CHAPTER 3

CRETE - I

Crete stands alone.

In a sea where islands gather in friendly clusters, it stands alone geographically, half-way between Greece and Asia Minor, half-way between Europe and Africa.

It stands apart from the rest of Greece, and indeed from the rest of the ancient world, in its unique civilisation, which may well have been fostered by its geographical position.

Sea-surrounded, it was shielded from large waves of immigrants like those which disrupted the life of the mainland at regular intervals, and was thus able to develop a stable, advanced, and highly individual culture. Its textile tools suggest the arrival of newcomers in the Early Bronze Age, but from then until after the final destruction of Knossos a millennium later, the history of textile production in Crete forms one homogeneous chapter.

Sea-connected, at the centre of the eastern Aegean sea-routes, it was prevented from becoming an isolated backwater, and, through trade, was in contact with the ideas, art, skills and products of countries as far away as Babylonia and Egypt. Conversely, other civilisations encircling the island could not remain unaware of Minoan achievements, and its influence was naturally greater in 'backward' countries, and chief among them, mainland Greece.

Crete is a paradox, both in the past, and today, for it is difficult not to think of it both as part of Greece, and as a separate country.
It is noticeable that while it is possible to write an account of the archaeology or prehistory of Crete with minimal reference to Greece, it would be very difficult to write a prehistory of Greece without including Crete, so great was its influence on the mainland and the other islands.

Today, thanks to its own strenuous efforts to become so, it is part of Greece, and perhaps the most typically Greek part of the country - yet it is subtly different. The difference, difficult to define, may be that it is a little more Greek than the rest of Greece. All the qualities of Greece, both land and people - beauty and sunshine, hospitality, courage, intelligence, and that excellent characteristic which is not well-conveyed by the English word cunning - are 'writ large' in Crete. Both archaeologically and otherwise, it provides the comparatives to the rest of the country's positives, and to its comparatives, the superlatives.

The humourist George Mikes, in a slight but very perceptive sketch of the island's character, tells the story of a young man in Herakleion who, upon being asked if he were Greek, replied proudly that he was one hundred per cent Greek - and two hundred per cent Cretan. The story summarises the Cretan paradox neatly. As one of the Greek lands, Crete has its place in this thesis; but as a land true to its own traditions, it requires individual treatment.

Neolithic Crete (Map 5).

Anyone who has spent some seasons digging with the British School of Archaeology's expert Cretan workmen from Knossos, will undoubtedly be aware that Crete is the best part of Greece, and Knossos is the best part of Crete. This statement contains a fair degree of general archaeological truth, and as far as the subject of this thesis is concerned, can scarcely be questioned. From Neolithic to Roman times Knossos was concerned in the production of textiles, often on a large scale. In the Neolithic period particularly, when it is the only Cretan site so far excavated to produce much evidence for spinning and weaving, it has yielded one of the earliest and most complete repertoires of textile tools anywhere in the Aegean.

In 1957-1960, John Evans conducted excavations below the Central Court of the Palace at Knossos. Late Neolithic remains lie almost immediately below the surface here, because the Palace builders levelled off and cut back the mound to accommodate the Court. Bedrock was reached approximately seven metres below the Court, and between the two lay a succession of Neolithic settlements, the earliest, of the Early Neolithic period, established at the end of the seventh or the beginning of the sixth millenium B.C., and the latest, Late Neolithic one, flourishing some three millenia later. The houses, of

1. I have seen numbers of Hellenistic and Roman loomweights turned up while working on excavations in areas round the Palace, and they are common finds among the ploughed earth of the surrounding vineyards.
mudbrick or pisé, often on a stone foundation, with beaten earth floors, were laid out on the same orientation for several millenia, suggesting a basic continuity in the settlement.

Ten phases of occupation are recorded, and almost all the evidence for spinning and weaving comes from the last three, Strata III-I, which represent the Middle and Late Neolithic periods.

The first reliable indication of the crafts is provided by the preceding Early Neolithic II Stratum IV, which is carbon-dated to the first quarter of the fourth millenium B.C. This consisted of a fragment of a made whorl, two incomplete clay objects tentatively identified as shuttles, and a long, fine bone needle.

There is earlier evidence, but it is inconclusive. A stone toggle, witness to clothing but not necessarily to cloth, was found in the lowest level, Stratum X (another came from Stratum II). Discs chipped out of discarded sherds occurred as early as Stratum VII, and, as has been seen, they were the precursors of made whorls on the mainland - but the majority of the Knossian ones had no central hole. They may have been merely unfinished, but they may have been intended for some quite different purpose, like counters. One of the pottery discs recovered from Stratum VI was centrally pierced, and the same phase produced a possible stone

4. J. D. Evans, 1964 op. cit., p. 172; Fig. 61, 11; Pl. 60, 1, No. 6.
5. J. D. Evans 1964 op. cit., pp. 142, 188; Fig. 58, Nos. 23,
4. J. D. Evans 1964 op. cit., p. 235, Pl. 58, Nos. 1, 2.
whorl, and a bone needle; the succeeding Stratum V had four pierced discs, another possible stone whorl, and a piece of a clay shuttle, although the latter may have been a stray. These two phases belong to the later part of a period designated Early Neolithic Ib, and have carbon dates in the fifth millennium B.C.

The great wealth of material commences in the Middle Neolithic Stratum III, which produced twenty-five made whorls, two possible stone whorls, six pierced sherd discs (out of a total of eighty), a clay shuttle, a possible bone needle-shuttle - and at least two sets of loomweights.

Stratum II, transitional between Middle and Late Neolithic, saw an extraordinary increase in the numbers of made whorls. No fewer than one hundred were found, three of which were decorated, plus a pottery disc, a possible stone whorl, a loomweight, and two shuttles.

Stratum I, the Late Neolithic phase, was apparently less productive, but it should be remembered that it had been partially destroyed by the builders of the Palace. It had a group of loomweights too shattered to be counted, thirty-six whorls, of which one was decorated, and two shuttles.

1. J. D. Evans, B.S.A. Vol. 59, 1964, p. 157; Pl. 60, 1, No. 1.
6. J. D. Evans 1964 op. cit., pp. 190 - 192; Fig. 56, 1; Fig. 61, 13; Pl. 56, Nos. 1, 20; Pl. 57, 2, Nos. 1, 7; Pl. 60, 1, No. 5.
7. J. D. Evans 1964 op. cit., pp. 182 - 188; Fig. 56, Nos. 3, 7; Pl. 57, 1, No. 2; 2, No. 8; 3, Nos. 2, 3.
8. J. D. Evans 1964 op. cit., pp. 190 - 192; Fig. 56, Nos. 4, 5; Pl. 57, 2, Nos. 6, 10; 3, No. 6.
A further four shuttles were found unstratified.

a). Spindle Whorls.

