LINEAR B

THE FIRST GREEK SCRIPT – ITS ORIGIN AND DEVELOPMENT

HELENA TOMAS

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Publisher
Filozofski fakultet Sveučilišta u Zagrebu, FF-press

For the publisher
Domagoj Tončinić

Editor of the field
Tomislav Galović

Reviewers
Marina Milićević Bradač
Jelena Marohnić

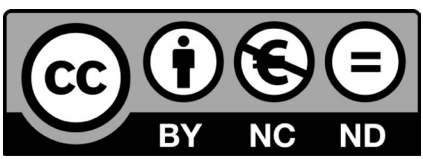
Language editor
Oliver Dickinson

Graphic design and computer typesetting
Marko Maraković

Year of the electronic edition
2023.

https://www.doi.org/10.17234/9789533791104

ISBN
978-953-379-110-4



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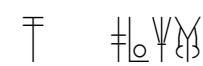
FF press

Zagreb, 2023.

Dedicated to
Tom Palaima


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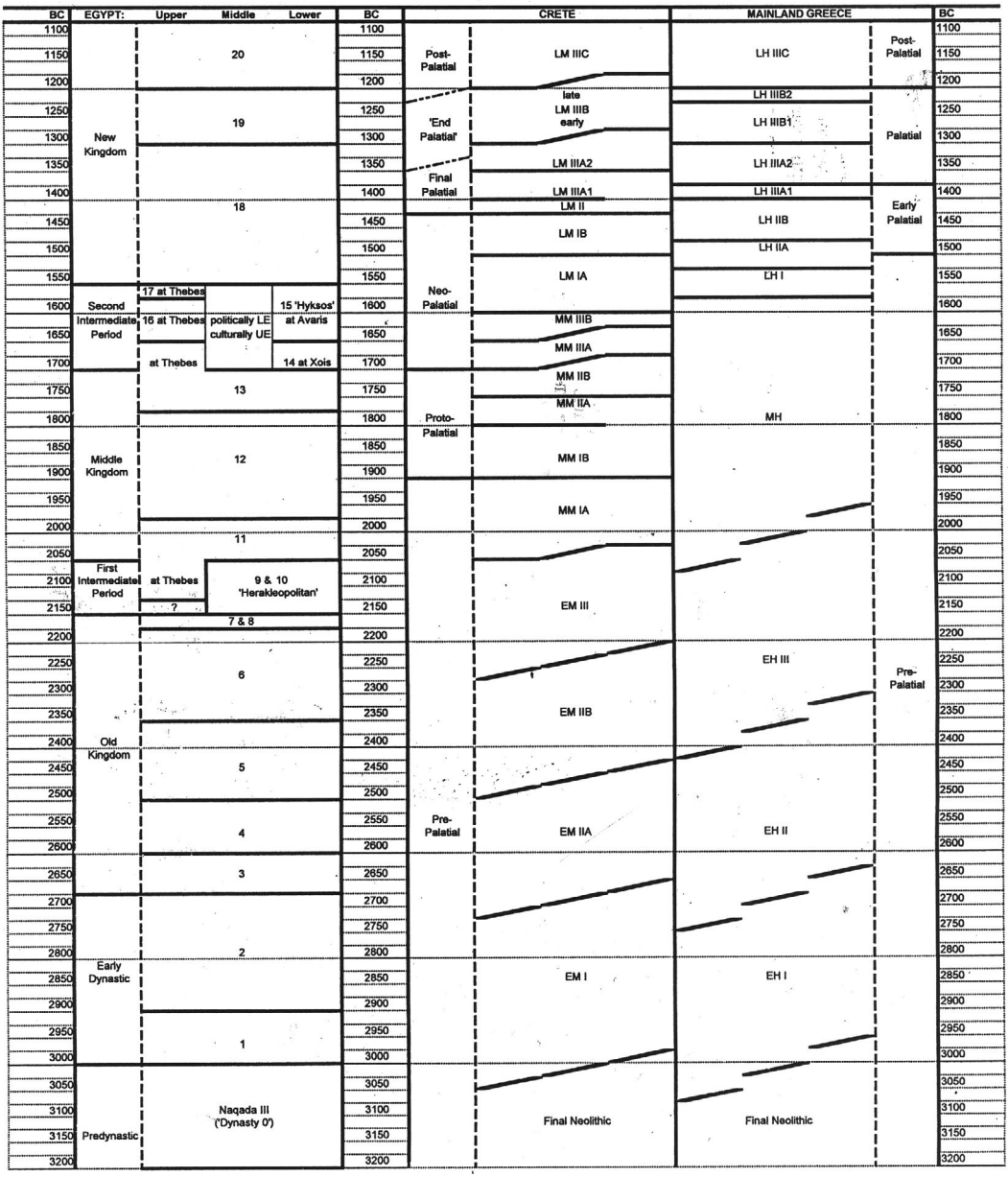

Aegean Bronz Age chronology
Abbreviations: EM (Early Minoan), MM (Middle Minoan), LM (Late Minoan)
EH (Early Helladic), MH (Middle Helladic), LH (Late Helladic)

Helena Tomas with the members of PASP in Austin (Joann Gulizio, Tom Palaima and Garrett Bruner), April 2018.

PREFACE

This booklet has been inspired by research of Tom Palaima, whom I always considered to be be my academic idol in the field of Mycenology, which is why I dedicate this book to him. The book is conceived as a textbook for the class on Mycenaean epigraphy, taken by students of the Department of Archaeolgy, Faculty of Humanities and Social Sciences at the University of Zagreb.

TOM PALAIMA – THE CONNECTOR

In his famous book The Tipping Point Malcolm Gladwell develops an idea that a certain kind of people function as Connectors. These are a specific type of person who has the contacts, knowledge, and social skills to effectively spread an idea far and wide.

According to Malcolm Gladwell, Connectors tend to be connected to many communities, whether through interests and hobbies, jobs that cause them to work with people in other fields, or other experiences. Their strength is in occupying many different worlds and bringing them together. They usually know people across an array of social, cultural, professional, and economic circles, and make a habit of introducing people who work or live in different circles. They are people who link us up with the world... people with a special gift for bringing the world together. It's the connector who really gets the idea moving and helps it expand.

The connector is likely to be well known, for example an educator or a frequent speaker at events. He will be a person who connects with different networks and the people in them. Some people just seem to have a gift for connecting people and ideas. They seem to know people in all sorts of industries, with varying interests, and they're able to 'connect the dots' between people and ideas and bring them together. They are 'Connectors'. The Connector, according to Gladwell, is a person who is able to make connections between what seem to be very different and disparate people and ideas. Connectors are the ones who seem to know everyone, and are always trying to connect people and their ideas. Connectors, according to Gladwell, have an extraordinary talent for making friends and acquaintances. They are then able to use these relationships and grow and connect people to each other.

Some people's personalities are just more inclined toward making connections with people, a skill that can be learned and practised. But the ability to connect ideas is a much tougher one to learn. There seems

to be a subset of people who have the ability to see things in ways others do not, and make connections in their minds that eventually lead to new breakthroughs.

In the field of Mycenology, Michael Ventris can definitely be taken as the first Connector. He set up a system of Worknotes that he used to write and distribute around the world.Thus he literally connected all scholars who were at the time working on deciphering Linear B. It was this collective effort, established by Ventris, that eventually led to the successful decipherment. Thanks to a generous invitation by Tom Palaima in spring 2018, I spent a month at PASP in Austin, as a visiting scholar. While exploring rich PASP archives, I realised that Emmett L. Bennett Jr. was the next Mycenology Connector. Hundreds of letters and notes written to him by Mycenologists are stored at PASP. Even larger is the number of letters and notes written to Tom Palaima. They testify that he was the next Connector in the field of Mycenology. And he still is so.

I entered this field by being introduced to the late Maurice Pope during my first visit to Oxford in 1996. He invited me to his home, where I timidly told him that I was interested in Linear A and B, but knew nothing about those scripts, nor did I know where to start learning about them. His answer was: start by reading everything that Tom Palaima has written. Everything by Tom Palaima was a lot. It took me months, but I made it. Having read it all, I became very keen to meet him in person. Numerous conferences where I met him gave me more and more knowledge on Mycenology, and they taught me that in addition to considering him my academic idol I could also gain his friendship. He was always cheerfully ready to talk about countless topics. I especially treasure the memory of our 2018 drive from the Aegean Conference in Venice to Nürnberg in Germany, where he took me to Bob Dylan's concert. Then we drove to Zagreb, where he was a guest speaker at our Aegean Seminar. The whole trip was about 2000 km. That is a lot of hours of conversation, the result being that our friendship was sealed.

His invitation to spend a month at PASP in Austin was an honour for me.[1] I had the privilege to hold in my hands original notes by Alice Kober

[1] PASP is an acronym for Program in Aegean Scripts and Prehistory – an institute founded by Tom Palaima in 1986 at the Department of Classics, university of Texas at Austin. This institute is a research centre devoted to a study of prehistoric scripts in Greece and Cyprus. PASP at Austin is where I completed the manuscript of this book, whereas I started writing it in 2005 at Carl Blegen Library (University of Cincinnati, Ohio) while holding the Margo Tytus visiting Fellowship. I am grateful to Tom Palaima for granting the PASP fellowship to me in 2018. Also I am grateful to the PASP members Joann Gulizio, Kevin Pluta, Dimitris Nakassis and Garrett Bruner for their assistance during my research at the PASP.

and countless other Mycenological treasures. I filled gaps in my knowledge on historiography of Linear B decipherment and consequently had an opportunity to complete this book on the Origin of Linear B. It is a book inspired precisely by Tom's work on the topic (Palaima 1988a). It was also at PASP that I realised that Tom is the Connector. While at PASP I met several of Tom's graduate students, and was kindly invited to attend their study of RTI images of Linear B tablets from Pylos. Having shared for a month the premises of PASP and having observed his ways of teaching and discussing the Aegean Scripts, I learned why Tom has always been considered such a superb teacher and not only a superb scholar. He has a talent for creating circumstances in which, in a very skilful and spontaneous way, he can lead his students through a complex labyrinth of prehistoric scripts (whether deciphered or still undeciphered) and bring them to a proper, self-confident and independent research path. In addition to all his knowledge and expertise, he has an inspiring and charismatic personality, so sharing a work and research environment with him for a month was a true scholarly joy. For all those reasons Tom's invitation to Austin and an offer of a visiting fellowship was an exceptional privilege for me, and his introduction of me to some of his friends from different scholarly fields has led me to remember M.Gladwell's idea of Connectors.

Figure 1. Map of Crete showing Cretan sites mentioned throughout the book.

1. AN OUTLINE OF THE MAIN PROBLEMS

The question of the origin of Linear B has been discussed since the first discoveries of the script (especially in Palaima(1988a) which inspired me to write this book). Arthur Evans (who discovered the first Linear B tablets in Knossos in 1900) offered early theories on the subject, but his views were subsequently shown to be incorrect, especially after the decipherment of the script. Even though modern scholars are far from having the final say on the topic, we are now sure that Linear B was not an advanced form of Linear A introduced as a result of a dynastic revolution, but still used for the same language, as was proposed by Evans (1909). Due to a lack of knowledge of the language(s) involved, Evans' views were in the first half of the 20th century supported by some other leading scholars in the field of Aegean archaeology. For example,Myres saw the creation of Linear B as a drastic reform of the local Linear A variants in the signary, proposing that the larger number of signs in Linear B did not indicate a different language, but "a more refined distinction between sounds"(Myres in Evans 1952). Pugliese Carratelli (1945) explained the introduction of Linear B as a spelling reform, with the languages of the two scripts remaining the same. The hypothesis that Linear A and B recorded the same language was disproved once Linear B was deciphered. Even before the decipherment Kober 1946; 1948) argued that Linear A and B did not represent the same language, since the inflection patterns obvious in Linear B could not be traced in Linear A.

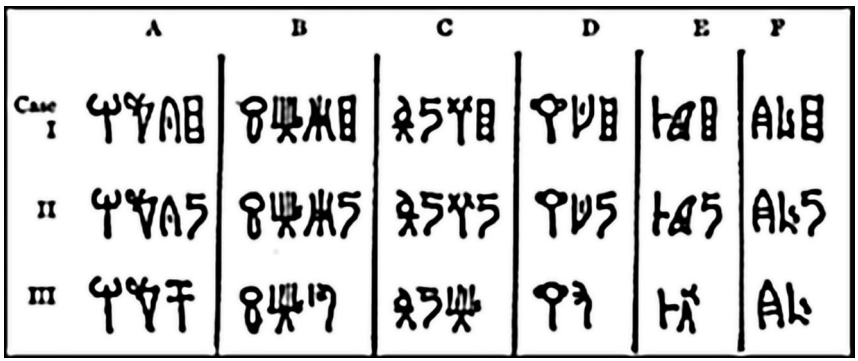

Figure 2. Examples of inflection detected by Alice Kober in Linear B prior to the decipherment of the script. Column B shows the following cases: case I (ko-no-si-ja), case II (ko-no-si-jo), case III(ko-no-so).

Once the decipherment of Linear B demonstrated that the two languages were not identical, the main focus of studies of the creation of Linear B

shifted to other questions, such as the place and period of creation. The decipherment made it obvious that Linear B was adapted from Linear A in order to express a different language, and that this adaptation was connected to intensified contacts between the people from Crete and the Mainland Greek-speakers. However, it remained unclear whether the creation of Linear B was executed by Minoan scribes, or whether it was the work of Mycenaeans acquainted with Linear A. We will see below that the recent studies of this question support the idea of collaboration between the Minoan and Mycenaean scribes in creation of Linear B.

Over the past few decades, the number of studies devoted to the problem has significantly increased, as can be seen from the overview below. Unfortunately, more than a hundred years after its discovery, some aspects of the origin of Linear B are still unresolved. We will see that the majority of scholars have felt that the most pressing questions are where and when Linear B was created, whereas a few have pondered the question of how. Perhaps the question of the process did not provoke as much controversy between scholars due to a general consensus that the Linear B script was an adaptation of Linear A; the details of that procedure seemed less pressing compared with the questions of when and where the adaptation occurred. Palaima (1988a) tried to bridge this gap by giving a detailed analysis of the process of creation: which Linear A signs were abandoned and why, which new signs were introduced and why, etc.

The overview below will show, furthermore, that most contributions to the problem are concerned with the origin of the script itself. However, it is sometimes forgotten that the term Linear B does not only refer to the script, but also to the administrative system for which the script was used. Once these two components are distinguished, resolving the origin of Linear B becomes a more demanding task and may reveal another source along with the traditionally acknowledged Linear A. Despite Evans' misinterpretation of the relationship between Linear A and B, one of his ideas on the origin of Linear B may still have some merit – the influence of Cretan Hieroglyphic, an issue which is more thoroughly considered throughout this book.

2. AN OVERVIEW OF THEORIES ON THE ORIGIN OF LINEAR B

2.1. WHY WAS LINEAR B CREATED?

This is probably the least debatable question concerning the origin of Linear B, so only a brief overview is provided. Most scholars believe that Linear B was introduced for the purpose of facilitating economic transac-

tions of developing Mycenaean centres. Pope (1961 – 1962) argued that keeping the palace accounts was the only purpose of Linear B – when that purpose vanished with the destruction of the palaces, there was no longer a reason for the existence of the script. Hooker (1979), on the other hand, suggests that the script could also have been created for writing of continuous texts, perhaps those of a literary character, but for now there is absolutely no evidence in favour of this option.

Quite a different view was more recently expressed by Driessen and Schoep (Driessen & Schep 1999) who thought that the creation of Linear B was one of the means of imposing political domination over Crete and of enhancing social stratification. Linear B was thus employed as a mechanism of control by the political elite.

2.2. WHERE WAS LINEAR B CREATED?

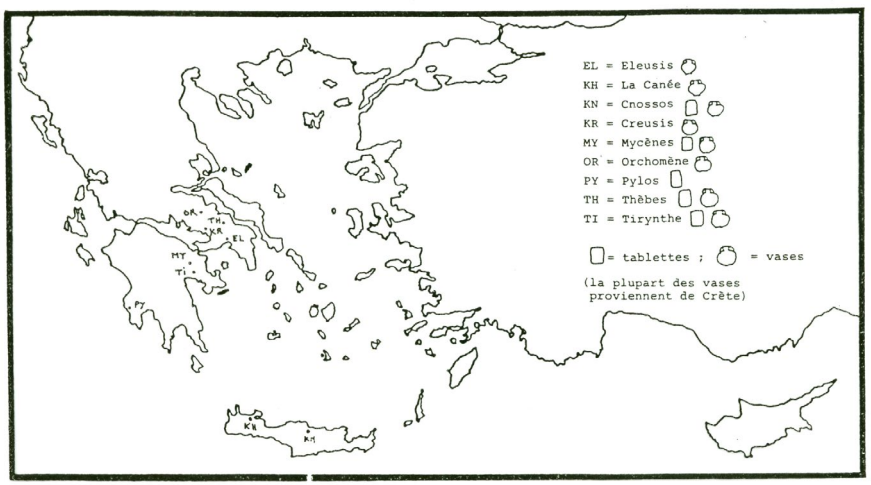

Figure 3. Sites on the island of Crete and on the Greek Mainland where Linear B inscriptions have been discovered.

The opinions here are divided into two main groups: those who believe that Linear B originated on Crete, and those who favour the Greek Mainland. A third candidate, the Cyclades, has also been proposed.

By assuming that Linear B was an advanced form of Linear A, Evans (1909) naturally concluded that the script originated on Crete. Nothing was obviously wrong with this idea at the time when Evans was writing, since Linear B documents on the Mainland were not known until their dis-

covery at Pylos in 1939 (Bennett 1955; Blegen & Rawson 1966). The first Linear B documents from Mycenae came to light in 1950 and 1952 (Bennett 1958, 1985) , followed by Thebes in 1964, 1970, 1982, 1993-96 and 2005 (Spyropoulos& Chadwick 1975; Aravantinos 1999, 2008; Aravantinos, Godart &Sacconi 2001, 2002), Symenoglou 1973; 1975, Tiryns in 1966, 1971 and 1974 (Olivier 1988), Midea since the 1990s (Walberg 1992- 1993, 1996- 1997), and most recently at Dimini (Skafida, Karnava & Olivier 2012), Iklaina and Ayios Vasileos (linear B tablets from the last two mentioned sites have not yet been published, all sites with Linear B are listed in Marazzi 2009). In addition to these, stirrup jars with painted Linear B inscriptions have been discovered at several Mainland sites: Mycenae, Tiryns, Eleusis, Kreusis, Orchomenos, Midea and Thebes (van Alfen 2011).

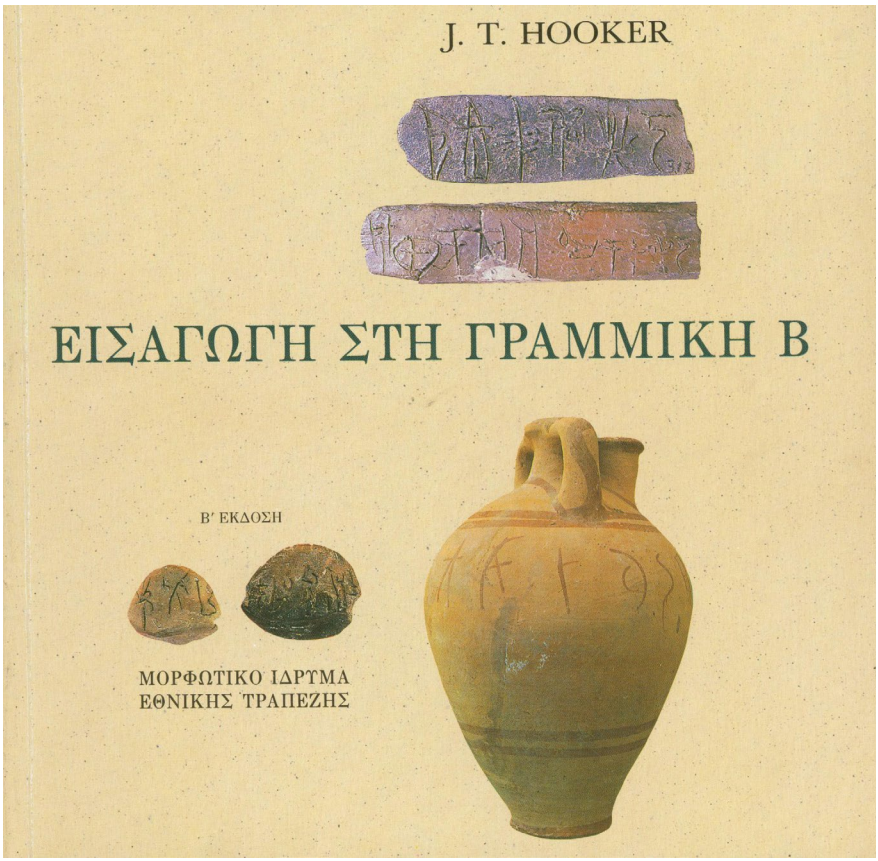

Figure 4. Types of objects inscribed in LinearB: elongated tablets on top, a stirrup jar on the bottom right, an the sealed objects on the bottom left front page of Hoooker 1979).

