



UNIVERSITY OF CAPE TOWN

*The Impact of the  
Decipherment of the  
Linear B Script  
on Linguistic and  
Historical Studies*

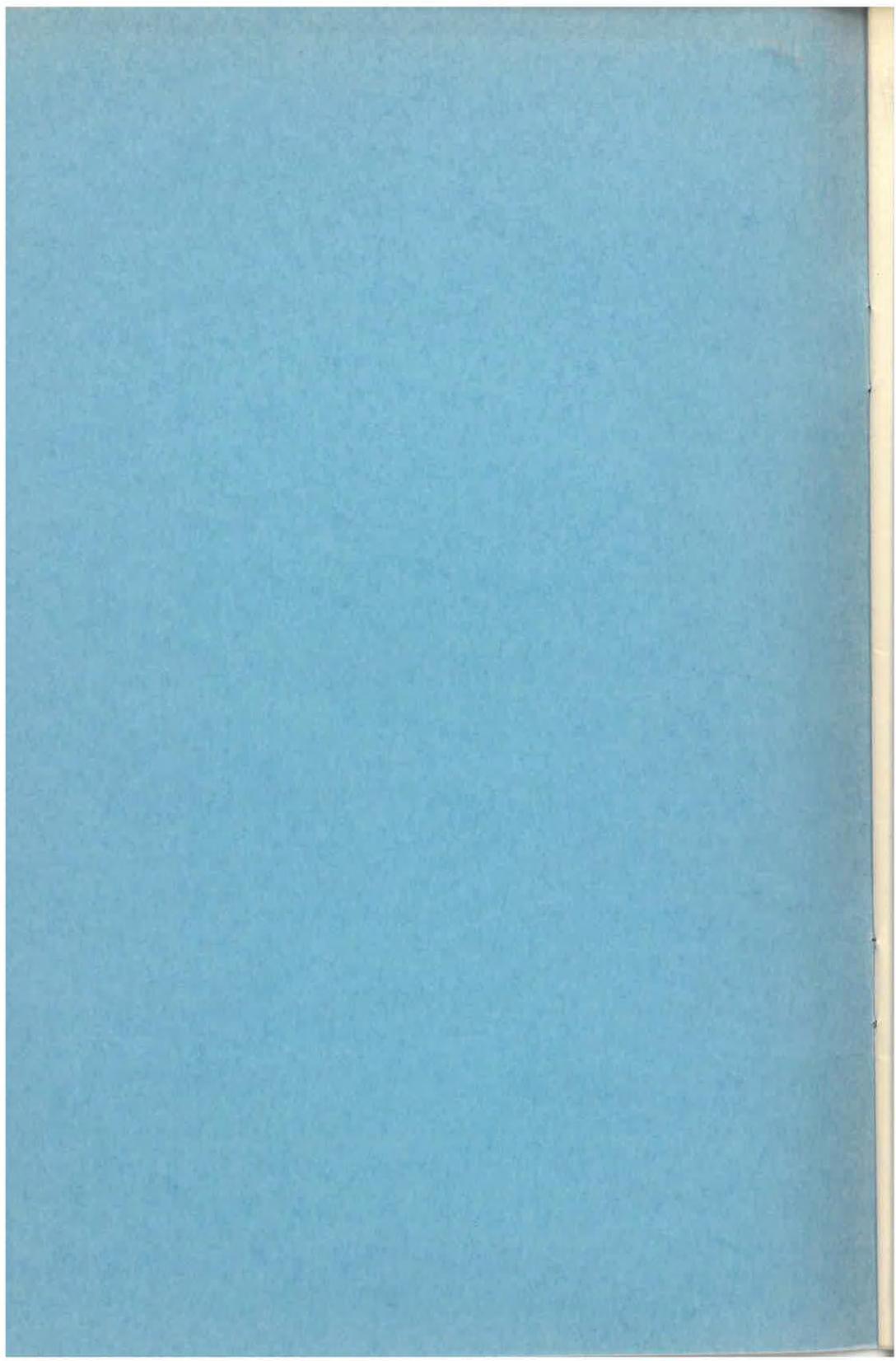
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# THE IMPACT OF THE DECIPHERMENT OF THE LINEAR B SCRIPT ON LINGUISTIC AND HISTORICAL STUDIES

by

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## Introduction:

Before I turn to the actual topic of my lecture, "The Impact of the Decipherment of the Linear B Script on Linguistic and Historical Studies", I want to say a few words about my immediate predecessors in the second chair of Classics at this University. When I was a junior lecturer at my Alma Mater, the University of Stellenbosch, Professor William Rollo, the incumbent of the other chair of Classics at U.C.T., started the idea of having meetings of the staff-members of the Classics Departments of the two Universities, at which one or other of us would read a paper. It was then that I met both Professors Rollo and Baldry, and Maurice Pope, later to succeed Professor Baldry after the short interregnum of Professor George Gold. I remember Professor Baldry particularly for his fine scholarship, and for his clear and sympathetic approach to his subject; Professor Rollo, in whose Department I had the privilege of working years later at Rhodes University, stands out in my mind as one of the most enthusiastic classicists I have ever met, combining as he did a wide knowledge of his subject with the ability to inspire in his students a deep love for the Classics. Less than a week before his death in 1960, we founded a branch of the Classical Association at Grahamstown, and seldom have I heard a more impassioned plea for the Classics than on that occasion. Many of you, I am sure, remember Maurice Pope — versatile, often polemical, always ready to initiate discussion — in the Beattie Common Room morning coffee has not been the same without him. And then there is André Hugo, who had not been long at U.C.T. when he was afflicted with an incurable disease: the courage and faith with which he bore his suffering will always be remembered by all who knew him. The broad sweep of his knowledge, his enthusiasm, his lecturing ability, were all features of the man. He could breathe life into the most uninteresting of Greek particles, or the deadest of dead stones, and if he said, "The destruction of this or that Classical building is a tragedy" we all felt with him that it certainly was a tragedy. It will be hard to maintain the standard set by these men, but I shall do my best.

And finally, a word of appreciation to my Head of Department and friend, Professor Anton Paap. It is indeed a privilege that I have had you to introduce me here this evening, and I thank you for the 12 years of happy co-operation we have had since I joined the staff as senior lecturer in 1965 — I look forward to many further years in your Department.