1). Sherd Whorls. Discs made from discarded pottery occurred in all strata from VII to I, and there were particularly large numbers in Strata IV and III. So many unpierced ones were found, that they ought probably to be regarded as a separate class of object from the pierced ones, and designed for some other purpose. It is interesting that some of the few centrally-pierced ones do occur earlier than the made whorls, just as on the mainland.

2). Stone Whorls (?). There is no reason why the flat or flattish centrally-pierced discs of stone found from Stratum VI upwards should not have been used as whorls, if they had a diameter of at least ten centimetres and/or a weight of at least ten grams (page 80 ff. above), and the central hole was large enough to receive a spindle. These objects, usually only in small numbers, are found in strata of diverse periods at sites all over Greece, and, no doubt, further afield also. Other uses, such as pendants in the case of small, well-made ones, and lids or net weights in the case of larger ones, do suggest themselves, and it is not possible to be dogmatic about their function.

1. J. D. Evans, B.S.A. Vol. 59, 1964, p. 192, Fig. 56, No. 6, Pl. 57, 2, Nos. 1, 4, 5, 12.
3). Made Clay Whorls. Their excavator character-
ises the whorls of neolithic knossos as ranging from plano-
convex and disc-shaped through biconic 1 to flattened
globular. The biconical section is said to have been the
most popular, followed by the plano-convex type, while the
two opposite extremes of bun-shaped and disc-shaped were
relatively rare. Diameters were usually within a range of
3 - 5 cms.

The fragmentary whorl of Stratum IV was not of a
common type, although two others with similar decoration
occurred in Strata II and I. It had been a spheroid
object, the black surface of which bore incised dots filled
with white.

The great majority of the neolithic Knossian
whorls that I was able to examine, whether their profiles
were discoid, biconical, or plano-convex, were wide and
flat (Stratum III: Fig. 17, Pl. XXVIIa, b; Stratum II:
Fig. 18a, Pl. XXVIIc, d; Stratum I: Fig. 18b, Pl. XXVIIIa,
f). Their diameters, especially in Stratum III, approached
5 cms. rather than 3 cms., and were sometimes a little in
excess of the larger figure. Each phase produced one or
two higher biconical or "bun-shaped" whorls, the diameters
of which tended to be a little smaller, and this type seems to
have become slightly more numerous in the Late Neolithic
Stratum I. Their numbers are augmented by those published
by Sir Arthur Evans, which presumably came from upper and
therefore later Neolithic levels.

1. J. D. Evans, B.S.A. Vol. 59, 1964, p. 233, Fig. 56, No. 10.
2. All 25 whorls from Stratum III; 40 of the 100 whorls from
Stratum II; 10 of the 36 from Stratum I.
3. Exact statistics are not possible as so many were incom-
complete.
4. P.M. I, p. 42, Fig. 10, Nos. 5 - 9.
Very few of the whorls are decorated, and when they are, the designs are of the simplest, dots, or pairs of lines running from the central hole to the circumference. Almost all, however, are very well made and well fired. The clay is usually quite fine, and varies from greyish-black to blonde, with intermediate colours of dark grey, dark red, salmon pink and pale yellow. Some of the whorls are mottled in variegated colours from the firing, which is most attractive. Many have burnished or slipped and burnished finishes. In spite of many incomplete specimens, it is a handsome collection.

b). Loomweights.

Despite their excavator's occasional question marks, there can be little doubt that the objects published as loomweights, are loomweights. All except two were found in groups. All except these two are unbaked, or very lightly baked, and would speedily disintegrate in water or weather. The holes of some of the more complete examples bear distinct marks of thread wear (Figs. 19a, b, 21a; Pl. XXVIIIa - d), while others' holes are broken in a manner suggesting strain.

The Middle Neolithic Stratum III contained two sub-phases, and one set of weights was found in each. The slightly earlier set consisted of roughly rectangular objects with perforations at some or all corners (Fig. 19a, Pl. XXVIII a). The only relatively complete one has holes at all four corners, and thread wear indicates that it hung as illustrated in Fig. 19a and Pl. XXVIIIa. Four of its broken fellows probably resembled it, but the thread wear on a

1. P.M. I, Fig. 10, No. 7; Christian Zervos "L'Art de la Crète néolithique et minoenne", 1956, Pl. 115.
fifth (Pl. XXVIIIa, bottom right) indicates that it hung
diagonally. A seventh weight (Pl. XXVIIIc, left), made of
the same fine, creamy clay as this group, and found in the
same trench on the same day, but bearing a different cata-
logue number, is probably one of the same set.

An eighth weight, with the same catalogue number as
the majority of the group, is quite different from them
(Fig. 19b, Pl. XXVIIIc, right). It is of coarse, dark brick-
red fabric, had a round rather than a rectangular profile,
and two holes, through one of which it is now broken. It
is slightly reminiscent of the later minoan discoid two-
hole weights, except that it is very much thicker. Its
presence in the group is probably accounted for by its
being an old weight, or a spare weight from another set,
brought in to replace a breakage.

Cuboid weights, usually pierced with four holes,
were to be one of the standard types of minoan weights;
they were to be particularly prevalent in the middle minoan
period, and to be virtually confined to east crete. They
may well have been the descendants of this group from
Neolithic Knossos. Their design is distinctive, so much
so that one feels they must have been created for some
specific purpose, some specialised kind of weaving. Having
four holes, they have provision for four thin bunches of
warps, instead of one or two thick ones. Perhaps these
bunches were of different colours.

There is a form of weaving called tablet-weaving,
which is normally used for narrow strips of patterned cloth,
like braid, but can also be used for decorative borders.
The 'tablets' are thin plates or pieces of card with varying
numbers of holes, through which different coloured warps are passed. By turning the tablets a varying number of turns in varying directions, a pattern in the warp is created. Perhaps the Cretan cuboid weights were used in a somewhat similar manner.

The second and slightly later set of Middle Neolithic weights are larger and heavier than the first, and of a different design. Again they are approximately rectangular, but with rounded tops and flattened bases. They are sometimes taller than they are wide, sometimes wider than they are high; they are always wider than they are thick, and pierced with two horizontal holes through their shortest axis, a little below the top. They differ considerably in size and shape (Figs. 20a, b, 21a, b, Pl. XXVIIib), and weight, but not so much as to preclude their use on the one loom. There are five reasonably well-preserved examples, and a further six recognisable ones; all but one are of the same greyish-brown fabric with white grits, as are two curious, slightly tapering cylindrical objects apparently found with them. One is broken at one end, the other at both, so that it is only possible to guess at their original form. They may once have had a single horizontal piercing near the top, or they may simply have been large, unpierced clay cylinders, although they do not appear to have the slight 'waist' usual on bobbins or spools (Pl. XXVIIIe).

