crete (with the exception of the island of Cythera, located between Crete and the Peloponnese), but it has just been discovered much more to the north, in Samothrace, an island situated at the latitude of Chalcidice. In Crete, it is until now strangely found only eastward of Haghia Triada (see §2.5.2.2, 3.3.1): there is no “hieroglyphic” text confidently located in the western part of the island. The script’s main date lies between  $\pm$  -2100 (beginning of the MM Ia) and  $\pm$  -1700 (end of the MM II). Some Malia’s inscriptions might be dated between  $\pm$  -1700 —  $\pm$  -1600 (MM III). The few sealings dated from  $\pm$  -1500 —  $\pm$  -1450 (LM Ib) seemed to be just an anachronistic use of older seals, but a new “hieroglyphic” inscription from Petras (Sitia: eastern Crete) could be dated from this same period<sup>6</sup>. “Hieroglyphic” script is written on stone, metal, ivory, as well as clay (the clay texts are administrative documents of various forms: sealings, tablets,

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<sup>6</sup>Tsipopoulou—Hallager 1996.

bars, cones, and so on). About 370 texts have been discovered so far, totalling less than 2.000 signs. The whole "hieroglyphic" corpus could be written on one or two A4 pages. The inscriptions have various purposes, mainly identification (seals and sealings), but also accounts and dedications. "Hieroglyphic" texts may be very difficult to read on seals and sealings, since the direction of their reading is often uncertain. The distinction introduced in the beginning of this century by A. Evans<sup>7</sup> between "hieroglyphic" of "class A" and of "class B" is now completely superseded: there exists just one "hieroglyphic" script.

The name "hieroglyphic" might be misleading, because this writing has nothing in common with Egypt<sup>8</sup>. A similar remark can be made for the term "pictographic", used as a synonym for this script, and which wrongly suggests it could be purely ideographic. Actually, the Cretan "hieroglyphic" script has ideographic components, but also a group of about 100 signs whose ideographic use cannot be proved. As shown by Pope 1968, the formula discovered by Mackay 1965<sup>9</sup> suggests that the full repertory of non demonstrable ideographic "hieroglyphic" signs should not greatly exceed hundred or so<sup>10</sup>. And Pope concluded rightly that the numbers of different signs in the known scripts of the world, whatever their main

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<sup>7</sup>Evans 1909, 19-22.

<sup>8</sup>By the way, one should stop using "hieroglyphic" for any script other than Egyptian...

<sup>9</sup>This formula allows a fair estimation of the total number of different signs of a given script, even if the sample used is very short and shows only a restricted part of the signs of this writing. The sample of the script must however be representative of the considered script. True, Mackay's 1965 formula gives only an approximation. Having checked it on several samples of about 240 signs (Duhoux 1980; 1989, 64, 114), I may say that the greater the number of signs in a script, the more underestimated the results of Mackay's formula are. In alphabets, it works really superbly. In a purely ideographic system, its result is crudely underevaluated. In syllabaries, the Mackay formula works reasonably well on systems of about fifty syllabograms (in my experiments, I found underestimations up to c. 14%). In systems of about one hundred syllabograms, underestimation may climb to c. 29%. Hereunder, we will however see that if applied to a very short syllabic text (c. 20 syllabograms), the formula may prove severely inaccurate (see §2.4.2).

<sup>10</sup>Using Mackay's 1965 formula, Pope 1968 has actually shown that there should be about between 65 and 75 signs whose ideographic use cannot be proved in the Cretan "hieroglyphic" system. His calculation should be made up to date, using the new texts discovered since then, but his conclusion about the syllabic nature of these signs is still valid.

component may be — alphabetic, syllabic or ideographic —, imply these “hieroglyphic” signs should very probably be syllabograms of an open syllable type, like Linear B. Up to now, only about a dozen “hieroglyphic” syllabograms seem to have reasonable Linear B parallels<sup>11</sup>. The phonetic transcriptions of “hieroglyphic” (H) signs on the basis of their Linear B (LB) counterparts will be conventionally introduced here by H > LB. One should not forget that the Linear B structure and orthographic rules may allow a rather large graphic ambiguity: e.g. LB *pa-te* is actually used to write both *πατήρ*, “father”, and *πάντες*, “all”. A similar ambiguity could likely happen in “hieroglyphic”.

### 2.1.2.2. Language

There is no available study about the characteristics of the language of the “hieroglyphic” script. A very superficial examination of the corpus shows, however, that it uses “prefixes” and “suffixes”<sup>12</sup> — see for instance the three following groups of alternances, taken from sequences where contextual analysis shows a high probability for getting different forms of the same “words” (in bold, the supposed “radical” element).

1)

H ]077-042-049-016-016-056-077 (Malia # 112.b: clay bar)  
 ]•-042-049-016-016-077<sup>13</sup> (Malia # 112.a: clay bar)  
 042-049-016-016[ (Malia # 113.cA: clay bar)<sup>14</sup>

<sup>11</sup>The list published by Olivier — Godart 1996, 19 must be taken as it is: just *possible* matches. It seems clear that some of its suggestions are highly speculative.

<sup>12</sup>“Prefix” and “suffix” are used here in a purely factual meaning. They refer to elements able to appear optionally before a “radical” — I conventionally understand “radical” as the part of a “word” seeming to bear its lexical meaning. “Word” is conventionally applied here to a graphic autonomous sequence presumably corresponding to a lexical unit. Of course, supplementary items could be appended to this unit (clitics, possessives, etc.).

<sup>13</sup>In H ...-016-077, sign H 016 has been written on an erased H 056 — compare with the preceding form, ending in H ...-016-056-077. Unfortunately one cannot totally exclude the erasing of H 056 was a mistake...

<sup>14</sup>That these three sequences are forms of the same “word” is made clear by: their common find-place (Malia); their use in accounting documents; the writing of the two first of them in the same text; the reasonably significant length of their common sequence (four syllabograms).

H > LB ] 077-a-049-016-016-056-077  
                   ] •a-049-016-016-077  
                   a-049-016-016[

In this group, the sequence H ...-016-016... shows how “hieroglyphic” texts are fond of reduplicated signs. This particularity is also found in Linear A as well as in the Phaestos disk.

2)

H           038-010 (more than ten examples on seals)  
               038-010-031 (more than twenty examples on seals  
                                   and sealings)<sup>15</sup>

H > LB *ja-010*  
               *ja-010-re*

3)

H    036-092 (seven examples on seals and sealing)  
       036-092-031 (nine examples on seals)<sup>16</sup>

H > LB *036-ru*  
               *036-ru-re*

The main information a seal conveyed was, one may presume, the name of its bearer, to which could be added the name of his father/mother, his gentile, function, etc. Actually, three sequences of groups 2) and 3) may appear alone, without any other “word”<sup>17</sup>. This suggests two conclusions: a) the sequences of these groups should likely be anthroponyms; b)

<sup>15</sup>That these two sequences are forms of the same “word” is made clear by: their use on seals/sealings; the association of each one with no less than six different forms: H 036-092, 036-092-031, 044-005, 044-049, 046-044, 057-034-056 (H > LB 036-ru, 036-ru-re, 044.\*79, 044-049, 046-044, 057-034-056).

<sup>16</sup>That these two sequences are forms of the same “word” is made clear by: their use on seals/sealing; the association of each one with three different “words”: H 038-010/038-010-031, 044-005, 044-049 (H > LB *ja-010/ja-010-re*, 044.\*79, 044-049).

<sup>17</sup>H > LB *ja-010* (Crete # 181 [?], 212, 214; Malia # 228), *ja-010-re* (Crete [?] # 195, 218, 279; Knossos # 162, 169), *036-ru* (Malia # 131, 229).

their syntactical function should very probably be something we could conventionally call “case zero”, i.e. similar to the “nominative”.

Now, both groups 2) and 3) exhibit the same alternance: “suffix” zero ~ “suffix” H -031 (= H > LB -re). What could be the function of these two marks? Since the four forms where they appear are supposed to be at “case zero”, a natural guess would be that “suffix” zero could mark the basic form, whereas “suffix” H > LB -re could be a derivational mark. In an anthroponymic context, “suffix” H > LB -re should likely form derivatives which could either be true anthroponyms (when used absolutely) or express “filiation”, both forms being morphologically derived from other anthroponyms. H > LB -re could then be compared with, for instance, Greek suffix -ιος, which has similar functions (see also §3.3.2.5).

The zero “suffixed” forms, H > LB *ja-010* and *036-ru*, are paired in two seals<sup>18</sup>, whereas forms with “suffix” H > LB -re, H > LB *ja-010-re* and *036-ru-re*, are paired in six or seven others<sup>19</sup>. And zero “suffixed” forms may also be associated with H > LB -re “suffixed” ones<sup>20</sup>. This recalls well known onomastic formulas in various languages, and one may suppose the H > LB -re “suffixed” forms, when not used absolutely, should be patronyms, gentiles, etc.

## 2.2. Linear A

### 2.2.1. Selected bibliography

- a) *Editions*: Raison — Pope 1994 (transnumerated edition: each Linear A sign is transcribed by its conventional number; large apparatus criticus; many archaeological and bibliographical references; no photographs nor facsimiles); Raison — Pope 1977 (still useful, but now incomplete); Godart — Olivier 1976-1985 (quite good photographs and facsimiles; almost no archaeological details, nor apparatus; lacks a transnumerated edition: the signs are reproduced in their original forms, so it is

<sup>18</sup>Kasteli # 265; Malia # 288.

