ONE of the outstanding problems with regard to the Minoan scripts is that of the relationship between the different forms of writing which were in use on the island of Crete during the second millennium B.C. Evans's view, which is still orthodox, of three scripts, the hieroglyphic, and the linear of classes A and B, which succeeded each other in a chronological or evolutionary sequence, raises serious difficulties. For not only is his category of linear class A, which he took to include all the advanced linear inscriptions of the island other than those of the main Knossian archives, too broad, but it is now clear that hieroglyphic writing was used at several places alongside the linear.

In the space here available, it is proposed to consider only one small set of related inscriptions which may have a bearing on this wider problem. The group concerned, which in its full form appears to consist of five signs, is found six times inscribed or painted in linear characters on vessels or libation tables (Fig. 1A-F), and twice engraved in hieroglyphic form on seal-stones (Fig. 2A, B). This sign-group has been considered by various scholars, and their main conclusions may be set out as follows:

1. S. Xanthoudides, publishing the inscribed limestone ladle from Troullos in Ephemeris Archaïologike for 1909 (pp. 179-96),

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1 Nos. I and II in this Series appeared in Vol. xlv of the Bulletin and No. III in Vol. xlvi. This paper was first presented at the Conference on Minoan and Mycenaean Writing at the University of Edinburgh, on the 13th of June 1963.
first pointed to the resemblance between the group of signs on this object (Fig. 1c) and one on the Dictaean Libation Table (Fig. 1a) originally published by Evans in 1897, and another group on a cup sherd from Palaikastro (Fig. 1e). In this last case the

\[
\begin{array}{ll}
A & \begin{array}{c}
\text{Dictaean} \\
\text{Table (I 1)}
\end{array} \\
B & \begin{array}{c}
\text{Knossos-} \\
\text{Table (I 8)}
\end{array} \\
C & \begin{array}{c}
\text{Troullos-} \\
\text{Ladle (I 16)}
\end{array} \\
D & \begin{array}{c}
\text{Palaikastro-} \\
\text{Table (I 4)}
\end{array} \\
E & \begin{array}{c}
\text{Palaikastro-} \\
\text{Cup (I 12)}
\end{array} \\
F & \begin{array}{c}
\text{Prassà-} \\
\text{Table (I 17)}
\end{array} \\
L & \begin{array}{c}
\text{Formula} \\
\text{Sign nos.}
\end{array}
\end{array}
\]

**Fig. 1.** The "Libation Formula" in Minoan Linear Script.

first sign was different, but he considered that it might have conveyed a phonetic value similar to that of its counterpart in the other two instances. For the reduplicated sign which occurs second and third in the group he proposed a probable phonetic value of sa, like that of a similar Cypriot sign. He conjectured further that the whole group might have conveyed the name of the Goddess for whom the offerings were set out in the vessels.

(2) Arthur Evans in *The Palace of Minos* added to the examples given by Xanthoudides a phrase (Fig. 1b) on the side of a libation table from the "House of the Frescoes" at Knossos (i. 456, 459), and a combination of two signs, the first two of the same group, on a libation table from Palaikastro (i. 630). This last instance is considered too uncertain for inclusion here. Evans followed Xanthoudides in speculating that the formula concerned might "contain an actual reference to the Minoan divinity with whom the cult was associated" (i. 631).
H. Th. Bossert was the first to compare the libation formula in linear script with the hieroglyphic inscription on the seal-stone P 41 (Fig. 2A). In an article entitled "Die Beschworung einer Krankheit in der Sprache von Kreta" (Orientalistische Literaturzeitung, 1931, pp. 303-29) he referred to the first four signs of the libation formula in the four instances illustrated in Fig. 1A, B, C and E, and read them on the acrophonic principle, and by comparison with the Cypriot syllabary, as *legagali*, with the meaning of "foams" (cf. Hesychius λαγαγεῖ = ἀφρίζει). With this reading he compared the last word on the Egyptian medical papyrus (B.M. 10059) in the language of the Keftiu, ṭ-ḳ-ḳ-ṛ (= l-g-g-l) (Fig. 3). He suggested that the double-axe and gate signs which alternate in the linear group might have conveyed the same basic sound in singular and plural forms. He read the inscription on the seal-stone similarly as *lagaga* plus an ideographic double-axe, with the meaning "he who pours a libation to the double-axe". But he took the direction of the writing here as from left to right and from top to bottom, and gave the
value la not to the double-axe as in the linear inscriptions but to the vessel, or possibly to the bird.

Fig. 3. Phonetic interpretations by Bossert (above) and Deroy (below).

(4) Sp. Marinatos in Kretika Chronika, i (1947), p. 389, noting the repetition of the second sign of the linear group, suggested that "Akakallis", the name of a nymph in Cretan mythology, might possibly be that also of the Cretan Goddess.

(5) In an article of 1948 ("The Minoan scripts: fact and theory") in The American Journal of Archaeology (vol. lii, pp. 82-103), Alice E. Kober followed Bossert in comparing the group of four linear signs with the inscription on the seal-stone P 41 b. But she was puzzled by the order of the signs in this last case, and remarked "To get the same reading we have in Pc 4 (i.e. Fig. 1e), we would have to read P 41, b from right to left, and from bottom up, i.e. last line first" (p. 88, n. 25).