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1. For a fuller explanation, see Audrey S. Henshall, P.P.S. Vol. XVI, 1950, p. 130 ff., p. 148; also Elizabeth Siewertz van Reesma "Contribution to the Early History of Textile Technics", 1926.
2. The weight with four holes weighs 195 grams.
3. The weight in Fig. 20a is well over 500 grams, the limit of the scales used; that in Fig. 20b, 350 grams (broken); that in Fig. 21a, just over 500 grams; and that in Fig. 21b, 368 grams (chipped).
Two 'stray' weights were found. The first was of the fine, dark grey fabric used for some of the whorls, and like them also, it was well-fired, and coated with a creamy burnished slip. It was much smaller than any of the other weights, and had two holes near its slightly-rounded top (Fig. 22b, Pl. XXVIIId, bottom left). It was from a middle Neolithic context. The other, from the transitional Middle/Late Neolithic Stratum II, was a flat plaque of very hard-fired brick-red coarse ware, with holes at all four corners showing signs of wear. It was larger and flatter than either the Middle Neolithic or the Minoan cuboid weights with four holes, and has no close parallels (Fig. 22a, Pl. XXVIIId, top).

The loomweights mentioned so far, are only those which have been fortunate enough to survive the years in a recognisable form. A bag of 'mud brick', that none but the most conscientious of archaeologists would have distinguished from lumps of mud, includes an occasional smoothed and rounded corner, and the fabric appears to be the same as that of a very fragmentary weight from a late Middle Neolithic context (Pl. XXVIIId, bottom right), which came from the same trench. Another possible group of weights came from the Late Neolithic Stratum I; they were so shattered that it was not possible to estimate their number or comment on their form, and their interest lies merely in the fact that they demonstrate that the warp-weighted loom continued in use.

1. The piece of weight illustrated in Pl. XXVIIId, bottom right, was from Trench B, Level 10, and the 'mud brick' from Trench B, Level 8.
c). **Shuttles**.

The attractive little objects nicknamed spools by Sir Arthur Evans, and shuttles by Professor John Evans, seem to be unique to Knossos, and to be confined to Neolithic levels even there.

They are small bars of clay with a groove or a pair of 'horns' at each end, suitable for holding thread. They are generally quite well-fired, and sometimes, especially in the earlier examples, burnished; and all are decorated with pleasing but irregular patterns of incised lines or dots, or a combination of the two (Fig. 23a - c, Pl. XXVIII).

They occur at least as early as E.N. II, and are found in all succeeding strata. Their numbers are respectable, a dozen being found in the more recent excavations, and at least four, probably more, in the earlier ones.

It is impossible to prove whether these objects were actually used as shuttles or not, but their basic design is so suited to the purpose that it was the one adopted for the reconstruction of a warp-weighted loom seen in Pl. VIIIId. The fact that the thread can be wound lengthwise round the shuttle makes it less bulky and easier to handle, while the thread itself is less likely to develop kinks than thread wound round and round a stick, like the shuttle seen in Pl. IXa.

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1. J. D. Evans, B.S.A. Vol. 59, 1964, p. 233, Fig. 56, Nos. 1-9.
2. P.M. I, p. 42, Fig. 10, Nos. 1-4.
An objection to the anossian shuttles is that they are often thicker and always shorter than is desirable, and this means that they hold shorter lengths of thread than they might. Experiment with the three illustrated in Fig. 23, using 4-ply wool, showed that 23a could take twenty-five turns of the thread, a length of 4.80 metres; 23c could accommodate twenty-six turns, but with its shorter length, this was only 3.75 metres; 23b held forty turns of thread, and as it is broken and its original length unknown, it is not possible to estimate what length of thread this represents, but obviously it would have held more than the other two. If the average capacity of a shuttle is taken as being 5 metres, and cloth half a metre wide is being woven, it means the shuttle will have to be refilled after every nine or ten rows of weft are inserted. Although a longer thread would be preferable, this is by no means so frequent as to preclude the use of the objects as shuttles.

There is no good reason why shuttles should be decorated, unless for their owners' pleasure - and if this were the case, it seems strange that more of the whorls were not incised. The incised surfaces of the shuttles were possibly of some help in gripping the first turn of thread, and preventing it from slipping. - if indeed the objects were used for holding thread.

As John Evans points out, the fact that the shuttles make their appearance at the same time as the first made whorls, and only a little before the first loomweights, is in favour of their being connected with
the weaving industry. They are suitable for use as shuttles, and it is very probable they were used for this purpose, but it cannot be incontrovertibly proved.

d). Bone Tools.

Sir Arthur Evans felt that many of the bone tools which "abounded" in his Neolithic deposit must be concerned with a textile industry, and he mentions specifically shuttles (?), needles, and "punches, perhaps for leather."

There was an abundance of bone tools on the recent excavations also, and some of the pointed, polished ones may have served as pin beaters, awls or punches. All except four of the bone needles with eyes which are illustrated look fine enough to pass through loosely-woven homespun, and the four that are too wide or thick for this purpose are suitable for use in pattern weaving - one of them is, in fact, almost long enough for a needle-shuttle.

e). Pottery Patterns.

Sir Arthur Evans considered an incised chequer motif on some of his pottery to be of "obviously textile origin" (Fig. 23d). It is more difficult to imagine incised pottery patterns as cloth than it is painted ones. If the incisions are imitating a plain check, there is nothing to say except that this is one of the simplest patterns to produce. If they represent panels of vertical stripes alternating with

3. E.g. J. D. Evans 1964 op. cit., Pl. 61.
4. J. D. Evans 1964 op. cit., Pl. 60, 1, Nos. 1 - 3; 2, Nos. 1 - 4.
5. J. D. Evans 1964 op. cit., Pl. 60, 1, Nos. 4 - 7.
6. J. D. Evans 1964 op. cit., Pl. 60, 1, No. 5.
7. F.A. 1 loc. cit., Fig. 8, Nos. 4 - 5.
plain panels, divided by horizontal bands in the west, the pattern is more interesting, although still well within the compass of the warp-weighted loom that was being used. Pottery with similar patterns was found on the more recent excavations, from Early Neolithic and Middle Neolithic contexts.

Other simple incised geometric patterns, chevrons, waves, diamonds or lozenges, vertically hatched bands and so on, may be derived from textile patterns, but it is not possible to make out a very strong case.

f). Raw Material(s).

Caprine bones were recovered from all levels of the more recent excavations. Only those of the E.M. la and b periods have been studied in depth as yet, but the results are interesting. About three-quarters of all the bones of these periods were caprine, and, where they could be distinguished, sheep bones seem to have been about four times as numerous as goat. The scholars who made the study suggest "an explanation for the predominance of sheep at Knossos may be seen in the local topography, which with gently rolling hills and fairly close vegetation is more suited to sheep than to goats. It is not till further inland that one meets with more rugged surroundings, the commonly preferred environment of goats."