<sup>19</sup>Crete # <254>, 257, 262 (?); Mirabello # 272; Neapolis # 314; Pyrgos # 309; Xida # 312.

<sup>20</sup>H > LB *036-ru* with *ja-010-re* (Crete [?] # 263, 299) and H > LB *036-ru-re* with *ja-010* (Crete # 258).

impossible to read or to print them without a cumbersome conversion; the last volume has a transnumerated *index*, but a new numbering of the signs has been introduced, without, alas, international co-operation: this is a source of permanent difficulties for people using the traditional transnumeration). Since Raison — Pope 1994, several new Linear A inscriptions have been found and edited.

- b) *Problems of decipherment, interpretation, linguistic typology, etc.*: Duhoux 1978, 1983, 1989, 1992; Packard 1974 (basic for the methodological problems involved by the phonetic reading of the Linear A syllabograms); Stephens — Justeson 1978.

## 2.2.2. Short description

### 2.2.2.1. Script and texts

Linear A is mainly found in Crete, but it is also documented in other Greek islands, in the Greek continent, and even — this is brand new — in Asia Minor and in Israel<sup>21</sup>.

Most of the texts date from  $\pm$  -1750 to  $\pm$  -1450<sup>22</sup>. A few of them date from  $\pm$  -1400 —  $\pm$  -1325 (LM III al-2). The (until now) unique Israeli Linear A text is dated from the beginning of the -XII<sup>th</sup> century. If the date is right, this is an extraordinary survival: more than one hundred years after the extinction of Linear A in Greece, some Minoans could still have used it in a remote settlement...

We have presently about 1.500 edited Linear A texts, totalling *c.* 7.500 signs — the equivalent of *c.* eight A 4 pages. About 9/10 of these inscriptions are accounting documents, originally written on wet clay (tablets, sealings, nodules<sup>23</sup> and roundels<sup>24</sup>). The administrative nature of these texts is made evident *inter alia* by signs which are clearly arithmetical symbols (units; tens; hundreds; thousands).

The remaining inscriptions are written on various materials (terra cotta, stone, different metals, stucco) — most of the inscribed items are vases. Their nature and/or their find-spots

<sup>21</sup>See Niemeier 1996; Finkelberg — Uchitel — Ussishkin 1996.

<sup>22</sup>From the transition between MM IIa and MM IIb until the end of LM I.

<sup>23</sup>Clay balls of various forms (prismatic, ovoid, etc.).

<sup>24</sup>Disks made of flattened clay.



suggest that many of them must be religious documents (ex-votos, offerings, etc.).

Linear A has evident ideograms (numbers; signs representing clearly recognisable items; etc.), but also about one hundred signs whose ideographic use cannot be proved. Mackay's 1965 formula suggests that the total number of these last signs could lie between 102 and 110. So, these signs should very probably be syllabograms of an open syllable type (§2.1.2.1). Now, *c.* 70 of them are found in Linear B. Since this last script has been deciphered (§1), one may try to attribute to the Linear A signs the same phonetic values as their Linear B counterparts. Several reasons suggest this method is rather reasonable, but this does not necessarily mean that the Linear A signs do have *exactly* the same phonetic values as Linear B. For instance, vowels read *e* in Linear B could perhaps sound more closed (*i*) or more open (*a*) in Linear A...; consonants read *d*... in Linear B could possibly note a complex phoneme in Linear A...; etc. Of course, we will be fairly sure about the lecture of Linear A syllabograms only when its tongue will have been identified. Until then, one is bound to use a strict equivalency between the Linear A syllabograms and the syllabic values of their Linear B corresponding signs. Hereafter, phonetic transcriptions of Linear A (LA) signs on the basis of their Linear B counterparts<sup>25</sup> will conventionally be introduced by LA > B. On the possible ambiguity of the script, see §2.1.2.1.

### 2.2.2.2. Language

The language written by Linear A uses "prefixes", "suffixes" and "infixes"<sup>26</sup>, but it is characterised by a significantly higher use of "prefixes" than Greek written in Linear B. Here are some examples of presumably grammatical alternances generally found in votive texts<sup>27</sup>. The repetitive character of these documents guarantees one has different forms of identical lexemes (in bold, the "radical" element):

<sup>25</sup>After Duhoux 1989, 65-75.

<sup>26</sup>"Infix" is used here in a purely factual meaning. It refers to elements able to appear optionally in the middle of a "radical".

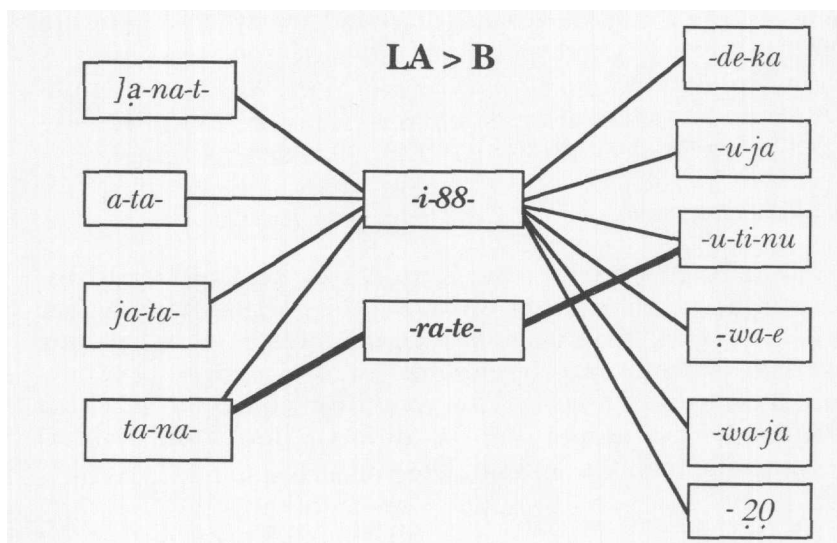
<sup>27</sup>After Raison — Pope 1994.

LA > B ]*a-na-ti-88-wa-ja*[ (IO Z 8)  
*a-ta-i-88-de-ka* (ZA Z 3)<sup>28</sup>  
 [ *a-* ] *ta-i-88-wa-e* (PK Z 11)  
*a-ta-i-88-wa-ja* (IO Z 2, etc.)  
*ja-ta-i-88-u-ja* (AP Z 1)  
*ta-na-i-88-u-ti-nu* (IO Z 6)  
*ta-na-i-88-20b* (PS Z 2)

LA > B *a-di-ki-te-te* (PK Z 11, etc.)  
*ja-di-ki-te-te* (PK Z 15, etc.)  
*ja-di-ki-tu* (IO Z 2)

LA > B *a-sa-sa-ra-me* (PK Z 11, etc.)  
*ja-sa-sa-ra-ma-na* (KN Z 10)  
*ja-sa-sa-ra-me* (IO Z 6, etc.)

The full range of these presumably grammatical alternances may be impressive. Here is an example of the most complex set we have up to now (in the middle of the figure and in bold, the two “radicals” concerned):



Linear A exhibits a specially high frequency of reduplicated signs, exactly like the Cretan “hieroglyphic” and the Phaistos disk.

<sup>28</sup>This text seems not to be votive.

## 2.3. The Phaestos disk

### 2.3.1. Selected bibliography

- a) Critical edition and archaeological dossier: Duhoux 1977a; Godart [1995] — unfortunately, most of the so called “facsimiles” of this book are inaccurate.
- b) Analysis of the writing system, of the text, and typology of the language: Duhoux 1977b, 1980, 1983; Nahm 1969.

### 2.3.2. Short description

#### 2.3.2.1. Script and text

The Phaestos disk is a clay roundel of *c.* 16 cm diameter and *c.* 1,8 cm thickness, discovered along with a Linear A tablet in a dependency of the Minoan palace of Phaestos (southern central Crete). Its date is situated anywhere between  $\pm$  -1800 and  $\pm$  -1600 (MM II — MM IIb). The immediate archaeological context of the disk suggests it could have been part of a deposit of cultic items. The Cretan origin of the disk has been regularly disputed<sup>29</sup>, but several precise archaeological parallels show it is undoubtedly Minoan. The disk bears a text of 241 signs printed (*sic*) on its two faces. This printing was made when clay was still wet, by a set of seals. The writing follows a spiral and goes from the outer rim to the centre. In contradistinction to all the other texts on tablets written in the other Cretan scripts of the Bronze Age, the Phaestos disk has been not accidentally, but deliberately baked<sup>30</sup>.

The disk's writing has 47 different signs. One of them is clearly ideographic: it is an oblique stroke, whose function is to indicate the end of a verse (see below). Another diacritical sign is a dot, used to mark the beginning of each side. The Mackay's 1965 formula suggests the graphic system of the disk could have had *c.* 55 different signs. This number implies these signs must probably be syllabograms of an open syllable type (§2.1.2.1). There are no more than *c.* ten syllabograms of the disk which

<sup>29</sup>The disk has been found in 1908, during official excavations, so its authenticity cannot be doubted.

<sup>30</sup>But it has been corrected after its baking.

could *possibly* match Linear A or “hieroglyphic” signs<sup>31</sup>.