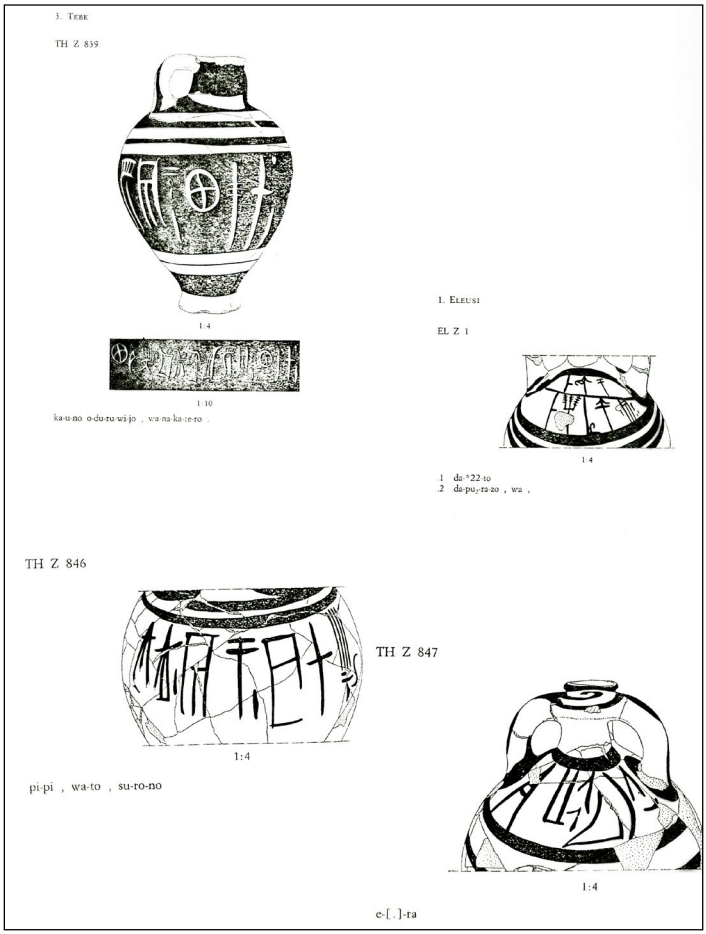

Figure 5. Several examples of Mycenaean stirrup jars with painted inscriptions in Linear B.

Even after the discovery of the Pylian archive, some scholars, like Carratelli, pursued the idea of a Cretan origin of Linear B, which consequently, they assumed, was exported to the Mainland. Later scholars supported the same line of thought, even after the script was deciphered and shown to have recorded Greek. Sacconi's argument was similar to that proposed by Peruzzi (Peruzzi 1960). She explained the phenomenon of the 'unità grafica continentale as a result of the Mainland adoption, at a certain moment, of a particular Linear B graphic style from Crete, and not as a more spontaneous development of the script on the Mainland. Had the script evolved on the Mainland, Sacconi argues, the graphic style would have been more diverse; its unity shows that it was introduced there in an established form. (Sac-

coni 1976). That Linear B was created on Crete, more precisely at Knossos, was also supported by Heubeck, (Heubeck 1982) who, however, thought in terms of a much later date than that proposed by Olivier (see below). Pope (1961–1962) also initially argued for the Knossian origin of the script, mostly because of the graphic similarity of the signs of ink-written Linear A inscriptions on two MM III Knossian cups (KN Zc 6 and 7, see figures 6 and 7), and certain signs in Linear B. Slightly later, however, he found it more plausible that Linear B was "created on the mainland in the period of the earlier shaft graves when Minoan influence was first strongly felt." (Pope 1964). Support for the Cretan or more specifically Knossian origin of Linear B has also been voiced by Driessen on the basis of the continuity from Minoan to Mycenaean administrative practice in the West Wing of the palace (for example, in the archives on the upper floor). According to Driessen, this continuity was a result of cooperation between Minoan and Mycenaean scribes, which obviously took place at Knossos, and indicates that Linear B was created in the Minoan milieu, rather than on the Greek Mainland (Driessen 1990: 130).

Figure 6. Two Knossian clay cups KN Zc 6 and 7 from the MMII period with painted Linear B inscription inside them (GORILA vol. IV).

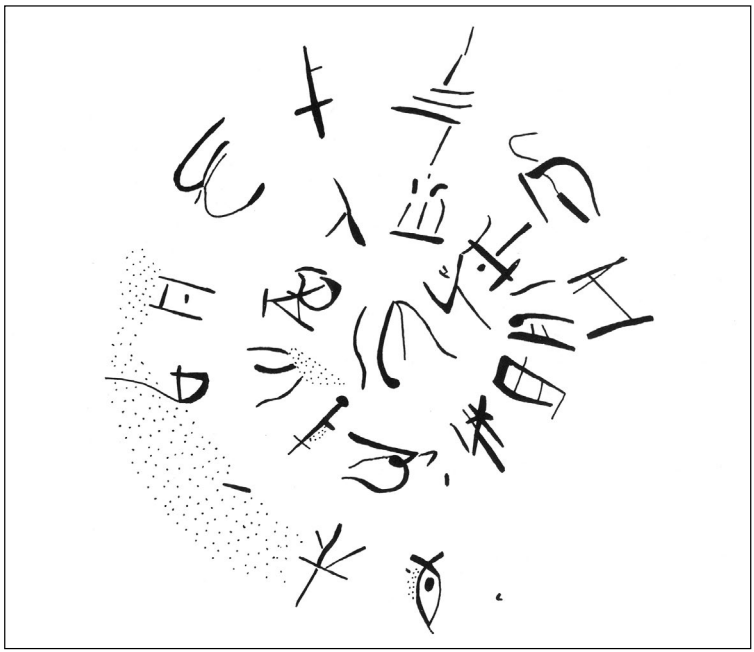

Figure 7. Text from inside one of the clay cups depicted on figure 6. (GORILA vol. IV).

As for the Mainland origin of Linear B, today the most ardent supporter of the theory is probably Godart,[2] although he initially believed that the script was created on Crete (Godart 1976: 32, 47). Not only did Godart later move to the 'Mainland team', but he even proposed a particular location where this creation occurred: Mycenae, as the cultural capital of the Mycenaean world (*ibid.*). (The view that Linear B was created in Mycenae has also been considered by Duhoux, but with some reservation.) Godart's determined views of the script's Mainland origin, and Olivier's conviction that Linear B was created by Greeks on Crete, were published side by side in the 1979 volume of the *journal Studi Micenei ed Egeo-Anatolici*, giving the impression that by doing so the editors wanted to stress how divided opinions were on this matter (Godart 1979; Olivier 1979).

A combination of these two extremes was proposed by Hooker (1979: 71–73). He suggested that a Minoan script, related to that of the Haghia Triada

[2] The 1994 discovery of the Kafkania pebble inscribed in Linear B reinforced Godart's conviction of the Mainland origin of Linear B. The pebble is dated to the end of MMII period. (Godart 1999; 2002). Howerever many uthors doubt the authencity of this pebble (e.g. Palaima 2002 – 2003 : 190, , n.7).

tablets, was introduced into the Mainland during the sixteenth century B.C. by Minoan scribes themselves. Immersed in the Greek environment, the script gradually started to modify (proto-B) and was steadily introduced to Crete, where it experienced its final adjustments in the fifteenth century in the light of political changes on the island. That the script was created by Minoan scribes brought to the Mainland was also suggested by Chadwick (1976: 106– 107); he argued that these scribes abandoned their language and modified their script to write in Greek. A similar idea has been cautiously suggested by Driessen and Macdonald (1997: 117): that a Mycenaeanised Linear A (i.e. Linear B) was introduced to Crete by Minoans upon their return to the island after having abandoned it during the social unrest of LM I. The most recent view in support of the Mainland origin of Linear B came from Hallager. Since he believes that the Cretan Hieroglyphic played a decisive role on the creation of Linear B, Hallager (1997–1998) suggests that scribes of Cretan Hieroglyphic must have arrived to the Mainland and introduced their knowledge there during the early Neopalatial period before Linear A became dominant on Crete.

A quite different view has been offered by Palaima who saw the Cycladic islands as a mediator in transferring the script to the Mainland Greeks. He proposed that the creation of Linear B took place in the Cyclades in LM IB/LH II periods. (Palaima1982).

2.3 WHEN WAS LINEAR B CREATED?

The answer to the question of when Linear B was created depends on other, still unresolved chronological intricacies, such as the date of Linear B deposits at Knossos, or the date of the Mycenaean arrival to Crete (assuming that the script was created on the island).

Table 1: Proposed dates for the final destruction of the palace at Knossos.

Date	*Supporters*
LM II	Evans
End LM II – LM IIIA1	Boardman
LM IIIA1	Furumark, Godart & Tzedakis
Early LM IIIA2	Popham, Warren, Driessen, Cucuzza
LM IIIA2	Hood, Raison, Snodgrass, Hawke Smith
Early LM IIIB	Rehak & Younger
End LM IIIB1	Olivier
LM IIIB	Blegen, Hallager, Niemeier
End LM IIIB	Palmer

Figure 8. A table showing different suggestions for the date when the palace of Knossos was destroyed by fire which baked Linear B tablets – those would then be the dates when Linear B was in use at Knossos (the listed names are the authors who support the respective dates – a detailed bibliography can be found in Tomas 2004).

Hooker (1979: 46) suggests that by the time of their arrival to Crete,[3] the Mycenaeans must already have been literate – a thought provoked by the historical circumstances in the Aegean in the sixteenth and fifteenth centuries B.C. (i.e. noticeable Minoan influences), which would make it difficult to believe that the Mycenaeans were not yet acquainted with writing. Hooker further points out that, if one accepts that the Mycenaeans were illiterate at the time of their arrival to Crete (supposedly in LM II), it becomes difficult to explain the fact that in a mere fifty years they managed to create a script which was, according to him, much more advanced than Linear A despite at least two centuries of Minoan prior scribal tradition (Hooker 1979: 48. Goold and Pope expressed the same belief they found it hard to believe that the Mycenaeans could have created a script stable enough to last unchanged for another two centuries on the Greek Mainland, all in the space of about fifty years of their presence at Knossos. (Goold & Pope 1955:V).

Hooker (1979: 36, n. 2) argued that the creation of Linear B was already under way during the period when the Haghia Triada tablets were written, something that had been previously suggested by Evans.[4] As already said before, Pope tried to push the origin of Linear B to the MM III period on the basis of a comparison of some ornate and elaborate Linear B signs on two Linear A painted cups from Knossos (KN Zc 6 and 7), dated to MM III (Pope1961 – 62). He suggested that examples of elaborate Linear A script like those attested on these two cups, rather than examples from Haghia Triada tablets, may have been a model for the creation of Linear B. According to Pope (1961 – 1962: 311), pinacological and epigraphical differences make the Haghia Triada documents an unsuitable parent to Linear B. However, Palaima undertook a detailed palaeographical analysis and found no justification for Pope's argument. The fact that some Linear B signs are more elaborate than their Linear A counterparts on tablets, can be

[3] This supposed event was in earlier literature placed at the beginning of the LM II period (for example, Ventris & Chadwick 1956, 38; Hooker, 1979, 41); for a concise overview of architectural, burial and pottery features which may indicate presence of the Mycenaean/Mainland tradition on Crete in LM II-IIIA1, see Haskell 1997, 188–189; Alberti 2004; Preston 1999; 2004; 2008, 314–316. A minority of scholars, however, argue that the Mycenaeans arrived to Crete during the LM IIIA2–IIIB period, instead of LM II-IIIA1 (for a summary of both opinions, see Driessen & Farnoux 1997: 1–2). For other valuable contributions to the question, see Driessen & Macdonald, 1997; D'Agata & Moody 2005.

[4] Evans had proposed the early half of the fiteenth century B. C. as the date of the introduction of linear B. He saw Linear B as the script of a ruling class which overlapped with a rival Linear A script, used at the same time in Haghia Triada and elsewhere on the island(Evans 1902 – 03: 53; 1921: 646).

explained, for example, by their creation from archetypal forms (Palaima 1988a : 331).

In considering the date of the creation of Linear B, Olivier (Olivier1979: 45) tried to show that until the beginning of the sixteenth century B.C., Mycenaean society did not reach an economic level which required the use of a script. The *terminus post quem* he proposes is LH I. Olivier (*ibid.*) suggests that the script must have been created while Linear A was still in use, i.e. prior to the destructions around 1450 B.C. (LM IB). Furthermore, since Linear B appears to have been created from an archaic form of Linear A, that may have happened, according to Olivier (1979: 47), in a phase well before 1450 B.C., probably around 1600 B.C. (MM IIIB/LM IA). Graphic varieties indicate that the Linear B records which have been preserved at Knossos are considerably later than Linear B that was exported to the Mainland.

Godart (1979: 34–35) agrees with Olivier that the creation of Linear B coincided with the attainment of a certain economic level, which probably occurred three or four centuries before the destruction of the Mycenaean palaces (i.e. around 1600 B.C., as also proposed by Olivier (see above), but he does not agree, as we have seen above, on the place of its initial creation. Godart observes certain similarities between Cretan Hieroglyphic and Linear B documents, which further suggests to him that the creation of Linear B should be dated fairly early – the end of MH III (Godart, Kanta and Tzigounaki1996: 597– 598).

Duhoux (Duhoux 1985: 30, 31, 34) suggested a later date for the creation of Linear B: between (LM IA – LM II), possibly at Mycenae (Duhoux 1985: 30, 31, 34). This event, in his view, was preceded by a period when the Mycenaeans on the Mainland were using Linear A scribes for their administration (a practice which could have started during MM IIIB). Heubeck (1982: 201) proposed an even later date for the transition from Linear A to Linear B: LM II or LM IIIA, but at Knossos, as a result of a change in population and new political circumstances. A compromise date is proposed by Driessen. According to him, the transition from Linear A to B was a result of cooperation between Minoan and Mycenaean scribes in the West Wing of Knossos (first proposed by Begg 1987: 184). This cooperation would have occurred in the intermediate period between Minoan and Mycenaean administration in this area. Driessen, to repeat, attributes the RCT deposit to this intermediate, LM II or early LM IIIA1 period (Driessen 1990: 130).

Hallager strongly disagrees with Driessen's interpretation that the RCT documents are earlier than the rest of the Knossian documents, therefore he does not support his view that the RCT would belong to such an intermedi-

ate period. According to him Linear B was created earlier, some time after the MM IIB destructions, and, as has already been quoted, not on Crete, but the Mainland.[5]

But, Rehak and Younger (2000: 288–29) argue a date similar to Driessen's for the introduction of Linear B – LH II. It must be pointed out that the establishment of Linear B on the Mainland does not equal the beginning of administration. Rehak and Younger argue the existence of pre-LH II Mycenaean administration, reflected in sealstones, mostly from LH I–II context and imported from Crete, which have been found in the shaft graves in Mycenae and tholos tombs elsewhere.Thus they divide the Mycenaean administration into three phases: **1**. LH I–II seal-stones from the mentioned funerary contexts, **2.** LH II development of Linear B (either on Crete or the Mainland), and **3.** LH III documents. After the beginning of LH IIIA the number of seals rapidly decreased, which coincided with and was probably caused by the development of the Mainland palatial centres and the full exploitation of a script for the administrative purposes.

2.4. HOW WAS LINEAR B CREATED?

This question encompasses a range of sub-questions, such as:

1. What was the source for the creation of Linear B, i.e. according to which prototype was it modelled?
2. Who were the executors of this process?
3. Was this creation a sudden act which followed a resolution of a ruling body; or was it a gradual process, that was a result of a spontaneous development rather than an articulated decision?

As for the first questions, most scholars are confident that Linear B was developed from Linear A. A minority of scholars, however, have allowed for the possibility that Linear B was developed from a script other than Linear A, perhaps a common predecessor to both Linear A and Linear B. This idea is supported by the shape of some Linear B signs, which look more cursive and ornate than the most advanced Linear A signs from Haghia Triada. Due to a lack of evidence for the existence of some other script, Cretan Hieroglyphic has been proposed to have played the role of this common predecessor, although, as we will see below, the number of matching signs remains unsatisfactorily low.

[5] Some other scholars disagree with Driessen's dating of the RCT documents, for example Popham (1993: 177). According to Hallager, Linear B was created earlier, some time aftwer the MM IIB destructioins, and, as has already been quoted (see above), not on Crete, but the Greek Mainland.

When it comes to the second question, historical circumstances favour one of the options: that the Mycenaeans created the script in order to accommodate their language. A small number of scholars accepted a possibility that the Minoans executed this task, i.e. transformed their own script to satisfy the needs of a foreign language (see above). The compromise solution is that this was a collaborative effort.

Along with the first two questions, the third will also be more thoroughly addressed below. For now it suffices to summarise the two main streams of thoughts on how abrupt the creation of Linear B was: one sees it as a carefully planned and sudden act, and the other as a result of a gradual process.

3. DISTINGUISHING THE ORIGIN OF THE LINEAR B SCRIPT AND THE ORIGIN OF THE LINEAR B ADMINISTRATIVE SYSTEM

A more systematic study of the last set of questions (how was Linear B created?) is, I believe, crucial for better understanding of the origin of Linear B. However, any further analysis in this direction will demonstrate that a search for the origin of the script is intertwined with a study of the main purpose for which the script was created. Thus, the administrative system behind the script plays an important role in understanding the origin of Linear B. This is where the whole issue becomes more complex because it is easy to fall into a trap of assuming that the two originated from the same source. Further sections of this book focus on showing that it is difficult to maintain a self-assuming notion that both Linear B script and administrative system were modelled after a single prototype, and that the origin of Linear B becomes clearer if analysed from two different points: the origin of the script and the origin of the administrative system. Since Linear B is a name used to designate both, scholars typically conflate these two aspects.

A below analysis of both aspects will show that although Linear A remains the most convincing predecessor for the Linear B script, when it comes to the administrative system Linear A does not provide convincing parallels. Some of these parallels are, surprisingly, found in the Cretan Hieroglyphic administration, which, on the other hand, is not a plausible scriptual predecessor. Thus it is indeed wrong to assume, at least on the basis of current evidence, that Linear B in its origin relied on a single source.

3.1.THE ORIGIN OF THE LINEAR B SCRIPT

Due to a very limited choice, there has not been much speculation on this matter. For now, there are only three options: **1)** that Linear B was created from Linear A, as supported by most scholars on the basis of numerous common signs; **2)** that it was created from Cretan Hieroglyphic, as suggested on the basis of some more embellished forms of signs, and the fact that some Linear B signs can be traced back to Cretan Hieroglyphic; and **3)** that Linear A and Linear B were created from another script, yet un-evidenced 'Linear X', as a common predecessor to both. Early studies proposed that in fact Cretan Hieroglyphic may have played the role of the common predecessor. This was partly due to a lack of any other candidates, and partly due to a belief that Cretan Hieroglyphic was the earliest of the three scripts. Subsequent discoveries of documents, however, revealed that for now it is not possible to show that Cretan Hieroglyphic preceded Linear A, unless EM III – MM IA inscribed seals from Archanes are considered as early examples of Cretan Hieroglyphic (as is done in CHIC), and not as a separate script. To sum up: the main argument for Linear A as a predecessor to Linear B are the numerous similarities between the two scripts, whilst the main reason for regarding Cretan Hieroglyphic or some third script as a common predecessor to both is directly opposite – certain differences between Linear A and Linear B.

The reason why a majority of scholars readily accepted that Linear A was a persuasive prototype for the Linear B script is the large number of matching syllabograms: Carratelli, for example, had proposed fifty-four common syllabograms, Evans at least fifty, Myres sixty-nine, etc. The number of common syllabograms has today stabilised at seventy (almost 80% of all Linear B syllabograms), relying on Godart's and Olivier's classification (in CHIC: 18). The correspondence between logograms is not as prominent, but is still significant. As for other types of signs, Linear B abandoned, with a few exceptions, the rich repertoire of Linear A monograms and ligatures, but increased the number of adjuncts. The Linear A system of aliquot fractions was replaced by a new metrical system. The system of numbers, however, remained the same. One further link with Linear A is evident: the manner in which transactions were presented, namely in sequences of sign-groups + logograms + numbers.