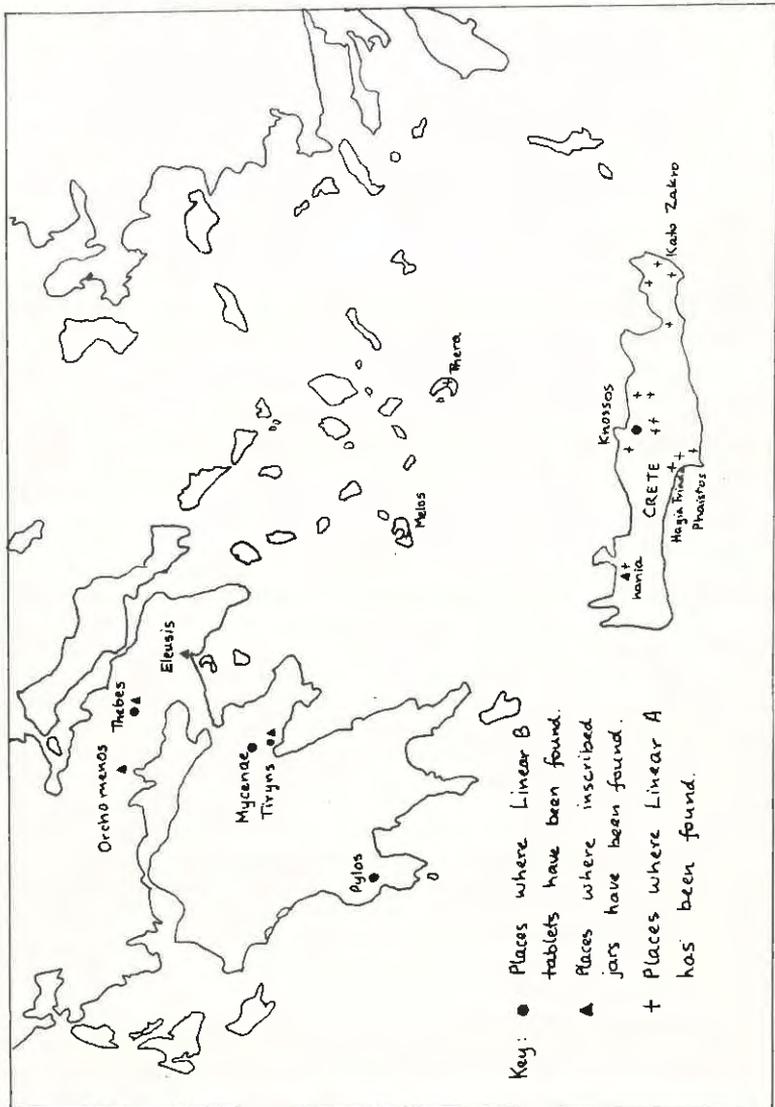


Fig. 1: Map showing distribution of Linear A and B.

When presenting a lecture of this kind, the lecturer has two important duties to perform, which are also great opportunities. He has in the first place the duty and the opportunity to demonstrate to his audience the importance of the subject in which he has specialized, and to give as it were an "apologia pro disciplina sua"; in the second place, he has the opportunity to speak of new developments in his subject, to show that there is "life in the old dog yet". The topic which I have chosen as the subject for this lecture is, I consider, eminently suitable in both these respects. The branch of Greek studies which has come to be called Mycenology<sup>1</sup> is of relatively recent growth: it began in 1952, when Linear B, one of the scripts of Bronze Age Greece, was deciphered by Michael Ventris. Since 1952 much new knowledge has been gained, so that it has been possible to build up a much clearer picture, not only of the early history of the Greek language, but also of the culture of Crete and Greece in the late Bronze Age. My purpose in this lecture, then, is to examine the importance of the decipherment of Linear B for linguistic studies on the one hand, showing how the decipherment was firmly founded on comparative Indo-European linguistics, and examining its importance for the study of early Greek, and on the other hand to show how the new knowledge gained from the Linear B tablets of Knossos, Pylos, Mycenae and Thebes has helped us to put flesh on the bare bones of the past as revealed by archaeology.

When Sir Arthur Evans began excavating in Crete in 1900, he found in the ruins of the palace at Knossos several thousands of tablets and fragments of tablets of unbaked clay which were inscribed with a kind of script. These tablets were accidentally fired to hardness and so preserved for posterity by the fires which destroyed the palaces at the end of the Bronze Age. Evans gave the name Linear B to the script on the tablets, to distinguish it from an earlier related script, Linear A; the script was called Linear because of the way the signs were formed; they consisted of lines and circles made with a sharp instrument on damp clay. He dated Linear B to the period immediately preceding the destruction of the palace, which he placed at about 1400 B.C. In 1939, just before World War II, a large number of Linear B tablets were discovered by Professor Carl Blegen at Pylos in the S.W. Peloponnese. Excavations were stopped by the war, but were resumed some time after hostilities ceased. Tablets have also been discovered at Mycenae, Thebes and Tiryns, and vases inscribed with Linear B at Thebes, Tiryns, Orchomenos, Eleusis and Chania (fig. 1).

Sir Arthur Evans was convinced that neither Linear A nor Linear B had been used to write Greek, so that it came as a considerable surprise when in June 1952 Michael Ventris sent out his now famous Work-note 20, entitled "A frivolous digression — are the Knossos and Pylos tablets written in Greek?" As a schoolboy Ventris had heard Evans lecture, and fired with enthusiasm he made up his mind that he would one day decipher the Linear B script. The war intervened, and this idea was put in the background. But he could not leave the problem alone, and began sending out a series of work-notes to scholars in all parts of the world, asking their opinion and reporting on the progress of his research. These work-notes have been preserved, so that it is possible to follow the whole process of the decipherment step by step. Ventris' great achievement lies in his successful decipherment of an unknown script without the help of a bilingual, as was the case with the Rosetta stone. He achieved this by a careful analysis of the signs and combinations of signs, and by drawing up a syllabic grid noting the relations of the different sign-groups to each other. He had not set out to find Greek on the tablets, but eventually, as Work-note 20 showed, the truth that the Linear B tablets were in Greek imposed itself on him. John Chadwick, a Cambridge classicist and linguist of note, was soon convinced of the correctness of the decipherment, and joined Ventris in a partnership which was to end with Ventris' un-