(6) In 1952, Louis Deroy in his article "Kubaba, Déesse cretoise" (Minos, ii, pp. 34-56) made a comparison with a corresponding sign-group in Hittite hieroglyphs, and proposed the reading "Kubaba" for the seal-stone inscription P 41 b (Fig. 3). He took the order of the signs, as did Bossert, as being from left to right, the upper line preceding the lower. In order to bring the linear group of four signs into harmony, he inverted its order, without explanation, to L 53-31-31-52/32, and took L 53 to correspond with the vase (= ku), and the two drawings of L 31 with the two fishes (= ba-ba). The bird of the seal-stone would be a phonetic complement (= baba) and the double-axe an
attribute of the goddess. Deroy did not explain the alternation of this last sign with the linear "gate". In this article, Deroy also remarked on similarities between the signs of the "Kubaba" phrase and those on the hieroglyphic inscriptions P 43 and P 49b (Fig. 2c, d).

(7) In a lecture of 1956 to the Deutsch Archäologische Institut ("Linear A und die altkretische Sprache", text privately circulated, dated 10-7-'56), A. Furumark proposed to read the name of the Goddess in the group of four linear signs as A-sa-sa-ra or J-a-sa-sa-ra, on the strength of the syllabic values proposed by Ventris for the equivalent signs in Linear B.

(8) In an article of 1957 on the sacral inscriptions in the Linear Script A (Minos, v, pp. 163-73), G. Pugliese Carratelli pointed to two instances where the sign-group carried the same fifth sign. He proposed therefore to read these inscriptions (Fig. 1a and f) respectively as J-a-sa-sa-ra-me and a-sa-sa-ra-me.

(9) Also writing in 1957 ("Akkadian Tablets in Minoan Dress", Antiquity, xxxi. 237-40), C. H. Gordon said of the recurrent Linear A phrase ya/a-sa-sa-ra, "It is hard to dissociate this from what appears in classical Babylonian as ušēšer (perhaps (y)ašayšar in the Linear A dialect ?) ' I/he set(s) aright.'"

(10) In 1958 E. Grumach dealt at length with what he was the first to call "the libation formula" in Linear A and on the seal-stone P 41b in an article "Zur Frage des x-Initials in den hieroglyphischen Inschriften") in Minoica (Festschrift . . . Sundwall, ed. E. Grumach), pp. 162-91. Here he made two new constructive proposals: first, that the inscription on P 41b should be read from right to left and from bottom to top, as Kober had earlier suggested with misgivings (§ 5, above), since the cross to the left of the vessel was meant not to mark the start of the text, but to indicate an ideogram; second, that the double-axe and its alternative the gate be understood as ideograms in both the linear and hieroglyphic phrases, and that the vessel on the seal-stone and its equivalent (L 53) in the linear formula be also interpreted in this fashion. He regarded the bird sign as being an extra infix in the hieroglyphic inscription. The argument becomes clearer if it is noticed that the four mentions of A 31 in the second paragraph on page 183 are misprints for A 53.
Grumach's suggested interpretation of the hieroglyphic phrase is therefore "Der DOPPELAXT-Priester der 40-40-TAUBE-LIBATION ", and of the linear phrase, "Der DOPPELAXT-Priester der 31-31-LIBATION ".

(11) In 1958 N. Platon published in *Minoica (Festschrift . . . Sundwall, ed. E. Grumach, pp. 305-18) an " Inscribed libation vessel from a Minoan house at Prassà, Heraklion ". On side c, this contained the full linear formula of five signs (Fig. 1f), which had already been referred to by Carratelli (§8, above). Like Carratelli, he read it as a-sa-sa-ra-me, and to Carratelli's comparison of the fifth sign (L 84 = B 13, Ventris's me) with that on I 1 (Fig. 1A), he added another with the fifth sign (L 104) on I 4 c (Fig. 1d), which he took as a variant form of L 84. Platon offered no definite proposal as to the identity of the Goddess whose name was so written, but in footnote 22 he drew attention to the name of the Phoenician Ba' al's assessor, Asherat, corresponding to the Greek goddess Rhea.

(12) L. R. Palmer, however, in a note on " Luvian and Linear A " (*Trans. Philol. Soc., 1958, pp. 95-100) proposed a theory about the identity of the Goddess, which he repeated in a section under a similar title in his book of 1961, *Mycenaeans and Minoans* (pp. 232-50). In his view the Linear A (j)a-sa-sa-ra (-me) would correspond with the hypothetical Luvian designation Ashasara (mi), meaning " Lady " or " My Lady " according to whether the enclitic me/mi were absent or present. This word is based on the Hittite hieroglyphic "Hasusaras" of Carchemish, and is understood as a title of the Earth Mother, the supreme Goddess of early Anatolia.