If the number of common signs is the main criterion for establishing a predecessor, then Linear B relates to Linear A better than to Cretan Hieroglyphic. This is not to deny that some Linear B signs resemble those in Cretan Hieroglyphic (ca. 25% of Linear B syllabograms can be traced to Cretan Hieroglyphic), but these are in most cases the same signs that also show a connection between Linear A and Cretan Hieroglyphic. Ac-

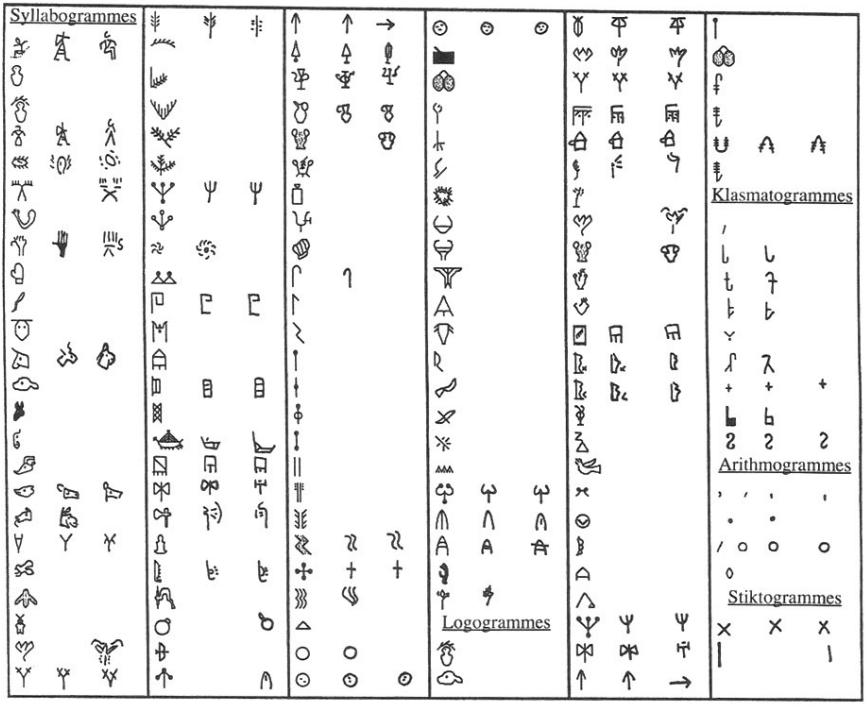

Figure 9: a table of corresponding Cretan Hieroglyphic, Linear A and Linear B syllabic signs (CHIC: 19).

cording to the comparative list in CHIC (see fig. 9), a very small number of signs shows a link between Cretan Hieroglyphic and Linear B without a Linear A intermediary. In saying that the Linear B script was developed from Linear A rather than Cretan Hieroglyphic the latter is thus not completely excluded, since some signs, as said, are common to Linear A and Cretan Hieroglyphic. However, when immediate influence is sought, more numerous similarities indicate that Linear B scribes looked primarily at Linear A texts, rather than those in Cretan Hieroglyphic, and probably consulted Linear A scribes.

The scenario that Linear B was adapted from Linear A for the purposes of a new language was established immediately after the decipherment of Linear B, and this became the crucial explanation for the changes in the syllabary from Linear A to Linear B. If we discount the above mentioned differences in logograms and in the metrical system, which may have been caused by reasons other than the unsuitability of the script to a new language (for example, different economic interests, different levels of administration reflected in preserved records, different trade-contacts, a different

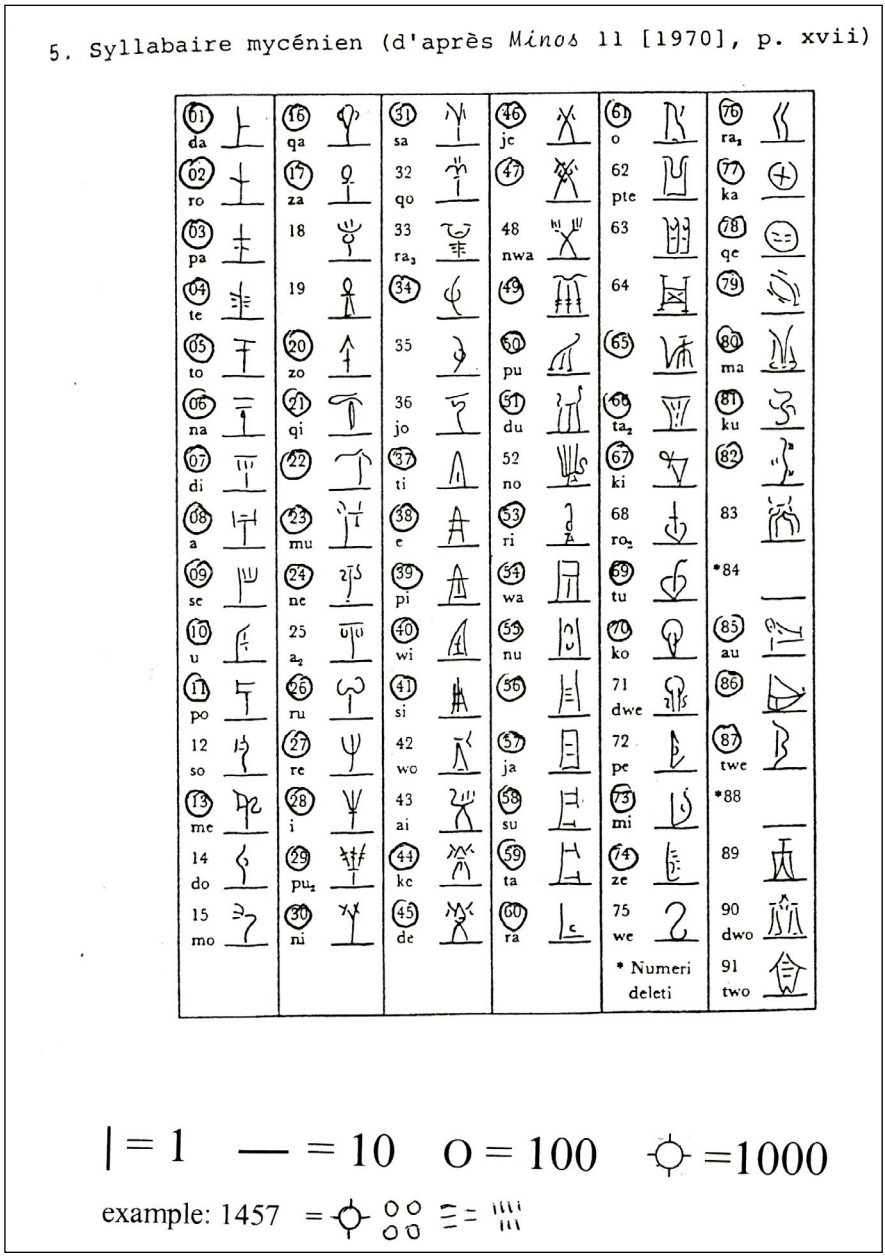

Figure 10. Linear B syllabary - encircled are the signs that are common to Linear A and Linear B. Below are the signs for numbers, which are identical in the two scripts.

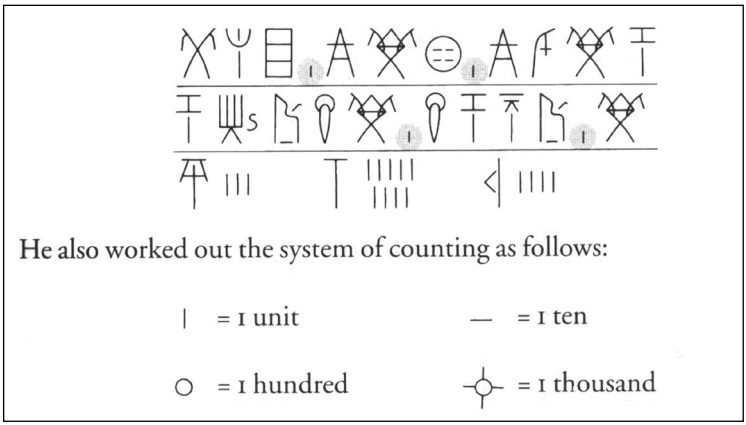

Figure 11. Signs for numbers – they are identical in Linear A and B (except for the sign for 1000, which exists in Linear B only, not in Linear A.

political structure, cultural differences, etc.), and concentrate on syllabograms, then the differences in the two linear scripts are minor. The number of common signs, however, is not the only criterion to be considered while discussing the development of Linear B script. Two other categories of similarities and differences are important: phonetic values of the syllabic signs (the phonetic aspect), and the shape of matching signs (the palaeographic aspect).

THE PHONETIC ASPECT

This aspect of the similarities and differences between Linear A and B is very difficult to assess. What we are interested in is how many Linear A syllabic signs were suitable for expressing Greek, i.e. how many adjustments the devisers of Linear B had to undertake to render it suitable for the new language. The large number of common signs indicates that these adjustments were not immense. However, two points need to be taken into consideration before concluding that the phonetic systems of the two languages are therefore similar.

The first point is that it is not clear that we can indeed read Linear A by applying Linear B phonetical values (Meissner & Steele (2017) have argued that this is a justified method). Although most signs were transmitted from one script to the other, we have no conclusive evidence that the same was done with their phonetic values (Nevertheless, if we examine more recent and better documented adaptations of a script for the purpose of recording a new language – for example, the replacement of Arabic script with the Latin alphabet for the purpose of recording Turkish (Aytürk 2008),

or the transformation of the Greek alphabet into the Cyrillic script for recording Slavic languages – we see that the phonetic values of signs were adopted wherever possible. Additional signs were introduced only in those cases where the phonetic peculiarities of the new language could not be expressed by already existing signs in the adopted script. This is not an argument about the inadequacy of the new script-users, but an argument of efficacy. Why alter the values if the model script mostly worked? The same, I believe, goes for Linear A and B. We should furthermore keep in mind that this was, as far as we know, the first time that the Greeks adapted a script to record their language. Accordingly, they probably would not have taken the radical step of completely altering the phonetic values of the adopted signs, but would have sought to make the process as uncomplicated as possible. However, until the language of Linear A is identified, we cannot be entirely certain that this was the case. Thus, although most scholars accept the application of Linear B phonetic values to matching Linear A signs (and the present study does not differ from this consensus), some reservation should always be kept in mind.

The second point is that even if we were fully certain that Linear B phonetic values can be applied to Linear A signs, this would not necessarily tell us much about the phonetic system of the Minoan language. Various conventions were used when writing Greek in the form of Linear B and one sign may stand for different spoken syllables. The same may have been the case with the Minoan language(s) and Linear A.

Despite all these obstacles, in my doctoral thesis (Tomas 2004) I examined the differences in phonetic systems between the records from Haghia-Triada and the Room of the Chariot Tablets (taken as representatives of chronologically closest records in the two scripts), as reflected by written syllabograms, and by assuming that matching signs had the same values in the two scripts. Two conclusions were drawn. The first is that these differences are not as drastic as has usually been argued. It does appear that Linear B abandoned a number of Linear A syllabic signs which were not needed in Greek, and introduced some new ones for those syllables which could not be matched in the Minoan language. My analysis, however, has shown that the use of non-matching signs in either script was low. None of the uniquely Linear A syllabograms from Haghia Triada (HT) records was used in a proportion significant enough to claim that it contained some crucial Minoan phonetic combinations. The same holds for the unique Linear B syllabograms in the RCT, apart from a group of signs of the *-o* series (*so*, *do*, *mo*, *qo*, j*o*, *wo* and *no*), and two of *the -e* series (*pe* and *we*). It can therefore be concluded that the HT and the RCT syllabaries significantly differ in only nine signs, whereas seventy are common. This may indicate that the adaptation of Linear A for Greek may not have been a very laborious task.

The second conclusion is connected to the oft-repeated statement that the *–o* series is generally underrepresented in Linear A, but the *–u* series better represented than in Linear B. My analysis of the Haghia Triada vocabulary has shown that it is true that the number of signs containing the vowel *o* is low, but still significant, especially the syllabogram *ro*, often an ending to words (a possible suffix?). Thus it does not seem justified to agree with previous claims that the vowel *o* was foreign to the Minoan phonetic system. It is true, however, that it is poorly represented in comparison to its successor. In Linear B *o* is the most frequent vowel in the final syllables of words, so its high representation has a morphological cause (since *o* is a dominant vowel in ending of the *o-* declension).

If the two scripts are taken as reliable manifestations of phonetic combinations represented in the two languages, we may conclude that the differences between Linear A and B were not overwhelming – at least when the earliest stages of Linear B are considered – since such a large proportion of Linear A signs were retained in Linear B. It appears that Greeks found it largely suitable to record their language in the Linear A syllabary. This is not an argument for the similarity of the two languages, but for the similarity of methods by which these languages were written down. Since mostly common signs were employed, this aspect of the analysis leads me to believe that Linear B script was indeed created from Linear A.

THE PALAEOGRAPHIC ASPECT

Some Linear B signs are more elaborate or embellished than the latest Linear A signs, especially than those from Haghia Triada, which some scholars consider the most likely substrate for the creation of Linear B. Two solutions have been offered as an expalnation for this issue. The first is that the parent-script was not Linear A, but Cretan Hieroglyphic script, some of whose signs resemble Linear B better than Haghia Triada signs do. The second solution is that the parent-script was Linear A, but not that from Haghia Triada and the rest of the LM IB corpus, but rather MM III Linear A, evidenced by the two cups from Knossos with painted inscriptions (KN Zc 6 and 7, see fig. 6) and some libation tables figure 12).

Both solutions can easily be dismissed. The first falls because of the low correspondence in the signaries of the Cretan Hieroglyphic script and Linear B), especially compared with the obvious correspondence between the Linear A and Linear B signaries (see above). The second solution falls because the ornate nature of the signs on clay cups and libation tables does not have any chronological repercussions, but can be explained in other ways: for example, since the inscriptions on such objects had a decorative

Figure 12. A libation table from the cave Psychro with an incised Linear A inscription (GORILA IV:56).

value as well, scribes may have been more careful in making the signs resemble archetypal forms; the tablets, on the other hand, reflect a daily routine where no such embellishment would be expected.

Driessen (Driessen, 1990: 147) has similarly claimed that the signs from the Minoan 'monumental' testimonia – inscriptions on stone and metal – show better graphic parallels with the RCT signs than those from the LM IB administrative documents. According to him, the former should be regarded as predecessors to the RCT signary. Palaima, however, argues that newly invented Linear B signs are more embellished because they did not undergo simplification through use; thus, they would be closer to archetypal form (Palaima 1988b: 166).

We conclude that the elaborateness of signs is not a good criterion either to establish Cretan Hieroglyphic or monumental inscriptions in Linear A as the parent-signary, or to date the origin of Linear B to a period earlier than the majority of Linear A records, since so many other factors may account for the elaborateness of certain Linear B signs.

Although my premise has been that – due to a high proportion of common signs – Linear B (LB) signs have been modelled after Linear A (LA), I did not want *a priori* to dismiss a proposed Cretan Hieroglyphic (CH) influence on the nascent Linear B signary. To test this possibility I have compared the CH signary to the signs from the chronologically closest Linear B deposit, i.e. the RCT, and then contrasted them to their Linear A counterparts. In establishing the matching signs, I have relied on CHIC (CHIC: 19, see above fig. 9) which identified thirty- three parallels between Cretan

Hieroglyphic and Linear B syllabograms. Of these only twenty signs are used as syllabograms in the RCT. In my comparison I have decided to focus on syllabograms only, because, as elaborated further below, they probably represent an initial stage of an adaptation of a script. It has already been mentioned above that differences in logograms and metrical systems may have been caused by reasons other than unsuitability of a script to a new language, and signs for these may have been formed by following different principles.

Those twenty RCT–CH equations in syllabograms proposed in CHIC are the following: AB 02–CH 070, AB 04–CH 025, AB 08–CH 042, B 12–CH 043, AB 24–CH 052, AB 26–CH 092, AB 27–CH 031, AB 30–CH 024, AB 31–CH 019, AB 37–CH 093, AB 38–CH 094, B 48–CH 006, B 52–CH 008, AB 54–CH 041, AB 57–CH 038, AB 58–CH 035, AB 74–CH 045, AB 76–CH 069, AB 78–CH 075, AB 86–CH 040.[6]

When all eligible instances of these signs are compared in all three scripts, the following can be observed:

1. Of twenty matches in syllabograms, sixteen RCT signs have a more persuasive prototype in LA than in CH: AB 02, AB 04, AB 08, AB 24, AB 26, AB 27, AB 30, AB 31, AB 37, AB 38, AB 54, AB 57, AB 58, AB 74, AB 78. Most of these signs have a number of varieties in LA and not all of them closely resemble LB, but in most examples at least one group of LA signs is directly related to the RCT shapes. The main problem here is that the CH sample is usually small, i.e. only a few examples of particular CH signs are preserved. Still, from what is preserved, here mentioned CH signs resemble the RCT signs less than most LA counterparts.

2. Four signs remain. Of those, RCT B 86 has no convincing parallels in either CH or LA, there are only superficial resemblances. But, this sign is in the RCT attested only once, so there is no much to go on. The latest palaeographic study of LA- B signs is by Salgarella (2021).

3. The three remaining signs are not attested in LA (B 12, B 48 and B 52). Of them only B 48 has a credible prototype in the CH.

When all this is summed, the case that CH may have served as a prototype to LB remains very weak. We have seen that only about a quarter of syllabograms match (and some of the proposed CH matches have a very low number of occurrences on tablets, so such matches are difficult to prove!). Of these, a majority of signs have a LA intermediary, which is at

[6] Explanation of abbreviations: CH- Cretan Hieroglyphic sign, AB – sign common to Linear Aand Linear B. A – sign used only in Linear A. B – sign used only in Linear B, HT – Haghia Triada, RCT – Room of the Chariot Tablets.

least in one of its varieties better related to Linear B. Only three signs do not have a LA counterpart, and of these, for a single CH sign we can claim to have been a prototype for LB (B 48). One such case is therefore insufficient to claim Cretan Hieroglyphic precedence over Linear A in influencing the creation of the Linear B script, especially when far more numerous Linear A correspondences are obvious. The overall conclusion therefore is that Linear A and not Cretan Hieroglyphic must have served as a source for the creation of the Linear B script.

3.2. THE ORIGIN OF THE LINEAR B ADMINISTRATIVE SYSTEM

Whereas numerous similarities in the signaries of Linear A and B reveal them as a parent-script and its offspring, the relationship between the administrative systems behind the two scripts was not so linear. As an administrative system I consider types of documents employed for recording administrative transactions, their correlation in the administrative cycle, and methods of organising information on them. The last aspect is best studied on clay tablets, not only because they contained the largest amount of textual information, but also because the tablet is one of the rare document-types that was common to Linear A and B, and can thus be an object of a direct comparison. It may come as a surprise to realise how distinct this document was in the two administrations. Despite the identical name, a Linear A clay tablet appears to be quite a different type of document from the Linear B one. These differences are most obvious in the sphere of pinacology and epigraphy, as further elaborated below. Since the rest of Linear A and B documents also display more differences than similarities, it becomes difficult to claim that Linear A administrative system served as a model after which Linear B administrative system was formed, a case quite opposite from what we saw with the scripts. An unexpected outcome of the document analysis is that some Liner B types display similarities with Cretan Hieroglyphic ones. I say unexpected because of a significant chronological gap between the documents in the two administrative systems (at least those documents that have been preserved to us).

AN OVERVIEW OF DOCUMENT-TYPES

Before moving on to a more detailed analysis of the announced differences and similarities, here is a brief overview of the characterising features of the three compared administrative systems.

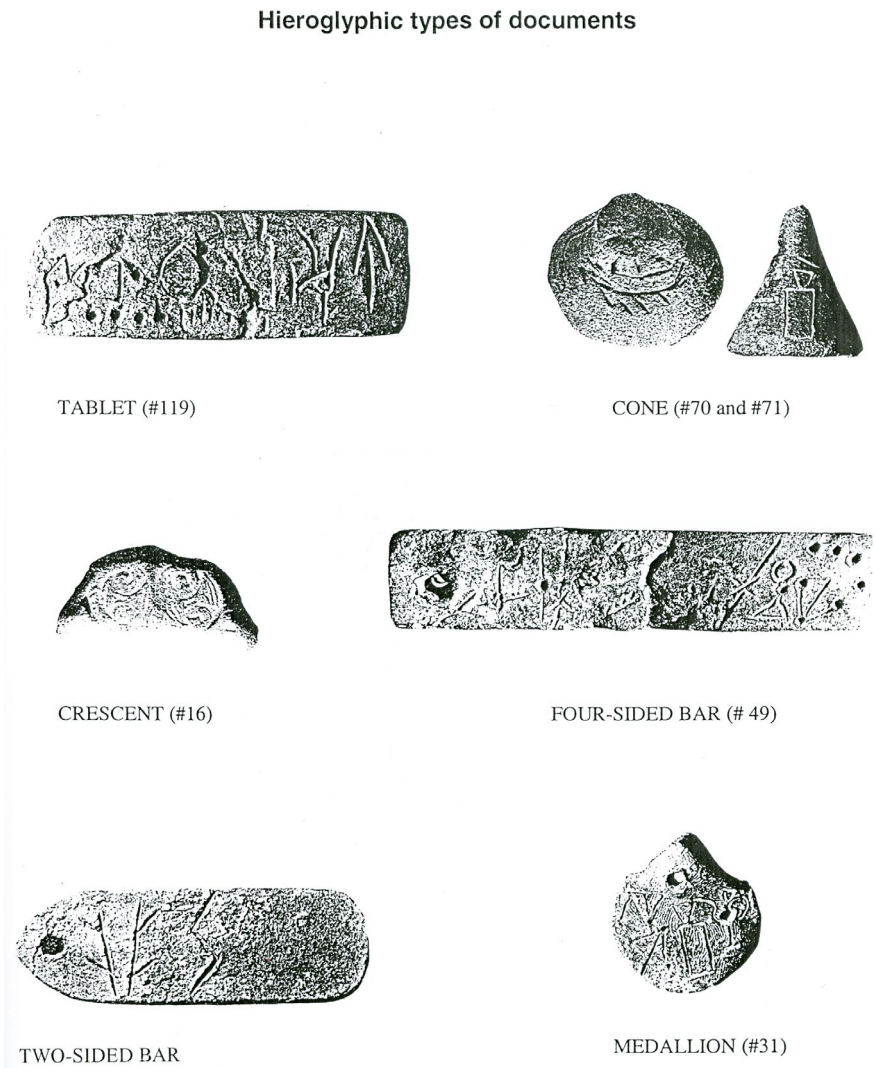

Figure 13. Cretan Hieroglyphic types of documents.