The text of the disk is written in 61 boxes, each of them containing between 2 and 7 probable syllabograms. Every box very presumably exhibits a “word”. The 61 “words” constitute 17 greater units, which are separated by the oblique stroke we just spoke about. Hereunder is the list of the final “word” of each of the 17 units of the disk (the oblique bar symbolises the oblique stroke)<sup>32</sup>. It is clear that those 17 units form four bigger ensembles, two of them exhibiting “rhyming”, or, perhaps better, anaphoric finals (here, with a border and in bold underlined characters, the “rhyming”/anaphoric final “words”). The numbers used to transcribe the disk’s signs have nothing to do with those of “hieroglyphic”.

v. 1 02-12-13-01-18/  
v. 2 .....29-45-07/  
v. 3 .....02-12-32-23-38/

v. 4 .....	<u><b>28-01/</b></u>
v. 5 .....	<u><b>02-12-31-26/</b></u>
v. 6 .....	<u><b>02-12-31-26/</b></u>
v. 7 .....	<u><b>28-01/</b></u>
v. 8 .....	<u><b>02-12-31-26/</b></u>

v. 9.....23-19-35/  
v. 10.....02-37-23-05/  
v. 11.....16-23-18-43/

v. 12 .....	<u><b>29-36-07-08/</b></u>
v. 13 .....	<u><b>29-45-07/</b></u>
v. 14 .....	<u><b>22-29-36-07-08/</b></u>
v. 15 .....	<u><b>07-45-07/</b></u>
v. 16 .....	<u><b>22-29-36-07-08/</b></u>
v. 17 .....	<u><b>45-07/</b></u>

<sup>31</sup>For possible Linear A matches, see Duhoux 1983, 34.

<sup>32</sup>After Duhoux 1980.

The final repetitions of the disk are evidently deliberate, with a scheme a-b-b-a-b (vv. 4-8) and c-d-c-d-c-d (vv. 12-17). Added to its unusual spiraliform writing<sup>33</sup>, this suggests the text of the disk could be a poem, or, perhaps more reasonably, a religious document — this kind of text may be characterised by a regular use of the anaphora. For comparanda, I give an example of a section of the *Iguvian Tables*, VIb, 53-55<sup>34</sup>. The scheme is here a-a-b-c-c-d-e-e:

*pis est totar tarsinater*  
*trifor tarsinater*  
*tuscer naharcer iabuscer nomner*  
*eetu ehesu poplu*  
*nosue ier ehe esu poplu*  
*sopir habe fsme<sup>35</sup> pople*  
*portatu ulo pue mers.est*  
*fetu uru pirse.mers.est*

### 2.3.2.2. Language

The disk's text is very short: no more than 6 or 7 printed lines. Its language uses “prefixes” and “suffixes”. Just as Linear A, it is characterised by a significantly higher use of “prefixes” than Greek written in Linear B<sup>36</sup>. Here are examples of several presumably grammatical alternances shown in the disk's text (in bold, the “radical” element):

1)                    **13-01**  
                       **13-01-39-33**  
                       **15-07-13-01-18**  
                       **02-12-13-01**  
                       **02-12-13-01-18**

<sup>33</sup>This form is not isolated in the pre-alphabetic Cretan scripts. See for instance the golden ring of Mavro Spilio, where a Linear A inscription is written along a spiral (KN Z 13).

<sup>34</sup>After Prosdocimi 1978, 688. I have corrected one mistake after Prosdocimi 1984, 207.

<sup>35</sup>*fsme* is an engraver's error for *esme*.

<sup>36</sup>On the contrary, the frequency of the “prefixes” does not significantly differ in the Phaistos disk and in Linear A.

2)	45-07 0745-07 2745-07-12 2745-07-35 2945-07
3)	31-26-12 31-26-35 02-12-31-26

These rich alternances show clearly that this text has probably a very elaborated syntax.

The disk is also characterised by an especially high number of reduplicated signs, like in Cretan “hieroglyphic” and in Linear A.

## 2.4. The Arkalokhori axe

### 2.4.1. Selected bibliography

Edition and small archaeological dossier of the discovery: Boufidis 1953-1954. See also Duhoux 1977, 15-16; Godart [1995], 144-149 wrongly supposes the axe does not bear a true script: he has failed to notice diacritical signs like the oblique stroke (§2.4.2), etc. — his so called “facsimile” is incredibly rough.

### 2.4.2. Short description

The bronze double axe of Arkalokhori was unearthed in 1935 in a cave of central Crete, together with an impressive number of offerings (hundreds of bronze arms — swords and daggers; several hundreds of double axes, in bronze, silver and gold — two of them are inscribed with a Linear A text: see §3.2.1). The axe we are interested in is dated *c.* -1600 (transition between MM III and LM I).

The socket of the double axe bears a short inscription of about twenty signs (less than one printed line !) vertically written in three columns. There are two diacritical ones and ten others. The axe’s script is clearly cognate to the Phaistos disk’s writing (see hereunder). Nevertheless, the two systems are basically distinct, although they share the same graphic

ambience.

There is a problem with the use of the Mackay's 1965 formula here. The result of its calculation is that the axe's script could have *c.* 30 non diacritical different signs. This number could perfectly fit with an *alphabet*, and this is very strange, because several features suggest the axe's writing should probably be an open syllable syllabary: one of its non diacritic signs is identical with the Linear A syllabogram LA > B *da*; its two diacritical marks are the same as in the Phaestos disk (an oblique stroke and a dot); finally, the axe's date and its purely Minoan context point to a syllabic system. So, one must wonder if the Mackay's formula is adequate for such a short text written in what should be a syllabary. In order to assess the point, I have made a test on five samples of Greek texts written in the classical Cypriot syllabary, each of them being twenty syllabograms long<sup>37</sup>. The samples have respectively 15, 12, 14, 15 and 17 different syllabograms. The Mackay's 1965 formula suggests their script could have respectively *c.* 60, 30 (*sic*), 47, 60 and 113 (*sic*) different signs — the correct answer is 56. So, it becomes clear that, if applied to very restricted samples of a syllabic script, the Mackay's 1965 formula might dramatically over- (113) or under- (30) estimate the number of its signs. One may thus confidently suppose that the Arkalokhori axe's script is very likely an open syllable syllabary which should probably have *more* than *c.* 30 non diacritical different signs. The archaeological context of the find makes highly probable that the inscription must be a votive text.

There is no example of reduplicated sign in the axe's text. This might not be significant, because the inscription is probably too short to be representative. Compare, e.g., the "hieroglyphic" votive inscription of Malia # 328, with its 16 signs, without any reduplication, although reduplicated syllabograms are frequent in the rest of the "hieroglyphic" corpus (§2.1.2.2).

The text of the Arkalokhori axe has up to now never been satisfactorily edited. This is paradoxical, since it is the shortest Cretan pre-Hellenic corpus we know. Moreover, it has been known for more than 60 years, has been officially published, its photograph has been reproduced several times, and it is very easy to examine: the Arkalokhori axe is permanently exposed in

<sup>37</sup>These samples are taken from the first hundred signs of the Cypriot text quoted in Duhoux 1980, 132.

one of the open access rooms of the Iraklion Archaeological Museum...

## 2.5. Eteocretan

### 2.5.1. Selected bibliography: Duhoux 1982.

### 2.5.2. Short description

#### 2.5.2.1. Script and texts

First millennium Crete has left us six inscriptions on stone, written in the Greek alphabet, but whose language is not Greek. They are dated on palaeographical criteria between c. -650 and the -III<sup>d</sup> or -II<sup>d</sup> century. These texts come from the eastern (Praesos) and from the central (Dreros) part of the island. The ancient Greek tradition gave people speaking this idiom the name of Ἐτεόκρητες ("True Cretans"; this term, known since Homer, could however be a Hellenization of a pre-Hellenic appellative). There are a half dozen other inscriptions which have been supposed to be Eteocretan, or to contain some Eteocretan terms, but this is either uncertain, or clearly impossible<sup>38</sup>. The surely Eteocretan texts constitute a very restricted corpus: 422 letters — about eight typewritten lines. Moreover, each inscription is mutilated and thus incomplete. Finally, three quarters of the texts have no word-dividers, so contextual analysis becomes rather complicated. The archaeological contexts suggest that all the Eteocretan documents are probably official texts, but their interpretation is problematic.

#### 2.5.2.2. Language

Because of the rather recent date (compared with the texts of the Bronze Age hitherto presented) of Eteocretan, one must wonder if it could be, instead of a pre-Hellenic tongue, just a non Hellenic one, which could have been introduced in Crete *after* its Hellenization. Actually, the Greek historical traditions clearly associate Eteocretan with the period of Minos, in the

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<sup>38</sup>The difficult word in the Greek text \*DRE β, which could have been Eteocretan, but also Greek, has now satisfactorily been explained as good Greek by Van Effenterre 1989.



time prior to the first Greek known civilisation, the Mycenaean one (§1). On the other hand, these traditions seem to find a confirmation in the cultural Minoan survivals of the first millennium which have been discovered at Dreros and Praesos. Moreover, there are clear archaeological proofs of Minoan settlements during the second millennium B.C. in the Eteocretan area. See also below for the geography of the Eteocretan ~ “hieroglyphic” texts. It seems thus reasonably sure that Eteocretan is a genuine pre-Hellenic language.