1. J. D. Evans, B.S.A. Vol. 59, 1964, Pls. 47, 3, No. 6; 48, 1, No. 14; 49, 1, Nos. 3, 6, 10, 14; 50, 1, No. 1.
2. J. D. Evans 1964 op. cit., Pls. 46, 5, Nos. 3, 5, 6, 7; 46, 4, Nos. 4 - 6 (E.N. I); 47, 3, 4, all sherds except 3, No. 6 (E.N. II); 48, 1, most sherds, especially No. 17; 49, 1, all sherds (E.N.); 49, 3, both sherds (E.N.); 50, 1, all sherds; 52, 1, Nos. 3 - 6 etc.; 52, 2, Nos. 1 - 3, 10 (L.N.); 53, 1, No. 2 (notice effect of sewn seams), No. 3; 53, 3, Nos. 6 - 8.
Knossos was sheep country, even in the sixth millennium B.C. It is tempting to speculate whether the 'woollen industry' propounded for much later Minoan Crete (page 338 ff. below) may not have had its origins here.

There is no evidence for or against the presence of flax.

The information about spinning and weaving in the rest of Neolithic Crete is minimal. A sherd whorl, made from incised ware, was found at Magasa, and a few made whorls of the higher biconical type, sometimes incised, are known from Phaistos.

The evidence from Knossos, however, is sufficient compensation for the dearth elsewhere.

By the end of the Early Neolithic period, the inhabitants of Knossos were possibly producing enough thread for their own needs with sherd whorls and the first made whorls, and the clay shuttles may be evidence for weaving.

In the Middle Neolithic period it seems likely that there was a considerable increase in the production of textiles. Both the main sets of loomweights contained one of a fabric different from the rest, and these two may once have belonged to other groups of weights similar to themselves. The small slipped weight illustrated in Fig. 28b may have had fellows, and the fragmentary weight and bag of 'mud brick' (page 188 above) may have represented yet another set. Thus

in the Middle Neolithic phase there can seldom have been fewer than two looms in existence, and the number may have been as high as six. The area the excavation covered was small, the houses few. Unless by some great good fortune all the looms of the settlement were gathered in one area, a factor which in itself would suggest organisation, a rather surprising number of looms must have been in existence. It may be worth stating that looms in use in Greece today have almost always been handed down in a family for at least three generations, and it would have been a natural procedure in prehistoric times also.

The same spindle whorls also often suffice both grandmothers and grand-daughters. The number found in the Middle Neolithic Stratum III, twenty-five, is ample for the area excavated, and the hundred whorls from the succeeding Stratum II is quite excessive. At the end of the Middle Neolithic period, the inhabitants of Knossos must certainly have been producing far more thread than they required themselves, and it seems very likely they were also weaving surplus cloth.

Add to these indications the hint of a diversity of techniques provided by the two different forms of loom-weights, a glimmer of professional pride in the decorated shuttles (?), the suggestion of patterned cloth reflected by incised designs on pottery, and an unusual predominance of

1. At Tylissos today, where many of the inhabitants weave under contract to tourist shops in Herakleion, there are three looms in one group of houses a little larger than that covered by the Knossos excavations. There are other looms elsewhere in the village. It is noteworthy that there is not a loom in every house. At the Messenian village of Karpofora, which is not concerned with the tourist trade, there is only one loom, which anyone may use at need.
sheep bones, as opposed to mere caprine bones, even in the settlement's earliest phases, and a rather startling picture emerges.

Sooner or later the inverted commas have to be removed from the words 'textile industry' in connection with Crete. I think it is highly probable that a textile industry was already in existence at Knossos in the Neolithic period.
The Early Bronze Age is a satisfactory period. A large number and wide variety of archaeological finds can either definitely or very plausibly be attributed to spinning and weaving, and, while some have their origins in the preceding period, and a few continue in use in the succeeding ones, the majority are almost entirely confined to the Early Bronze Age, sometimes even to the extent of being useful dating material, which is unusual with tools.

Although the textile tools of the Early Bronze Age are not always found in the same combinations, or even associated with the same type of pottery, they do tend to divide the country into four zones, within each of which a certain degree of uniformity may be expected. These are: the north, including Macedonia, Thessaly, and the islands of Lemnos, and, to a lesser extent, Lesbos; central Greece and the Peloponnese, with a sphere of influence which seems to have included some of the Ionian islands; the Cyclades; and Crete.

Crete was the most isolated of these zones. Its textile tools were quite different, not only from those of the rest of Greece, but also from those of its own earlier period. There is a possible slight affinity with some of the other islands - Samos, Lesbos, and Kea - but on the whole, Crete stood apart.

The other three zones, although retaining their own characteristics, show a pleasing open-mindedness towards the ideas of their neighbours, or possibly, (since textile tools are conservative and commonplace objects unlikely to travel far without their owners), towards their
neighbours in person. The picture is one of sporadic and unhindered movements of small groups of peoples in various directions, a peaceful and beneficent exchange of ideas and techniques.

The sea must have played a major part in this interchange, providing the best of all highroads, needing no making, requiring no upkeep, suffering from neither summer dust nor winter mud. Travel by ship must have been faster and more comfortable than any form of transport available on land, so long as the weather was fine - and if it were not, there were islands and harbours enough in which to shelter.

This last explains the comparative isolation of Crete. Even in classical times, ships travelled by day and were beached at night. Crete is about eight hours' sail from Thera even in today's ships. Although there is general evidence for some contact with other parts of the Aegean, it must have been a much more difficult journey, often involving undesirable night sailing.

Although the Early Bronze Age may be considered as approximately occupying the third millennium B.C., there are the usual difficulties over chronology and terminology. 'Early Bronze Age' is as exact a definition as may be expected for the North. The central and southern mainland and the Cyclades have the advantage of the tripartite divisions of Early Helladic I, II, and III, and Early Cycladic I, II, and III, but too little material has been

1. The horse had not been introduced.
accurately enough dated to make them of much use in this thesis.

In central Greece, where the evidence is based chiefly on Eutresis, the Early Helladic period seems to have ended with a destruction, followed by a change of population, at the end of E. H. III, the succeeding phase being of course the Middle Helladic; but J. L. Caskey, excavating at Lerna in the Argolid, found that there the destruction and change occurred at the end of the E. H. II period, and puts forward a good case for the same sequence of events elsewhere in the north-east Peloponnesse, notably at Zygouries and Asine. This theory has the modest support of a spindle whorl, of a kind typical of the Middle Helladic period only at Eutresis, which was found in an Early Helladic context at Lerna.

The evidence to be considered consists of numerous varieties of spindle whorl, among which, however, two or three kinds predominate; one of them, with rare exceptions, can be dated to the Early Bronze Age on the evidence of type alone; almost a dozen different varieties of loomweight; curious little clay objects known, because of their shape, as 'anchors', again certain indicators of the Early Bronze Age in Greece, the connection of which with textiles is, though hypothetical, often suggested; bone needles and other bone tools; a few bronze needles; numerous mat impressions; and a scrap of cloth.