Linear B Syllabary

Basic Values

𐀀 a	𐀁 e	𐀂 i	𐀃 o	𐀄 u
𐀅 da	𐀆 de	𐀇 di	𐀈 do	𐀉 du
𐀊 ja	𐀋 je		𐀌 jo	
𐀍 ka	𐀎 ke	𐀏 ki	𐀐 ko	𐀑 ku
𐀒 ma	𐀓 me	𐀔 mi	𐀕 mo	𐀖 mu
𐀗 na	𐀘 ne	𐀙 ni	𐀚 no	𐀛 nu
𐀜 pa	𐀝 pe	𐀞 pi	𐀟 po	𐀠 pu
𐀡 qa	𐀢 qe	𐀣 qi	𐀤 qo	
𐀥 ra	𐀦 re	𐀧 ri	𐀨 ro	𐀩 ru
𐀫 sa	𐀬 se	𐀭 si	𐀮 so	𐀯 su
𐀱 ta	𐀲 te	𐀳 ti	𐀴 to	𐀵 tu
𐀷 wa	𐀸 we	𐀹 wi	𐀺 wo	
𐀻 za	𐀼 ze		𐀽 zo	

Special Values

𐀾 a <sub>2</sub> (ha)		
𐀿 a <sub>3</sub> (ai)		
𐁀 au		
𐁁 nwa	𐁂 dwe	𐁃 dwo
𐁄 ra <sub>2</sub> (rya)	𐁅 pte	𐁆 pu <sub>2</sub>
𐁇 ra <sub>3</sub> (rai)		𐁈 ro <sub>2</sub> (ryo)
𐁉 ta <sub>2</sub> (tya)	𐁊 twe	𐁋 two

Untranscribed signs and doubtful values

𐁌 *18	𐁍 *19	𐁎 *22	𐁏 *34	𐁐 *35
𐁑 *47	𐁒 *49	𐁓 *56 pa <sub>3</sub> ?	𐁔 *63	𐁕 *64 swi?
𐁖 *65 ju?	𐁗 *79 zu?	𐁘 *82 swa?	𐁙 *83	𐁚 *86

Fig. 2: Table of values of Linear B signs.

timely death in a motor accident in 1956, just before the publication of their joint work, *Documents in Mycenaean Greek*, which has already appeared in a second edition. Most scholars of the Greek language have accepted the decipherment as essentially correct, so that to-day Mycenology is an important branch of Greek studies, and the decipherment itself has been hailed as "The Everest of Classical Archaeology".

Of course, the decipherment has been attacked, and there are still some scholars who do not accept it. I do not wish to spend time this evening on a discussion of this negative aspect. I have discussed the objections of the dissenters on a previous occasion, and refer you to the discussion in *Acta Classica XVI* (1973) pp. 1-14. On this point I find it sufficient to say here that I accept the decipherment because on the whole it works. When we find such transparently Greek names as Alexandra and Theodora on the tablets, and when we find a tablet showing certain vessels with three feet described as *tripode*, and vessels with four, three and no handles described as *qe-to-ro-we*, *ti-ri-jo-we* and *a-no-we*, which are Greek words meaning "four-eared", "three-eared" and "without ears" respectively (fig. 3), we must agree with Blegen, when he applied Ventris' sign-values to this very tablet in 1953, that this could not be mere co-incidence.<sup>2</sup>

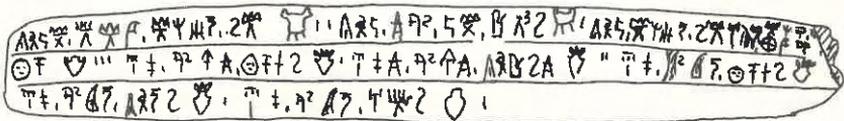


Fig. 3: PY Ta 641.

Let us proceed then to consider the positive value of the decipherment, and look first at its importance in the field of linguistics. Let me stress at the outset the fact that the decipherment is firmly based on comparative Indo-European studies, a branch of linguistics which the disciples of Chomsky tend to push into the background as outmoded in comparison with modern trends in linguistic studies. Surely a branch of linguistic studies cannot be outmoded if it made possible the decipherment of an unknown script, and if, as was the case here, it was constantly used in the checking of the decipherment and in the subsequent interpretation of the texts. On the other side of the coin, Comparative Linguistics received as it were a fresh transfusion of blood through the decipherment, in that on the one hand it confirmed many of the theories of scholars of Comparative Linguistics while on the other hand it made it necessary for them to revise some of their earlier conjectures.

Before 1952 our oldest texts in the Greek language were the Homeric poems, about the date of which there is still a measure of uncertainty. The most generally accepted date is the latter half of the 8th century B.C. Our knowledge of the Greek language has therefore been pushed back many centuries to the time of the Bronze Age — 1400 B.C. for Knossos, if we accept Evans' date for the fall of the palace there, and the 12th century for most of the Mainland sites. The Greek that emerges from the tablets is a strange, truncated form of Greek, but this is to be ascribed to the imperfections of the script for writing Greek. Still, it is recognisably Greek. As is to be expected, Mycenaean Greek, as the Greek of the tablets has come to be called, displays many archaic features which had already been conjectured for this early period by comparative linguists, thus proving the soundness of much of their work. So we find in Mycenaean Greek a distinct set of signs for the labio-velars of the parent Indo-European language, which had been reconstructed from correspondences in the daughter languages. I give a few examples in tabular form:

Sanskrit	Latin	Germanic	Greek
kas, cid	quis, quid -que	who, what	· τῷ τε
catvaras	quattuor quando	(four) when	τέτταρες πότε
gaus	(bos)	O.E. cū, E.cow	βοῦς

Here Mycenaean Greek shows the earlier form  $q^u$  as a reflex of the Indo-European labio-velars, showing that the Greek development to dentals or labials occurred after the Mycenaean period. The enclitic word for "and" which appears as *-que* in Latin and τε in Classical Greek, appears as *qe* in Mycenaean. We find the expected form of the numeral 4 on the famous tripod tablet referred to earlier in the compound *qe-to-ro-we*, while in lists of male workers cowherds appear as *qo-u-ko-ro* (later Greek βουκόλος). In many cases, the presence or absence of the labio-velar in Mycenaean has resulted in the revision of previously accepted etymologies. So the Greek adjective παλαιός (old) was earlier derived from a root with a labio-velar and connected with πῆλε (far). That etymology has had to be rejected because the word appears with *p* on the tablets (*pa-ra-jo*, *pa-ra-ja*) and all doubt as to its meaning has been removed by the fact that it is sometimes used as the opposite of *ne-wo* "new", "young".<sup>3</sup> Similarly, the Greek word for "all", πᾶσι, appears in all its inflexional forms without the labio-velar which had formerly been postulated for it, thus proving correct the formerly rejected proposal of Meillet, who had connected it with forms in Tokharian showing *p*.<sup>4</sup>