Cretan Hieroglyphic script was recorded on thirteen document-types: tablets (Hi), three-sided bars (Hg), four-sided bars (Hh), two-sided bars (Hf), medallions (He), crescents (Ha), cones (Hd), irregular string nodules, combination nodules (hybrids between irregular string nodules and a direct-object sealing), noduli, flat-based nodules, direct-object sealings and roundels. The following observations concerning these documents are relevant for their comparison with the other two administrative systems (a detailed overview of each type and their classification marks are given in Hallager (1996).

1. Apart from the tablets, cones, noduli and some bars, all Cretan Hieroglyphic document-types were intended to be attached to some other object, whether by means of a string (pierced bars, medallions, crescents and irregular string nodules), or by being directly affixed (direct-object sealings, combination nodules, flat-based nodules).

2. Unlike in Linear A, where several types of documents bear seal-impressions, a considerable proportion of Cretan Hieroglyphic document-types are inscribed only, i. e. are never sealed (tablets, bars, cones and medallions).

3. Unlike in the other two administrative systems, and especially in Linear A, only one type – the crescent – regularly combines writing with sealing practice.

4. Hieroglyphic sealings have a unique feature which is absent from Linear A and B: seal-impressions that contain carved syllabic signs (occasionally also logograms), i.e. text. There are about 150 seals or seal-impressions with signs of the Cretan Hieroglyphic script. The most numerous come from Knossos and Quartier Mu in Malia, where almost half of seal-impressions contain CH sign-groups, while another 15% were impressed with single signs. Olivier argued that these inscriptions were not intended to be read, i.e. to convey legible information, but may have been examples of ornamental or decorative writing.[7]

5. The practice of multiple seal-impressions, which was widely used in pre-LM IB Linear A administration, but much less common in LM IB and almost completely absent from Linear B , is present on the Cretan Hieroglyphic sealings from Knossos.

Linear A administration regularly employed eight types of documents (see fig. 12): tablets, dome noduli (We), disc noduli (Wf), roundels (Wc), flat-based nodules (Wb), single-hole hanging nodules (Wa), two-hole hanging nodules (Wd), and a direct-object sealing (Wg). The following observations are important for our comparison:[8]

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7 Olivier 1989, 43. Perhaps conveying information was of secondary importance, and identification of the owner of primary significance (Militello 1990, 334). Note, however, that Olivier himself (198: 44) notices cross-references between sign-groups carved on Hieroglyphic seals and those incised on clay documents, which obviously indicates that sign-groups from the seals conveyed a certain message, and were not randomly used signs with a purely decorative function. The relationship between the sign-groups on the Cretan Hieroglyphic seals and those written on other administrative documents was first examined by Evans (1921: 279).

8 Their physical aspects and function are in detail presented in Hallager 1996; concisely in (Tomas 2010). Note that the direct-object sealings are common only during the Protopalatial period of Linear A administration, and become almost obsolete in the Neopalatial period.

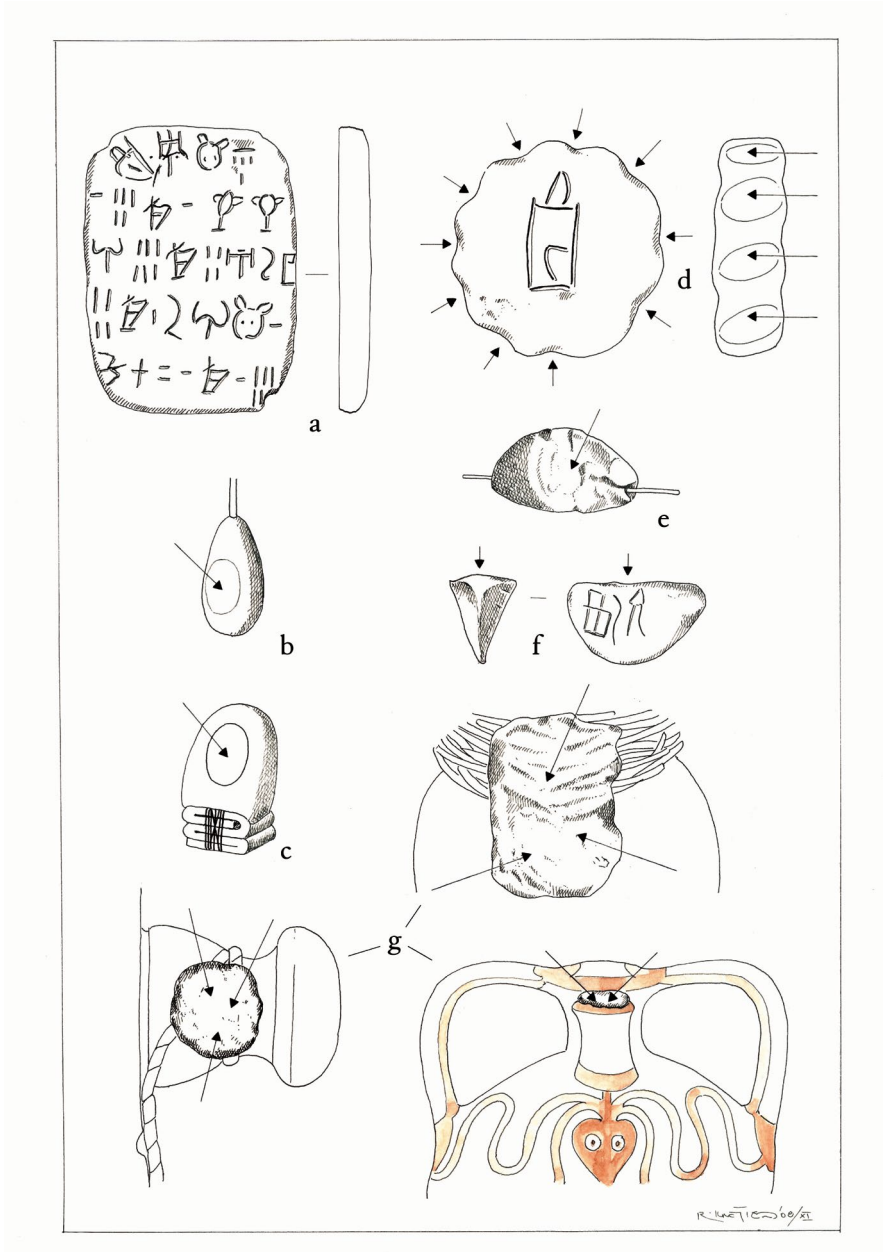

Figure 14. Linear A types of documents. a) tablet; b) single-hole hanging nodule (subtype: pendant); c) flat-based nodule (subtype: recumbent); d) roundel; e) two-hole hanging nodule; f) nodulus (subtype: dome); g) direct object sealings on a stirrup jar (clay-stopper). Arrows indicate the position of seal-impressions. Drawings by K. Rončević based on images from GORILA, Fiandra 1968; 1975; Hallager 1996; 2001).

Figure 15. An example of a single - hole hanging nodule (photo H. Tomas).

Figure 16. An example of a two - hole hanging nodule (photo H. Tomas).

Figure 17. An example of a dome nodulus (photo H. Tomas).

Figure 18. Two examples of seal impressions from Minoan sealings (Warren 1975: 37).

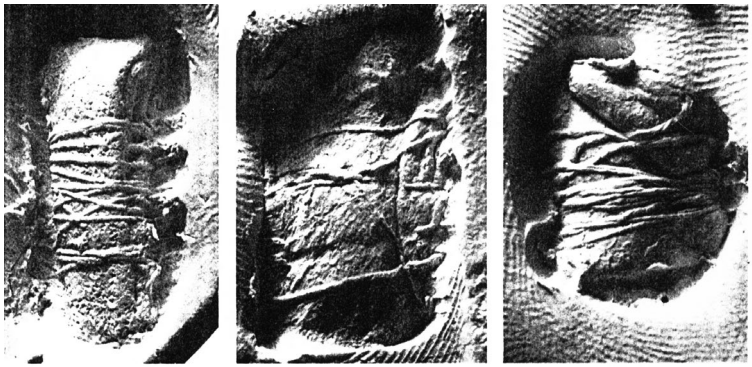

Figure 19. Negative impressions of flat-based nodules with imprints of folded parchment with a thin thread around it (Hallager 1996, vol II:).

1. While all Cretan Hieroglyphic documents, other than tablets, cones, noduli and some bars, were meant to be attached to something, Linear A made greater use of stand-alone documents. Thus we have a larger number of tablets and noduli, as well as a typical Linear A document: the roundel.
2. In the Cretan Hieroglyphic system only the crescent combines seal-impressions and incised text, whereas in Linear A quite a few types of documents combine the two: roundels, noduli, single-hole hanging nodules and a few two-hole hanging nodules. The only Linear A documents that almost never contain text, but always a seal-impression, are the flat-based nodules and direct-object sealings.
3. Apart from tablets (and one two-sided bar – PH 9) we do not have any other Linear A documents that contain solely text, which clearly shows that tablets did not require authentication in the form of seal-impressions, as other documents did. In Cretan Hieroglyphic, as we have seen, documents other than tablets are inscribed but not sealed: bars, medallions and cones. This indicates that the role of sealing was more prominent in Linear A administration than in Cretan Hieroglyphic.
4. Unlike its Cretan Hieroglyphic counterpart, Linear A makes a more advanced use of hanging documents. Hanging sealings in Linear A were typically used to authenticate, rather than only label commodities. Thus Linear A single-hole or two-hole hanging nodule, which probably hung off the objects, were regularly sealed. By contrast, Cretan Hieroglyphic medallions or two-sided bars, which hung off object too, were never sealed. Only one hanging CH document - type was sealed – the crescent.
5. Unlike Cretan Hieroglyphic, Linear A administration did not use seals that contained sign-groups (i. e. text).

Linear B administration operated with eight document-types: tablets, labels, noduli, regular and irregular string nodules, direct-object sealings, combination nodules (hybrids between a irregular string nodule and a direct-object sealing; pressed against basketry of flat surface), and occasional flat-based noduli. The following observations are important:

1. The number of sealing-types is smaller compared to Cretan Hieroglyphic and Linear A (if rare flat-based nodules are excluded). Nor is it just the number of different sealing-types that is reduced, so is the total number of all sealings: at Pylos, for example, with more than a thousand tablets, we find only 165 sealings. This is especially small when compared to Haghia Triada, which yielded 147 Linear A tablets and about 1000 sealings, or Zakro with thirty-one Linear A tablets and 500 sealings. Clearly sealings lost the prominent position they held previously: Mycenaeans either invented some other form of authentication, or authentication was no longer necessary and administrative control was performed in some other way.
2. The types of sealings which were most common in Linear A found no place in the administration of Linear B, namely roundels, flat-based nodules (apart from those in the RCT), and single-hole hanging nodules.
3. Most Mycenaean sealings were meant to be attached to commodities. Preceding self-standing Linear A sealing types were underrepresented: noduli are preserved in small numbers while the roundel was completely abandoned.
4. Unlike those in Linear A, the majority of Linear B sealings (especially regular string nodules) display a much clearer link to the incoming commodities.
5. The use of the irregular string nodule and the combination nodule, which were a part of Cretan Hieroglyphic administration, but not of Linear A, indicates a possible Cretan Hieroglyphic link with the Linear B sealing system.
6. The practice of direct sealing, after becoming almost obsolete in Linear A administration of the Neopalatial period, reappeared in Linear B.
7. Linear B did not see the introduction of any novel types of sealings, apart from a new type of direct-object sealing which Weingarten named 'molar'.[9] Considering the numerous innovations that Linear B users showed themselves capable of, the lack of novelties in the sphere of sealings further demonstrates that theMycenaean system was not particularly interested in using them.

[9] Weingarten 198: 6–7). However, she mentions one molar in the Linear A Temple Repository (listed in Appendix II of Weingarten 1989: 50), and Pini mentions one from the Hieroglyphic Deposit at Knossos (Pini 1990: 39).

8. Unlike the previous two administrations, where writing and sealing had equal importance on clay documents, writing became fully dominant in Linear B clay documents, while sealing practice was mostly neglected. Furthermore, inscribed sealings display much more written information than in the previous scripts, including, for example, personal names, toponyms, administrative terms (like *o-pa*, *a-pu-do-ke*), qualifications of commodities, ideographic countermarks over the seal-impression, etc. Palaima believes that an increase in the types of transactions required a greater use of writing on Mycenaean sealings.[10] Linear A sealings, apart from roundels, mostly bear only one inscribed sign. We have, however, about 150 Cretan Hieroglyphic seals or seal-impressions with sign-groups – in this Linear B sealings more closely resemble Cretan Hieroglyphic sealings than Linear A ones.[11]
9. The multiple sealing system, already rare in post-LM IA Linear A administration, is not practised in Linear B.[12]
10. Sealings from Knossos were impressed by the least active seal-users, as Weingarten puts it (Weingarten 1990: 113; 2010, 325). See also Palaima 1987: 256–257). Frequent repetition of seal-impressions indicates a high activity of local seal-users (as in most Minoan deposits). Seldom repeated seal-impressions marked incoming goods, probably representing taxes or tributes, rather than internal storeroom administration (as did most Minoan deposits). Furthermore, those sealings that have been preserved reveal a non-elite pattern of seal use, whereas some Minoan sealings clearly show involvement of an elite (like the Knossian replica rings). Weingarten 1988: 1, 13–14).

One of the aims of the preceding overview is to point out not only striking distinctions in the types of documents employed in Linear A and Linear B administrations (and surprising similarities between Cretan Hieroglyphic and Linear B), but also apparent differences in those Linear A and B documents that bear the same name. Here follows the elaboration of some of the aforementioned differences, as well as some others that reveal basic discrepancies between Linear A and Linear B administrative systems.

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10 Palaima 1987b, 256: "As Linear A economic record-keeping developed from MM II through LM IB, seals and sealings came to play a larger and larger role in Minoan economic transactions in conjunction, not in competition, with written records." (see also Palaima 1994: 308).

11 Godart takes this as an indication for the influence of Cretan Hieroglyphic system on the development of Linear B (Godart, Kanta & Tzigounaki 1996: 594).

12 Weingarten 1988: 5. However, there is one example from LM III Malia (see Pelon 1970: 130-135, plate XXVI/4).

Figure 20. Two examples of Linear A tablets (Warren 1975: 37).

DIFFERENCES IN LINEAR A AND LINEAR B CLAY TABLETS

The most prominent document-type in Linear A and Linear B administrations is the clay tablet. However, remarkable differences are noticeable in the spheres of pinacology and epigraphy, as well as in the role of Linear A and B tablets in the administrative cycle. On this occasion the most striking features are presented.

Comparison of pinacological[13] aspects of Linear A and Linear B tablets shows differences in all the examined features. Shape, size and cutting are addressed, whereas other pinacological features (clay texture, preservation, palm- and finger-prints, etc.) are not crucial for the present discussion.

Shape. Whereas Linear B makes use of both page-shaped and horizontally elongated -shaped tablet (Evans initially called them palmleaf- shaped tablets),[14] only the former is employed during the latest stages of Linear A.

[13] The term pinacology derives from the Greek word *pinax* - 'tablet'. It examines the physical aspects of tablets: Into the study of Aegean scripts this discipline was introduced by Olivier (1968).

[14] A palmleaf-shaped tablet is of a horizontally elongated shape, whose height never exceeds its length. Such tablets in most cases have only one inscribed line, but sometimes two, or even three divided by ruled lines. They usually contain concise information (single transactions or simple entries), and never summarising records. When the height of the tablet noticeably exceeds its length, it is described as page-shaped and interpreted as a document that summarises the information from palmleaf-shaped tablets or sealings. As such it has many lines of the inscribed

We do find several elongated tablets inscribed in Linear A, but they are dated to the MM II or MM III period. No elongated tablets with Linear A were found amongst the LM IB documents. It is true that many LM IB tablets are far too fragmentary to make a definite decision about their shape. But, since not a single complete Linear A elongated tablet has been preserved in any LM IB deposit, we assume that the fragmented Linear A tablets of that period were also page-shaped when complete. RCT tablets, on the other hand, are mostly elongated , and less than 4% are page-shaped (see further below). Thus, shape of the tablets is the major pinacological factor that distinguishes the RCT from the LM IB tablets (Elongated tablets are in more detail analysed in Tomas 2017a).

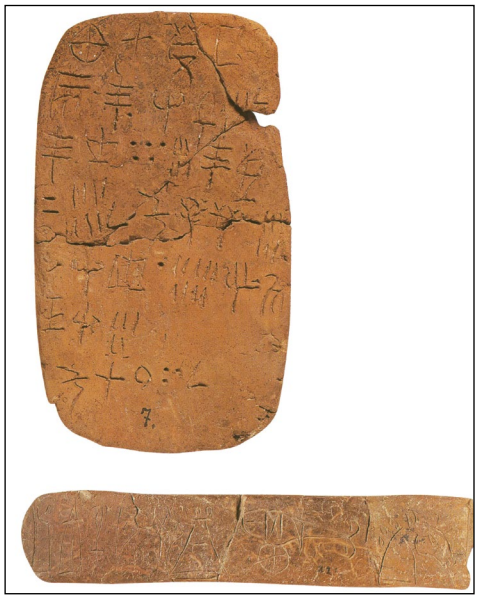

Figure 21. An example of different shapes of tablets: Linear A page-shaped tablet on top and Linear B elongated tablet on bottom (Warren 1975: 37).

text divided by ruled lines. Some tablets are of palmleaf shape, but they do not record single entries – which is the second part of the definition of the palmleaf-shaped tablet. Instead, they contain longer and more complex information similar to the information on page-shaped tablets. I will refer to this group of tablets as complex-leaf tablets. Their shape is a result of the organisation of the text: it was important that a certain chain of information, i.e. one entry, could fit in one line and was not divided between two or more. Such lines happened to be quite long, but not numerous, which gave a horizontally elongated tablet as a result. Since this is how summarising records are organised on page-shaped tablets, these horizontally elongated tablets should be regarded as page-shaped as well, even though they do not fit the above definition (basically, if we turned such a tablet 90°, we would get a regular page-shaped tablet). This type of tablet appears only in Linear B.

Figure 22. Examples of the page- shaped Linear A tablets from Haghia Triada (photo H. Tomas in theArchaeological Museum at Iraklio.

Figure 23. A Page- shaped tablet from Pylos – its two parts joined back together after the tablet was broken during the destruction of the palace.

Figure 24. Horizontally elongated Linear B tablets from Pylos (photo H Tomas, store rooms of the National Archaeological Museum at Athens).

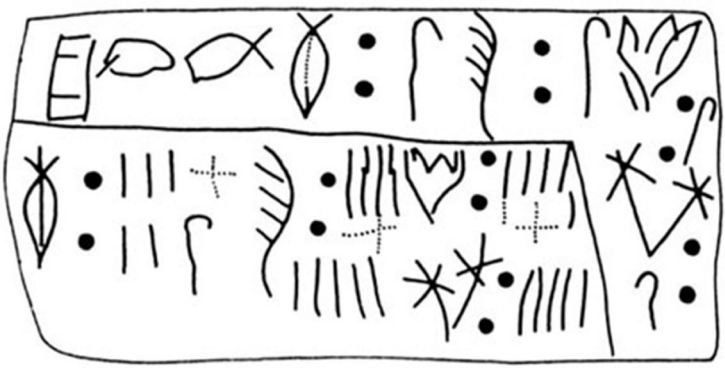

Figure 25. A drawing of a Cretan Hieroglyphic tablet (CHIC).

Size. Linear A page-shaped tablets are generally smaller (as visible on figures 22 and 23), as is the average amount of information on them. The proportions of the size of the tablets and the crowdedness of the signs show that Linear B page-shaped tablets hold a larger amount of information on the available space. There may be several reasons for this. One may be the nature of the language; the comparison of the number of signs in syllabic groups indicates that Linear A words may be generally shorter than those in Linear B (Duhoux 1978: 68). Secondly, the way of recording information may be different in the two scripts; one possibility is that Linear A used abbreviations more frequently. Finally, the disparity in the length of texts

may also imply certain differences in administrative practices; for example, that Linear B page-shaped tablets may have been intended to contain more information than Linear A tablets. There are three possible reasons for this last option: (1) that in Linear A more extensive information was recorded on some other material, possible perishable[15]; (2) that Linear A tablets never reached an administrative level requiring the recording of more extensive documents[16]; or (3) that the larger and better organised Linear B page-shaped tablets are a result of the improvement of administrative practices over time.