3. H. Goldman 1951 op. cit., p. 198, Pl. XIX.
a) Spindle Whorls.

1) Domed Whorls. The most typical and widespread Greek Early Bronze Age whorl is the one variously known as plump conical, convex-sided conical, semi-ovoid or hemispherical, and for the purposes of this thesis called 'domed'. Like the majority of the period's whorls, these are usually large and heavy. While some examples are comparatively low, (Figs. 27c, 28d, 30e, 31f), the majority are of a height which is only a little less than their diameter. There are virtually no examples in which the height exceeds the diameter. The flat surface, usually referred to in publications as the base, but possibly actually the top (page 76 above), is sometimes slightly concave (Figs. 25w, x, y, z, aa, 28e), or hollowed (Fig. 26a).

So many whorls, the great majority of the domed type, were found at Early Helladic Corinth, that their excavator, Leslie Walker-Kosmopoulos, thought that the textile industry might have been as important at the site then as it was to be in later Classical and Hellenistic times (Fig. 28d, e). The same type of whorl has been constantly found at other excavations in the vicinity, including Korkou on the coast to the north (Pl. XXXIc, Nos. 1, 2). Others were found further south, at Phlius near Nemea (Pl. XXXId), and at Zygouries (Pl. XXXIb).

1. Approximate maximums: 7 cm. diameter; 90 grams weight.
2. See also H. Goldman "Excavations at Eutresis in Boeotia", 1931, p. 192, Fig. 285, top. row, No. 7.
5. C. Blegen "Korkou", 1921, p. 104, Fig. 129, Nos. 1, 2.
7. C. Blegen "Zygouries", 1928, p. 190, Fig. 179.
Although no domed whorls are illustrated in the 1 Tiryns publication, four are on display in the archaeological museum at Nafplion, in a case of Early Helladic finds from that site. Two (Nos. 1287, 1288, Fig. 30a, b) are of the usual size, while the other two (Nos. 1290, 1296, Fig. 30c, d), although approximately the same shape, are so much smaller that they ought perhaps to be excluded from the category. Five more Tirynthian whorls are on display in the National 2 Archaeological Museum, Athens, and of these, three are of the domed type (Fig. 30e - g). It is very difficult to equate the text of the Asine publication with the illustration it refers to; but again there is a typical domed whorl among the material from that site in Nafplion museum (Fig. 30j).

The small finds from Lerna have not yet been dated, but the site had over forty domed whorls which are 4 certainly Early Helladic in appearance (Fig. 29a - d). Three-quarters of these were of the more usual higher variety. Almost all were made of well-refined and very well-fired buff clay; three (L6.9, L6.11, L6.42) were of coarser red fabric, and these and some others were partially blackened from firing; all were well-smoothed, sometimes with slip which has preserved finger-marks, and two (L5.327, L5.154) were burnished; two (L2.41, L6.11) had slightly concave tops, but the majority were flat or very slightly convex. The diameter range was 3.7 - 5.5 cms. with an

2. Case 15, all with No. 1613.
3. O. Frödin and A. Persson "Asine", 1938, p. 250 ff., Fig. 177.
4. I should like to thank Prof. J. L. Caskey, of the University of Cincinnati, for allowing me to study these and other small finds from the site, and to include them in the thesis.
average of 4.75 cms., and the range of heights was 2.4 - 4.5 cms., with an average of 3.5 cms. The central holes, with a range of 0.6 cms. - 1.2 cms., and an average of 0.8 cms., must have accommodated spindles similar in size to today's.

Although the domed whorls were perhaps more numerous in Corinthia and the Argolid than elsewhere, they were by no means confined to this part of Greece. Asea in Arcadia is for once in line with other sites in having domed whorls in its Early Helladic levels, but produces its usual confusion by claiming them also for the Neolithic period.

Across the water from Corinth, near Perachora, this type of whorl has recently been found in a context which may be E. H. 1. It continued to be used in the succeeding phase, but seems not to have been quite so high (Fig. 28b, c). The whorl also occurred very early at Eutresis, and continued in use in the E. H. II period, and later (see below, page 395) (Fig. 28a). Other sites in central Greece at which it has been found include Aghios Kosmas on the Attic coast near Athens (Fig. 27e - g), and Lithares near Thebes (Fig. 27a - d). The whorl illustrated in Fig. 27d, with its bevelled upper edge, approaches an asymmetrical biconical shape, and is similar to one of the smaller whorls from Tiryns (Fig. 30c), and two from the north (Fig. 25aa, t).

1. Erik J. Holmberg "The Swedish Excavations at Asea in Arcadia, 1944", p. 117 ff., Fig. 113, Nos. 2, 7.
2. J. M. "Ossey, B.S.A. Vol. 64, 1969, p. 65, Fig. 8.
3. J. L. and Elizabeth G. Caskey, Hesperia XXIX, 1960, pp. 142, 145, 157, Pl. 53; E. Goldman "Excavations at Eutresis in Boeotia", 1931, p. 192, Fig. 265.
4. G. E. Mylonas "Aghios Kosmas", 1959, pp. 30, 32, 34, 36, 38, 41, 146, Fig. 170, Nos. 2 - 5, 7 - 11.
5. T. G. Spyropoulos, Deltion A¹, Vol. 24, 1969, p. 29, Pls. 29f, 30a.
Few whorls from the Cyclades have been published, and even fewer dated. The domed whorl does appear to have been represented there, however, as two from Melos are on display in the National Archaeological Museum, Athens (Fig. 31 2 e, f); and another is known from Amorgos (Fig. 31c).

The whorl is less frequently found north of the Spercheios. There is little record of it in Thessaly unless Tsountas' rather small No. 21, found in both Stone and Bronze Ages, is taken into account (Pl. XXIXb, No. 21). It seems to be present in Macedonia, however, at Vardaroftsa (Fig. 24v), and at Armenochori in the far north, where all the whorls are reported as having concave tops (Fig. 25w, z, aa). Three domed whorls have been found in the recent excavations at Servia. Two (Nos. 71 and 110, Fig. 26b, c; Pl. XXXd, centre and right) come from reasonably secure Early Bronze Age contexts. The third (No. 303, Fig. 26a; Pl. XXXd, left) is from a mixed level, but, except for the accentuated hollow top, is very like the domed whorls of the Peloponnesse in fabric, firing and finish. The site at Servia was abandoned at the end of the Early Bronze Age, and not disturbed thereafter save by some middle Byzantine pits and perhaps a World War I French army bivouac, so the assignation of the whorl to the Early Bronze Age is more secure than it seems.

The type occurs in some of Greece's farthest islands. It appears to have been known at Thermi on Lesbos, although

1. Case 64, bottom shelf.
4. W. A. Heurtley "Prehistoric Macedonia", 1939, p. 87, Fig. 67v.
5. W. A. Heurtley 1939 op. cit., p. 87, Fig. 67w - aa.
quite another type of whorl predominated there. Two fragmentary whorls from Dörpfeld's excavations at Stenon on Leukas seem to be of this type. Finally, the whorl was found in the far north-west of Greece, at Aphiona on Corfu (Pl. XXXIa, No. 17), a Neolithic/Early Bronze Age site said to have affinities with both Leukas and southern Italy in its earlier settlement, and with Epirus and Macedonia in its later one.