Another sound which disappeared from Attic and Ionic at an early stage, but was retained longer in other dialects, as inscriptions show, was the *w*-sound. That this sound was still in use in the Mycenaean period, was seen in two of the first words to be identified on the tablets, the words for 'boy' and 'girl'. These appear as *ko-wo* and *ko-wa*, interpreted *korwos* and *korwā*, Attic κόρος, κόρη, Ionic κοῦρος, κοῦρη. In this respect the decipherment has proved the soundness of much of the earlier work of comparative linguists; as the *w* seems always to be expressed in the script, its presence or absence would give a clear indication of whether a later Greek word had originally contained *w* or not. So, e.g., it had earlier been assumed that the Greek word for 'olive', ἐλαία, had originally been ἐλαῖφα because of the presence of *w* in Latin *oliua*, a loan-word from Greek. Now Linear B shows forms like *elaiwa*, *elaiwon*, in records of olive oil, giving clear evidence for the *w* in this word in early Greek.<sup>5</sup> In other cases the presence or absence of the *w* has necessitated the revision of previously accepted etymologies. One example will suffice, the name of the goddess Hera who appears on the tablets without the *w* which had previously been restored in her name, in an attempt to connect it with Latin *seruare* and provide a respectable Indo-European etymology for the goddess' name. The Attic form of the name, Hera, had already suggested the absence of the *w*, for otherwise Hera would have appeared in Attic as Hērē, in the same way as *korwā* > *korwē* > *korē*. No entirely satisfactory Indo-European cognates have been found for the name Hera, and it is possible that the goddess and her name belong to the pre-Hellenic substratum of religion and language.<sup>6</sup>

The early investigators of the Mycenaean language were at once struck by the fact that many grammatical forms and vocabulary words found on the tablets appear in later Greek only in Homer, and very occasionally in other poetry. The most notable form is the *o*-stem genitive in *o-jo* on the tablets, -οιο in Homer. The Homeric form had already been explained as going back to I.E. \**osjo* (cf. Sanskrit -*asya*), so that it came as no surprise to find the form in *o-jo*, already showing loss of *s*, in Mycenaean. Another archaic ending which is still found in

Homer and occasionally in lyric poetry is the ending  $-\phi\iota$ , e.g. Homeric  $\epsilon\phi\iota$ , which has locative, ablative and instrumental function. This ending appears in Mycenaean as  $-pi$ , with similar functions. There are also in Mycenaean certain words in common use, which appear later in Homer only, or with changed meaning elsewhere. We think at once of the usual word for 'king' in Mycenaean, *wanaka*. In Homer  $\omega\nu\alpha\kappa\iota$  (still pronounced *wanax*) is one of the words for 'king' but in later times it appears only in poetry, while the usual Greek word for 'king' is  $\beta\alpha\sigma\iota\lambda\epsilon\upsilon\varsigma$ . This word, too, is found on the tablets, in the form *qa-si-re-u*, but on the tablets the *qa-si-re-u* is a minor official, and some scholars even refuse to accept the identification of the word with later  $\beta\alpha\sigma\iota\lambda\epsilon\upsilon\varsigma$ . In passing, I may point out that we have sufficient examples in language of the rise and fall in social status of certain words (e.g. the marshall was originally the servant who looked after the horses; the English word 'queen' and the archaic 'quean' are cognates of the ordinary Greek word for 'woman',  $\gamma\upsilon\nu\eta$ ). Therefore the humble standing of the *qa-si-re-u* need not be a stumbling block in the way of identification of this word with  $\beta\alpha\sigma\iota\lambda\epsilon\upsilon\varsigma$ . The significance of the presence of these and other words in Linear B and in Homer and rarely elsewhere, is that they were probably originally in everyday use in the Mycenaean period, but were later restricted to poetry and eventually passed out of use altogether.<sup>7</sup>

The decipherment of Linear B as Greek is particularly important for the light it throws on the distribution of the Greek dialects in the pre-classical period. The Greeks themselves, as early as the time of the poet Hesiod,<sup>8</sup> had divided their dialects into three main groups, Attic-Ionic, Aeolic and Doric. To these, modern scholarship added the Arcado-Cyprian group, which the ancients had grouped with Aeolic. The Doric group has also been sub-divided into N.W. Greek and Peloponnesian Doric. On the grounds of the distribution of the dialects in the classical period, Paul Kretschmer<sup>9</sup> in the early years of the present century postulated the idea that the Greeks had entered the Balkan peninsula in a series of waves, each with its ready-made dialect, the Doric speakers being the last to come. The new knowledge supplied by the decipherment of Linear B has caused many scholars to abandon the "wave-theory", retaining only the so-called Dorian invasion as something sufficiently supported by tradition. Even the Dorian invasion as the cause for the fall of the Mainland palaces has for some time been doubted by many archaeologists, and recently Chadwick<sup>10</sup> has put forward a theory which, if correct, will finally lay the ghost of the Dorian invasion. His theory, in brief, is that there could have been no Dorian invasion, because the Dorians were already there, as the subservient class in the hierarchy of the Mycenaean palaces. When the end came for these palaces, possibly as a result of an attack from outside Greece, the Dorians would have risen and their dialect would have replaced the universally used Mycenaean language in the Peloponnese.