Figure 26. A page-shaped Linear B tablet from Pylos- its size is obvious by the fact that it is covering the whole palm of the person holding it (photo H Tomas, store rooms of the National Archaeological Museum at Athens).

15 Linear A flat-based nodules (with imprints of folded parchment with a thin thread around it, see fig. 19) support the idea that perishable material (Papyrus or parchment) was used for writing (Hallager 1996, vol. I, 135–145).

16 Olivier's distinction between domainal and palatial administration applies in this case. He argues that Linear A and Linear B tablets reflect two different levels of administration, even when the same commodities are treated. Unlike Linear B tablets that represent palatial records, those in Linear A appear to reflect a lower, domainal economy. This distinction is corroborated by the differences in the number of people and quantities of goods recorded: low figures on Linear A tablets *versus* high figures on Linear B tablets (Olivier 1987: 231-235; 1990, 69–72). Whereas Schoep, disagrees with this interpretation (2002: 41), Palaima explains the limited information recorded on Linear A tablets in a similar way: they concentrate on individual regional centres, i.e. they have a very local focus, whereas Linear B tablets have a much wider scope, the Pylos tablets, for example, cover a territory of ca. 2,000 km2 (Palaima2004: 282, 284). Linear B administration is found in so-called first order centres, whereas Linear A administrative traces are often found at the lower, local sites (Bennet, 1988: 31 and n. 44; 1990, 199, 210–211; Schoep, 1999: 212).

Figure 27. The author of the book (H. Tomas) holding a Linear B tablet from Pylos (photo from the store rooms of the National Archaeological Museum at Athens, photo by K. Paschalidis).

Cutting. The reasons for this practice seem to be clearer in Linear B than in Linear A. In Linear B, tablets were most probably cut after having been inscribed, when the residue of clay with no text was removed, possibly to be reused to form other tablets or to economise on space needed for their transport and storage, probably also to reduce weight for the same reason. Linear B page-shaped tablets were usually cut at the bottom, exceptionally at the top (see fig. 23).

Cutting of tablets was not a very common practice in Linear A. In Haghia Triada, the site with the largest number of Linear A tablets, only ten tablets (15%) are cut, most of them at the bottom. We cannot claim here that this was, like in Linear B, done after the text was inscribed and in order to remove blank and therefore superfluous part of the tablet. The fact is that the scribes of the Haghia Triada tablets were not so preoccupied with saving space on tablets or neatness of filing. In most cases, when the tablets were cut that was not done immediately after the end of the text, but further below, thus leaving plenty of unused space (e.g. HT 1). This suggests that the tablets in Haghia Triada were cut before they were inscribed and that the estimation of the space needed for the text was often wrong, since many cut tablets are still too large for the inscribed text. Such a lack of coordination between the size of Haghia Triada tablets and the length of their inscriptions tells us something about the process of producing tablets. It

is obvious that a tablet was conceived separately from the text, and at the time of its production the scribe did not yet have an idea of the amount of the text to be written thereon. Such a disparity, furthermore, suggests that the scribes of Haghia Triada did not produce their own tablets, but had assistants for that task, so called 'flatteners'. An opposite case may be argued for the Linear A tablets from Khania. If we compare these to tablets from Haghia Triada, we notice that the former display a much better correlation between the size of a tablet and the length of its inscription. When Khaniot tablets were cut, that was in most cases done immediately beneath the last line. That means that the collaboration between the scribe and the flattener was much closer in Khania than in Haghia Triada – or even that they were the same person.

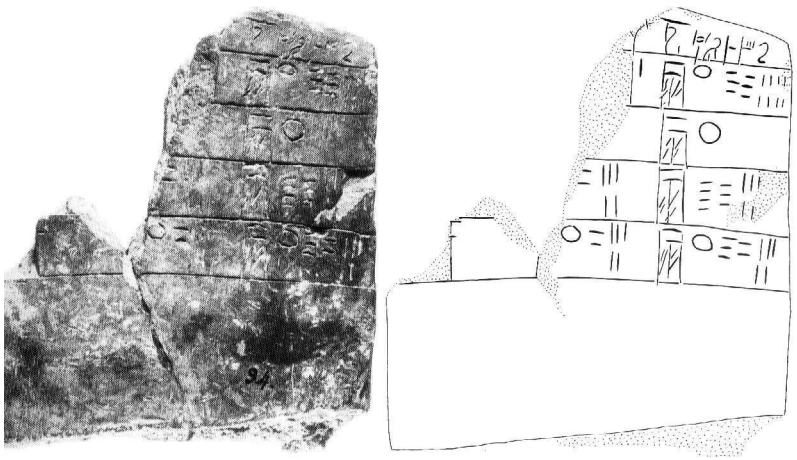

Figure 28. A Linear B tablet cut at the bottom.

The small number of RCT page-shaped tablets (3,7% in the overall RCT corpus) precludes us from establishing how they fit into the overall Linear B pattern of cutting tablets. As for the Linear B palmleaf-shaped tablets, an interesting practice has been detected in the RCT. Many of the RCT palmleaf-shaped tablets are cut on their left, right, or both sides. This was not done for economising ofclay, another explanation has been proposed: the practice of dividing a set of information into separate records. The interpretation is suggested by some features of the Vc(1) set, whose tablets consist of a personal name followed by the number one and cut immediately thereafter. Driessen managed to join together a number of tablets of the Vc(1) series, and some of the tablets of the Xd series, proving that these small palmleaf-shaped tablets initially belonged to one larger tablet. The name introduced to describe this kind of a document is a *simili*-join (Dries-

sen 1987, 154-157, 162, pl. I–III.). Larger tablets were probably divided into these smaller units for the purpose of rearranging the information. For example, the initial record may have simply listed the names of people. By dividing this list into individual records, the information could have been rearranged as required, for example, according to the status of the people recorded, or according to their type of work (paid work or un-paid, slave work), or according to their particular duties, such as potters, textile workers, leather workers, etc. *Simili*-joins are a feature unique to the RCT. With an exception of a single other case[17] we do not find it anywhere else in Knossos, or other Linear B deposits. Perhaps this was a very early Linear B administrative feature which for some reason proved inefficient and was abandoned thereafter (in more detail the issue is elaborated in Tomas 2013).

A comparison of epigraphic features has also revealed striking differences between the two groups of documents:

Opisthography.[18] The majority of Linear A opisthographic tablets comes from Haghia Triada. On some of them the text from *the recto* is continued on the *verso* due to a lack of space. On some others, however, the *recto* and *verso* appear to contain more than one lists. The latter tablets can still have a uniform document on *the recto* and *verso*, but with slight changes in their contents (e.g. HT 28, HT 85, HT 95, HT 123). These changes are indicated by a different textual structure on the two sides, or by the introduction of new headings, new logograms or new transaction signs on the *vers*o. Sometimes ruled lines or spacing help us to distinguish different lists/sets of contents.

A similar classification of the types of page-shaped opisthographic tablets cannot be done for the RCT documents due to their scarcity: only seven RCT opisthographic page-shaped tablets have been preserved, most of them in fragments. The text on some obviously continues from *recto* to *verso*. Yet, due to their fragmentary condition, it is unclear whether their content differs or not, and if so, how. As for the opisthography of the RCT palmleaf-shaped tablets, they display different patterns from page-shaped tablets. They mostly have a single sign or a single word incised on the *verso*, fig. 29, and I believe that these should be interpreted as classifying marks.

[17] The only other Linear B example, as detected by Olivier, are simili-joins B 7035+B 808. B 808 was found in the Long Corridor at Knossos, but the findspot of B 7035 is unknown (Driessen 198: 161).

[18] The term derives from the Greek word *opisthen* – 'in the back, backwards'.

Figure 29. Linear B opistographic tablet from the RCT with a single sign on the verso.

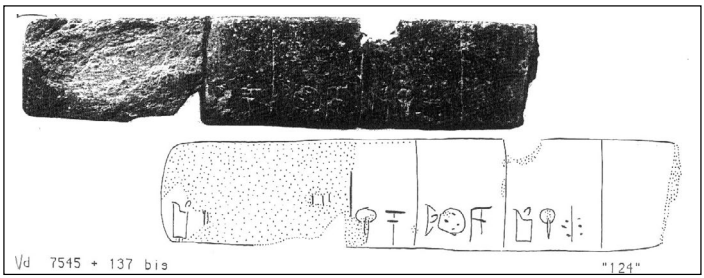

*Figure 30. Linear B elongated tablet from the RCT, Knossos with vertical lines, possibly indicating where the tablet is to be cut into smaller fragments (simili-*joins*).*

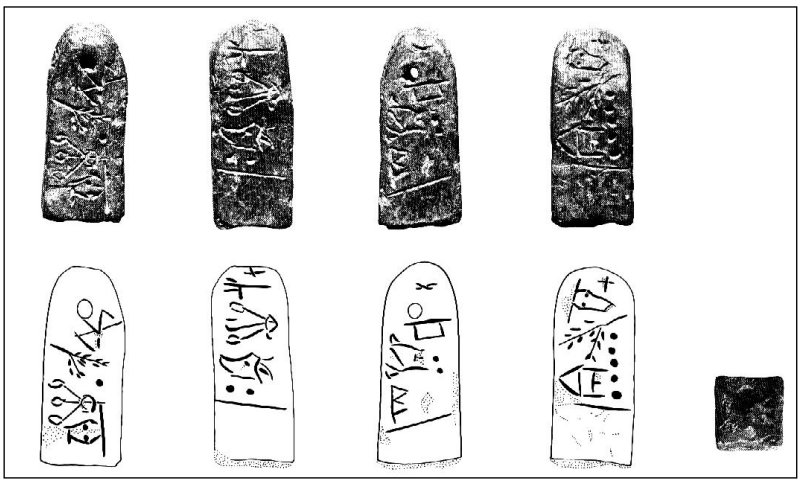

Figure 31. A Cretan Hieroglyphic bar with incised vertical lines.

In later Linear B administration, opisthographic tablets mostly have related texts on their *rectos and versos*. It is not usual for these tablets to have different lists on the *recto* and the *verso*, as is often the case with Linear A opisthographic tablets. From this we may conclude that Linear B tablets, even when opisthographic, represent a single list, whereas Linear A tablets may contain more than one list. This reinforces the idea that Linear A tablets were meant only for rough and more temporary records. It did not matter that there were two different lists on a single document, as long as they were clearly sepa-

rated (for example, by a ruled line), so that there could be no confusion when text was transferred onto other media (some ephemeral,i.e. perishable material, like papyrus or parchment). In Linear B, on the other hand, it was important that at the 'page-shaped level' of the administrative chain, each tablet was already a separate record, and not just a medium for 'rough notes' which were thereafter organised onto other documents. (Perhaps this feature also indicates less reliance on perishable material amongst the Linear B scribes, as further discussed below). Thus we can establish an important difference in the practice of opisthography between the two administrative systems. Since the number of RCT opisthographic page-shaped tablets is small, and so fragmentary, it is impossible to say if this change in opisthography had already taken place by the RCT period of Linear B administration.

Ruled lines. Nearly all tablets from the RCT and other Linear B deposits that have more than one inscribed line contain ruled lines between the lines of text. In Linear A ruled lines are not common. Not only they are rare, but their purpose is different from the purpose of ruled lines on Linear B tablets: they do not divide the lines of the text, they usually divide sets of contents, that is different lists (e.g. HT 9b, HT 86a, HT 117a). This practice is irregular and not all sets of content/lists are divided by a ruled line. A change of content is sometimes indicated by other means; for example, by spacing or a blank line.

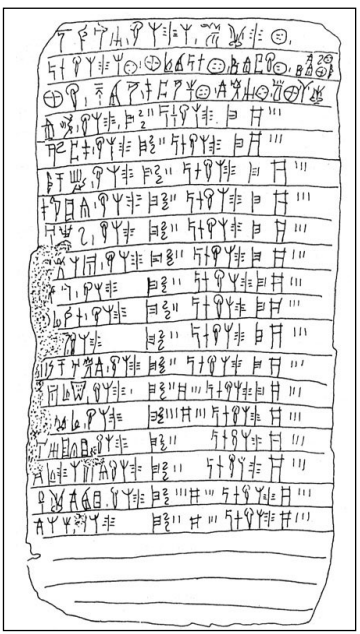

Figure 32. A Linear Bpage-shaped tablet (PY Jn 829)with ruled lines below each line of the inscribed text.

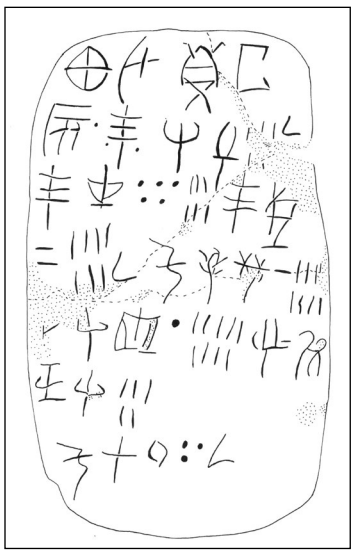

Figure 33. A LinearA page-shaped tablet without ruled lines.

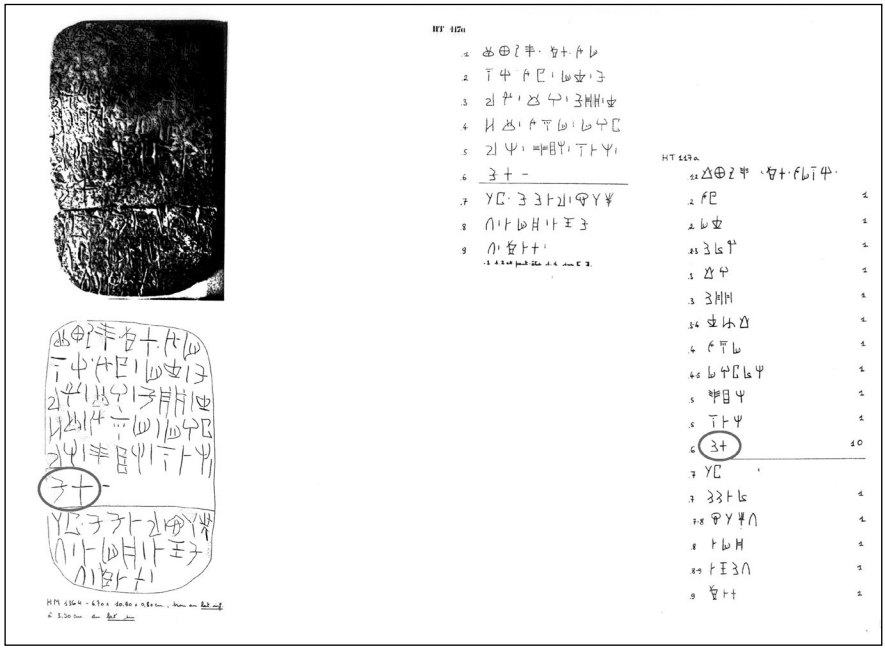

Figure 34. A Linear A tablet with a ruled line before the word KU-RO (that word is encircled in red).

Line-spacing and blanks. Differences in line-spacing and blanks between Linear A and B page-shaped tablets are mostly a result of the different layout of the text. In most cases Linear B scribes employ a columnar arrangement of the text(see fig. 32). In order to organise the text in this manner, blanks are often left between words, logograms and numbers. On Linear A tablets line-spacing and blanks are often a result of a disproportion between the size of the tablet and the length of the text (e.g. HT 17, HT 18). In some cases, however, spacing and blanks are used to emphasise certain words (like KU-RO, meaning the 'total'.[19]

(e. g. HT 95b, HT 13, HT 94b, HT 122b) or to separate different units of content, but again this practice is not regular.

Insertions and squeezing. There are three main reasons for insertions and squeezing: scribal omission, lack of space and additional clarification. In Linear B they are relatively rare, which means that the scribes seldom made mistakes while inscribing, or misjudgements about the space they needed to fit the text on the tablet. Linear A tablets had a higher percentage of insertions and squeezing. This not only indicates that Linear A scribes made mistakes more often, but also that they were less skilful in organising the space on a tablet in relation to the length of the text. If, however, clay tablets were only used for rough writing, perhaps no special attention was paid to fitting in the text properly.

Majuscules and minuscules. The practice of employing majuscules and minuscules has been noticed in Linear B, but not in Linear A. On Linear B tablets majuscules were probably used to put stress on a particular word, whereas minuscules carried information of inferior importance. Some Linear B tablets commence with a word in majuscule, a sort of a heading, or a more general information on the data to follow (for example, a toponym), this more general information was intended to catch the attention of the reader at first glance.

Palimpsests and erasures. On both Linear A and B tablets, palimpsests and erasures occurred for the same reason. Palimpsests were made once the information on the tablet became obsolete, and the tablet could be reused for a new record, whereas erasures were the result of scribal mistakes. As one may expect, more erasures occur on Linear A tablets. As for Linear B

[19] So far only three Linear A words have been deciphered: KU-RO – 'total', PO-TO-KU-RO- 'grand total' and KI-RO- possibly meaning 'deficit'.Another frequent Linear A word is SA-RA$_2$, BUT its meaning is still unclear. I have argued in (Tomas 2004, that it may have been a word denoting some place, possibly a store room) For a more detailed discussion on these words, see Schoep 2002, 159-165).

tablets, palimpsests and erasures are far more numerous in the RCT than in the rest of the tablets, yet another indication that the RCT tablets are somehow different from the rest of the Linear B corpus.

Layout of the text. Most of the epigraphical features addressed so far contribute to the layout of the text. They show that the RCT tablets, and Linear B tablets in general, are better organised, more comprehensible and clearer than those in Linear A. In the majority of Linear B tablets the inscription is very neat. When it contains more than one line, a ruled line is often incised between lines of the text to enhance clarity (fig. 32). Other means are also employed to improve the neatness of the inscription. For example, particular attention is paid to the arrangement of information: list-words, logograms and numerals are always arranged in columns. Spacing and squeezing have been used where necessary to preserve this columnar arrangement (fig. 32). Even when there is a lack of space, which is not often the case, signs are inserted in a way that maintains visual order. The text fits comfortably on most Linear B tablets, without too much space left over or signs squeezed in due to a lack of space. This indicates a close collaboration between scribes and flatteners, or perhaps even that scribes made their own tablets, as has been suggested by Palaima in the case of Pylos (Palaima1985: 101–102.).

In comparison to neat Linear B tablets , Linear A tablets look less organised and somewhat messy (e.g. HT 26b, HT 106, see fig. 33 in this book). No means of emphasising more significant information were applied, such as majuscules. Headings are therefore difficult to spot. Sometimes, when a new heading is introduced in the middle of the text, blank space or a ruled line have been inserted prior to it to indicate the change, but not always. Apart from some examples of words KU-RO, PO-TO-KU-RO, KI-RO and SA-RA$_2$ (for their meaning see footnote 19) no other parts of the text have a privileged position on the tablet that would emphasise them. Nor do Linear A tablets observe a columnar arrangement: in Haghia Triada, and Linear A in general, no attention whatsoever is paid to placing list-words, logograms and numerals under each other, which makes understanding the text more difficult. The lines were inscribed until there was no more space left, and then continued onto the next line; the words, sometimes even numerals are often split between two lines (e.g. HT 1, HT 93). Efforts were only occasionally made to avoid this, such as squeezing the signs at the end of a line, or starting a word in a new line, since it could not fit at the end of the previous one (e. g. HT 7.3, HT 85a.3). These remarks suggest that, unlike Linear B scribes (and already at the RCT stage of their administration), Linear A scribes did not follow strict rules about the organisation of the text. Even apart from the lack of standardisation, the text often looks disordered. For

example, the lines are not straight on some tablets (e. g. HT 16, HT 26b), sometimes the ruled lines are not straight either (e. g. HT 106, HT 131b), on some tablets the previous text is not well erased (e.g. HT 29), on some others the size of the signs is disproportionate, etc.

Four different explanations for the textual disorganisation of Linear A tablets are possible:

1. Linear A scribes did not reach the level of writing clarity achieved by their Linear B counterparts. The chronological gap between the two groups may have given the Linear B scribes enough time to improve the organisation of their texts (this suggests greater efficiency achieved through collective experience and transmission of accumulated knowledge).
2. No general and strict rules about the organisation of the text existed in Haghia Triada; they varied from scribe to scribe.
3. Linear A tablets may have been less exposed to their future readers than those from the Linrar B deposits. According to the last explanation, Haghia Triada scribes could allow themselves to be careless. Perhaps these tablets were more temporary than those in Linear B, possibly just drafts, and clearer and more comprehensible texts were to be copied soon after (perhaps by the same scribes who would have had no trouble in understanding the text which they themselves had written). Driessen calls this habit as of writng in a familiar fashion (1997: 216). See also Schoep, who suggests that Linear A tablets "were intended to circulate within a restricted group, whereas Linear B tablets were destined for proper archival processing by third parties." (Schoep 1999: 210).
4. Linear B page-shaped tablets are neat because they were summarising records of previously written data documented on related sealings and primary records on smaller tablets (see the discussion in the next section). In Linear A, on the other hand, we have no evidence of a similar process of transfer of information (excluding one example from Haghia Triada –Hallager 2002). It is possible that Linear A tablets were composed on the basis of oral data (perhaps a dictation to a scribe), and not written; hence the lack of neatness. If Linear A scribes wrote tablets by following oral dictation, they may not have had time to organise their texts nicely. If the dictation was slow, they could have applied some of the mentioned epigraphical features, but if it that dictation was fast, not only they had not time for the epigraphical features, but were also messy as a result and made mistakes (as evidenced by numerous erasures or squeezed signs which were previously mistakenly omitted).