Eteocretan shows some clear presumably grammatical alternances, whose best examples are hereunder (in bold, the “radical” element):

- |    |   |
|----|---|
| 1) | ...αιραρ-ιφ (PRA 3.10)<br>...ειραρ-ι (PRA 3.4)<br>]ειρερ-φ... (PRA 3.8)<br>...ειρερ-ει... (PRA 2.9)<br>]ιρερ... (PRA 3.7) |
| 2) | ισαλαβρ-ετ... (DRE 1.1)<br>ισαλυρ-ια (DRE 1.2)  |

It is quite possible that Eteocretan could be a recent stage of a tongue known through the Bronze Age Cretan corpora. Up to now, there is no linguistic evidence for such a continuity, but one should pay attention to an extra-linguistic interesting feature. Eteocretan is confined until now in central and eastern Crete — exactly like the “hieroglyphic” texts (§2.1.2.1). If one of the pre-Hellenic Cretan Bronze Age corpora could be the ancestor of Eteocretan, “hieroglyphic” should be a not too bad candidate.

### 3. Interpretations

The Cretan pre-Hellenic corpora involve many problems. I will review three of them here: 1) decipherment of the scripts; 2) interpretation of the texts; 3) identification of the language(s) used.

### 3.1. Decipherments

The state of the decipherment of the scripts hitherto examined varies.

*Eteocretan* is directly readable, since it is written in the Greek alphabet — but there are two letters (hapax) otherwise unknown.

I have already said (§2.2.2.1) that *c.* 70% of the *Linear A* syllabograms could be experimentally read thanks to the phonetic values of the *Linear B* homomorph signs, which have been confidently deciphered. All these readings may probably not be totally right, because there might have been phonetic changes when *Linear B* (used to write Greek) was created on the model of *Linear A* (used to write a pre-Hellenic language). Nevertheless, they offer a reasonably solid (and, actually, our only...) starting point. But this beginning point should be strictly adhered to, except when valid reasons forbid it. Too little would-be decipherers are practising this basic rule.

The *three other Cretan pre-Hellenic scripts* are undeciphered. However, the less opaque of them, “hieroglyphic”, has about a dozen syllabograms (on *c.* one hundred) in common with *Linear B*: these signs could thus be tentatively read. But we are then left with about eighty unreadable signs... The situation of the *Phaestos disk* and of the *Arkalokhori axe* is still worse.

Several of these three writings are regularly presented as deciphered. But none of these trials succeeded to convince neither the scholarly world nor the competing would-be decipherers. This lack of plausibility is caused by several defects. Here are some examples of them (just a selection: the list is far from being complete): use of wrongly edited texts; phonetic values attributed on an acrophonic basis<sup>39</sup>; ideographic interpretation of all the signs; incorrect direction of reading; etc.

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<sup>39</sup>Acrophony should always be considered with extreme caution when used to find phonetic values of signs. First, it regularly happens that the interpretation of a sign's form is neither obvious nor indisputable. Second, even if this interpretation is crystal clear, one should never forget that there are usually several synonyms for a same item, and this lessens the probability of the right choice. Finally, even if only one word should be used, its form should probably have changed during its history, introducing another risk of error.

### 3.2. Interpretations of the texts

**3.2.1.** The *Linear A* corpus, the less restricted of all, is also the less badly interpreted.

The less difficult texts, anyway in their structure, are the *administrative* documents: many of them are quite clearly accounts. They count various items: living creatures as well as objects. Many of their ideograms may be self evident, or well known through their *Linear B* counterparts. Thanks to these texts, we know with an absolute certainty the meaning of two *Linear A* “words”: *LA > B ku-ro*, “so much; total”, and *LA > B po-to-ku-ro*, “grand total” — this last form looks like a compound of *LA > B ku-ro* plus a first element *LA > B po-to-*.

Here is the beginning of an accounting tablet (first, transnumerated edition<sup>40</sup>, presented in a tabulated version — *LA* means that each syllabogram is transcribed by its conventional number<sup>41</sup> —, then in transliteration — *LA > B*; a comma symbolises the word divider):

**HT 117a.1-6:** Haghia Triada (Crete); clay accounting tablet; between ± -1500 and ± -1450 (LM Ib)?

(LA)		(LA > B)	
1. 95-29-72-92 , 103-22 ,		ma-ka-ri-te , ki-ro ,	
1.-2. 97-76-26-57 ,		u-mi-na-si ,	
2. 97-59	1	u-su	1
2. 76-06	1	mi-tu	1
2.-3. 98-53-27	1	ku-ra-mu	1
3. 95-55	1	ma-ru	1
3. 98-01-25	1	ku-*56-nu	1
3.-4. 06-68-95	1	tu-68-ma	1
4. 97-51-76	1	u-di-mi	1
4.-5. 76-55-74-53-54	1	mi-ru-ta-ra-re	1
5. 92-32-54	1	te-ja-re	1
5. 26-30-54	1	na-da-re	1
6. 98-22	10	ku-ro	10

<sup>40</sup>After Raison — Pope, 1994.

<sup>41</sup>These numbers have nothing to do neither with those of “hieroglyphic” nor of the Phaistos disk.

The general structure of this text is clear: first, two “words” introducing the whole document (LA > B *ma-ka-ri-te ki-ro*). Then, a “word” heading the first section of the tablet (LA > B *u-mi-na-si*). After that, a list of ten rubrics, each of them consisting of a “word”, followed by the number “1”. The first section is then concluded by the name of the “total”, LA > B *ku-ro*, followed by the number “10” (ten being, of course, the total of ten times one). Everything is however not known, far from that, in those six lines. We ignore the exact grammatical nature and meaning of the three “words” of the beginning — they probably tell about the nature and/or the reason of the count. Note however that LA > B *ki-ro* seems generally to function like Linear B *o-pe-ro*, ὀφελος, “deficit; debt” (§3.2.2). Each of the two other “words” of lines 1-2 could be e.g. a place name, an occupational name, an anthroponym, etc. It is tempting to interpret the “words” followed by the number “1” in lines 2-5 as anthroponyms — inter alia because many of them are hapax —, but one cannot exclude that some of them could be appellatives or toponyms. Notice that five of these suggested anthroponyms end in LA > B *...u*, whereas three of them end in LA > B *...a-re* (there are reasons to think that LA > B *-re* could be a characteristic final of anthroponyms in Linear A).

The situation is less favourable in the Linear A *votive texts*. Here, we have clearly complex sentences, using elaborated syntactic variations. But for the present time, we can but make conjectures about the meaning of the lexemes and the function of the morphemes used. Here are two examples of votive texts<sup>42</sup> (the restitutions are made after parallel inscriptions):

**PK Z 11:** Palaekastro (Crete); serpentine “libation table”; exact date unknown.

**LA**

- a. [52-] 74-100a-88:75a-44, 52-51-103-92-92 93-
- b. 34-54, 56a-92-23, 52-45:52-61 52-
- c. 31-31-53-84a, 97-26-55-29-26-78
- d. 100a-56a-26-76-26[ ] 57-55-[.] , 100a-26-32:02-72

<sup>42</sup>After Raison — Pope, 1994.

**LA > B**

- a. [a-] *ta-i-88-wa-e* , *a-di-ki-te-te du-*
- b. *pu<sub>2</sub>-re* , *pi-te-za* , *a-ko-a-ne a-*
- c. *sa-sa-ra-me* , *u-na-ru-ka-na-ti*
- d. *i-pi-na-mi-na[ ] si-ru[.]* , *i-na-ja-pa-ri*

**TL Z 1:** Troullos (Crete); marble “ladle”; between ± -1700 and ± -1600 (MM III)?

**LA**

- a. *52-74-100a-88-75a-32* , *80-59-62-54*
- b. , *32-31-31-53-84a 97-26-29-26-57*
- c. [ *100a-56a-26-95* , *57-55-92 vacat*

**LA > B**

- a. *a-ta-i-88-wa-ja* , *o-su-qa-re*
- b. , *ja-sa-sa-ra-me u-na-ka-na-si*
- c. [ *i-pi-na-ma* , *si-ru-te vacat*

All the votive texts are not as difficult, however. Three of them — a steatite “ladle”; a golden and a silver double axe — exhibit what seems very probably the name of a female deity (LA > B [-] *da-ma-te*), optionally preceded by an element LA > B *i-*. LA > B *i-* could be a syntactic marker — case mark (“dative”; “genitive”) or preposition —, or, who knows, an article (if the Linear A tongue used it)<sup>43</sup>.

**3.2.2.** The interpretation of the texts of the *four other corpora* is even more problematic than Linear A.

The only *Eteocretan* “word” whose meaning could be reasonably secured is a sequence ...φραισο..., found in Praesos and which seems to be the Eteocretan name of the city of Πραισός.

The examples hereafter will show how quickly associations or interpretations may become uncertain. They are taken from the “*hieroglyphic*” corpus.

We have seen above a typical alternance between “suffix” zero and “suffix” H > LB *-re* (§2.1.2.2). A possible supplementary example could be provided by the following group:

<sup>43</sup>Duhoux 1994-1995 [1997].

H	<i>047-070</i> (Malia # 286: seal — direction of writing unclear) <sup>44</sup> <i>047-070-031</i> (Knossos # 058b: accounting bar)
H > LB	<i>047-ro</i> (direction of writing unclear) <i>047-ro-re</i>

It is truly tempting to think that H > LB *047-ro*, granted it should be read rightwards, could have the same function as the zero “suffixed” forms H > LB *ja-010* and *036-ru*. This is because H > LB *047-ro* is associated with H > LB *ja-010* in the seal Malia # 286 (the direction of the writing of this last “word” being rightwards). However it is by no way sure that H > LB *047-ro-re* has the same “radical” as H > LB *047-ro*: notice the difference of stuff the two forms are inscribed upon; and add the absence of any association of both sequences with a common “word” or “radical”. So this grouping of two forms could perfectly be an illusion...