Much work has been done on the dialect pattern of the second millennium B.C. and on the relationship of the Mycenaean dialect to the dialects of the classical period.<sup>11</sup> It is interesting to note that modern methods of dialect geography have been applied to the study of the Greek dialects, and from the work of men like Porzig and Risch, it has become clear that many of the features distinguishing the dialects from each other in the classical period were late innovations (e.g. the change of original long  $\alpha$  to  $\eta$  in Attic-Ionic). The picture of a far more homogeneous pattern of speech in the second millennium than in the first is confirmed by the decipherment. The tablets at Knossos, dating to c. 1400 B.C., and those at Pylos, Mycenae and Thebes which belong to the 12th century, show very little that could be seen as differences in dialect. There are some minor differences in spelling at Knossos and Pylos, and even in the same palace some scribes use different forms from the rest, but on the whole the language of the tablets seems to

be uniform. That Mycenaean was already distinct from the ancestors of the Doric dialects is clear from the fact that it shows the development from *-ti-* to *-si-* which was a feature of the so-called East Greek dialects of the later period, whereas the West Greek dialects retained the *-ti-*, e.g. Doric ἔχουτι, Attic ἔχουσι, Myc. *e-ko-si*. There is therefore evidence of at least two dialects in the Mycenaean period, but nothing like the multiplicity of dialects known from the classical period.

As to the possible continuation of Mycenaean in any dialect of the classical period, while agreeing that of these dialects Arcado-Cyprian shows the greatest affinity with Mycenaean, most scholars are of the opinion that the Mycenaean language has no direct descendants in the classical period. On the grounds of some spelling variations at Pylos, Professor Risch has advanced the theory that the language of the tablets was a language used for the specific purpose of keeping the state records, which would explain its homogeneity in the different centres. The variations in the tablets he sees as occurring when a scribe substituted a form of his own spoken dialect, which may have differed from the language of the tablets. The language of the tablets, which Risch calls "mycénien normal", would have disappeared after the fall of the palaces, while the ordinary spoken language of the people, which he calls "mycénien special", would have continued to develop. This is perhaps just another way of speaking of a Mycenaean *koine*, if one understands by the term not a mixture of dialects, but the development of one dialect into a kind of *lingua franca*, in this case the court language of the palace records. This is Bartoněk's theory, and it has much to recommend it. This seems as far as we are likely to get for the present in the dialect studies of the second millennium B.C., but it is enough to show the importance of the decipherment for furthering our knowledge of the early history and development of the Greek dialects. All in all, I think we can confidently say that the decipherment, firmly based as it is on Indo-European comparative linguistics, shows that this branch of linguistic studies is still very much alive.

We turn now to the significance of the decipherment for our knowledge of the history and culture of Greece in the Bronze Age. In this respect a gratifying feature has been the closer co-operation which has established itself over the years between the classical linguist and the classical archaeologist. At the conferences and colloquia on Mycenaean studies I have attended, the need for this closer co-operation has been realised, and there have been sessions in which both linguists and archaeologists have worked together to provide a clearer picture of the period in question. In his interpretation of the Linear B texts the classical linguist has on the whole used the findings of the archaeologist to check the probability of his interpretations, and the archaeologist has received valuable supplementary evidence for his reconstruction of a period for which there had previously been no written sources which could be read and interpreted. The Swedish scholar M.P. Nilsson<sup>12</sup> earlier referred to the monuments of Greek religion in the Bronze Age as "a picture book without text." We can extend the application of this, and say that the Linear B tablets have gone some way towards providing a text, not only for the religion of the period, but also for the whole political, social and economic life in the palaces of the Bronze Age.

Now what is the picture that emerges? I must limit myself to a few aspects of life in Bronze Age Greece, but I hope they will be sufficient to show how important the evidence of Linear B is in this respect. The archaeological discoveries had revealed an advanced and prosperous civilization in Crete in the Early and Late Palace periods (c. 2000-1400 B.C.) and on the Greek Mainland in the Late Hellenic period (from 1600 B.C. to the fall of the palaces in the 12th century). The discovery of the Linear B tablets had shown that this civilization was literate, but

until the tablets could be read, nothing could be known about it except what could be reconstructed from the material remains — and from the material remains we should never have been able to conjecture the existence of the elaborate bureaucratic organization which operated in the palaces. The tablets reveal a political structure with a king at the head (the *wa-na-ka* already mentioned), followed by a second-in-command, the *Lāwāgetās* (a compound formed from two Greek words meaning "Leader of the People") and a whole host of minor officials, some of whose titles are familiar from later Greek, such as the *basileus*, while others have no echo in the later language, e.g. the *ko-re-te* and *po-ro-ko-re-te* who are mayors or some such local official in the different towns of the kingdom of Pylos, but whose names have not survived into later Greek and have therefore not been satisfactorily interpreted.

The tablets also give evidence of a considerable labour force in the palaces. At Pylos,<sup>13</sup> where the records are most complete, there are several series of tablets which record groups of women workers and their children, both girls and boys. These groups of women, who were probably of servile status, may be mentioned as often as three times; in one series of tablets they are merely listed, with the numbers of women and children in each group, and the addition of what have been interpreted as supervisors in some groups; in another series, the same groups are repeated, with the addition of the rations they receive (equal quantities of wheat and figs, still today important foodstuffs in Greece); thirdly, the groups of women are mentioned as the mothers of groups of unnamed young men. Though there are some slight variations in the numbers of women in the first two series, it is clear that the same groups of women are referred to. Taking this repetition into account, it has been estimated that there were approximately 750 women workers at Pylos, together with a similar number of children. These women, whose numbers in each group range from one to 38, are described in two ways, either according to their occupation or according to their place of origin. Some came from as far afield as Miletus, Knidos and Lemnos, if these place-names refer to the same localities on or near the coast of Turkey as in classical times, and it is a reasonable assumption that they were war-captives brought to Pylos from the Near East. Occupational names include wool- and flax-workers (carders, spinners and weavers), corn-grinders, bath-attendants and even "maid-servants". At Knossos,<sup>14</sup> too, there is a whole series of tablets recording women textile workers, who came from or are stationed at different centres in Crete, such as Phaistos, Tyliisos and other places: these places are clearly under the control of Knossos. There is evidence, too, of job reservation based on sex. The women, as we have seen, ground the corn, but men baked the bread (there are no fewer than 17 bakers listed on a tablet from Mycenae).<sup>15</sup> Women did the carding and spinning but both men and women seem to have been weavers. Men's occupations include shepherds and herders of other animals, gold- and bronzesmiths, potters, fullers, carpenters, shipwrights, unguent-boilers and even a doctor. A stern check was kept on raw materials issued to bronze-smiths for working, and even the absence of an allocation of bronze is noted. At Pylos,<sup>16</sup> the tablets listing bronze-smiths and their allocations show that there were 143 smiths attached to the palace, and that they had 801 kg. of bronze to work. Another tablet,<sup>17</sup> which gives a total, mentions 1046 kg. of bronze. (In passing, I may just mention that 801 kg. of bronze would yield c.534 000 arrowheads, or 2 300 swords or spears, or 1 000 bronze helmets; this shows the extent of the bronze industry at Pylos). The stern check on workers and their rations, and on the raw materials allotted to them, is a feature of a bureaucratic system. A careful recording of rations is required for another reason also, the fact that it is nowhere apparent, neither in the archaeological discoveries nor in the tablets, that there was any form of currency, or any commodity used

for exchange or barter. In the absence of a currency, workers are paid in kind, and there is need to keep a strict check on rations given in lieu of money payment.