(13) Palmer's interpretation was challenged by M. Pope in *Bulletin Number 8* (1961) of the *Institute of Classical Studies of the University of London* (pp. 29-31, " The Minoan Goddess Asasara—an Obituary "). Pope points out that the inscription in I 12 (Fig. 1f) may be incomplete, and that all full instances of the sign-group are of the form (j) a-sa-sa-ra-me, except for I 8 a (Fig. 1B), where he reads the complete word as ja-sa-sa-ra-ma-na. He rejects Evans's punctuation between the fourth and fifth signs of I 1 (Fig. 1A) in his transcription of 1921 (*PM*, i Fig. 467), and in conclusion sees no justification for regarding-me as an enclitic.
(14) C. H. Gordon on page 215 of his book of 1962, *Before the Bible*, apparently abandoning his earlier interpretation (§ 9 above) of the sign-group, read its first two signs, together with the one which precedes them, on the Palaikastro libation table I 31, as *le-ya-sa-[illeg.]*, meaning in West Semitic "To Y." He adds, "Y. is taken by all Minoan scholars to be the deity whose name (*Ya-sa-sa-ra-mu*) occurs on six other cult objects from different Minoan sites ".

It is evident that of all the various phonetic interpretations of the sign-group set out above, as the Goddesses Akakallis, Kubaba, Asherat, Hasusaras or she identified by initial Y., or as "foams" or "I/he set(s) aright", only one at the most can be correct. For the moment it may seem safest to allow them to cancel each other out, and to regard them as demonstrations of the perverse power of coincidence to lead by these methods to plausible but erroneous results.

*The Hieroglyphic Formula.* The two-sided bead-seal of agate, P 41, carries on face *a* a scene of an ibex pursued by a hound, and on face *b* the libation formula shown in Fig. 2a. Evans in *Scripta Minoa*, i (p. 254, Fig. 110) proposed that the inscription should be read from left to right and from top to bottom, beginning at the libation vase and ending at the double-axe, which is punctuated as a separate word-sign. In this opinion he was followed by Bossert (§ 3, above). He regarded the symbol which came second according to his order of reading as a unique sign (no. 80) representing a "bird seated, perhaps an owl or crow". But in the British Museum catalogue *2* the sign is described as "a bird to left, with head under its wing". This seems from an examination of a cast *3* to be a more accurate interpretation than that of Evans, whose drawing differs from that offered here in including an eye and a second leg. He interpreted the third and fourth signs as the sepia (no. 60), and remarked in two contexts (pp. 205 and 254) that this same sign is also inscribed

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1 This is the inscription referred to in § 2 above.
2 H. W. Walters, *Catalogue of Engraved Gems and Cameos, Greek, Etruscan and Roman, in the British Museum* (1923), No. 3.
3 Kindly supplied by Dr. R. D. Barnett, Keeper of the Department of West Asiatic Antiquities in the British Museum.
in duplicate on the Dictaean Libation Table. He thus recognized some affinity between the two inscriptions, but did not compare the full sign-groups. The sepia or cuttle-fish is certainly a hieroglyphic symbol (e.g. V. E. G. Kenna, *Cretan Seals* (1960), nos. 214, 215, 218), but the sign on P 41 b, which does not separate the tentacles, is more reasonably regarded by Deroy (§ 6, above) and by the British Museum catalogue as a fish with bifurcated tail, head downwards.

The same group of five signs appears on the two main sides (a/c) of an ivory seal from Goubes Pediados (Herakleion Museum Inv. no. 1868). This was published by E. Grumach in a note on “Zwei hieroglyphische Siegel” in *Kadmos*, i (1962), pp. 153-62 (pl. 2); in a supplement to this article in *Kadmos*, ii (1963), pp. 76-8, Grumach remarked on the similarity between this inscription and that on P 41 b. The Goubes Pediados inscription is shown on Fig. 2b, where it is drawn, like that of Fig. 2a, as an impression. To facilitate comparison with Fig. 2a, side a is shown below side c, though of course they could be equally well arranged in the opposite order. The resemblance between the two inscriptions is obvious, except for the order of signs on the short panel or side, and the identity of the middle sign on the long. Grumach (p. 153) described this sign on the Goubes Pediados seal as a so far unplaced vegetable symbol, but it may be considered as a crude representation of a flying bird, to be compared with the standing bird in the corresponding position in Fig. 2a.

It is suggested that the hieroglyphic sign-group of Fig. 2a and b may be most reasonably understood in the manner proposed by Evans for the “official titles” in the hieroglyphic script (*Scripta Minoa*, i (1909), pp. 263-72), namely with each sign conveying a complete symbolic meaning. This would explain the difference between the separate punctuation of the double-axe on Fig. 2a and the absence of this punctuation on Fig. 2b. For while it might be a matter of individual choice whether or not to separate a sign in a string of ideograms, such latitude would make nonsense of phonetic writing. This kind of interpretation would also account for the differences in respect of the order of their signs between Fig. 2a and b, and more particularly between Fig. 2a and the linear formula of Fig. 1. Both Kober and Grumach
In order to effect a comparison with the linear sign-group, suggested that the hieroglyphic formula on Fig. 2a be read from below upwards, although this would be contrary to the usual practice. But such an explanation is unnecessary, for in a phrase in an ideographic script the order of the signs, though it may become set by convention, may for the purpose of conveying meaning be quite variable, and even completely reversible.