A detailed comparison of page-shaped tablets in the two groups of documents has revealed that there are more dissimilarities than similarities. Both their pinacological features and the relevant epigraphical features indicate profound differences. In some cases these differences can be explained as an improvement of scribal practice from Linear A to Linear B, but in most cases they clearly show that Linear A page-shaped tablets served a different administrative purpose from those in Linear B. Indeed, the dissimilarities are so notable that page-shaped tablets from the two administrative traditions have little more than their name in common. The purpose of this particular study was to show that what we call a page-shaped tablet is in fact two distinct types of document in Linear A and Linear B: it is misleading to refer to them by the same name; and, moreover, to assume that they played the same role in the administrative cycle.

DIFFERENCES IN THE OTHER TYPES OF DOCUMENTS IN LINEAR A AND LINEAR B

Apart from tablets, the following types of documents were used in Linear A during its latest phase (LM IB), and these are here listed in the descending order of the total number of documents: the single-hole hanging nodule (about 980), the flat-based nodule (about 700), the roundel (about 180), the nodulus (about 150) and the two-hole hanging nodule (70 examples). These numbers are taken over from Hallager (1996, vol. I).

When we move to Linear B administration, we surprisingly find that only the page-shaped tablet connects it to Linear A (although, I stress again, there are crucial differences, as elaborated in the preceding section). Occasional noduli have been found as well, but with the total of nineteen examples, we cannot claim that the nodulus was a widely employed Linear B document. The three most represented Linear A types of sealings were abandoned in Linear B: the single-hole hanging nodule, the roundel and the flat-based nodule, of which we find only several examples in the RCT). Since the RCT may be considered as the transitional stage in the development of Linear B, I am inclined to regard its flat-based nodules as a short-lived legacy from Linear A.

The reason why the single-hole hanging nodule and the flat-based nodule were abandoned in Linear B may lay in their function. As suggested by Hallager 1996, vol. I), flat-based nodules sealed documents in perishable material, probably folded parchment, as indicated by the imprints on the bottom side of the sealing. As far as single-hole hanging nodules are concerned, Hallager (*ibid.*) suggests that these were hanging off papyrus-rolls. Both documents were thus used to authenticate records on perishable material and prevent their unauthorised viewing. These two document-types

are our best evidence of writing on perishable material (papyrus or parchment in Minoan society. [20] Their disappearance in Linear B, however, does not necessarily indicate that perishable material was no longer used, but rather that there was possibly no need for their authentication in the way that was done within Linear A administration. The same explanation cannot be given for the disappearance of the roundel, since this document was not attached to the records on perishable material, but served as a receipt for goods taken out of the storage room Hallager 1996, vol I). I have explored the possibility that the function of this type of document may have been in Linear B assumed by the elongated -shaped tablet (Tomas 2008).

The final document-type the remains to be discussed is the two-hole hanging nodule. A similar looking Linear B document was for a long time referred to by that name. Hallager's later study, however,showed that there are significant differences from the Linear A two-hole hanging nodule. This is why he introduced a new name – the string nodule – which can furthermore be divided into two separate types: regular string nodules (inscribed and probably attached to incoming goods), and irregular string nodules (uninscribed and probably attached to stored goods; they were mostly found broken, probably a deliberate act at the time of their use). Apart from some physical features the purpose of these two documents also appears different than in Linear A. According to Hallager (2005, 253–258), in Linear A the two-hole hanging nodule was used to label commodities (Hallager 1996, vol. I: 36). In Linear B, on the other hand, string-nodules served to record primary transactions and were attached to the relevant commodity. Once detached, recorded information was transferred onto page-shaped tablets(Piteros, Olivier & Melena 199: 115, 182). The same process cannot be argued for Linear A two-hole hanging nodules. Further difference is that in Linear B this document (i. e. one of its sub-types) was more frequently inscribed than in Linear A. This may be taken as another evidence for a more prominent role of writing than of sealing, unlike in Linear A administration where writing and sealing practices were equally important.

[20] Weingarten 1983; Hallager 1985, 14 – 15; 1996, vol. I, 135 – 145, 197 – 199; 2000a. It was in fact Hogarth who first proposed that the Zakro sealings may have been pressed against papyrus (190: 76). Evans also thought that some sealings were attached to documents on papyrus or parchment. He believed that the two ink-written Knossian cups (KN Zc 6 and 7) indicated a wider use of ink for writing on perishable material (Evans1921: 617, 638, 679; 19: 592-593). The use of perishable material has been further supported by Halbherr (1903, 3), Pugliese Carratelli (1945:453), Marinatos (1951: 40), and Pope who proposed that the thinness of the strings of some nodules (or cretulae, as they were called then) indicated that they were attached to light objects, such as documents on perishable material (1960: 201).

Once this distinction is established, we conclude that none of the Linear A sealing-types continued into Linear B. If we remember previously discussed differences in tablets, we can extend this conclusion to saying that there is no a single document-type common to LM IB Linear A and Linear B. Once again, I need to express caution in assuming that documents bearing the same name were actually the same types of document. Both page shaped-tablet and the two-hole hanging nodule are excellent examples. By introducing the new name in Linear B (string-nodules) Hallager has now managed to avoid such a mistake in the latter case. Since a similar change in nomenclature is difficult in the case tablets, we will continue using the same name, but to keep in mind established differences (which are also presented in Tomas 2010b, 2011, 2014).

Linear B employed several other types of documents (listed above), which cannot be traced to the latest Linear A. Some of these Linear B document-types existed during the MM II period, with some of them, surprisingly, found only amongst the Cretan Hieroglyphic documents. This is exactly what led me to believe that Cretan Hieroglyphic and not LM IB Linear A administrative practice influenced the development of the Linear B practice, as is further elaborated below.

DIFFERENCES IN THE CORRELATION OF THE DOCUMENT-TYPES IN LINEAR A AND LINEAR B

Another significant difference between Linear A and B administrative systems is the circulation of information between different types of documents. Whereas Linear B page-shaped tablets served as summaries of the primary information from sealings and palmleaf-shaped tablets, this cannot be established in Linear A, where we find no evidence that the information from sealings was thereafter transferred onto tablets (apart from a single example from Haghia Triada mentioned above, Palaima 1994:317; Hallager 2002)[21]. So, what interests us now is how sealed documents and tablets are interrelated in Linear A and B.

[21] In the southern part of theMinoan villa at Haghia Triada (see the map at the end of the book) a group of 45 noduli has been discovered, each documenting one unit of wool. With them there was a linear A tablet (HT 24) listing 45 units of wool. It has been argued that this tablet was a summmary list of transactions first doocumented by the mentioned noduli (Hallager 2002; Palaima 1994:317).This is so far the only detected case of the linear A administrative system where records from primary documents were summarised on a tablet. In the Linear B administrative system, on the other hand, that was a common practice.

Driessen suggests (Driessen 1999: 207–208). that Linear B followed a pattern of a three-tiered recording system in which the information on sealings or palmleaf-shaped tablets was treated as the primary source which was then summarised on page-shaped tablets. On this account, information from page-shaped tablets may have been summarised onto some perishable material serving for permanent, archival recording (but for now we do yet have any direct evidence for Linear B document written on perishable material).[22] It is also possible that the information from sealings was first copied onto palmleaf-shaped tablets, and then from the palmleaf-shaped tablets onto page-shaped ones (which then assumes four stages in processing information). In short, the following options have been proposed:

nodule → page-shaped tablet[23] → perishable material
palmleaf-shaped tablet → page-shaped tablet[24] → perishable material
nodule → palmleaf-shaped tablet[25] → page-shaped tablet → perishable material

The same sequences, however, cannot be posited for Linear A. In Linear A administration there is no visible correspondence between sealings and tablets; indeed, they rarely appear together in the same archaeological

22 Driessen 1999, 207–208. It should be stressed that there is no direct evidence for the use of perishable material: no parchments or papyrus roles with Linear B have ever been found. In Linear A flat-based nodules are our best indication of the use of perishable material.

23 For example, sealings MY Wt 501–507 and the tablet MY Ue 611 from the House of Sphinx dealing with vessels; or the sealing MY Wt 700 and tablets MY Oi 701–706, all found in the Citadel House, dealing with the commodity *190 (Palaima 1987: 251, n. 6; Anderson 1994–95). Piteros, Olivier & Melena (1990: 172–183), suggest the same recording process for the summarising tablets PY Un 2 and Un 138; however, no sealings are preserved to prove this hypothesis.

24 Some examples of palmleaf-shaped tablets summarised on page-shaped tablets are given in Bennet 2001: 28, for example, the Pylian Eo and Eb land-tenure records summarised on En and Ep tablets respectively. That tablets of the PY Eb series were copied onto Ep tablets had already been suggested by Chadwick (1968: 12). He also suggested that KN Vc tablets were possibly summarised on tablets of the KN V series (Chadwick 1972, 27–28).

25 This is what Killen suggests for Knossian C(2) and perhaps C(1) sets (1994: 74). No sealings are preserved that can be linked to C(2) and C(1) tablets, so Killen's suggestion remains hypothetical. Killen similarly suggests that the tablet KN M 683 may have summarised the records from some Knossian Wm sealings, since they share the same information: the logogram *146 followed by the quantity of thirty units. The problem is, as Killen observes himself, that the tablet and sealings in question were not discovered in the same part of the palace (Killen 2002–03, 105-106). PY Wr 1374 can be connected to tablet PY La 1394, both of which refer to TELA+pu (Bennet 2001: 29).

context (excluding that one case from Haghia Triada described in fotnote 21). It has therefore been suggested that information from Linear A sealings was summarised directly onto perishable material. If we accept the same for Linear A tablets, i.e. that they were directly summarised on perishable material, the natural conclusion is that Linear A sealings and tablets had different functions, and that sealings did not precede tablets in the information cycle, as is the case in Linear B. Instead of this 'linear' processing of information, Schoep suggests a 'dendritic' pattern for Linear A (Schoep 1996).

It must be pointed out that these three (or four) linear stages of Linear B information processing cannot be confirmed in all cases. One deposit of documents, the Room of the Chariot Tablets, does not follow this scheme, and I would argue that the three-tiered system had not yet developed in the period of the RCT records. When we say that Linear B page-shaped tablets summarise palmleaf-shaped tablets, our evidence is typically from Pylos – records which may be as much as two hundred years later than those from Knossos. Only a few examples of a three-tiered system can be found in Knossos, and possibly only two in the RCT. Furthermore, the number of page-shaped tablets is much smaller in Knossos than in Pylos: in Pylos they represent about 15% of all tablets, in Knossos only 5%, and in the RCT even less than that (3,7%). Most sealings from Knossos appear not to have been summarised on tablets, whether palmleaf-shaped or page-shaped. Since Linear A sealings do not appear to have been summarised on tablets (for one possible exception see footnote 21), it seems reasonable to suppose that the Knossian records – especially those from the RCT – represent a transitional stage in the development of Linear B, which finally resulted in the three-tiered system represented at Pylos.

Whereas Weingarten (Weingarten 1988: 11) has argued that sealings from the RCT mix early and late features, which is why the deposit appears transitional, dating to LM II or early LM IIIA1 (just as Driessen has dated it). Palaima (1990: 98), suggests that Knossos *in toto* represents a transitional stage in the development of Linear B. According to him, the smaller number of page-shaped tablets compared to the later Pylian corpus, but also the shorter length of text on tablets, further supports the argument that Knossos represents a transitional stage. Palaima has calculated that the Knossian records have an average of 7.7 signs per tablet, whereas the Pylian ones have 25, meaning that there is a significant increase of lexical information on latter tablets. He concludes that the brevity of the Knossian tablets makes them more akin to those in Linear A. The fact that the Knossian tablets are also syntactically simpler that the Pylian ones additionally speaks in favour of chronological proximity to Linear A. Finally, if we divide page-shaped tablets into so-called card-shaped and elongated page-shaped tablets, we find that most Linear A tablets are card-shaped, as are those from the RCT,

apart from KN V (2) 280. The prominence of elongated page-shaped tablets at Pylos suggests development away from the shape of the RCT tablets, which may have been influenced by Linear A tablets. Not only did the page-shaped tablets changed from Knossian to the Pylian times, so did the palmleaf-shaped tablets. Thus the Pylos palmleaf-shaped tablets are more complex than the RCT ones, as are already some of the tablets from later Knossian deposits (for example, sheep tablets).

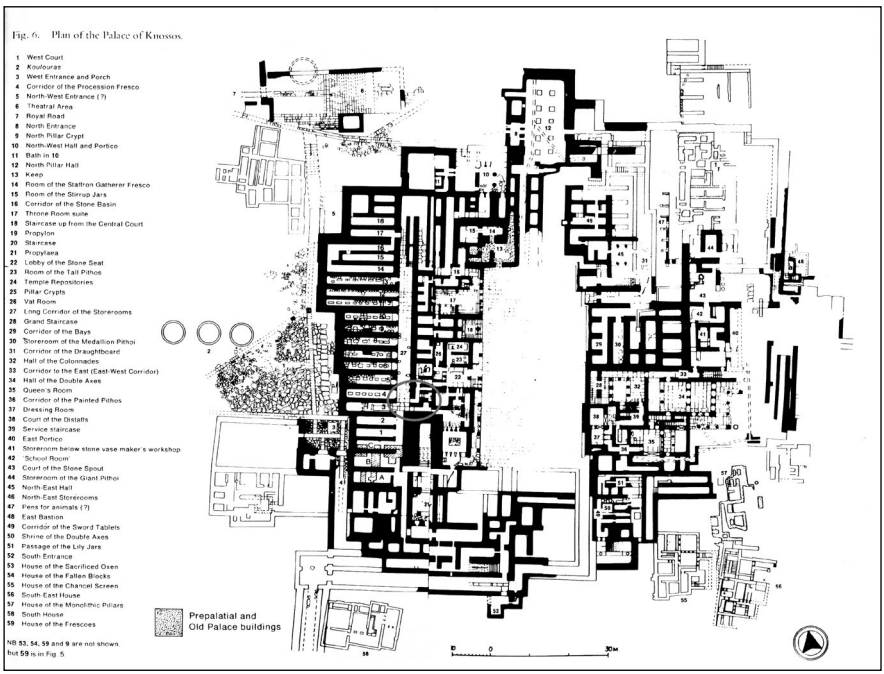

Figure 35. The plan of Knossos – encircled is the Room of the Chariot Tablets (RCT).

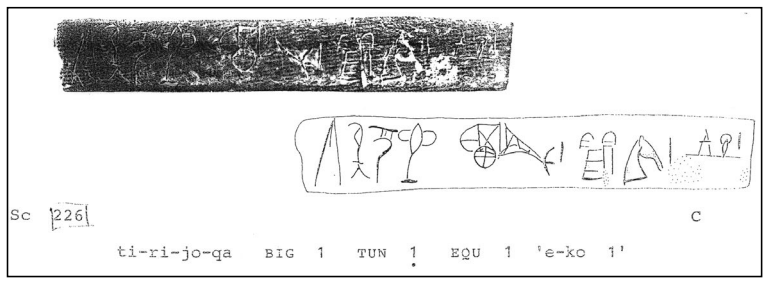

Figure 36. One of the RCT tablets recording the allocation of military equipment to the defenders of Knossos: in this case a man called ti-ri-jo-qa (the first word on the tablet) is getting one chariot, one corselet and one horse.

Figure 37. Another Linear B tablet from te RCT recording the allocatioin of military equipment.

The RCT has yielded 645 tablets. Only twenty-four are page-shaped and 585 are horizontally elongated (the shape of thirty-six tablets cannot be determined due to their fragmentary state). One could argue that scribal activity in the RCT was focused on simple records executed on elongated tablets, whereas page-shaped tablets are expected to be found in archives. The small number of page-shaped tablets in the RCT, therefore, suggests that the room did not function as an archive, which is why, some could say, we would not expect to find evidence of a three tiered-system there. However, this reasoning, especially the idea that the RCT documents did not belong to an archive, can be dismissed on several grounds:

1. The tablets from the RCT were not initially placed in this room, but fell from the upper floor, which is where the archives were usually placed during the preceding Minoan administration (Begg 1987).
2. Consequently, and according to the archaeological context, the room where the documents initially belonged was not a workshop, a type of the area where simple records were often taken;
3. Even though the room was situated close to the Magazines of the WestWings (figure 38), it was not a storeroom, where simple records would have been taken as well;
4. The range of commodities recorded in the RCT also demonstrates that it was not a specialised workshop or a storeroom. It is true that the majority of the recorded commodities are military in nature. However, since many other commodities are also recorded, we cannot conclude that the RCT was a specialised office for military records.[26] It is possible that a large number of records with military equipment reflects a specific socio-political situation in the period

[26] As previously concluded by Chadwick, who noted that some Linear B deposits were specialised: the south-east corner of the palace yielded sword-tablets (Ra series), the Room of the Column bases was preoccupied with olive oil (Fh series). "By contrast the Room of the Chariot Tablets is unspecialized." (Chadwick 1967: 103).

when the RCT records were written , such as a military conflict. Perhaps further deposits of tablets from the same period would produce more records of military equipment (as is the case with later Knossian deposits, when military records were not confined to a single place in the palace, but several: Northern East Entrance Passage, the Arsenal, the Throne Room and the Corridor of the Sword Tablets).

5. As Hallager has recently reminded us (Hallager 2005: 260), the majority of Mycenaean sealings were found in storerooms and workshops and very few in the archives. This fits nicely with the RCT where only a handful of sealings has been discovered.
6. Some palaeographical features of the RCT tablets, as argued by Driessen, also suggest that the documents formed an archive. [27]

Figure 38. Magazines of the West Wing of the at Knossos (Warren 1975: 21).

By following these arguments, we concluded that the RCT may have been some kind of an archive where evidence of a three-tiered system would have been found. A lack of evidence for that practice, therefore, must be explained differently. My suggestion, to repeat, is that the three-tiered system of Linear B data processing may not have been yet invented at the period of the RCT documents. A very small number of summarising page-shaped tablets in relation to a large number of elongated shaped tablets may speak in favour of this idea.

[27] Or a pre-archive, since the central archive is presumed to have been comprised of records on perishable materials (Driessen 1990: 116). For the meaning of the word 'archives' applied to Linear B administration see Olivier 1984: 15–18; Pluta 1996–97, 240–241; Driessen 1999: 244; Palaima 2003b: 169–173.

The disproportion of page-shaped and elongated shaped tablets, and the lack of evidence for summarising patterns, is not the only difference between the RCT and the rest of Knossian/Pylian records that may point to their chronological distinction. Sealing practice is similarly suggestive. The number of types of sealings is much larger in Linear A administration than in Linear B. The Knossian sealing-system – other than that from the RCT – already shows patterns apparent in the later Pylian sealing system: for example, the presence of direct-object sealings and labels pressed against wicker-baskets. These traits are not found in the RCT, again possibly implying that the latter pre-dated the rest of the Knossian deposits.

We have also seen that some types of sealings completely vanish in Linear B. The flat-based nodule, which is so prominent in Linear A, was not found elsewhere on Crete or anywhere on the Greek Mainland. But there are several examples from the RCT. The lack of flat-based nodules implies that Linear B either did not use perishable material (which puts Driessen's three-tiered system in question), or that Mycenaeans used different means for securing such documents. This second option would not be surprising, since the Mycenaeans generally abandoned sealing practice for the purposes of authentication and often used sealings for labeling commodities (which then makes them more akin to the Cretan Hieroglyphic administrative system). And yet the total abandonment of perishable documents would also not be surprising since, in the Mycenaean context, we find an increased number of page-shaped tablets and good evidence that these summarised palmleaf-shaped tablets and sealings. Furthermore, Bennet (Bennet 2001: 29) has argued that pinacological, epigraphical and vocabulary features indicate that page-shaped tablets were sufficient media for permanent records and that, consequently, there was no need for further recording on perishable material.

Whereas Weingarten[28] has argued that sealings from the RCT mix early and late features, which is why the deposit appears transitional, dating to LM II or early LM IIIA1 (just as Driessen has dated it). Palaima suggests that Knossos *in toto* represents a transitional stage in the development of Linear B (Palaima in CMS Beiheft 6; 2000). According to him, the smaller number of page-shaped tablets compared to the later Pylian corpus, but also the shorter length of text on tablets, further supports the argument that Knossos represents a transitional stage. Palaima has

[28] Weingarten 1988: 11. The transitional features of the RCT sealings, and other remnants of Minoan administrative practices, are summarised in Driessen 1990: 114. See also Bennet, who claims that the RCT administration represents a transitional stage from Minoan to "the fully-fledged Mycenaean bureaucracy" (1993: 173).

calculated that the Knossian records have an average of 7.7 signs per tablet,[29] whereas the Pylian ones have 25, meaning that there is a significant increase of lexical information on latter tablets. He concludes that the brevity of the Knossian tablets makes them more akin to those in Linear A. The fact that the Knossian tablets are also syntactically simpler that the Pylian ones additionally speaks in favour of chronological proximity to Linear A. Finally, if we divide page-shaped tablets into so-called card-shaped and elongated page-shaped tablets,[30] we find that most Linear A tablets are card-shaped, as are those from the RCT, apart from KN V (2) 280. The prominence of elongated page-shaped tablets at Pylos suggests development away from the shape of the RCT tablets, which may have been influenced by Linear A tablets. Not only did the page-shaped tablets changed from Knossian to the Pylian times, so did the palmleaf-shaped tablets. The longated tablets from Pylos pa are more complex than the RCT ones, as are already some of the tablets from later Knossian deposits (for example, sheep tablets).