The archaeological excavations of Bronze Age sites have revealed a wealth and luxury which are surprising for a country as poor agriculturally as Greece. A question that immediately springs to mind, is where the wealth of the kingdoms came from which enabled the rulers to keep their bureaucratic system of palace administration going, and which provided them with many luxury products such as gold and ivory, to mention but two of the articles Greece could not produce. We see that gold and ivory are attested both in the archaeological discoveries and in the tablets. Part of the answer may well be provided by the tablets concerned with sheep, wool and textiles at Knossos<sup>18</sup> (wool is a commodity which would not leave its mark archaeologically except in exceptional circumstances). On these tablets, sheep are usually recorded in round numbers, so that it is obvious that we do not have an actual census of flocks here. Interesting is the preponderance of rams over ewes; rams outnumber ewes by almost 8:1, which, as everyone with even a nodding acquaintance with sheep-farming knows, is an unnatural situation. The Cambridge scholar John Killen<sup>19</sup> has, I am sure, found the answer in a series of important articles. He comes to the conclusion that the rams recorded on the tablets are wethers, or castrated rams, which are known to be the best wool-producers, but which for obvious reasons are useless for maintaining the numbers of the flock. By comparing the Knossos sheep and wool tablets with wool records of medieval England, he has shown that it is very likely that these Knossos tablets are the records of a flourishing sheep breeding and wool producing industry. Wool and textile production may well have been one of the main sources of wealth in the Bronze Age, especially in Crete. Loom weights found in large numbers give support to this on the archaeological side.

There is evidence on the tablets, too, for other agricultural products. The production of olive oil, still today one of the staple products of Greece, must have played an important part in the economy of Crete and Greece. Tablets from both Pylos and Knossos<sup>20</sup> record quantities of olive oil, some of it scented, given as offerings to gods and rations to humans. That olive oil was exported, is clear from finds of stirrup-jars in many parts of the Mediterranean. Grain, both wheat and barley, wine and honey are recorded, as well as a variety of herbs and spices, such as sesame, cumin, mint, fennel and coriander, which would have given some added flavour to an otherwise uninteresting diet (we recall that the women workers received rations of wheat and figs). The names of some of these spices are Semitic loanwords, such as sesame and cumin, which would point to contact between Bronze Age Greece and the Semites even at this stage.

In the field of religion, too, the Linear B tablets provide important evidence.<sup>21</sup> Many of the names of the Greek deities mentioned by Homer and worshipped in the classical period occur on the tablets, so that we have clear evidence for the worship of these gods in the Bronze Age also. Zeus is there, sometimes coupled with his wife Hera; Poseidon is there, playing an important role at Pylos; Athena appears, as do Artemis and Ares and others. The presence of these divine names on the tablets lends support to Nilsson's hypothesis that the roots of Greek religion and mythology go back to the Bronze Age. But apart from the presence on the tablets of these and other deities not known in later Greek religion, we learn little about them; there is nothing about the way they were worshipped or what the Mycenaeans believed about them; they appear on the tablets only as recipients of offerings, which include bulls, rams, sheep-skins, cheeses, wheat, wine, honey and especially olive oil. The very fact that these gods appear, however, is of vital importance for the study of Greek religion.

The decipherment has enabled us to define more closely the relationship between Crete and the Mainland in the Late Minoan/Late Helladic period. Sir Arthur Evans had believed in a Knossos-dominated culture both on Crete and the Mainland throughout the Bronze Age; he did not accept the possibility that Greek could have been the language of this culture at any stage. The Mainland palaces, in his view, were mere outposts of Minoan civilization, controlled by Knossos. The myths about Theseus and the Minotaur and the tribute of seven Athenian youths and maidens to the Minotaur each year seemed to support this. But now the decipherment shows that Greek was used at Knossos in the Late Minoan II period (i.e. between 1450 and 1400 B.C.), and we have had to revise our ideas. It is clear that in the Late Minoan II period at any rate Knossos was ruled by Greeks from the Mainland, who used the Linear B script to keep their accounts, and whose language was Greek. When and where the Linear B script evolved, is still a matter of conjecture. I consider it highly likely that the Mainlanders took over the Cretan accounting system when Cretan influence on the Mainland was strong, round about 1600 B.C., and that they adapted it to writing Greek, thus developing the Linear B script. This script they took with them when they established themselves as rulers at Knossos in the Late Minoan II period. That no examples of Linear B are found on the Mainland before about 1200 need not surprise us. It is clear from the tablets that the records were not preserved for more than a year or two; the tablets have no dates on them, only references to "this year" and "last year". A further prerequisite for the preservation of tablets seems to be the destruction of the palaces by fire, so that no records can be expected from periods where there were no destructive fires.

Wherever the origin of Linear B is to be found, there is no doubt that this script was used at Knossos prior to its fall in c.1400 B.C. or just after. The Knossos tablets show very clearly that Knossos controlled the rest of the island, as tablets containing place-names such as Phaistos, Tylissos and others indicate. The control of the rest of the island from Knossos by Greek-speakers ties in nicely with one of the most earth-shattering events of all time, the violent volcanic explosion which blew up the centre of the island of Santorini (ancient Thera) round about 1500 B.C. blanketing what remained of the island under a shroud of volcanic ash and pumice. In 1967, Professor Spyridon Marinatos,<sup>22</sup> at one time Director of Antiquities in Greece, began to excavate under the layers of ash and pumice on the island, and laid bare the remains of a civilization similar to that on Crete. As early as 1939, Marinatos had suggested that the destruction of many of the sites in Central and Eastern Crete had been caused by the explosion on Thera, which is situated only about 80 miles from Crete. Though there are many difficulties attached to this theory, mainly chronological (e.g. the latest pottery found under the ash on Thera belongs to the Late Minoan Ia period, whereas Late Minoan Ib was already being used on the Cretan sites at the time of their destruction), the likelihood that Crete was affected in some way by the eruption is not to be dismissed lightly. In the first place the Cretan navy may well have been destroyed by the tsunamis resulting from the eruption, and secondly, the island, or parts of it, could have been covered by volcanic ash. The researchers of two marine geologists, Ninkovich and Heezen,<sup>23</sup> who extracted cores from the seabed round Crete and discovered in them a layer of volcanic ash which is almost certainly from the Thera explosion, show that the ash fallout was heaviest in an area to the north, east and south of Crete, as can be seen on the map (fig. 4). This distribution of ash makes it very likely that the central and eastern parts of the island were covered by a blanket of volcanic ash which, if thick enough, would have rendered the island infertile and uninhabitable for some time. Whether the palaces in Eastern and Central Crete were destroyed before or after the ash fall-