An ideographic sign-group, moreover, in which each symbol would correspond to a word or phrase in a sentence, may well vary in form, by substitution, omission or insertion of particular signs, to become another group of similar type. Thus in the jar-stamp P 43 (Fig. 2c), a vessel, bird and fish are displayed, in no obvious order, but the second fish and the double-axe of the full hieroglyphic formula are left out. In P 49 (Fig. 2d), however, a bifoliate figure (and possibly a spray, if Evans is correct in so interpreting, in *Scripta Minoa*, i, the border hatching) is interposed between the two fish symbols, while the "bird" is replaced by a "hand". On an unpublished seal impression in the Ashmolean Museum (Fig. 2e), moreover, the double-axe and two "fishes" are accompanied only by a cross pommée, while on the early clay sealing from Knossos P 16 (Fig. 2f), the double-axe and fish are preceded by the leg.

A clue to the interpretation of the hieroglyphic libation formula may be afforded by the head decoration of a terra-cotta figurine of a Goddess from Gazi, Herakleion, shown on Fig. 771 of *L'Art de la Crète* by C. Zervos (1956). This ornament (Fig. 4A) consists of a perched bird, possibly a dove, three double-tailed fish-like symbols, and two objects possibly intended as discs. Similar figurines from Gazi and Karphi carry in this position snakes, poppies and horns of consecration, all objects which are known from other evidence to have had ritual or sacral association with the Goddess.

The representation of a libation into a vessel placed between two double-axes, on each of which stands a bird, on the Hagia Triada sarcophagus is, of course, well known; and the design on a seal-stone from the former Dawkins collection (Fig. 4b, from a cast in the Ashmolean Museum) may be regarded as additional

evidence of a Minoan bird-cult. Fishes are depicted on sarcophagi from Milato and Pachyammos, and a bird and fish are shown together on a vase from Kalvina, Phaestos.\(^1\) The double-axe, in turn, is to be taken as a fetish or symbol, or possibly a special aniconic form of the supreme Minoan Goddess.\(^2\)

![Figure 4](image)

**Fig. 4.** A. Head of figurine from Gazi. B, C, Seal-stones.

(V. E. G. Kenna thinks that C is not genuine)

The full hieroglyphic "libation formula" may therefore be provisionally understood in some such fashion as "A libation, or its pourer, in the context of the bird and the fishes, at the place of or in some connection with the Goddess": or, if written in the opposite direction, "At the place of or in connection with the Goddess, in the context of the fishes and the bird—a libation, or its pourer ".

It is proposed further that the libation formula be similarly understood when written in linear characters. The degree and nature of the resemblance between the hieroglyphic and linear

\(^1\) C. Zervos, *L'Art de la Crète* (1956), Figs. 776, 782 and 737.

sign-groups have been differently estimated by Kober, Deroy and Grumach. Miss Kober (§ 5, above) compares only the first three signs, the double-axe and the doubled sign. Deroy (§ 6, above) draws the signs in the linear group in inverse order, but omits what should then be the opening sign, L 27. He equates L 53 with the vase hieroglyph, and regards the bird as an extra infixed sign in the group on P 41 b. Grumach (§ 10, above) adopts the same equation of signs as Deroy, but adds an explanation of the differing order of arrangement, by proposing to read P 41b from right to left and from bottom to top.

It is suggested, however, that the vase hieroglyph be equated not with L 53 but with the usual fifth sign of the linear group. Pope (§ 13, above) rightly maintained that this group can nowhere be shown definitely to have comprised less than five signs. His reading of the group differs from that of Fig. 1 in two respects. First, he does not recognize any punctuation mark between the fourth and fifth signs. In the inscription of Fig. 1F at least the point appears clear, but the issue is in no way vital to the interpretation here suggested. Second, Pope identifies the fifth linear sign as L 84 (= B 13, Ventris's me), and in this respect he is in agreement with Carratelli, Platon and Palmer (§§ 8, 11 and 12, above). Gordon, however, in his second interpretation of the group (§ 14, above) stands alone in awarding the sign concerned the Ventris syllabic value mu, and appears therefore to read it as B 23 (= L 27). This latter seems the better identification, especially in the case of Fig. 1F. In Fig. 1A the sign is reversed, as frequently occurs with signs of the linear script A. The sign resembles the libation vase of the hieroglyphic script in respect of the loop of the handle and the ogee-shaped upward curving spout, while the body of the vase may be indicated by the extra lines in the lower part of the sign in Fig. 1A, and possibly too in Fig. 1C. It may also be remarked that the fifth sign on Fig. 1B, which is manifestly different from that in the other cases, and is understood by Pope as L 95 (= B 80, Ventris's ma), is faint on the original, and may be intended as a two-handled bowl, of the type of L' 12.

1 L. R. Palmer, however, follows Ventris in deriving this linear sign from the hieroglyph, "ox-head seen in profile" (Evans's no. 62 in Scripta Minoa, i).
STUDIES OF SOME ANCIENT SCRIPTS

The other sign of the linear group which raises a problem is the fourth (L 53). It has already been seen that Deroy and Grumach equate this with the hieroglyphic vase, but if the vase corresponds to the fifth linear sign, as here suggested, then L 53 would stand in the place of the bird of Fig. 2A and B. It may be considered that there is a resemblance between the main lines of the bird hieroglyph in Fig. 2A and those of L 53. But the bird, if such it be, on Fig. 2B is of different form, and the sign which follows the second fish on both Fig. 2D and E is distinct again in each case.