Many Greek Early Bronze Age tools have clear origins, sometimes within the country, often beyond its borders. There appears to be little trace of these whorls beyond Greece. Schliemann illustrates two from his excavations at Troy, and a plain conical type with a slightly convex profile does seem to have been in use in his earliest city, but it differed from the Greek whorls in being "a lustrous black colour." Even these, however, do not appear to have been common in Anatolia, where, as on Lesbos, quite another type of whorl predominated in the Early Bronze Age.

Greece had many tools in common with her neighbours, but domed whorls do not seem to have been amongst them. The inescapable conclusion is that the type was developed in Greece itself, perhaps in the north-east Peloponnese, where it occurred so frequently and in such numbers, or in central Greece, where it can be dated to the very beginning of the

1. W. Lamb "Excavations at Therai on Lesbos", 1936, p. 161, Fig. 47, No. 27.
2. W. Dörpfeld "Alt-Ithaka", 1927, p. 284, Pl. 58d, bottom row, left; Pl. 59b, No. 4.
3. H. Bulla, Ath. Mitt. LIX, 1934, p. 187, Fig. 4, No. 17.
Bronze Age at Perachora and Eutresis.

Although other whorls introduced in the Early Helladic period were to survive into later times, the domed whorls are seldom seen after the end of the Early Bronze Age. There are a few exceptions: at Eutresis, where they continued into the Middle and Late Helladic periods; at Corinth, where two were found in graves with Middle Helladic pottery; and at Nichoria in Messenia, where a fragment of one was found in a Middle Helladic context; but basically, the domed whorls both came and went with the Early Helladic era.

2) Tall Convex-Sided Cones. These may be related to the domed whorls, but the fact that their height exceeds their diameter makes the 'domed' description inapplicable. They are usually of considerable size and weight. They are not very common. Their identification with the Early Bronze Age rests on their presence at Aphiona (Pl. XXXIa, No. 16), and on Tsountas' classification of them in Thessaly (Pl. XXIXb, No. 20). The others illustrated, from Syros (Fig. 32a), Phylakopi (Fig. 31d), and Lerna (Fig. 29g), are dependent upon analogy for dating, and that this may be insecure is indicated by the occurrence of such a whorl in an L. M. II context at Nichoria (page 433 ff. below).

1. H. Goldman "Excavations at Eutresis in Boeotia", 1931, p. 192, Fig. 265, Rows 2, 3.
3. N. 185. I should like to thank Professor W. A. McDonald of the University of Minnesota, for allowing me to study the material from Nichoria, and include it in the thesis.
4. E. Bulle, Ath. Mitt. LIX, 1934, p. 167, Fig. 4, No. 16.
7. On display in the National Archaeological Museum, Athens, Case 64, bottom shelf, No. 5846.
3) **Low Conical Whorls.** These whorls had already become established in Greece in the Late Neolithic period. They were notable in House Q of Rakmani's Third Period (page 172 above), and, in view of their overall numbers, may well have continued in use there. They were also instituted early on Samos (page 153 above), and may have become an island type, being found on Amorgos (Fig. 31a, b), and Paros (Fig. 31g, h). Twenty-five were found at Lerna, but no date is available for these. Two are illustrated (Fig. 29e, f), but the one with the concave top (Fig. 29e), being the only one to have this feature, should perhaps be regarded as a different type. Many of them, although too low to be called 'domed', have a slightly convex, rather than a straight-sided lower half.

Both the low conical whorls illustrated from Armenochori (Fig. 25x, y) also had concave tops, and Heurtley, in a footnote, characterises this as a typical 'Danordic' form.

4) **Medium Cones.** Straight-sided conical whorls of medium height are perhaps an even more common type than domed whorls, which may have developed from them, as suggested in the terms 'plump cone' and 'convex-sided cone'. They are often found in the same contexts as their more rounded counterparts (e.g. Fig. 28a). They may be either true cones, (e.g. Fig. 26d), or truncated cones (Fig. 26e). Some were

1. A. J. B. Wace and M. S. Thompson "Prehistoric Thessaly", 1912, pp. 42 - 43, 53, Fig. 28.
2. C. Tsountas, A.E. 1898, p. 168, Pl. 8, No. 7; on display in National Archaeological Museum, Athens, Case 72, bottom shelf, No. 5342.
3. On display in National Archaeological Museum, Athens, Case 70, bottom shelf.
already in use in the Late Neolithic Age (page 170 ff. above),
and, once established, they continued to be used throughout
the prehistoric period and later, so that they cannot be dated
on form alone. Early Bronze Age specimens, however, may,
again, often be distinguished by their comparatively large size
and weight.

It is difficult to think of an Early Bronze Age site
at which they do not occur. They were present at Corinth,
1 although in a strict minority, at Korakou (Pl. XXXIc, no. 3) 2
and Zygouries (Pl. XXXIb, left). They were numerous at
Lerna, although not as numerous as the domed whorls; about
thirty were found, some plain, some burnished or slipped and
burnished. Three had concave tops. (Fig. 29m). These
whorls from Lerna, being undated as yet, are included only as
possible Early Helladic types (Fig. 29j, 1).

Conical whorls occurred further afield in the Pelop-
5 onnese, at Asea, and at prehistoric sites near Olympia.
They appear to have been prevalent in the western parts of
Greece, as they were the dominant type at Pelikata, Ithaca
7 (Fig. 32g -1), and were found on Leukas and at Aphiona (Pl.
8 XXXIa, No. 18).

1. Leslie Walker-Kosmopoulos "The Prehistoric Inhabitation of
Corinth", 1948, p. 57, type d.
2. C. Blegen "korakou", 1921, p. 104, Fig. 129, No. 3.
3. C. Blegen "Zygouries", 1928, p. 190, Fig. 179, No. 14.
5. Erik J. Holmberg "The Swedish Excavations at Asea in
Arcadia", 1944, p. 117, Fig. 113, Nos. 6, 8.
6. Fr. Weege, Ath. Mitt. XXXVI, 1911, p. 180, Par. II; W. Dörpfeld
"Alt-Olympia", 1935, p. 275, Fig. 24.
7. W. A. Heurtley, B.S.A. XXXV, 1934-1935, p. 35, Fig. 30, Nos.
139, 139, 146. The first two came from Area IV, which had
about thirty M.H. sherds among thousands of E.H. ones. No
information is given for Area I, from which No. 146 came.
The site is mainly late E.H., with some M.H. and L.H. III -
p. 41.
8. W. Dörpfeld "Alt-Ithaka", 1927, pp. 307 - 308, Fig. 61b,
Nos. 7, 8 - these were quite large; note scale.
9. H. Bulle, Ath. Mitt., LIX, 1934, p. 167, Fig. 4, No. 18.
The two excavations at Eutresis bear witness to the whorl's use in central Greece (Fig. 28a). The pre-World War I excavators Tsountas and Wace and Thompson are its chief advocates in Thessaly. Tsountas' No. 13 (Pl. XXIXb), a rather tall whorl with its flat top decorated with incisions, has parallels in Bulgaria. He found both this and his other conical type, No. 18 (Pl. XXIXb) in both Stone and Bronze Age levels. Wace and Thompson reported four conical whorls from Rini, and high conical whorls in their later strata at Tsani.