Another example of a possible illusion is provided by sequences customarily supposed to be the “hieroglyphic” forms of one of the most characteristic Linear A “word”, LA > B *a-sa-ra-me* and its variants (see §2.2.2.2 and here above):

H	<i>042-019-019-095-052</i> (Arkhanes # 202.α-β, 251.β-α, 252.β-α, 315.I-H; Crete # 205.α1-2; Gouves # 292.α-γ; Knossos # 203.α-β; Moni Odigitria # 313.α-β: seals) <i>042-019-019-095</i> (Knossos # 179.1-2: sealing)
H > LB	<i>a-sa-sa-095-ne</i> <i>a-sa-sa-095</i> ]

Actually, this equation is by no way sure. *First*, sign H 095 cannot be equated with LA > B *ra*: the forms of both syllabograms quite clearly diverge. *Second*, the final “hieroglyphic” syllabogram of the intact form is H > LB *-ne*, whereas Linear A has LA > B *-me* or *-ma-na*. *Third*, the “hieroglyphic” sequence is actually always split in two parts. This happens in two different ways. One has H > LB + *a-* + and *-sa-sa-*

<sup>44</sup>H ...-047-070... is also found in the sequence of 14 continuous syllabograms of the seal Crete # 294 β.

095-*ne*<sup>45</sup>, on the one hand. On the other hand, one reads H > LB *a-sa-l* and *-sa-095*<sup>46</sup>, and even (once) H > LB *a-sa-* separated from H > LB *-095-ne* by one of the seal's side<sup>47</sup>: these two last texts follow the way the sequence is split in all its other examples, with H > LB *a-sa-* written separately from H > LB *-sa-095-ne*<sup>48</sup>. These splittings never appear in Linear A. *Fourth*, Linear A offers a typical alternance LA > B *a- ~ ja-* at the beginning of the "word". This feature is totally unknown in "hieroglyphic".

Should the comparison prove nevertheless correct, it would point to quite different forms of the supposed same "word". This could be explained either by a loan (independently made by both "hieroglyphic" and Linear A to a common source, or directly from one of them to the other one), or by a rather loose linguistic kinship between these two pre-Hellenic corpora.

A further example will provide a possible candidate for the word expressing the "total" in "hieroglyphic". The form H 056-070-070 (= H > LB 056-*ro-ro*) appears at the bottom of the broken clay bar Knossos # 061. As in the three other Knossian bars with an inscribed bottom, this part of the document is clearly intended to add an information to its main faces — the best example is # 056, where the text of the bottom (face e) begins at the end of face b. This addition is every time a "word" followed by a number. Now, in the three other bars, this number is always inferior to most of the preceding ones. Compare, in # 053, "22" to "170, 160, 110[, 170["; in # 054, "60" to "110, 170, 160, 150, 50, 450"; in # 056, "83" to "483, 46, 800, 85, 540, 44, 800". Actually, the bar # 061 is different: the number on its bottom is *much higher* than every of the preceding ones. Compare "12" to "1, 1, 1, 1, [ ], 1, 1, 1". So, I get the impression that, in # 053, 054, 056, the bottom text is just a rubric like the preceding ones, whereas in # 061, it could be something else, and introduce the total of the preceding rubrics. *Twelve* could actually be a nice total for this bar, whose

<sup>45</sup>Crete # 205: with a diacritical cross (+) before and after the first syllabogram.

<sup>46</sup>Knossos # 179: with a diacritical line (l) after the two first syllabograms.

<sup>47</sup>Gouves # 292.α-γ.

<sup>48</sup>The sequence H 042-019, H > LB *a-sa*, written on four sealings (Knossos # 134; Samothrace # 135, 136, 137), is seemingly just the beginning of this "word".

preserved rubrics totalize “7”. If the lost number in face c was “1”, like everywhere else on the bar (its structure should then be similar to the Linear A tablet HT 117a.1-6 quoted above), one would need only four rubrics lost with each time the number “1” in the lacunae to get a total of “12”. This possibility cannot be excluded at all, but we are of course unable to check it. Moreover, H > LB 056-ro-ro is hitherto a hapax. So, this form could well be the “hieroglyphic” name for the “total”, but one should wait for further confirmation for this tentative meaning.

In the Knossian clay bar # 056, one is tempted to understand the “word” H 044-049 (no Linear B corresponding signs) as the “hieroglyphic” name for the “deficit”. This text has several times the following sequence: a “word” plus a rather high number (“483, 800, 540, 800”); then, H 044-049 followed by a smaller number (“46, 85, 44, 83”). This remembers the structure of a Linear B text like KN V 145 (scribe “124”), with, after a first number, the abbreviation LB *o*, which stands for LB *o-pe-ro*, ὀφελος, “debt”, followed by the number of lacking items. For a Linear A example with LA > B *ki-ro* seeming to have the same function and meaning as LB *o-pe-ro*, see HT 123a (Duhoux 1989, 79). All this sounds rather good. But H 044-049 is used in some other accounting texts with a seemingly different function; moreover, it is mainly used in seals and sealings, sometimes absolutely, as though it were an anthroponym. So, we are left with two possibilities: a) H 044-049 could express two different “words” (this is quite possible with a script involving some graphic ambiguity: §2.1.2.1), one of them meaning “deficit” in the bar # 056; b) H 044-049 notes only one “word” and my interpretation must be wrong.

### 3.3. Identification of the language(s) used

#### 3.3.1. One or several languages?

Do our five Cretan pre-Hellenic corpora represent just one language, written in five different ways, or several ones? Many would-be decipherers choose a unique tongue. This hypothesis is surely not necessarily absurd, because several corpora exhibit apparently morphological similarities. So, the Linear A’s and the Phaistos disk’s languages seem both to be highly “prefixing” (§2.2.2.2, 2.3.2.2). Similarly, the “hieroglyphic” script, Linear A and the Phaistos disk very frequently use



reduplicated signs (§2.1.2.2, 2.2.2.2, 2.3.2.2).

One should however not forget that, *first*, granted two corpora could use one sole language, this does not imply the same for the three others... *Second*, even if two or three pre-Hellenic corpora had morphological similarities, this could theoretically be caused by a purely typological kinship. *Third*, even if one oversees as mythical the Homeric tradition of Cretan polyglottism<sup>49</sup>, it would be fair to admit that the existence of no less than four pre-Hellenic Cretan graphic systems in the Bronze Age speaks in favour of, rather than against, the hypothesis of a Minoan linguistic diversity. Otherwise, one would have to imagine a concurrence between several scripts intended to write the same tongue. Whereas this could perfectly be advocated for two different writings, it seems hard for as much as four of them — especially since they have a very restricted number of syllabograms in common. Notice moreover that “hieroglyphic” and Linear A are sometimes attested in identical places. This cannot be possible without a functional reason, which could hardly be something else than linguistic difference, since these scripts are used on similar materials and for similar purposes — although there are up to now almost no seals inscribed in Linear A. *Fourth*, there are striking differences in the number of syllabograms the Mackay’s 1965 formula supposes for the pre-alphabetic Cretan scripts:  $\pm 55$  (Phaistos disk)  $\sim \pm 102-110$  (Linear A) — for “hieroglyphic”, the count is not available, but the actual number of different signs is about one hundred; for the Arkalokhori axe, the number must probably be greater than *c.* 30. These structural differences could well (but, I admit, must not necessarily) be explained as the result of an attempt to adapt writing to various different languages. *Fifth*, the non Greek theonyms listed in the Linear B Knossos tablets seem totally unknown in Linear A<sup>50</sup>. *Sixth*, the pre-Hellenic Cretan toponyms are distributed in a way which suggests several different linguistic areas<sup>51</sup>. *Seventh*, notice that, up to now, western Crete has no single example of “hieroglyphic”, whereas, during the first millennium, the same is true for Eteocretan. The mapping of these two corpora is to be compared with Linear A, used throughout the whole island. One gets the impression that the language(s) of Eteocretan and

<sup>49</sup>Duhoux 1982, 14-15, 218-219.

<sup>50</sup>Duhoux 1989-1990.

<sup>51</sup>Dorsi 1976-1977.

“hieroglyphic” could have a more restricted use than Linear A. And this difference would be fairly well explained by linguistic diversity. *Eighth*, if I am right interpreting the “hieroglyphic” “suffix” H > LB *-re* as a morpheme added to zero “suffixed” likely anthroponyms (§2.1.2.2), this should be compared with the Linear A situation. There, we have likely anthroponyms whose apparently zero “suffixed” forms end in LA > B *-re* (§3.2.1). The same ending H > LB *-re* and LA > B *-re* could thus be, in the same kind of “words”, a “suffix” in “hieroglyphic”, but the end of an apparently zero “suffixed” form in Linear A<sup>32</sup>. Moreover, if “hieroglyphic” H > LB 056-ro-ro had the same meaning as Linear A LA > B *ku-ro*, which surely means “total” (§3.2.1), one would have a further example of difference between both corpora — but remember that the “hieroglyphic” form’s meaning is by no way sure.

For all these reasons, I think it is probable that our five pre-Hellenic Cretan corpora might well conceal more than one tongue.