The alternation of the double-axe and gate signs in the first position in the linear group is, as Grumach has shown (§ 10 above, pp. 180-1), a feature of the Cretan hieroglyphic script and the linear scripts A and B.1 He has argued convincingly that these two signs are better regarded as being alternative ideograms rather than as conveying similar sounds. A possible clue to the relationship of the two ideograms may be afforded by the design on an unpublished pendant in the Ashmolean Museum (Fig. 3c).2 Two women are shown adoring a double-axe set on an object resembling one form of the so-called gate hieroglyph. If this is meant as a table or altar, as on certain gold rings from Mycenae,3 or possibly as the sacred building or enclosure indicated by its plan or its portal, then the relationship of the two signs becomes explicable. The double-axe would symbolize the deity, the "gate" the holy place. Written together, as they sometimes are, they would carry some such meaning as "The place of the deity".

It is readily admitted that the details of interpretation suggested above are extremely tentative. But they are of much less importance than the more basic question of what kind of writing these scripts represent. From the content, the arrangement and the punctuation of the Cretan hieroglyphic inscriptions,

1 Grumach's Tables 1 and 3 illustrate examples from the hieroglyphic script and the linear script B. Further instances of alternation of these signs in the final position in linear B phrases could be given. Examples from the linear script A are shown in W. C. Brice, "Some observations on the linear A inscriptions" (Kadmos, i (1962), p. 45, Fig. 2 § 10.)

2 V. E. G. Kenna, however, informs me that he regards this object as a forgery, and for this reason omitted it from the Ashmolean catalogue in his Cretan Seals (1960).

3 H. Th. Bossert, The Art of Ancient Crete (1937), Figs. 397h, 399f, k.
they appear to consist, as Evans saw early, essentially of ideograms. If a formula of ideographic character in the hieroglyphic script is found elsewhere written in linear signs, then it must be understood there too ideographically, and this creates a strong presumption that the entire inscription of which it forms part should be comprehended in this way.

The "libation formula" is not the only sign-group common to the hieroglyphic and linear scripts. Another is the combination L 31-58 which occurs frequently on the linear tablets from Hagia Triada and which can be matched with the hieroglyphic association of the "sepia" and "serpent" (Evans nos. 60 and 84). It is a characteristic of the Cretan scripts that while each has certain peculiar signs, they overlap in varying degrees in regard to their repertories of signs and the use of certain sign-combinations. At the same time they have in common certain striking general features of arrangement, notably the use of ligatures and of what might be called, in the structural if not in the grammatical sense, prefixes, infixes and suffixes. These observations are best explained by regarding all the Minoan scripts as belonging to the same general system of writing, one which was essentially ideographic. The differences between them would arise from the different contexts in which they were used. For the repertory of signs in an ideographic script, unlike that of a phonetic script, would vary according to the range of its subject matter.
V. A Sketch Plan of the Linear B Syllabary

By JANE E. HENLE

It is ten years since Michael Ventris published his decipherment of Linear B, which, along with many other students, I am unable to accept. It occurs to me on this anniversary to ask whether this very decipherment might not help us toward a correct one. Has it anything to teach us, those of us who are not yet ready to translate? If we reject it as an answer or as a guide, has it any mistakes that shine in the night and point a way?

Let us go back first to Ventris's grid, the checkerboard on which he laid out the signs. Or we might go back a little farther, to the principle underlying the grid: vertical lines of vowels, horizontal lines of consonants (Fig. 1). Into the squares created by the crossed lines go signs which will later be given phonetic values. The character of these phonetic values has already been determined by the grid: consonant so-and-so plus vowel so-and-so.

The values which have actually been fitted to the signs cannot be right, or some of them cannot be right, if the decipherment is

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1 This paper was read at the Conference on Minoan and Mycenaean Writing at the University of Edinburgh on the 14th of June 1963.

wrong. But I am not concerned with the individual values because I think they were committed to being wrong, or most of them were, before they were ever assigned. I think the fault lies not in themselves but in the scheme.

I should like to examine this scheme on its own terms and then to examine the terms. For the moment, then, we may assume that we are dealing, first, with a form of Greek and, second, with Greek written in syllables.

The scheme of the grid, consonant plus vowel, that is a system of open syllables, comes to Linear B from the classical Cypriote syllabary. This is a syllabary based on five vowels and twelve consonants, so that it would have sixty-five signs if the system were complete—about the number of phonetic signs that can be called not infrequent in Linear B.

The Cypriote syllabary, a system used for writing Greek in syllables, was obviously devised for another language, not Greek. In its poverty of consonants, it does not distinguish among voiced, voiceless, and aspirated. Thus PA represents BA, PA, PHA. It cannot cope with consonantal groups but heaps open syllables upon each other. Thus Aphrodite is written A-PO-RO-TI-TA. Also, it omits a nasal before another consonant, as ἀνθρωπός, A-TO-RO-PO-SE.