out, is uncertain; what is reasonably certain, is that a weakened Crete fell prey to attacks by Mainlanders who established themselves as rulers at Knossos, and controlled the rest of Crete from there. Of particular importance here are the sheep and wool tablets of Knossos discussed earlier. If, as seems likely, grazing land is the first to recover after a country has been covered by volcanic ash, these records reflect the picture of a Crete slowly recovering from the effects of the explosion, and using the restored grazing lands to maintain a flourishing sheep, wool and textile industry.

When Knossos finally fell, is still a matter of controversy, a subject which I leave to one side here. The traditional date of the fall of Knossos, 1400 B.C. or just after, was in 1960 called into question by Professor L.R. Palmer<sup>24</sup> who claimed to have found evidence from unpublished note-books of Duncan Mackenzie, Evans' assistant, that the date of the fall of Knossos had been wrongly worked out; Palmer and some others date the final fall of Knossos to the 12th century B.C. This controversy could be the subject of several lectures; suffice it to say that the weight of opinion, of the archaeologists at any rate, is still on the side of the earlier date.

Finally, what caused the destruction of the sites on the Mainland? This, too, is still a matter of controversy. What is certain, is that most of the Bronze Age sites in the Peloponnese were destroyed by fire in the Late Helladic IIIC period (roughly the 12th century B.C.). An invasion by Dorian Greeks is now rejected by many scholars, and the idea of attack by foreign enemy is gaining ground. Certainly there was much unrest in the Mediterranean at this time. Troy VIIA, usually equated with Homer's Troy, was destroyed in the latter half of the 13th century B.C. We hear a lot about the mysterious "Peoples of the Sea" who launched an attack on Egypt in the time of Ramses III (early 12th century B.C.), but were repulsed. Many scholars ascribe the fall of the Mycenaean civilization to these "Peoples of the Sea", but there are many problems. All I would venture to say is that from Hittite and Egyptian records a picture emerges of a period of turmoil and general unrest in the Mediterranean World at this time, and it is against this background that the end of the Mycenaean civilization is to be seen. That the inhabitants of Boeotia, Attica and the Peloponnese were expecting trouble, is evident from the precautions taken by them. The strong walls of fortification at Tiryns, Mycenae, Gla and other places date to the 13th century; cisterns to ensure a water supply in time of siege were constructed at Mycenae, Tiryns and Athens; a defensive wall was constructed at the isthmus of Corinth. From the Pylos tablets, also, comes the indication that the people of Pylos were making preparations for the defence of their kingdom. There are lists of weapons and armour; one tablet<sup>25</sup> mentions a collection of bronze by the chief dignitaries of the important towns in the two provinces of Pylos; this bronze is said to be for making "points for spears and javelins". An important set of five tablets<sup>26</sup> starts with the words "Thus the watchers are guarding the coastal areas" and there follows a list of the contingents of men with their commanders and liaison officers who seem to have had the task of giving advance notice of invasion, an invasion which seems to have been expected by sea. The circumstances surrounding the end are still unclear — but it is clear that the end came. The watchers of Pylos' coastal areas could not ward off the danger. One day trouble struck, and the palace went up in flames. The glory of Sandy Pylos was past; similar disaster struck Mycenae, Tiryns and other centres, but in the ruins the Linear B tablets were preserved, awaiting the day when they would be discovered and deciphered to unlock their secrets to an astonished world.

## Notes

1. Broadly speaking, one uses the term "Mycenology" to cover the study of the culture of Greece in the Late Bronze Age. This period is usually called the Late Helladic or Mycenaean period, and it begins about 1600 B.C. The term "Mycenaean" is derived from the Bronze Age palace of Mycenae, excavated by Heinrich Schliemann just over 100 years ago; it refers to the culture of the Greek Mainland in this period, without implying any political domination of Mycenae over the other centres. In narrower terms, "Mycenaean" is used of the language and script in use in the palaces of Bronze Age Greece, and "Mycenology" in its narrower sense is a study of this language and script.
2. PY Ta 641; see Chadwick, *The Decipherment of Linear B*, Cambridge 1958, second edition 1967 p. 81.
3. Chadwick and Baumbach, *The Mycenaean Greek Vocabulary (MGV)*, *Glotta* XLI (1963) s.v. πάλαι.
4. *MGV*, s.v. πᾶς
5. *MGV*, s.v. ἐλαΐα
6. *MGV*, s.v. ἥρα
7. Chadwick, *Mycenaean Elements in the Homeric Dialect, Minoica: Festschrift Sundwall* (1958) pp. 116-122; also *JHS* LXXXIII (1963) pp. 174f. (review of G.P. Shipp, *Essays in Mycenaean and Homeric Greek*, Melbourne 1962).
8. Hesiod fr. 7.
9. Kretschmer, *Glotta* I (1907) pp. 9ff.
10. Chadwick, *Who were the Dorians? La Parola del Passato* CLXVI (1976) pp. 103-117.
11. Important articles on this subject include:

W. Porzig, *Sprachgeographische Untersuchungen zu den altgriechischen Dialekten, Indogermanische Forschungen* 61 (1954) pp. 147-169.

E. Risch, *Die Gliederung der griechischen Dialekte in neuer Sicht, Museum Helveticum* 12 (1955) pp. 61-76; *La position du dialecte mycénien, Etudes mycéniennes* (1956) pp. 167-172; *Les différences dialectales dans le mycénien, Proceedings of the Cambridge Colloquium on Mycenaean Studies*, 1965, pp. 150-157.