Finally, another noticeable difference is the prominent role of sets of documents in Linear B, and their complete absence in the earlier administrative systems. According to Chadwick's definition Chadwick 1967: 103), sets are"… groups of tablets written and filed in one place and constituting a single document". Sets were intended to be read as one document, and a correlation can often be established between a particular scribe and a set of documents. Tablets of one set are usually of the same size and shape, and their text follows a formulaic composition. These formulae allow us to attribute fragmentary tablets to particular sets. Standardised way of subject dealing allowed the classification of Linear B tablets into series according to their content. Sets of documents cannot be recognised in Linear A, while the possibility of classification of Linear A tablets into series has been rejected by some scholars, but attempted by others, although the overall small number of preserved tablets made the latter attempts difficult (especially in comparison to classifiable Linear B tablets). The non-existence of the formulaic structures on Linear A tablets may indicate a lack of specialisation amongst Linear A scribes (of the kind that is evident, for example, from Knos-

[29] Palaima 1987a,: 304. According to Driessen's statistics the average number of signs is 25 for Pylian tablets, 8.5 for Knossian, and 3.67 for the RCT tablets (Driessen 2000, 25). See further statistics in Bartoněk 1983.
Palaima 1987a, 304. One must be cautious, Palaima warns, since this could be the result of other factors, regional, cultural, or even architectural (*ibid*., n. 30).

[30] As was done by Driessen (200: 42) who defines card-shaped tablets as those that have between three and five ruled lines, whereas proper page-shaped tablets have more than five ruled lines.

sian sheep- and military-tablets).[31] as well as a lack of centralisation and standardisation in Linear A administration.[32]

EXPLORING A POSSIBLE LINK BETWEEN LINEAR B AND THE PRE-LM IB ADMINISTRATION

From the above overview, we conclude that whereas the link between the Linear A and B scripts is undeniable, the administrative systems display more differences than similarities. It was shown that only one type of Linear A document – page-shaped tablet – although with significant changes in its features and function, relates to Linear B administrative system. The most prominent Linear A sealings, namely the single-hole hanging nodule, the flat-based nodule and the roundel, were left out.

Now, Linear B introduced – or reintroduced, as we will see below – several other types of documents, which cannot be traced to the latest Linear A. These are: horizontally elongated tablet, a label pressed against wicker-baskets in which tablets were transported, a direct-object sealing, which prevented unauthorised access to various types of containers, a string nodule (regular and irregular), and the so-called combination nodule, which was a hybrid of an irregular string nodule and a direct-object sealing. None of these documents can be found in the LM IB Linear A deposits, and some are not found at all in Linear A. Are these documents a result of the inventiveness of Linear B officials, or were they taken over from some other source?

The clay label is unique, probably a result of an advanced archiving system (Palaima & Wright 198: 260–26). The other four document-types, however, are not novel. Direct-object sealings were widely used during the MM II–MM III periods on Crete. A deposit of 6,500 such sealings was found in the MM IIB Phaistos, and at least a thousand came from contemporary Monastiraki.[33]

Further examples were discovered at the MM II sites that have produced evidence for Cretan Hieroglyphic administration, whereas only occasional

[31] The lack of specialisation amongst Haghia Triada tablets has been argued for by Montecchi, who noticed that same scribes composed tablets with very diverse subject matters (Montecchi 2010: 21).

[32] As suggested by Driessen & Schoep 1999: 392; Schoep 1999: 207–209. Since many Linear A documents were found in smaller settlements and private houses, Schoep suggest a term 'private administration' for them (2004: 290). Differences in distribution of documents are discussed in (Hallager 2011), for a list of non-palatial sites (see Schoep 2004).

[33] For Phaistos: Levi, 1958; Fiandra 1968; 1975; Militello, 2000. For Monastiraki: Kanta 1999; Kanta & Tzogounaki 2000; Godart, Kanta & Tzigounaki, 1996; 2000.

examples come from the post-MM II period of Minoan administration.[34] As already said, elongated tablets were not found amongst LM I Linear A documents, but a few came from the MM IIB Phaistos (see GORILA, vol I). Cretan Hieroglyphic has so far produced only five tablets, and they are all horizontally elongated, see CHIC). As for the string nodule and the combination nodule, none is attested in Linear A (Weingarten 1988, 6–7). A recently discovered MM II Hieroglyphic deposit at Petras, however, has yielded examples of the irregular type of the string nodule former, and possibly also of the combination nodule (Tsipopoulou & Hallager, 1996; 1996a; Tsipopoulou, 1998: 437–438; Hallager 2005: 253; 2010).

Thus we see that some of the Linear B document-types which were obviously not inherited from the chronologically closest LM IB Linear A, existed during the MM II period of Minoan administration, two of them, surprisingly only amongst the Cretan Hieroglyphic documents. The question I pose is: is it possible that the Cretan Hieroglyphic administrative system in some way influenced the development of the Linear B administrative system?

Most of the Linear B types of documents were employed in Cretan Hieroglyphic administration, whereas only one in the latest Linear A administration. It is not only the fact that more Linear B document-types can be traced to Cretan Hieroglyphic rather than to Linear A that is particularly telling, but also the fact that the chronologically closest phase of Linear A, LM IB, failed to impose its characteristic types of documents on developing Linear B. I wonder if the reason for this phenomenon could be that the nascent Linear B administrative system did not look to the latest Linear A as the model for their documents, but rather to another source.

I would like to argue that this other source may be found in the Cretan Hieroglyphic administrative system. The recent discovery of the Hieroglyphic deposit at Petras emphasises this possibility, since it has yielded, as just mentioned, two document-types that are particularly important for our discussion: the combination nodule and the irregular string nodule. A combination nodule was until the discovery of the Petras deposit considered a unique Linear B type of document. Also until then, it was supposed that what was previously called the Linear B two-hole hanging nodule, but now called a string nodule, was taken over from Linear A. However, one of

[34] few examples have been found in the MM IIIB or LM IA Temple Repositories at Knossos (for a debate over the chronology of the Repositories, see Pini 1990: 52–53; Schoep 1995: 32; and Driessen & Macdonald 199: 76), and at LM IB Haghia Triada, Palaikastro, Khania and Archanes (for Haghia Triada, Palaikastro and Khania: Hallager 1996, vol. I, 201; Weingarten, 1989, 40; 1990, 107–109; for the Archanes stoppers: Blackman 2001: 126; Petrakos, 2001: 100).

this type, the irregular string nodule, now has a counterpart in Cretan Hieroglyphic, whereas the regular string nodule is fairly distinct from the Linear A two-hole hanging nodule. This, consequently leaves the page-shaped tablet as the only Linear B document that was taken over from the latest Linear A, but with prominent alterations, as elaborated above.

Common types of documents, previously addressed amount of written information placed on sealings, and consequently a dominance of writing over sealing practice, are for now the features where Linear B administrative system has correspondences with Cretan Hieroglyphic administrative system. Other features, however, do not correspond, but this may partly be caused by the small number of discovered CH documents. (thus, for example, it is very difficult to assess if CH tablets summarised information from other types of CH documents, since only five CH tablets are preserved). The same goes for the epigraphical features.

The only epigraphical feature where a Cretan Hieroglyphic link could be hypothesised is the use of vertical lines to divide information on a tablet. This takes us back to one early feature from the RCT that disappeared completely in the later Linear B records, both Knossian and Mainland – the practice of cutting a tablet into separate records, which are then named *simili*-joins. These *simili*-joins are not found in Linear A administration, but there may be something similar in Cretan Hieroglyphic where several tablets and bars are incised with vertical lines. In the RCT these lines probably indicated where a palmleaf-shaped tablet was to be cut into separate, smaller tablets (see figure 30). The arrangement of vertical lines on Cretan Hieroglyphic documents, however, casts doubt on the idea that they assumed a purpose similar to that on the RCT tablets. Most Cretan Hieroglyphic documents with vertical lines are inscribed on more than one side. RCT *simili*-joins, on the other hand, are never inscribed on their v*erso*s, unless with a single sign or a single word (discussed in Tomas 2013). Moreover, vertical lines on Cretan Hieroglyphic documents rarely correspond in their position, so that if one were to cut the document following the vertical line on one side, the text would be severed on the other sides. Some CH documents have two lines of text inscribed on one side, divided by a ruled line (fig. 31). The vertical lines on them are either not placed underneath each other, or appear in only one line and not in the other (for example, #063.a, #113b, #120.a). It seems that in these cases the vertical lines are used to divide the information,i.e. separate entries into sections, rather than to divide the actual tablet or a bar. Since in a few cases these vertical lines separate a sign-group from a number, they are used differently from the word-dividers known from Linear A, which may separate sign-groups, logograms or transaction signs, but do not separate these categories of information from the following or preceding numbers. In Linear A it is usually the case that

an entry was ended with a number, and the next sign-group was therefore part of a new entry. This practice made it unnecessary to place a word divider between a number and the following sign-group in order to stress that they referred to separate entries, hence the small number of word-dividers in Linear A. However, it seems that Cretan Hieroglyphic needed to mark the separation of entries, and that vertical lines were employed for that purpose.[35]

This brief overview of the vertical lines on Cretan Hieroglyphic documents does not support a connection with the vertical lines on RCT palm-leaf-shaped tablets: the former appear to be used to separate entries, and the latter to guide the cutting of the tablet. That said, Olivier (1994–1995) has noticed thatCH bars #057 and #058 match nicely when placed against each other – they must have been one bar cut into two separate documents. Olivier (192–195) consequently refers to them as *a simili*-raccord, following Driessen's term *simili*-joins for similarly cut documents in the RCT. Three sides of bar #057 have vertical lines (one example is on Figure 31). Although there is no line on the fourth side, Olivier argues that a line was initially there, but no longer visible after the bar had been cut. Both parts have holes for suspension. Oliver claims that the two bars were inscribed by two different hands, but that was never the case *with simili*-joins in the RCT.

Simili-joins from the RCT may be another reason for believing that this deposit is earlier than the rest of the Knossian documents, since the practice of *simili*-joins ceases after the RCT period. A single exception has been detected by Olivier: KN B 808 and B 7035 (see footnote 17). This example could be regarded as a short-lived legacy from preceding RCT practice, which later disappeared from the rest of the Linear B records, both on Crete and the Mainland.

There are two more similarities that emerge from a comparison of Linear B and early Minoan administrative practice, but this time with Linear A, not Cretan Hieroglyphic. The first is the practice of incising a ruled line after each line of the text, which can be noticed on some MM IIB tablets from Phaistos (PH 8, PH 11 and PH 16). Such ruled lines are not present on the rest of the tablets from Phaistos, which shows that the practice was not uniform. After MM IIB, ruled lines after each line of the text are not attested on Linear A tablets, apart from the tablet PK1 (LM IB period).

The second feature that is absent from the post-MM IIB Linear A records, but reappears in the Linear B records of the RCT, are tablets of very small dimensions. There are two tablets from Phaistos (PH 10 and 24),

[35] All RCT simili-joins were inscribed by only two hands: 124r and 124s. It is always the same hand, though, that inscribed the matching *simili*-joins (see Driessen 1987: 156–157, 162).

which Schoep calls tags due to their tiny size. Tiny palmleaf-shaped tablets occur in the RCT, but not amongst the later Linear B records.[36] Their small size suggests that they were meant to be documents that could be, just like sealings, easily carried around by individuals. The similarity is also noticeable in the type of recorded information: one word on both Phaistian tags, and one word, sometimes followed by a number in the case of the RCT small-sized tablets.

Both of these features are chronologically too distant to have had a direct impact on the development of Linear B system. I mention them here simply to show that some of the advanced Linear B features, such as ruling after each line, had precedents from the very beginnings of Minoan administration.

CONCLUSIONS ON THE ORIGIN OF THE LINEAR B ADMINISTRATIVE SYSTEM

The initial aim of my comparison of the Linear A and B administrative systems was to elucidate the process of transition from one to the other. Cretan Hieroglyphic system was brought into the picture primarily to shed light on the origin of some Linear A documents; instead it told us more about the origin of Linear B. We will now see that neither the transition from Cretan Hieroglyphic to Linear A, nor from Linear A to Linear B is a clear-cut, but blurred by a mixture of features.

If we put aside the question of the Archanes script, the earliest inscriptions in both Cretan Hieroglyphic and Linear A are from the MM II period. During the MM II–III periods these two administrative systems coexisted on Crete, sometimes both were yielded at a single site. At the end of MM III Cretan Hieroglyphic was abandoned and Linear A remained as a single script on the island. The chronological and geographical overlap of the two Minoan administrative systems resulted in a number exchanged features, although at the same time both kept some uniqueness to themselves. A good example of exchange of features are sporadic clay bars, documents typical of Cretan Hieroglyphic, but occasionally also inscribed in Linear A (MA 1, MA 2, MA 10), or a roundel, typical of Linear A, but in a few cases inscribed in Cretan Hieroglyphic (PE Hc 2, possibly also KN Hc/Wc 1). An example for the latter aspect – documents unique to one of the two systems – is the

[36] Apart from several examples from the Megaron room in Pylos (Palaima 2003: 162, n. 11). These tiny RCT tablets are less than 6 mm thick, less than 2 cm high and less than 4 cm long (Driessen 1988: 132).

single-hole hanging nodule or the page-shaped tablet. We find these documents amongst the earliest Linear A remains from MM IIB Phaistos, but they had no parallels in contemporary Cretan Hieroglyphic administration. As for the uniquely CH example, I take the medallion, already in function in MM II, but never found inscribed in contemporary Linear A. For some of these unique documents we can still entertain the idea of a common predecessor. It has been noticed, for example, that the CH medallions and some early LA roundels from Phaistos are similar in shape. Perhaps there was a common predecessor for both of these documents, which thereafter developed different functions?) We can also speculate that the MM II records do not represent the earliest stage of Cretan Hieroglyphic and Linear A, and that there was a preceding stage where single-hole hanging nodules, page-shaped tablets and medallions were common to both systems, but were thereafter abandoned in one of them. Alternatively, we could suppose that these three document-types were simply a result of inventiveness of the respective officials.

Figure 39. The necropolis of Archanes

The transition between Linear A and B shows a similar case of the mixture of features. We have seen that this transitional period was characterised by the following aspects: a full adoption of some documents (for example, a page- shaped tablet in the RCT that continued into later Linear B periods), a sort of short-lived, experimental adoption of others (the flat-based nod-

Figure 40. A seal from Archanes (made of bone) engraved with the so-called Archanes script.

ules in the RCT), and a Linear B introduction of new types of documents and new epigraphical features (horizontally-elongated tablets, labels, new types of sealings, the practice of *simili*-joins, columnar arrangement, etc.). The former two aspects may be an important indication that the chronological gap between the latest Linear A and the earliest Linear B records was not long: if a lengthy period of time passed between the two periods, we would not expect specific Linear A features amongst the RCT documents, especially features that disappeared from later Linear B administration. The third aspect, however, tells us that there *was* some chronological gap, which allowed the development of some RCT features that are not traceable to the LM IB Linear A. It is also possible that some of the new RCT features were not necessarily a result of the chronological gap between the two scripts, but rather a result of some other influence, namely Cretan Hieroglyphic.

The analysis of Cretan Hieroglyphic documents was, as said, included into this study to elucidate the origin of Linear A document-types. It came as a surprise to realise how much they have in common with Linear B. The chronological gap between the two makes this difficult to explain. If the Hieroglyphic Deposit at Knossos is indeed to be dated to MM III–LM IA instead of MM II, as recently suggested by Pini),[37] then the gap between the latest Cretan Hieroglyphic documents and the earliest in Linear B is much reduced, but still considerable. I am not proposing that Linear B in general was developed from Cretan Hieroglyphic, rather than from Lin-

[37] Pini in the latest edition of Knossian sealings (CMS II.8, 2002; 6–7). Further discussion of the problematic chronology of the Hieroglyphic Deposit at Knossos can be found in Platon 1973; Younger 1996–97, 0–381; and Schoep 200: 147–148.

ear A, for some similarities between Linear B and Linear A as scripts are still significant. However, the differences between LA and LB administrative systems are numerous, perhaps this was a result of a change in economic and political systems. Unlike in the Linear A system where sealings played a prominent role, in Linear B more weight is put on tablets,i.e. on written information. Thus Linear B administration relied less and less on sealings as a means of authentication, and used them mostly for primary records of transactions attached to the relevant commodities. Even supposedly common types, like the tablet, displayed significant differences in pinacology, epigraphy, content, and its role in the administrative cycle. This dilemma in choosing the most persuasive predecessor of Linear B can be easily solved if we abandon the assumption that there was a single source for the creation of both the script and the associated administrative system. The hypothesis that Cretan Hieroglyphic administrative system influenced Linear B administrative system – as distinct from the script – appears fairly plausible.

4. CREATION OF LINEAR B: SINGLE ACT OR A GRADUAL DEVELOPMENT?

4.1. THE SCRIPT

The differences between the origin of the script and the origin of the administrative system can also be appreciated when considering the pattern of the development of Linear B. I agree with those who argue that the creation of the script was mostly a single and deliberate act, undertaken following certain political decisions and executed by a limited number of individuals (Driessen & Schoep1999). Since I adopt the view that the Linear B script was an adaptation of Linear A for the purpose of a new language, this process could not have been gradual, since it would have produced different results in different areas, for example different signs for the typically Greek phonetic combinations.

The need to record a new language imposes certain immediate requirements. The script could not have been transformed gradually, since from the outset most of the alterations would have been needed if the script was to record the new language successfully. As we do not have evidence that the Greek language was ever recorded in Linear A (but see Palaima 2003a) , it is clear that the decision to use Linear B script required immediate alterations. This might have been done by a small group of individuals, either bilingual Greeks who could read Linear A, or Minoan scribes and

Mycenaean officials gathered together to perform the task. The adaptation of syllabograms could have been completed over a very short period, especially since the phonetic systems appear not to have been drastically different, as argued above. Once Linear A syllables were pronounced, it must have been immediately apparent whether they were suitable for the Greek language or not. Upon exhausting Minoan combinations, but not yet satisfying the needs of the Greek language, a number of new signs was introduced to accommodate the uniquely Greek phonetic combinations, which may not have existed in the Minoan language. A more steady development in the syllabary may be reflected by a group of invented Linear B signs that are not attested in the RCT (supposedly the earlieast Linear B deposit). Their absence in the RCT may be due to chance, but it may also be that these signs were introduced at some later stage of Linear B. If they are indeed invented later, they may be understood as a result of sophisticating the syllabary. They may not have been necessary for the basic expressing of Greek, so were not introduced at the very outset of the creation of Linear B script.

As for non-syllabic signs, it was probably realised straight away that the Linear A signs for numbers would work well, so no alterations were needed (apart from the introduction of a new signfor numeral 1000). It could also immediately be recognised that the Linear A fraction system was superfluous, since in the Mycenaean exchange of goods a different metrical system may have been used, for which it was only needed to invent appropriate signs. Logograms were probably not all introduced at once, but only those that reflected the economic activities at the time of the creation of the script; others were introduced afterwards when the need arose. As for Linear A monograms, they might also have been found unsuitable at the outset, since they may have reflected the Minoan names for various commodities and thus would have been useless to the Mycenaeans who spoke a different language. Mycenaeans did not try to modify monograms, but abandoned them, with some exceptions (*me-ri* or *a-re-pa*), and introduced logograms in their place (the reason for the low correspondence between logograms in Haghia Triada and the RCT may be that commodities were often expressed by monograms in Linear A). One reason why the Mycenaeans did not adopt the system of monograms may be the length of words. Unlike in Linear B, the majority of Linear A words consist of two or three signs (Duhoux1978), which were easily combined into a monogram (like *me-ri or a-re-pa* in Linear B).