What is the connection of Cypriote with Linear B? Evans in Scripta Minoa, 1 pointed out resemblances of form of some of the signs of the two scripts and explained these resemblances by resemblances of both to signs of the Cypro-Minoan script, the Cypriote script of the Bronze Age. 1 Thus the connection between simple linear signs is not necessarily fortuitous. There is a line, albeit broken by silences, from Minoan to Cypro-Minoan to classical Cypriote, for which the values are known. From this it is a short step to taking over values from classical Cypriote for Minoan A or B, and it was fashionable to do this in the nineteen-thirties. 2 Resemblances were found between Cypriote and Linear B signs, and Cypriote values were used for translating Mainland inscriptions as Greek. And the assumption

1 Scripta Minoa, i (Oxford, 1909), 70 ff.
of a system of open syllables on the Cypriote pattern—the Cypriote assumption, as I call it—somehow slipped in with the Cypriote values.

In 1946 Professor Kober was drawing up paradigms for a declension of the language of Linear B, 1 "triplets", which seemed to represent different types of the same declension (Fig. 2). The declension seemed to be the same because the pattern of endings is the same, but the types appeared different because the signs involved in the pattern vary. This sameness underlying difference can be understood from declensional endings of known types, as Latin *servus, servi*, etc. 2 as against *hortus, horti*. The endings are the same but they are introduced by different consonants, in each case the stem ending of the word. On the Cypriote assumption, here is material for a phonetic breakthrough. 3

If we characterize Type A as having one stem consonant and Type B another, we have established the beginnings of two consonant lines (Fig. 3). Again, the same ending of the same declension will contain the same vowel, so that we have begun the vowel lines also. This is how, on the basis of these paradigms, Ventris was able to place ten signs on his grid.

1 Alice E. Kober, "Inflection in Linear Class B: 1—Declension", *AJA*, 1 (1946), 268 ff. 2 One of Kober's examples, ibid. p. 275. 3 Ibid.

<table>
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<td></td>
</tr>
</tbody>
</table>

FIG. 2
Here is a system of syllables pre-formed on the Cypriote pattern; here is a frame pre-furnished with ten signs. How other signs took their places in the squares and then took values, does not concern us; for we are not interested in them but in the pattern. But I should like to mention seven signs which came to the grid ready-fitted with values from the Cypriote syllabary: TA (DA), TI, TO, PA, LO (RO), NA, and SE (Fig. 4).

\[
\begin{array}{ccc}
V1 & V2 & \text{Fig. 3} \\
C1 & \Lambda & \Upsilon & \vdash \text{ta (da)} \\
C2 & \Lambda & \Upsilon & \Lambda \text{ ti} \\
C3 & \Upsilon & \Upsilon \Upsilon & \Upsilon \text{ to} \\
C4 & \Upsilon & \Upsilon & \Upsilon \text{ pa} \\
C5 & \Upsilon & \Upsilon \Upsilon & \Upsilon \text{ lo (ro)} \\
\end{array}
\]

We have gone back to the nineteen-thirties: the old Cypriote assumption, the old Cypriote values, unexamined, accepted because they had always been accepted—although they cannot make Greek out of Linear B words. The reason is as simple as that Linear B words are too short to represent Greek words spelled with Cypriote syllables. The average length of a Linear B word I take to be 3·6 to 3·7 signs.\(^1\) But Cypriote, with its laborious piling up of open syllables to approximate consonantal groups, produces long words if the words are Greek.

Ventris, whether or not he perceived the problem, found a solution to it in his "spelling rules", that fantastic set of conventions whose function is largely to cut down words to Linear B size, by cutting off inflection and cutting closed syllables in half.

\(^1\) My average of 3·65 is taken from 3,390 complete words from Knossos, Mycenae, and Pylos. An average of 3·63 comes from Kistopoulus' earlier count of 2,529 complete words ("Statistical Data on Minoan Words", *Minos*, iii (1954), 100 ff.).
Let me recall to you the spelling rule which bears especially on the problem. The consonants L, M, N, R, S—also the vowel I—are omitted at the end of a word, or within a word before a consonant. Thus ποιμήν, which would be written in Cypriote PO-I-ME-NE, is cut down to PO-ME. κόρφος, in Cypriote KO-RO-WO-SE, becomes KO-WO (Fig. 5). And so on. The

![Fig. 5]

Cypriote version is hardly elegant, but this dismembered, unintelligible Cypriote is barbarous.

You remember the Queen of Hearts, who "had only one way of settling all difficulties, great or small. 'Off with his head!' she said without even looking around." We may not agree with the solution, but we must agree that it recognizes a problem. In our case, similarly, Ventris's solution to the problem of Cypriote syllables was to cut off their heads, but here is still implicit recognition of a problem. In short, I submit that these spelling rules, with all their faults, with their words that sound more like baby talk than Greek—words like KO-WO and MA-MA-RO and PA-PA-RO—constitute that kind of shining mistake that points a way, a golden wreath to light a labyrinth.