Further north, conical whorls of various sizes are well-represented at Servia. The rather low No. 280 (Fig. 26g, Pl. XXXa, second from left) comes from an early phase of the Early Bronze Age. The large No. 336 (Fig. 26d, Pl. XXXa, left) is securely dated to the Early Bronze Age. No. 319 and No. 100 (Fig. 26e, j; Pl. XXXa, two on right) are from basically Early Bronze Age levels which contained a little earlier material. No. 193 (Pl. XXXa, centre) came from a mixed level, and is dated by analogy; and the very truncated No. 70 (Fig. 26f) with its groove round the hole on the upper surface, came from a context containing mostly Early Bronze Age material. A large conical whorl is among those from Vardaroftsa (Fig. 24u).

1. H. Goloumen "Excavations at Eutresis in Boeotia", 1931, p. 192, Fig. 265, Top Row, Nos. 2, 6; J. L. and Elizabeth G. Caskey, Hesperia XXIX, 1960, p. 145, Pl. 53.
5. A. J. B. Wace and M. S. Thompson 1912 op. cit., p. 149.
6. See page 120, note 5 above. I should like to thank the Hon. Cressida Ridley for much additional information concerning the contexts of the finds from Servia.
7. W. A. Heurtley "Prehistoric Macedonia", 1939, p. 87, Fig. 67u.
A conical whorl of medium height has been found in an Early Cycladic context on Naxos. Although there seem to be few reports of others, it is a type that might be expected in the islands, where low conical whorls appear to have been in favour.

5) Outsize Conical Whorls. Occasionally tall conical whorls are found which are so large and heavy that their function as spindle whorls must be in doubt. The two extreme examples come from Kirrha, the ancient port of Delphi, and are published as weights, a purpose for which their size and weight are suitable, but their form is not (Pl. XXXVd, left). The larger, No 6488, has a diameter of 7 cms., and a (broken) height of 6 cms. With such dimensions, it would have had a weight in excess of 160 grams, the postulated maximum weight for a whorl (page 81 above). The objects could possibly have been used as weights by passing the bunches of warps through the vertical holes, and fastening them to a small stick below; an ingenious but clumsy arrangement, perhaps unlikely to be used if orthodox and more convenient weights were available at the site (Pl. XXXVd, right). If these heavy things were used as whorls, they were probably for some specialised form of spinning, like doubling thread or making cord.

These objects are not securely dated to the Early Bronze Age. Both Early helladic and middle Helladic remains were found at Kirrha, and no indication appears to be given.

3. It is possible to spin with N447 from Nichoria (weight: 157 grams) but it is difficult and tiring.
4. I am indebted to one of the guards at the archaeological museum at Delphi for this suggestion.
as to whether they belong to one period or the other. They are included here only because large whorls are much more typical of the Early than of the Middle Helladic period. However a similar find seems to have been made at Middle Bronze Age Dodona.

The two large conical whorls illustrated from Lerna (Fig. 291, k) are also undated, and are included only for comparison. They were the two largest whorls found at the site.

6) **Miniature Whorls.** Even in the Early Bronze Age, objects which have the form of whorls, but seem rather too small for the purpose, occasionally occur. Winifred Lamb rightly remarks "There is no definite border line between spindle whorls and beads...one's choice of a name usually depends on size." Two such objects are illustrated from Servia. Both have a central piercing which would be unnecessarily large in a bead; and although they have low burnished finishes, neither can be called pretty. The spherical no. 239 (Fig. 26b) was useful as a whorl; but the conical no. 100 (Fig. 261, Pl. XXXa, right), weighing only 8 grams, assisted the rotation of the spindle very little.

7) **Cylindrical Whorls.** Cylindrical objects which are probably whorls occur in small numbers at scattered sites. They seem to have been a definite northern type, being found at Kritsana (Fig. 24bb) and Agios Mamas in the Chalcidice, and at Vardarolitsa (Fig. 24cc). They occur in the

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3. W. A. Heurtley "Prehistoric macedonia", 1939, p. 87, Fig. 67bb.
5. W. A. Heurtley 1939 op. cit., p. 87, Fig. 67 cc; W. A. Heurtley and R. W. Hutchinson, B.S.A. XXVII, 1925-1926, p. 34, Fig. 21, no. 2.
ionian islands, in Ithaca, and apparently in the whoirospilia Cave on Leukas, which may indicate an early date for them on that island.

One is illustrated from Lithares near Thebes, and, though not specifically mentioned in the publication, one is on display amongst a group of domed whorls from Aghios Kosmas in the National Archaeological museum, Athens (Fig. 27h). An almost cylindrical whorl from Tiryns (Fig. 30h) is also displayed in the National museum with the same catalogue number as the domed whorls mentioned above (page 200, note 2); another very like it is known from Zygouries (Pl. XXXIb, second from left). Tsountas' type 21 (page 202 above) is possibly more like these two than the true domed whorls. One with a slightly concave top or base is illustrated from Lerna (Fig. 29h); it is, of course, undated.

The larger examples of these whorls are one of the few types that can be confused with loomweights. Their form is similar to that of the pierced clay cylinders, and although these are usually too large to be mistaken for whorls, smaller versions occasionally occur. There is a small cylindrical weight from Lithares on display in the archaeological museum at Thebes, which has clear marks of string wear in its central hole, and it may be the same object that is shown in the centre foreground of the illustration referred to above (note 4).

1. W. A. Heurtley, B.S.A. XXXV, 1934-1935, p. 35, Fig. 30, No. 144. The object came from Area IV - see page 206 note 7 above.
6. Case 42, bottom shelf.
7. C. Blegen "Zygouries", 1928, p. 190, Fig. 179, No. 2.
Small, neat cylindrical weights are known from Crete (page 292 below). Coincidentally, cylindrical whorls also occur in Early Minoan Crete, but they are, naturally, of a very superior kind (page 265 below).

3) Biconical and Spheroid Whorls (Map B). After their early invention in the Neolithic period (pages 121 - 122, 133 ff. above), these types of whorls were always in use in some parts of Greece throughout the prehistoric period, and, indeed, later.