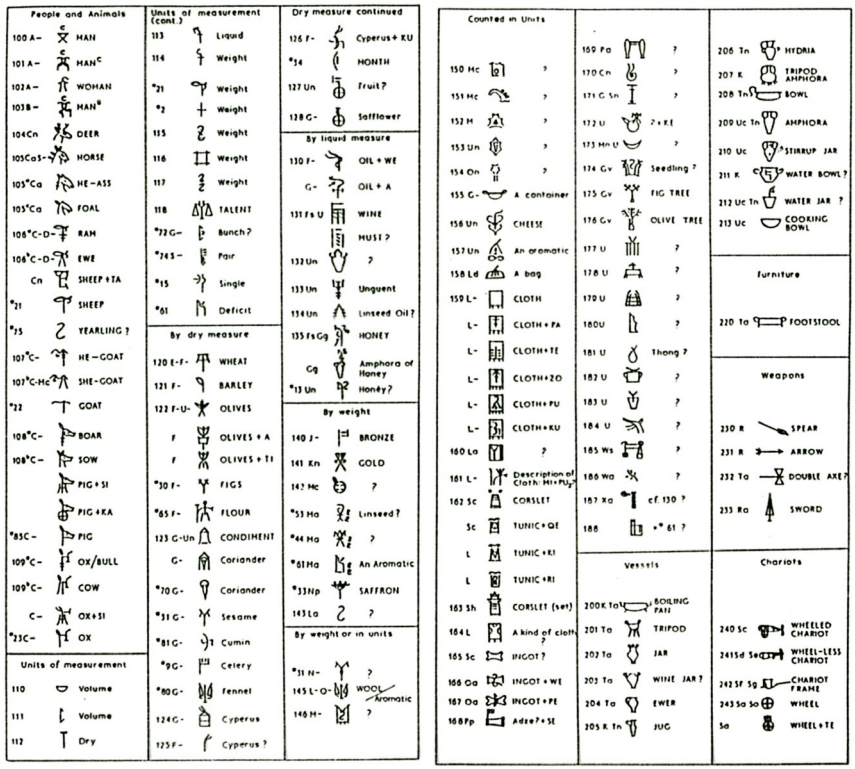

Figure 41. Linear B logograms Palmer 1963.

4.2. ADMINISTRATIVE SYSTEM

Unlike the creation of the script, probably executed within a short period of time, the creation of a new administrative system is more complex, was influenced by more than one source, and continued to develop and change within the Linear B system itself. Thus, noticeable differences are observed between the RCT, other Knossian tablets and Mainland tablets, especially in the size of tablets: amount of lexical information on them, and the ratio between page-shaped and horizontally elongated tablets. Such diachronic transformations are not only observable in Linear B administration: we can trace similar changes from MM II Linear A at Phaistos to LM IB records in Haghia Triada.

Some alterations in the administrative system seem to have occurred at the time of the creation of Linear B. Thus, the earliest preserved Linear B deposits already make use of phorizontally elongated tablets (which are missing in LM IB Linear A) and show no trace of the prominent Linear A

sealings. On Linear B page-tablets at the very beginning we already find well-defined epigraphical features absent from Linear A: a columnar arrangement, regular use of ruled lines, the use of spacing and majuscules to stress a prominent information, etc. Since these features are so noticeable and regular, and not just occasional, it appears that the administrative system, as reflected in the RCT, already followed well established rules. This suggests, at least to me, that the RCT does not represent the earliest Linear B records, but is a step away from the initial period. On the other hand, some transitional features can still be noticed, implying that the RCT records could not be much later than this initial period, for example, the occasional use of flat-based nodules, which completely disappeared in later Linear B. The conclusion is that the RCT is close enough to Linear A to reflect particular transitional features, but distant enough to reflect a well-established administrative system distinct from the latest Linear A one (as is obvious from the comparison of the LM IB Linear A and the RCT records, which is in detailed presented in Tomas 2004).

5. THE LIKELY DATE AND PLACE FOR THE CREATION OF LINEAR B.

The earliest so far preserved Linear B inscriptions date from the LM II period or early LM IIIA1, as argued by Driessen (1990), but this period does not seem right for the creation of Linear B for two reasons. First, since the RCT administration is already so well-defined and distinct from Linear A, we must allow enough time to arrive at this stage: Linear B could not have been created in LM II, unless at its very beginning, and still have developed such an established form by the end of the period. Second, there is no prototype in LM II to be adapted, since the regular use of Linear A seems to cease at the end of the LM IB period. Furthermore, if a Cretan Hieroglyphic influence is to be acknowledged, we must seek a period closer to MM III, which again makes LM II a less convincing date for the creation of Linear B.

From this it follows that Linear B must have been created during LM IB (or very early LM II), and the historical circumstances in the LM IB period, as presented by Driessen and Macdonald (1997: 117), support this possibility. The results of their study show that Crete was likely to have been susceptible to foreign take-over during the LM IB period, since the stability of the Cretan society appears to have been precarious at the time. Thus, the decline of Minoan LM IB palaces was not solely a consequence of foreign invasion, but of a general decline in society, as evidenced by a number of features, as well as of internal strife which, as a result, facilitated the

takeover. In general, the territorial and political fragmentation of the island during the LM IB period is observable through the weakening of the palatial authorities and the proliferation of the local elites (as suggested by the prominence of Archanes over its neighbour Knossos, Haghia Triada over Phaistos, and Palaikastro over Kato Zakro). The decentralisation of Linear A administration would be one reflection of this process. It seems likely that the Mycenaeans sought to exploit this social unrest and, as suggested by Driessen and Macdonald(1997) , arrived on Crete towards the end of the unstable LM IB period (or the beginning of LM II) to pacify the island and "fill a power vacuum". LM II may then be regarded as a period of recuperation or recovery, during which Knossos begins once again to function as a palatial centre, whereas the ruins of other palaces were populated by 'squatters'.[38]

If we accept that the arrival of the Mycenaeans to Knossos can be dated to LM IB or early LM II,[39] it follows that they created Linear B as soon as they captured the island. I disagree with the possibility that Linear B was created on the Greek Mainland before their arrival to Crete. As I have argued, influences other than the latest Linear A administration are apparent, which means that Linear B was created under the Cretan Hieroglyphic influence. This, of course, could not have happened on the Greek Mainland, where no CH documents were ever discovered. The suggested influence of the Cretan Hieroglyphic administrative system on the development of Linear B indicates that the script must have been created in the Cretan environment (i.e. where the CH milieu had existed), most probably at Knossos, where we find the earliest attestation of Linear B (Driessen 1990).

There is another reason why Knossos appears the most likely candidate for the place where Linear B was created: both Cretan Hieroglyphic and Linear A administrations left their traces here, which means that the scribes of both systems used to operate at the palace. This is a crucial circumstance considering the overall argument of this book that Linear B in its origin relied on both Cretan Hieroglyphic and Linear A. Future Linear B users

[38] For the Mycenaean arrival to Crete, see Macdonald (2010: 195–223).

[39] A suggested by Driessen (1990). In this book and elsewhere I accept Driessen's argument that the RCT deposit is older than the rest of the Knossian tablets and that should be dated to LM II or early LM IIIA1 (Driessen 1990: 130; 1997; 2011: 71–72); I believe that results of my own research support such a view, as does the research of some other scholars, for example Firth's work on find-places of tablets (1996–97: 75; 2000–0: 188–189), or Landenius Enegren's prosopographical study (2008 : 30–36). Whereas some scholars accept this earlier dating of the RCT (for example, Weingarten 1988: 11; Palaima 2003: 164; 2011, 115; Marazzi 2009: 147), others disagree with it (see, for instance, Warren 1992; Popham 199: 177; Pini CMS II.8, 8–9; Hallager 2005: 250–251; 2011, 327, n. 14).

may have thus encountered traditions of both Minoan administrations and adopted from each whatever suited them better.

I believe that scholars would more readily accept the possibility of the Cretan Hieroglyphic influence if it was not for the significant chronological gap. The case with Linear A is different. Thus, although Linear A is not attested in Knossos itself during LM IB (which does not mean that it was not used, see below), numerous finds all over the island testify to its regular use in this period. Unfortunately, we do not have any Cretan Hieroglyphic from this time. However, the dating of the Hieroglyphic Deposit from Knossos to MM III, or even MM III – LM I as argued by Pini (Pini in CMS II.8, 2002: 6–7), significantly reduces the gap between the (so far attested) latest use of Cretan Hieroglyphic and the earliest use of Linear B. One important point must be recalled here: the lack of any LM IB Linear A documents in Knossos has been explained by the fact that Knossos escaped a total destruction at the end of this period which would, as was the case with other administrative centres, bake and preserve its clay documents for the posterity. I wonder if the same can be posited for the absence of any Cretan Hieroglyphic documents from this period at Knossos, i.e. if the Cretan Hieroglyphic system exceptionally continued to be used here, but has not been attested due to a lack of a destruction-causing LM IB fire. One explanation for how the nascent Linear B administration got acquainted with some typically Cretan Hieroglyphic features may be found in the just proposed scenario.

I conclude that Linear B was most likely to have been created in Knossos towards the end of LM IB (or the very beginning of LM II). I do not find it plausible that it was created prior to LM IB, since we may assume that typically Linear B features would have possibly influenced contemporary LM IB Linear A documents, which would then show examples of columnar arrangement or regular use ofruled lines. However, it may be that these particular Linear B epigraphical features did not develop until LM II, even though the script may have been created earlier.

CONCLUSION

The results of the analyses conducted in this book show that the study of the origin of Linear B should not be limited to a single set of data. Our understanding of the issue improves if we distinguish the origin of the script from the origin of the administrative system. From this two-sided perspective, the transition from Linear A to Linear B script and the development of Linear B administrative system can be summarised as follows.

Linear B script was developed from Linear A. As for the Linear B administrative system at least one type of document, the page-shaped tablet, also appears to have been adopted from Linear A (although with pronounced pinacological and epigraphical differences), as well as the modus of recording the transactions (i.e. the sequence sign group + logogram + number). Although the link with Linear A is undeniable, it is easily shown that Linear B went through a number of changes:

Immediate changes. Through regular trade contacts with the Minoans, or upon their arrival to Crete, Mycenaeans became aware of the usefulness of a script in conducting administrative transactions. A decision was made to apply the script in their own administrative affairs, though it was soon realised that the Greek language was not easily recorded in Linear A. The script needed to be modified, possibly in a way described above. Apart from the script, administrative documents needed to be adapted. For some reason, the Mycenaeans found the Minoan sealing system unnecessary, though they adapted those sealings that could be used to label commodities. The horizontally elongated tablet was introduced as a prominent type of document for primary transactions. The creation of the script was a deliberate and conscious act, and the described changes in types of documents may have followed immediately thereafter.

Gradual development. The next phase we have is the RCT. We see a development in methods of recording information, particularly in a much improved epigraphy. Some Linear A features remain unused, especially in the domain of sealing practice. The RCT experimented with flat-based nodules, which indicates that the Linear A practice of authenticating documents on perishable material may have been retained for a while – though later on we do not have any evidence for it. The number of preserved sealings is much smaller than in Linear A, reflecting the general unpopularity of sealing practice in Linear B, which is later limited mostly to those sealings attached to commodities. The practice of *simili*-joins is significant in the RCT, but absent from later Linear B records and may be regarded as a specifically

RCT feature (and perhaps a transitional feature which was unneeded in later Linear B. First sets of documents make their appearance, coupled with the formulaic organisation of the data. Page-shaped tablets become larger and the first elongated page –shaped tablet occurs (KN V 280). A link with Cretan Hieroglyphic has been explored through the practice of cutting horizontally elongated tablets for the purpose of rearranging information; the evidence, however, remains inconclusive. The CH-LB link is more persuasive through the use or (re)introduction of the elongated tablet and some types of sealings.

In the subsequent Knossian records, there is a greater number of elongated page-shaped tablets. Possible examples of a three-tiered system of recording occur. The first labels attached to baskets containing tablets appear as well. As for the sealing-types, some features indicate a possible legacy of Cretan Hieroglyphic administration (irregular string nodules and combination nodules), not at all with Linear A.

On the latest Mainland Linear B records, there is clear evidence of the three-tiered system of recording. Sealings contain more textual information, and in Pylos more labels pressed against baskets with tablets are found, mostly in the Archives Complex (Chadwick 1958,1968). There is a larger number of page-shaped tablets, with a larger amount of lexical information on them. The syntax becomes more complex.

As shown in this brief summary, once created, the Linear B script remained more or less the same for two centuries or more, while the administrative system underwent numerous adjustments, changes and innovations. Whereas for the script itself it is easier to claim that it originated from Linear A, Linear B administrative system involves several layers, not all of which are connected to Linear A. Certain features show the influences of Cretan Hieroglyphic administration, rather than of Linear A. It appears therefore that the origin and the development of Linear B administrative system had three constituents:

1. The influence from Linear A, as visible from the adoption of page-shaped tablets and, at least temporarily, some types of sealings;
2. The influence from the Cretan Hieroglyphic administrative system, as visible from a possible adoption of elongated tablets and some types of Cretan Hieroglyphic sealings;
3. The internal development of Linear B administrative system, as visible from the features that progressed from the RCT, to the rest of Knossos, and then to the Mainland records: the abandonment of Linear A sealings that were employed in the transitional RCT (flat-based nodules); the general decrease in the use of sealings, along with the increase in the textual information on them; the enlargement of page-shaped tablets (only one elongated page-shaped tablet in the RCT

(KN V 280), but numerous in the rest of Knossos and the Mainland); the introduction of a three-tiered system, the introduction of sets of documents; and the improvement of epigraphical features (columnar arrangement, regularly present ruled lines, etc.).

Whereas the creation of the Linear B script was a singular event, the development of the administrative system for which it was used was a longer process, and had more than one source. Since one of these other sources may be identified within Cretan Hieroglyphic, the origins of Linear B should be sought on Crete, most probably in the LM IB or early LM II period.

Figure 42. Sir Arthur Evans, the first discoverer of Linear B script

ABBREVIATIONS

CHIC J.-P. Olivier & L. Godart, *Corpus Hieroglyphicarum Inscriptionum Cretae (Études Crétoises*, 31), 1996, Athens-Rome.

CMS *Corpus der Minoischen und Mykenischen Siegel*, Mainz.

COMIK J. Chadwick, L. Godart, J.T. Killen, J.-P. Olivier, A. Sacconi & Y. A. Sakellarakis, *Corpus of Mycenaean Inscriptions from Knossos*, 1986 (I), 1990 (II), 1997 (III), 1998 (IV), Rome-Cambridge.

GORILA L. Godart & J.-P. Olivier, *Recueil des Inscriptions en Linéaire A*, 1976 (I), 1979 (II), 1976 (III), 1982 (IV), 1985 (V), Paris.

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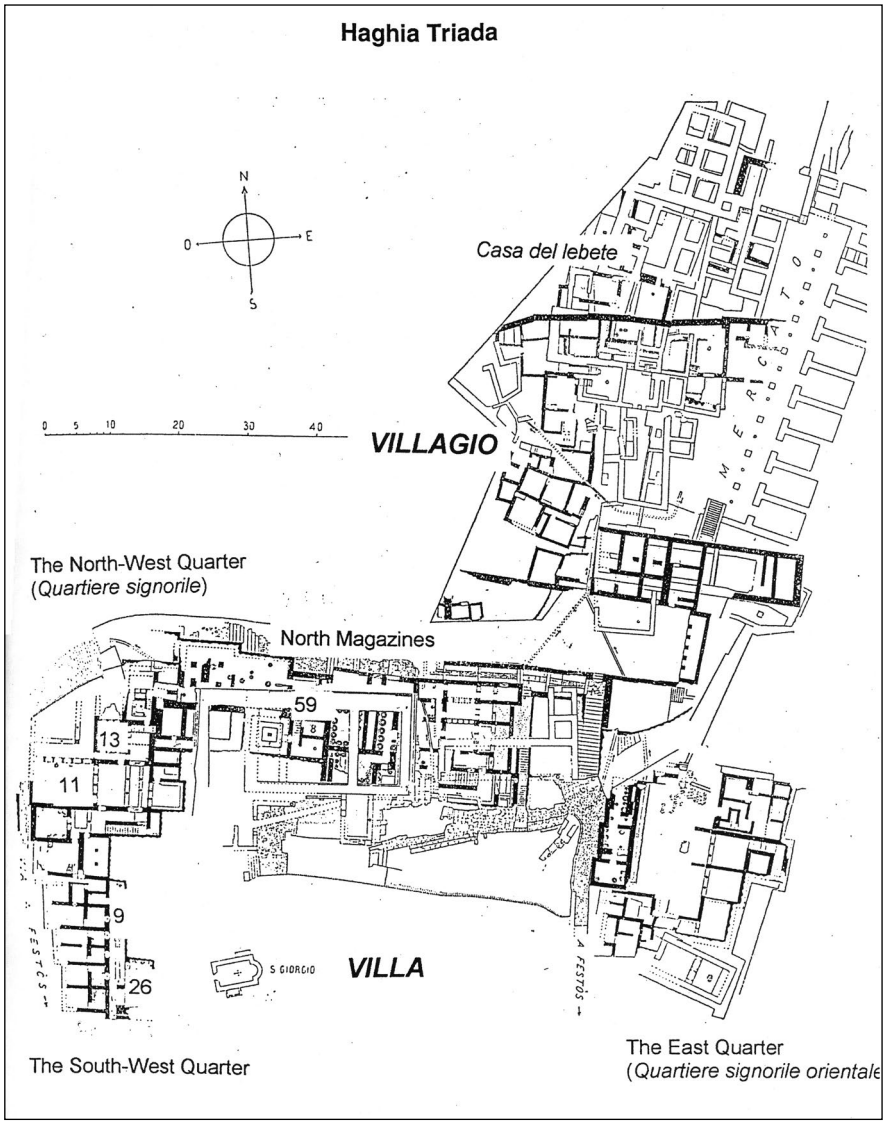
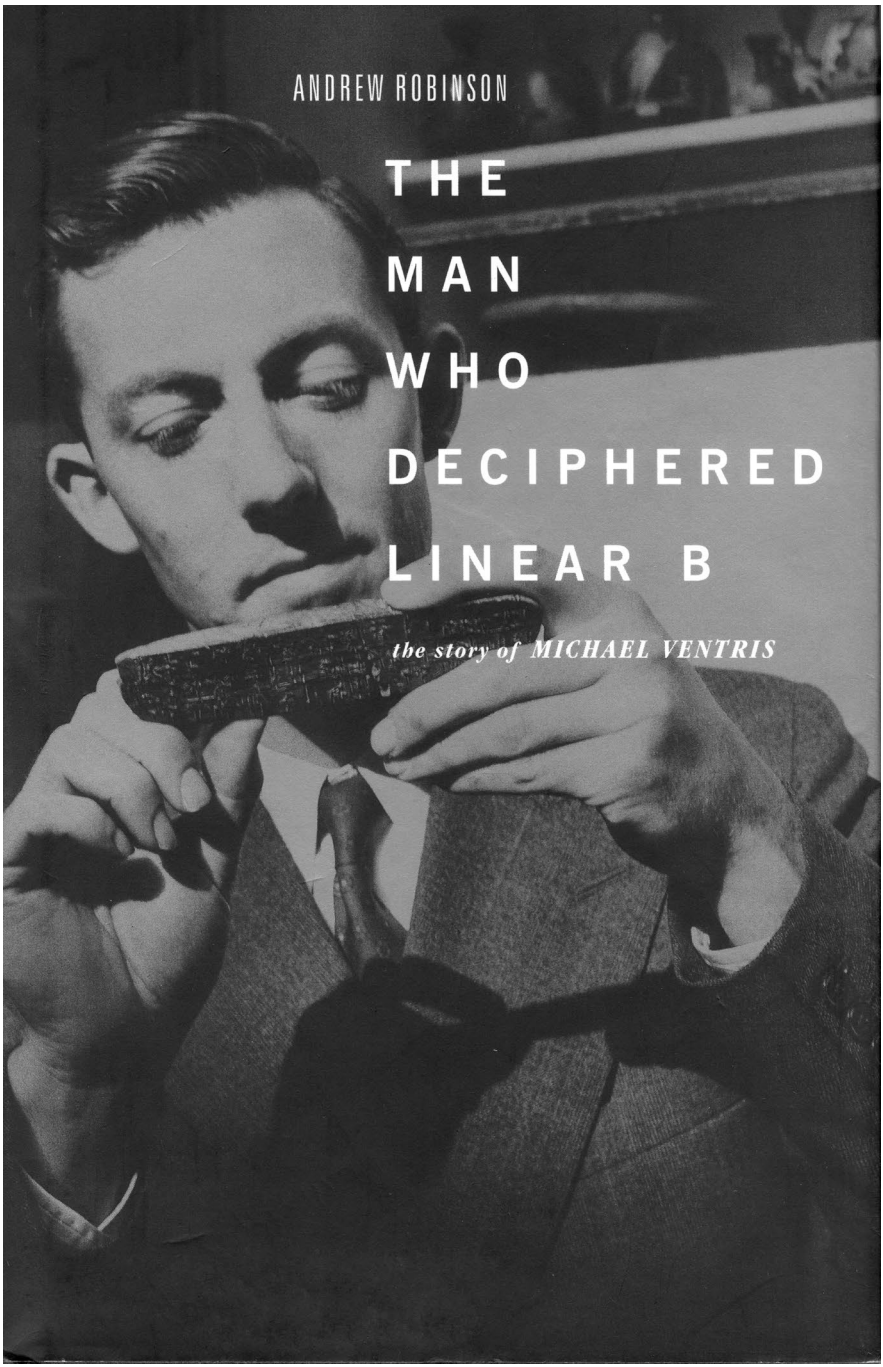


Plan of Haghia Triada


ANDREW ROBINSON
THE MAN WHO DECIPHERED LINEAR B
the story of MICHAEL VENTRIS

THE END