When we recognize the problem, we are perhaps in a position to offer a less drastic solution than the solution of the spelling rules. We can look for another method of dealing with syllables than cutting off their heads. And if we are to write Greek in syllables, there is only one method left to us that is not Cypriote and not decapitated Cypriote: a system that includes closed syllables. Instead of KO-WO, we need KOR-WOS, which is as short as KO-WO, so that it solves the same problem, but is intelligible. Perhaps KOR-WO-OS would be better: it is still short enough, and, since we are dealing with a rather small signary, we must be economical in our distribution of values. A system that includes closed syllables could write Greek in words of Linear B size, not
perfectly, but intelligibly. And the need for such a system seems to me to be clearly demonstrated by the hatchet work of the spelling rules.

We need closed syllables, then, if the problem we are facing is to write Greek in syllables, so that we should ask now whether the language to expect is Greek after all. We will not know, of course, until we can read it as Greek (or another language). To argue that it is Greek because words like WO-ZO or O-KO are Greek words, or because Dionysos was a Mycenaean god, is to give the wrong reason.

It may still be Greek for archaeological reasons, which are all we have in the absence of decipherment. The Greeks, of course, had been living in Greece long before 1500 B.C., the crucial date for Linear B, so that Greek as a spoken language is well established on the Mainland before Linear B appears at Knossos. Linear B, the script of Knossos and the Mainland, should represent Greek because it seems to represent a different language from the language of Linear A, an inflected language as against one for which inflection is not apparent. Since there is no strong tradition on Crete and the Mainland of a language besides Minoan and Greek, we are left with two languages and two scripts to represent them, the earlier script, Linear A, for Minoan; the later, Linear B, for Greek.

In terms of the find spots of the tablets, Hutchinson observes that Linear B tablets are found at one site in Crete, at several in Greece. This is exactly the situation of the Palace Style pottery. It was apparently made at one site in Crete, at many on the Mainland, and it is now recognized as a Mainland style for that reason. Knossos is only another centre of the Mainland style of pottery as it is only another centre of the Mainland script.

1 This suggestion has been taken up again by T. B. L. Webster in his revised edition of Sir Arthur Pickard-Cambridge, Dithyramb, Tragedy and Comedy (Oxford, 1962), pp. vi, 8 f.
3 Ibid. p. 102.
But in the case of the script, it is significant that the Knossian version, the Knossian Palace Style of writing, is earlier than the Mainland version: it was in Crete, from the scribes of Linear A, that the Greeks who occupied Knossos learned to write their own language. This accounts for linear signs rather than pictograms in a new script. The forms of the signs were developed by or under scribes who had behind them the linearization of the Minoan hieroglyphic script.

It also suggests that this new script, devised by experienced hands, should be able to write Greek not perfectly but better than KO-WO and DO-E-RO for κοφος and δορος. Of the sixty-six most frequent signs of the Linear B signary, only half to two-thirds seem to have been taken from Linear A. A good number of Linear A signs have been discarded and new signs have been added. This is a reworked, modern, streamlined script, devised by professionals, apparently about 1500 B.C.

This date, the dividing line between LM I A and LM I B, marks the only break in the history of Minoan art before the big break a century later. This is the time, in Knossian fresco painting, when the small and lyrical and elusive give way to the big and military and prosaic. The Shield Fresco of LM I,¹ to cite a single instance, is just as much a part of the Palace Style as are the great pompous jars of LM II, or the LM II sword tablets. Just at the time of the beginning of the new style, about 1500, come hints of what may have occasioned it. Some years ago I suggested that the event which marks the turn from LM I A to LM I B might not have been an earthquake, as Evans thought, but an invasion of Mainland Greeks.² This "earthquake", instead of overthrowing the palaces, as others had done, left them standing. Its traces are rather the footprints of terror: many wealthy homes abandoned in the neighbourhood of the palace of Knossos.³ A little south of the palace, also, there was trouble at the Temple Tomb, and a hasty mass burial.⁴ Matz now suggests that the Greeks came in the wake of the earthquake,⁵ though this seems strange after an earthquake so undestructive as this one

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¹ LM I B, I believe, not LM I A.
³ PM, ii. 627 ff.
⁴ Ibid. iv. 878, 988 ff.
⁵ CAH², ii, chap. xii (1962), 47.
would have been. At any rate, in whatever way it came, there is a break, about 1500, when a new style begins in painting and pottery, and a new script is being developed.

Perhaps, then, we may expect the language to be Greek. We have seen that we need closed syllables to write Greek—if the system is a syllabary. Of other possibilities, an alphabet is obviously out of the question because the signary is too large, about ninety signs used to form sign-groups. There is no question, either, of purely phonetic writing, because ideograms undoubtedly exist; and little question of purely ideographic writing, because inflectional endings apparently exist. The question becomes whether ideograms or phonograms give the script its stamp.

Since we can recognize some ideograms—man, various animals, pots, etc.—let us start with them. What is the criterion of an ideogram in an undeciphered script? I have found no clearer definition than that given by Professor Grumach in his article on ligatured signs, "single signs... often distinguished by their size from the signs constituting the introductory sign-groups. In addition, they are accompanied in most cases by signs indicating numbers and measurements."

Now that which is single is distinguished from that which is combined, and, being distinguished, it is distinguished from, distinguished as different. It should be as simple as that ideograms are distinguished from phonograms, but it is not. We cannot make a simple, clear-cut distinction: Professor Grumach has demonstrated that the so-called phonograms can be indistinguishable from ideograms. In a brilliant analysis he shows that the signs ME and RI (Fig. 6), which usually belong to sign-groups, are ideograms, used singly, in combination, and even "juxtaposed without being ligatured". In this last case, a sign-group, ME-RI, that looks like a spelled word, is either an ideogram or is playing the part of one. Grumach concludes: "This means, therefore, that so-called word-groups may also consist of ideographic signs."