Nevertheless, I am not prepared to accept, as some people suppose for Linear A and “hieroglyphic”, that everyone of these scripts could have been used to write two pre-Hellenic languages. This seems to me excluded for Linear A; as what concerns the Cretan “hieroglyphic” script, it looks like a gratuitous hypothesis.

By the way, the almost universal use of the term “Minoan” to characterise the pre-Hellenic civilisation of Crete could be misleading when applied to the linguistic situation of the island. To suppose that “Minoan” implies only one linguistic community could be as wrong as to do the same for “Cretan” in the first millennium B.C.: in this last case, we do know that (leaving aside a late comer as Latin), Cretan people used at least two different languages: Greek and Eteocretan. And the inscriptions found make it sure that the Greek language spoken in Crete in this period was by no way uniform: there were at least two different Greek dialects used in the island (Doric, of course, but also a form of Arcadian). Actually, “Minoan”, when applied to a linguistic situation, should be used as a synonym for “pre-Hellenic Cretan” and possibly imply several different

<sup>32</sup>There is no proof of the existence of a “suffix” LA > B *-re* in Linear A. Its corpus has just two pairs of “words” with a possible use of a “sufficing” LA > B *-re* (LA > B *a-ta* ~ *a-ta-re*; *pa-ja* ~ *pa-ja-re*). However, none of them can be neither proved nor even suspected to involve truly identical “words”.

languages.

### 3.3.2. Looking for possible cognate language(s)

**3.3.2.1.** *A priori*, every language of the ancient Mediterranean could be considered as a possible parent to (or even as being identical with) each of the five Cretan pre-Hellenic corpora's tongue. This large variety of idioms includes of course all the Indo-European and Semitic tongues, but also those of every other linguistic family...<sup>53</sup>.

This is not all. Another possibility exists, which cannot be ruled out: the Cretan pre-Hellenic language(s) could remain isolated, i.e. could *not* be recognised as parent to any known idiom.

**3.3.2.2.** Things could perhaps become easier if we knew where Cretan people living in Minoan times came from. Their most ancient component, as far as we know, is found in the island at the beginning of the Neolithic, *c.* -6875 (§1). This stock provides an excellent candidate for one or several pre-Hellenic language(s). Its archaeological characteristics seem "appropriate to new colonists"<sup>54</sup>, and for its origin, "western Anatolia seems a reasonable possibility"<sup>55</sup>, although "the Aegean sites have other features which are hard to parallel in the Near East"<sup>56</sup>.

Wherever these people came from, what kind of language did they speak?

For many scholars, their early date seems to speak against an Indo-European or Semitic linguistic kinship. See, more precisely, hereunder my arguments against an Indo-European Çatal Hüyük in western Anatolia *c.* -6500 (§3.3.2.3). Needless to say, the first proto-Indo-European and proto-Semitic speakers did not emerge from a linguistic vacuum. Their ancestors must have spoken something we could conventionally label pre-proto-Indo-European or pre-proto-Semitic. But even granted there should be a continuous evolution from pre-proto- to

<sup>53</sup>For a survey of the ancient languages used in the area during the Neolithic and the Bronze Age, linked with archaeological data and integrated in a tentative cultural reconstruction, see Mellaart 1973, 163-172.

<sup>54</sup>Dickinson 1994, 31.

<sup>55</sup>Dickinson 1994, 32.

<sup>56</sup>Dickinson 1994, *ibid.*

proto-languages, I think it necessary to put conventional limits, and to posit that pre-proto- is definitely not proto-. This/these Neolithic Cretan tongue(s) should thus be considered neither as Indo-European nor as Semitic, but added to pre-Indo-European or pre-Semitic languages like (surely) Sumerian, (maybe) Hattic, etc.

Not everybody agrees with this view, however, and some scholars are prepared to accept *c.* -7000 as a date of a (first?) dispersal of proto-Indo-European towards Crete (see §3.3.2.3).

**3.3.2.3.** This is only the beginning of the story, because archaeologists generally admit the possibility of new people moving to Crete between the end of the Neolithic and the beginning of the Bronze Age<sup>57</sup>. Where did these newcomers come from? This is rather difficult to assess. Several possibilities no doubt exist, but one of them could be Anatolia, since several artefacts found in Crete seem consistent with the possibility of this eastern origin<sup>58</sup>.

Now, there could be a strong cultural link between Minoan Crete and a very old Anatolian civilisation. The excavations initiated by James Mellaart at Çatal Hüyük, in central Turkey, have unearthed a Neolithic site which is exceptionally interesting for Minoan Crete<sup>59</sup>. It is an impressive urban agglomeration with no less than forty temples during its whole lifespan. Its evolution may be traced from  $\pm$  -6500 to  $\pm$  -5650.

One of the most striking characteristics of Neolithic Çatal Hüyük is a cult of the bull (apparently honoured as a fertility symbol). This cult uses *inter alia* bull's horns. Several representations of an anthropomorphic goddess giving birth to a bull's head were also found. All this reminds clearly some precise Cretan Minoan parallels: the Greek myth tells that the daughter of Helios, Pasiphaë, would have married king Minos. She would have had sexual intercourse with a bull sent to Minos by Poseidon and would have given birth to the "Minotaurus", half-man, half-bull. Now, the Minoan cult places exhibit a large

<sup>57</sup>See for instance Treuil 1989, 197, embarrassed, but nevertheless forced to admit this possibility. For more details, see Hood 1990.

<sup>58</sup>See especially Warren 1974. Hood 1990, 374-375, while admitting the possibility of an Anatolian origin, thinks "it is not possible to suggest a specific area from which settlers might have come to Crete at the beginning of the Early Bronze Age".

<sup>59</sup>Mellaart 1967.

number of "horns of consecration", which are actually bull's horns. Moreover, the bull was very important in the Minoan civilisation: see for instance the "bucrania", ritual vases having the form of a bull's head; the famous bull-games, where an acrobat "ran towards a charging bull, seized the horns near their tips, turned a full somersault over its head and was then projected over the back of the animal to the ground behind to be caught by another performer"<sup>60</sup>; etc.

These parallels between Crete and Anatolia are embarrassing. They seem too precise to be dismissed as a mere coincidence, but Çatal Hüyük's date sounds too old, compared with *c.* -3375, when Minoan civilisation begins its individualisation (§1). If there is a link between both cultures, when and how could an offspring of the Neolithic people of Çatal Hüyük have reached Crete? This is a question impossible to answer.

Let us, then, move on a purely hypothetical level and imagine that some people left Çatal Hüyük before or just after its end (*c.* -5650) for some other Anatolian places, and finally settled in Crete about -3375. Let us further conjecture this group of Anatolian emigrants still spoke, at this time, a form of language — or language(s): the plural cannot be excluded at all<sup>61</sup> — inherited from their presumed ancestors of *c.* -6500 onwards. There should have been at least some linguistic interaction or even blend between these newcomers and the old Cretan stock. And, one could suppose further, this could be the basic way at least one Cretan pre-Hellenic language could have emerged.

The question then arises: what tongue(s) was/were spoken by the people of Çatal Hüyük? As far as I know, two theories compete, supposing either Indo-European or non Indo-European. The Indo-European hypothesis has been advocated *inter alia* by Gamkrelidze-Ivanov 1995. They suppose that "the Çatal Hüyük culture could be traced to an ancient stratum of

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<sup>60</sup>Davaras 1976, 32.

<sup>61</sup>It is clear that ethnicity has no necessary link with language, but one should, at least, be aware that Çatal Hüyük's population could have been heterogeneous. Sure data are lacking, as far as I know, and we are left with the results of (true, beginning now to be obsolete) physical anthropology, which distinguishes three major distinct ethnic groups in Çatal Hüyük (see Burney 1990, 48).

the Indo-Europeans who migrated toward the east"<sup>62</sup>, granted that one may "date the period when Proto-Indo-European existed as a linguistic system to no later than the fifth to fourth millennia B.C., the date that must be given to the beginning of the Proto-Indo-European dialect dispersal" (Gamkrelidze-Ivanov 1995, I, 762). The non Indo-European theory has been presented by J. Mellaart<sup>63</sup>. He thinks an Indo-European language should be excluded in Çatal Hüyük, because the beginnings of the city go back to the middle of the -VII<sup>th</sup> millennium, whereas, he supposes, the Anatolian Indo-Europeans would have entered their new territories only after  $\pm$  2900 B.C. — more precisely, around  $\pm$  -2700 —  $\pm$  -2550 and  $\pm$  -2150 —  $\pm$  -2040<sup>64</sup>.

Who is right? I would like to begin by pointing to a major difficulty in Gamkrelidze-Ivanov's theory. There is a contradiction in their chronology. They locate the beginning of the proto-Indo-European dispersal in the -IV<sup>th</sup> millennium. At the same time, they suppose that the people of Çatal Hüyük spoke an Indo-European tongue *and migrated from their original homeplace to their western Anatolian location*. But these two hypotheses cannot coexist, since the Çatal Hüyük culture was already constituted *c.* -6500... This contradiction does however not totally exclude the theory of an Indo-European Çatal Hüyük. Colin Renfrew has proposed a variant theory<sup>65</sup>: Çatal Hüyük's people could be part of the original Indo-European nucleus, which could have existed *c.* -7000. So, its early date would no more be a problem.