J. Chadwick, *The Greek Dialects and Greek Prehistory, Greece and Rome* N.S. 3 (1956) pp. 38-50; *The Prehistory of the Greek Language*, in *Cambridge Ancient History*, ed. 2, Vol. II, chapter 39 Cambridge 1962.

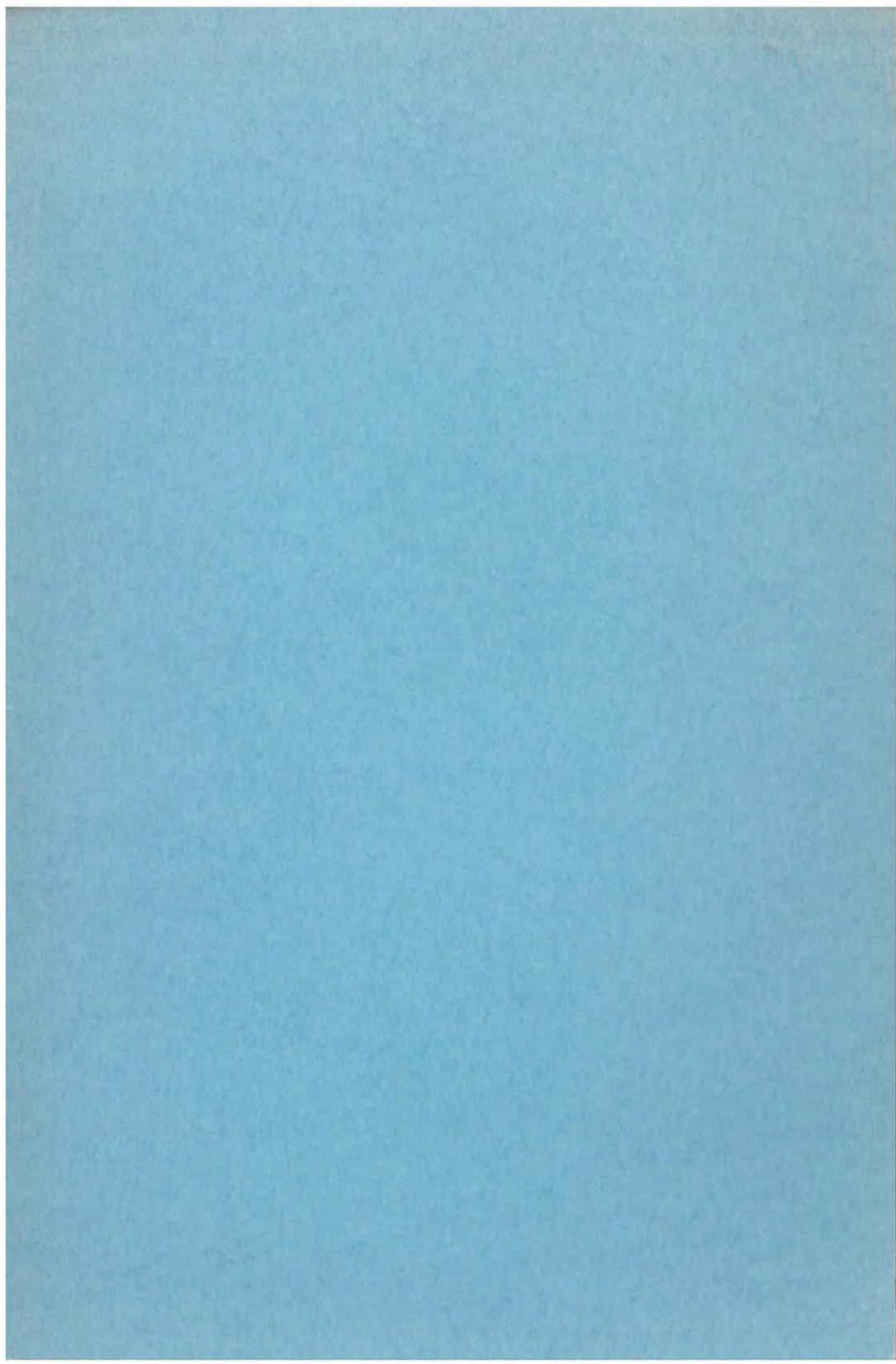
A. Heubeck, *Zur dialektologischen Einordnung des Mykenischen, Glotta* 39 (1961) pp. 159-172.

A. Bartoněk, *Mycenaean Koine re-considered, Proceedings of the Cambridge Colloquium on Mycenaean Studies*, 1965 pp. 95-103.

See also Appendix I in *Studia Mycenaea* (Brno 1968) on the Dialectal Classification of Mycenaean in the opinion of various scholars, pp. 155-210.
12. M.P. Nilsson, *The Minoan-Mycenaean Religion*, Lund 1927, p. 7.
13. The Pylos Aa, Ab and Ad Series.

14. The Knossos L Series.
15. MY Au 102.
16. The Pylos Jn Series.
17. PY Ja 749.
18. The Knossos D Series.
19. J.T. Killen, *The Wool Ideogram in Linear B texts*, *Hermathena* 96 (1962) pp. 38-72; *The Wool Industry of Crete in the Late Bronze Age*, *Annual of the B.S.A.* 59 (1964) pp. 1-15; *Minoan Wool-gathering*, *Kadmos* 7 (1968) pp. 105-123 and *Kadmos* 8 (1969) pp. 23-28.
20. The Knossos Fh, Fp and Fs Series, the Pylos Fr Series.
21. See e.g. Ventris and Chadwick, *Documents in Mycenaean Greek*, second edition, Cambridge 1975, pp. 125-129, 410 ff.; Chadwick, *The Mycenaean World*, Cambridge 1976, Chapter 6.
22. Spyridon Marinatos, *Excavations at Thera* 1968+, Athens.
23. Ninkovich and Heezen, *Submarine Geology and Geophysics*, *Colston Papers* (Bristol) 15 (1965) pp. 413-452.
24. L.R. Palmer, *Mycenaeans and Minoans* London 1961, 2nd edition 1965; *The Find-places of the Knossos Tablets*, in Palmer and Boardman, *On the Knossos Tablets* Oxford 1963.
25. PY Jn 829.
26. PY An 657, 519, 654, 656, 661.





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