1 Cf. PM, iv. 786: "a new and aggressive dynasty".
3 Ibid. p. 55.
I admire the demonstration but I do not follow the reasoning that a sign once an ideogram is always an ideogram. Let us turn the argument around, for the sake of demonstration, and try to show that a sign once a phonogram is always a phonogram. There are some signs of the Linear B signary that seem to be so widely used as inflectional endings that I suppose almost everyone would regard them as phonograms, even if phonograms used only to complement or suffix ideograms.¹ Let us reduce the number of such signs to a minimum and settle for JO and JA, and U/WE/WO (Fig. 7). There is a sign-group at Knossos and Pylos² spelled only with phonograms, WO-WE-U. In all cases of its use, it is a sign-group among others, apparently a word among words, a word in a phrase, from which an ideogram (or ideograms) is set off. WO-WO occurs, and WO-JO, under the same conditions. As we extend our list of phonograms—it is certainly longer than five—the possibilities of forming words increase. As the circle widens, ME and RI will be brought in.³ And yet we cannot say, once a phonogram, always a phonogram, because ME and RI are certainly also ideograms.

² Knossos 836, 911-3; Pylos Ad 142.
³ -RI-JO, e.g. is a frequent ending of Linear B words, and -RI-JA is not infrequent.
Let us now take short case histories for these signs ME and RI, which are demonstrably ideograms in some cases. RI is fairly frequent at Knossos and Pylos. It can occur in sign-groups of any size, two to seven signs, and in any position in the group, but it has a very marked preference for second place in the group—54 per cent. of the examples counted at Knossos and 56 per cent. at Pylos are in second place. Its next most distinctive position is as penultimate before JO and JA, so that here it looks like part of an inflectional ending. ME at Knossos shows a marked preference for first place, then penultimate. At Pylos it occurs as initial and penultimate about equally.1 As penultimate, it prefers to stand before NO and NA, as if ME-NO/ME-NA, again, were inflectional endings. Outside of first and penultimate places, ME is infrequent, though it, too, can stand in any position and in sign-groups of any size.

In contrast to their mobility and versatility in sign-groups, the identical signs, ME and RI, when they are used as ideograms, present a picture of sameness. They can stand alone or combine with each other and, at most, with a few other ideograms.

The sign SA shows this difference even more strikingly. The Pylian tablet Nn 831 offers an excellent example of its use as an ideogram (Fig. 8). It needs only a glance to see on the one side variety, on the other sameness. And yet the sign which behaves so uniformly here, when it is used in sign-groups behaves very freely. Unlike RI and ME, it shows comparatively little preference for one or another position in the sign-group. At Knossos it prefers first place slightly over second and penultimate and is least frequent as final. At Pylos it is almost impartial among the first three positions and is, again, least frequent in last place.

In each case, the same sign behaves one way in one function and another way in another. We shall return to this differentiation after we have seen the problem from another point of view.

Just as we dismissed any notion of alphabetic writing because of the size of the signary, I think we must reject the idea of largely ideographic writing for the same reason. As there are too many

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1 At Knossos about 40 per cent. of its occurrences are in first place, about one third in penultimate position; at Pylos, about one third in each, first and penultimate.
signs for an alphabetic system, there are too few for an ideographic system. Grumach wonders at the small number.\(^1\) Either expression would be excessively impoverished or ideograms must double and triple and quadruple for related concepts. In the latter case we should expect phonetic complements to define the meaning of the ideograms—so that phonograms have come in by the back door.\(^2\)

It seems to me therefore that the sign-groups must be words, combinations not of ideograms but of phonograms. And yet I do not see any real contradiction between the two concepts. If you scratch a phonogram you will find an ideogram.\(^3\) A phonogram is only a speaking ideogram. It speaks the name of the object the ideogram represents. Gelb, in his *Study of Writing*, gives a notable example of the ability of objects to take voice. He retells a Hungarian story of a man who sent his friend a package of coffee as a message to look out for the police. "The story can be understood on the basis of the phonetic principle by noting

\(^1\) Op. cit. p. 56.

\(^2\) Again, the apparent absence of determinatives in the Linear B script would seem to indicate a fairly clear phonetic system.

\(^3\) At least in most cases—perhaps not all.
that the Hungarian word for coffee is *kávé* and that it resembles in sound the Latin word *cave*, ‘beware!’”  

I think we can say a little more about these speaking ideograms that make up our syllabary. When they are used as ideograms, they represent themselves or a clearly associable related concept. When they are used as phonograms, they represent the sounds of their names. They are linearized pictures of objects, named, as we must infer from the versatility of the signs, by words of one syllable. A few signs, the rare and versatile, may represent longer words, but these do not concern us yet. Some of these one-syllable words belong to the language of Linear B. Others may belong to the language of Linear A, unless the linearized pictures have been renamed. To relate these names to these pictures is the task of decipherment.