How, then, can we choose between these two scenarios? I would like to look at our problem using a slightly different point of view, cultural diachronic typology. Its advantage is to be basically factual, instead of using a highly speculative

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<sup>62</sup>Gamkrelidze-Ivanov 1995, I, 787-788 (*sic*). I have a problem with this eastwards direction. Gamkrelidze-Ivanov clearly locate the supposed original Indo-European homeplace much more to the east than Çatal Hüyük, "within *eastern* Anatolia [my italics], the southern Caucasus, and northern Mesopotamia" (Gamkrelidze-Ivanov 1995, I, 791; see also I, 859 and their map I, 850-851; actually, Çatal Hüyük is located at the longitude of Cyprus, in *western* Anatolia). So, I cannot see how some supposed Indo-European people could have reached Çatal Hüyük through an *eastwards* migration. There must be a mistake: read "toward the west"?

<sup>63</sup>Mellaart 1975, 281-282.

<sup>64</sup>Mellaart 1981, 135-149.

<sup>65</sup>Renfrew 1987, 206-208 (reference taken from the French edition).

concept like the Indo-European character of archaeological artefacts. We do know a major characteristic of Çatal Hüyük: it is a true city<sup>66</sup>, extending itself on about fifteen hectares, with plenty of private houses and public buildings. Its economy included extensive agriculture, stock breeding, hunting. Commerce played a major role, with traffic of obsidian, silex, shells, etc. Could these people have spoken an Indo-European language? Why not, could one be tempted to answer. But if so, one should then admit that an Indo-European Çatal Hüyük would be astonishingly precocious compared with every other ancient Indo-European confidently identified group. In all these groups, with no single exception, the rhythm of the social evolution is much slower, and one has to wait *more than four millennia after -6500* until, only in some cases, such an elaborated society as Çatal Hüyük emerges. Thus, the typology of all the ancient Indo-European societies known almost forbids us to accept such an advanced stage at so an early date. It seems then much easier to me to suppose Çatal Hüyük was part of a different, non Indo-European, culture — see the Sumerian parallel, with a civilisation able to create a true script in the -IV<sup>th</sup> millennium<sup>67</sup> (just the period when Gamkrelidze-Ivanov locate the Indo-European dialect dispersal...). So, my conclusion is that Mellaart could be right, and that Çatal Hüyük's language could probably not be Indo-European. Had it/they some linguistic connection with any other tongue(s) — for instance in the Semitic family? This is matter of speculation<sup>68</sup>, which will perhaps be answered when at least one of the pre-Hellenic languages of Crete will have been satisfactorily understood...

**3.3.2.4.** Quite clearly, what has been discussed here about the language(s) of Çatal Hüyük is highly hypothetical. The same must be admitted for the Anatolian origin of new Cretan settlers in the beginning of the Bronze Age (§3.3.2.3). Let us nevertheless suppose all this is granted. And let us further admit the existence of (an)other possible pre-Hellenic language(s), going back to the Neolithic period and which should, we will imagine, probably be neither Indo-European

<sup>66</sup>For a definition of a "city", see Mellaart 1975, 278.

<sup>67</sup>Needless to say, I do not advocate here for (nor against...) a Sumerian speaking Çatal Hüyük...

<sup>68</sup>Gamkrelidze-Ivanov 1995, I, 777 consider that "Proto-Semitic dates to no later than the fourth millennium B.C."

nor Semitic (§3.3.2.2). Even so, I cannot see how one could exclude Indo-European or Semitic from the list of the possible pre-Hellenic Cretan languages. Because nobody can be *sure* that some Indo-European or Semitic speaking groups did not settle in Crete during the -IV<sup>th</sup> or -III<sup>th</sup> millennia. If Indo-European, it could be reasonable, for geographic reasons at least, to begin the search with the Anatolian family (Hittite, Luvian, Palaic, Lycian, and seemingly Carian).

**3.3.2.5.** So, I feel it very natural and perfectly respectable that most of the would-be decipherers regularly tried to elucidate the pre-Hellenic Cretan corpora using Indo-European as well as Semitic (to be fair, some of them refer to languages outside these families). Thus, we have an impressive number of propositions of linguistic identifications, either for the whole group of the five Cretan corpora, or for some or several of them. Here is, alphabetically ordered, a list of the tongues I know to have been used in these attempts: Basque, Carian, Chinese (!), ancient Egyptian, Finnish, Georgian, Greek, Hattic, Hittite, Hurrian, Indo-European, Luvian, Lycian, Phrygian, Sanskrit, Semitic, Slavic, Sumerian, Venetic, etc.<sup>69</sup>. Notice that the same language may sometimes be used with totally different results...

Most of these trials are presented by authors who are totally convinced they have really found the only right solution. Unfortunately, none of them succeeded in getting the approval neither of his fellows would-be decipherers, nor of the scholarly world. I regret to say this is caused by a series of often big methodological flaws. I limit myself to a few examples. Common sense suggests the following translation of a Linear A text should be treated with extreme reluctance (even granted there is a question mark): "Young sucklings, when falling in sleep (?), become extremely tired"<sup>70</sup>. And what about this "hieroglyphic" clay bar whose text is supposed to say: "This impression, a seal, a sealing, I seal, impress, impress, stamp, strike, impress, impress, a seal, I strike, [impress]"<sup>71</sup>? A very common defect consists in selecting just a small part of the

<sup>69</sup>For recent bibliographical details, see the *indogermanische Chronik* of *Die Sprache*; *l'Année philologique*; the *Bibliographie linguistique*.

<sup>70</sup>"Les jeunes nourrissons en s'endormant (?) se fatiguent beaucoup": Arnold 1982, 78.

<sup>71</sup>Davis 1970, 142-145 (translation of the seal Crete # 294).



examined corpus: for instance, one will explain a list of Linear A words; several morphemes; and even some syntagms. But one will be unable to understand and to explain in a satisfactory way complete votive sentences like those quoted above (§3.2.1). The archaeological context of the inscriptions is too often neglected — the result being that for instance a presumably official Eteocretan inscription may be taken as a funeral text. I pick a more limited example. The Semitic hypothesis admirably explains one of the two only Linear A “words” whose meaning is absolutely sure, LA > B *ku-ro*, “total”. Indeed, this term is extraordinarily similar to the Semitic word *kl*, which precisely means “total”<sup>72</sup>. This is really wonderful. But this same Semitic hypothesis proves unable to satisfactorily analyse LA > B *po-to-ku-ro*, meaning “grand total”. This is unfortunate<sup>73</sup>, and shows how quickly an interpretation may reveal its limits. I submit a last example, not yet proposed as far as I know, in the hope to avoid another further premature linguistic identification. We have seen that, in the “hieroglyphic” texts, a “suffix” H > LB *-re* could likely be a derivational mark, able to mean “filiation” (§2.1.2.2). Now, it is striking that Etruscan (both Italian and Lemnian) knows a morpheme *-le*, functioning as genitive mark as well as possessive suffix, and able to form patronymics<sup>74</sup>. It would obviously be foolish to speak about the Etruscan character of the “hieroglyphic” language on the basis of this sole isogloss<sup>75</sup>.

Needless to say, the failing of the hitherto proposed linguistic identifications does not exclude that some of the five Cretan pre-Hellenic corpora could conceal one of the languages considered up to now. Remember Linear B, which was several times unsuccessfully presented as deciphered and as writing Greek, and which Michael Ventris nevertheless proved to be Greek — but a quite different one than those of the previous would-be decipherers...

<sup>72</sup>The transliteration by LA > B *ro* could support /l/ as well as /r/: the two liquids (plus, of course, a vowel) are noted by a unique series in Linear B. It seems reasonable to presume the same could happen in Linear A.

<sup>73</sup>But if one wants to keep the relationship between LA > B *ku-ro* and Semitic *kl*, one could perhaps suppose the Linear A “word” would be a loan from a Semitic language.

<sup>74</sup>See Pfiffig 1969, 88-90. The transliteration by H > LB *-re* could likely support /l/ as well as /r/: see note 72.

<sup>75</sup>Needless to say, I do not exclude at all a possible relationship between both languages...

#### 4. Future perspectives

There are three main goals to pursue: read every of the pre-Hellenic corpora; interpret their texts; identify their language. One of the corpora seems less unpromising than the other ones: it is Linear A. This happens because Linear A has the less smallest amount of texts of all, and because *c.* three quarters of its known syllabograms may be tentatively read using the phonetic values of their Linear B counterparts. Regularly, thanks to the untiring work of the archaeologists, new Linear A texts are unearthed. One may hope they will, some day, constitute the critical mass allowing to better understand the vocabulary, the morphology and the syntax of these documents. The identification of the Linear A language could perhaps follow then, except if it has no perceptible resemblance to any other tongue. In this last case, further progress would naturally be very slow, since we would rely only on internal clues. In my opinion, Linear A could be cognate to any linguistic family of the Ancient Mediterranean, including of course Indo-European (where the Anatolian family could be the best first choice) and Semitic, but also every other one.

Whatever may be, the touch-stone of a future successful elucidation of any of the five pre-Hellenic Cretan corpora is to respect several basic methodological rules. I write here, slightly adapted, the list I gave some years ago for Linear A<sup>76</sup> (one should remember these rules are *necessary*, but, alas, not *sufficient* conditions...):

- 1) Use correctly edited texts.
- 2) Recognise the syllabic and the ideographic parts of the scripts considered.
- 3) Give a sound methodological justification of the phonetic readings.
- 4) Give a set of precisely defined orthographic rules.
- 5) Reconstruct the morphological system of the language considered.
- 6) Reconstruct the phonological system of the language considered.
- 7) Reconstruct the syntactic patterns of the language considered.
- 8) Explain the major part of the lexicon considered.
- 9) Completely interpret the highest possible number of

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<sup>76</sup>Duhoux 1983, 95-98.

- documents (and especially the syntactically most complex ones).
- 10) Get the highest compatibility with elements (words, morphemes) known by indirect tradition and suspected to be pre-Hellenic loans.
  - 11) Constantly respect the principle of economy: highest possible compatibility of the interpretation with the contexts — archaeological (direct and indirect) and historical; regularity of the postulated orthographic and phonetic rules; minimum number of lexical and morphological borrowings; etc.

### Bibliographic abbreviations

- Arnold, Paul  
1982 Le mystère basque dévoilé, Monaco: Rocher.
- Boufidis, Nicolaos  
1953-1954 Κρητομυκηναϊκά ἐπιγραφαὶ ἐξ Ἀρκαλοχωρίου,  
Ἀρχαιολογικὴ Ἐφημερίς II:61-71.
- Burney, Charles  
1990 The Indo-European Impact on the Hurrian World. In: When Worlds Collide: Indo-Europeans and Pre-Indo-Europeans (Thomas Markey & John A. C. Greppin ed.), Ann Arbor: Karoma Publishers, 45-49.
- Davaras, Costis  
1976 Guide to Cretan Antiquities, Park Ridge: Noyes Press.
- Davis, Simon  
1970 The Decipherment of the Minoan Linear A and Pictographic Scripts, Johannesburg: Witwatersrand University Press.
- Dickinson, Oliver  
1994 The Aegean Bronze Age, Cambridge: University Press.
- Dorsi, Pierpaolo  
1976-1977 Per una storia della toponomastica cretese antica, *Incontri Linguistici* 3:41-62.
- Duhoux, Yves  
1977a Le disque de Phaestos (archéologie — épigraphie — édition critique — index), preface by Michel Lejeune, Louvain: Peeters.  
1977b La fonction du "trait" oblique sur le disque de Phaestos, *Kadmos* 16:95-96.  
1978 Études minoennes I: le linéaire A (Yves Duhoux, ed.), Louvain: Peeters.  
1980 L'écriture et le texte du disque de Phaestos. In: Πεπραγμένα του

- Δ' Διεθνούς Κρητολογικού Συνεδρίου Α1, Athens: Πανεπιστήμιον Κρήτης, 112-136.
- 1982 L'éteoocrétois. Les textes — la langue, Amsterdam: Gieben.
- 1983 Les langues du linéaire A et du disque de Phaestos, *Minos* 18:33-68.
- 1989 Le linéaire A: problèmes de déchiffrement. In: Problems in Decipherment, 59-119.
- 1989-1990 Théonymes non grecs des séries Fp (1) — Fs de Cnossos et substrat préhellénique crétois, *Onomata* 13:94-97.
- 1992 Variations morphosyntaxiques dans les textes votifs linéaires A, *Cretan Studies* 3:65-88.
- 1994-1995 [1997] LA > B *da-ma-te* = Déméter? Sur la langue du linéaire A, *Minos* 29-30:289-294.
- Evans, Arthur J.  
1909 Scripta Minoa I, Oxford: Clarendon Press.
- Finkelberg, Margalit & Uchitel, Alexander & Ussishkin, David  
1996 A Linear A Inscription from Tel Lachish (LACH ZA 1), *Tel Aviv* 23:195-207.
- Gamkrelidze, Thomas V. & Ivanov, Vjačeslav V.  
1995 Indo-European and the Indo-Europeans, Berlin/New York: Mouton — de Gruyter.
- Godart, Louis  
[1995] Le disque de Phaestos. L'énigme d'une écriture, [no place of edition]: Éditions Itanos.
- Godart, Louis — Olivier, Jean-Pierre  
1976-1985 Recueil des Inscriptions en Linéaire A, Paris: Librairie orientale Paul Geuthner.
- Hood, Sinclair  
1990 Autochtons or Settlers? Evidence for Immigration at the Beginning of the Early Bronze Age in Crete. In: Πεπραγμένα του ΣΤ' Διεθνούς Κρητολογικού Συνεδρίου Α1, Chania: Φιλολογικός Σύλλογος "Ο Χρυσόστομος", 367-375.
- Mackay, Alan  
1965 On the Type-fount of the Phaistos Disc, *Statistical Methods in Linguistics* 4:15-25.
- Mellaart, James  
1967 Çatal Hüyük, a Neolithic Town in Anatolia, London: Thames and Hudson.  
1973 Bronze Age and Earlier Languages of the Near East: an Archaeological View. In: Archaeological Theory and Practice (D. E. Strong, ed.), London: Seminar Press, 163-172.  
1975 The Neolithic of the Near East, London: Thames and Hudson.

- 1981     Anatolia and the Indo-Europeans, *Journal of Indo-European Studies* 9:135-149.
- Meriggi, Piero  
 1973     Das Wort "Kind" in den kretischen Hieroglyphen, *Kadmos* 12:114-133.
- Nahm, Werner  
 1969     Zur Struktur der Sprache des Diskos von Phaistos, *Kadmos* 8:110-119.
- Niemeier, Wolf-Dietrich  
 1996     A Linear A Inscription from Miletus (MIL Zb 1), *Kadmos* 35:87-99.
- Olivier, Jean-Pierre  
 1987     Le redoublement en hiéroglyphique crétois. In: *Εἰλαπινη*, Iraklion: Deme of Iraklion, 423-429.  
 1989     The Possible Methods in Deciphering the Pictographic Cretan Script. In: *Problems in Decipherment*, 39-58.  
 1990     The Relationship Between Inscriptions on Hieroglyphic Seals and Those Written on Archival Documents. In: *Aegean Seals, Sealings and Administration* (Thomas Palaima, ed.), Liège: Université de Liège, 11-19.  
 1995     Les sceaux avec des signes hiéroglyphiques. Que lire? Une question de bon sens. In: *Sceaux Minoens et Mycéniens* (Werner Müller, ed.), Berlin: Mann, 169-181.  
 1996     Les écritures crétoises: sept points à considérer. In: *Atti e memorie del Secondo Congresso Internazionale di Micenologia* (Ernesto De Miro *et alii*, ed.), Rome: Gruppo editoriale internazionale, I, 101-113.
- Olivier, Jean-Pierre — Godart, Louis, with the cooperation of Poursat, Jean-Claude  
 1996     *Corpus Hieroglyphicarum Inscriptionum Cretae*, Paris: De Boccard.
- Packard, David W.  
 1974     *Minoan Linear A*, Berkeley/Los Angeles/London: University of California Press.
- Pfiffig, Ambros J.  
 1969     *Die etruskische Sprache*, Akademische Druck- u. Verlagsanstalt: Graz.
- Pope, Maurice  
 1968     The First Cretan Palace Script. In: *Atti e Memorie del 1° Congresso Internazionale di Micenologia*, Rome: Edizioni dell'Ateneo, I, 438-446.

Problems in Decipherment: Problems in Decipherment (Yves Duhoux *et alii*, ed.), Louvain-la-Neuve: Peeters, 1989.

Prosdocimi, Aldo L.

1978 L'umbro. In: *Popoli e civiltà dell'Italia antica VI*, (Aldo L. Prosdocimi, ed.), Rome: Biblioteca di Storia Patria, 585-788.

1984 Le tavole iguvine I, Florence: Olschki.

Raison, Jacques — Pope, Maurice

1977 Index transnuméré du Linéaire A, Louvain: Peeters.

1994<sup>2</sup> Corpus transnuméré du Linéaire A, Louvain-la-Neuve: Peeters.

Renfrew, Colin

1987 *Archaeology and Language: The Puzzle of Indo-European Origins*, London: Jonathan Cape.

Stephens, Laurence — Justeson, John

1978 Reconstructing "Minoan" Phonology: the Approach from Universals of Language and Universals of Writing Systems, *Transactions of the American Philological Association* 108:271-284.

Treuil, René *et alii*

1989 Les civilisations égéennes du Néolithique et de l'Age du Bronze, Paris: Presses universitaires de France.

Tsipopoulou, Metaxia — Hallager, Erik

1996 Inscriptions with Hieroglyphs and Linear A from Petras, Siteia, *Studi Micenei ed Egeo-Anatolici* 37:7-46.

Van Effenterre, Henri

1989 De l'éteoocrétois à la selle d'agneau, *Bulletin de Correspondance hellénique* 113:447-449.

Ventris, Michael — Chadwick, John

1973<sup>2</sup> Documents in Mycenaean Greek, Cambridge: Cambridge University Press.

Warren, Peter

1974 Crete, 3000 — 1400 B.C.: immigration and the archaeological evidence. In: *Bronze Age Migrations in the Aegean* (R. A. Crossland & Ann Birchall, ed.), Park Ridge: Noyes Press, 41-47.

Younger, John G.

1990 New Observations on Hieroglyphic Seals, *Studi Micenei ed Egeo-Anatolici* 28:85-93.

**Sigla**

H	“Hieroglyphic” signs transnumerated after Olivier — Godart 1996.
H > LB	Phonetic transcription of “hieroglyphic” signs on the basis of their supposed Linear B counterparts.
LA	Linear A signs transnumerated after Raison — Pope 1994.
LA > B	Phonetic transcription of Linear A signs on the basis of their supposed Linear B counterparts.
LB	Linear B.
LM	Late Minoan.
MM	Middle Minoan.