Although it also acquired newer forms, Servia remained loyal to the shape of whorl it had first adopted in the Middle Neolithic period. The large, heavy biconical whorl No. 350 (Fig. 25b; Pl. XXXb) came from an impeccable Early Bronze Age context, while No. 45 (Fig. 25a) was found in a level which consisted largely of pottery of the same period. No. 375 (Fig. 25f), a surface find, is dated by its likeness to these two. The more spheroid No. 528 (Fig. 25d) came from a level containing nondescript pottery, the only recognizable fragments belonging to an early phase of the Early Bronze Age; and the surface find No. 374 (Fig. 25e), though less symmetrical, is similar. The low biconical No. 27 (Fig. 25c), decorated with a lustrous black slip, came from the makeup of an Early Bronze Age floor, and so could be of that period or a little earlier. The unique No. 295 (Fig. 25h, Pl. XXXc), with a fir tree incised on its reddish-buff slipped surface, is from an early phase of the Early Bronze Age. It looks like an escapee from Troy, and, in view of the type of loomweight found at the site (page 228 below), this is quite likely. The wide, low No. 376, a surface find, is reminiscent of the "wheel-shaped" whorls Schliemann found in his lowest stratum at Troy;

1. For the special circumstances of occupation at Servia, see p. 202 above.
it is adorned with thin, blackish slip, but this cannot be called "brilliant".

Biconical and spheroid whorls were also popular at Kritas (Fig. 24 1 - q), Agios Mamas, and Saratse.

They remained the preferred type in the Verde and Rosso periods which succeeded the Azzuro phase of Poliochoni, and were also paramount at Themi on Lesbos, although there the majority were decorated (page 213 ff. below).

They had been known in parts of Thessaly in the Neolithic period (page 147 ff. above), and continued to be used at Tsountas' sites (Pl. XXIXa, Nos. 14 - 16, 22 - 23) and elsewhere. One of the three "double conoid" whorls from Hakhmani was found in the Third Period's House Q; the other two may have been in use later. Four biconical whorls are known from Rini; and, like the higher conical whorls, biconical whorls were common in the later phases at Tsani.

They were being used, although not in great numbers, in the Ionian islands, at Phina (Pl. XXXIa, Nos. 14, 16),

2. W. A. Heurtley "Prehistoric Macedonia, 1939, Fig. 67 1 - q.
5. L. Bernarbo Brea "Poliochoni", 1964, p. 655, Pl. CLXIX.
8. A. J. B. Wace and M. S. Thompson "Prehistoric Thessaly", 1912, pp. 42 - 43, Fig. 29.
11. H. Bulle, Ath. Mitt. LIX, 1934, p. 167, Fig. 4, Nos. 14, 15.
in Leukas, and at Pelikata (Fig. 32k, 1). At least one biconical whorl is mentioned from the prehistoric sites near Olympia, where the whorls are held to be a typical west Greek collection.

One small, low biconical whorl is on display in the National Museum among the Early Helladic domed whorls from Aghios Kosmas.

It is difficult to know what the situation in the islands was. Like Lesbos, Samos had incised biconical whorls (see below). "Pre-mycenaean" biconical whorls, some incised, are mentioned from Phylakopi, but cannot be more exactly dated. Three small spheroid whorls from Chalandriani, Syros, are in the National Museum; one has a hollow, another a circular groove or channel round the central hole (Fig. 32e, f), while a third (Fig. 32d), which may be that illustrated by Tsountas, has vertical incisions all round, which give it a segmented appearance.

8a) Incised Biconical and Spheroid Whorls. These has already made a few appearances in Late Neolithic Greece, at Clynthus in Macedonia, and in Thessaly (Pl. XXIXb, Nos. 14 - 16), but their numbers were very small, and their designs

1. W. Dörpfeld "Alt-Ithaka" 1927; Choirospilia p. 331, Pls. 11a, 83a; Skaros p. 284, Pl. 56.  
2. W. A. heurtley, B.S.A. XXXV, 1934-1935, p. 35, Fig. 30, Nos. 141, 145. No. 141 came from Area IV, and No. 145 from Area I - see p. 206, note 7 above.  
3. Fr. Weege, Ath. Mitt. XXXVI, 1911, p. 180, Par. II.  
4. Case 42, bottom shelf; it may be that in G. E. mylonas "Aghios Kosmas", 1959, p. 41, Fig. 170, No. 12.  
7. Case 71, bottom shelf.  
9. G. E. mylonas "Excavations at Clynthus Part I - The Neolithic Settlement", 1929, p. 90, Fig. 91a, b.  
very simple.

Biconical, and, less frequently, spheroid whorls with all-over incised patterns are typical of the earlier phases of the Early Bronze Age in Anatolia. They are documented with particular clarity at Beycesultan. They were not present there in the Chalcolithic period, but were introduced in E. B. I, bearing patterns described as "restrained", which, like the early Greek ones, seem to have consisted of dots and lines. Larger examples with bolder and more complex patterns characterised the E. B. II period. At the end of this period, there was a complete cultural break at the site, and a different type of whorl appeared in E. B. III.

Whorls like those of E. B. II Beycesultan were found at Thermi on Lesbos, especially in the first three settlements. Thermi was contemporary with, and closely connected with Troy I, and its whorls may have been derived from those at that site (Pl. XXIXd). Two whorls of this type appeared amongst the otherwise plain biconical whorls of Poliochni's Verde and Rosso phases, and one of these (Fig. 26j), has close parallels at Vukovar in Yugoslavia (Fig. 26 l), and at Late Bronze Age Vardino in Macedonia (Fig. 26m).

No incised biconical whorls are definitely assigned

2. Seton Lloyd and James Mellaart 1962 op. cit., p. 277, Fig. F5.
3. Seton Lloyd and James Mellaart 1962 op. cit., p. 277, Fig. F5, and Fig. F6, Level XIII.
4. Seton Lloyd and James Mellaart 1962 op. cit., p. 277 ff., Fig. F6, "Levels XII - VI.
5. W. Lamb "Excaevations at Thermi in Lesbos", 1936, p. 161, Figs. 46, 47.
7. R. R. Schmidt "Die Burg Vušedol", 1945, Text Fig. 70, No. 4.
8. W. A. Heurtley "Prehistoric Macedonia" 1939, p. 101, Fig. 104g; L.A.A.A. XII, 1925, p. 28, Pl. XIX, No. 6.
to the Macedonian Early Bronze Age other than the one from Servia (page 211 above), which is an unusual one in any case; but the French archaeologist Rey published a selection of "pre-Mycenaean" incised whorls similar to the E. B. II Beycesultan ones (Pl. XXiXc), and these, coupled with the Late Bronze Age whorl from Vardino, and the Neolithic ones from Olynthus, suggest a long and stable history for biconical incised whorls in Macedonia.

Incised biconical whorls seem to have been in use in some of the more southerly islands. Their occurrence in Samos is obviously attributable to the proximity of Anatolia. If the incised biconical pre-Mycenaean whorls from Phylakopi are of the same kind, the style may have made its way across the Aegean, although the whorls themselves were local products. The rather simply incised whorl from Chalandrani (page 213 above) may also be taken into account.

The whorls under consideration seem therefore to be derived from Anatolia, and to have moved into Greek territory by two routes, one through the north-west of Anatolia to the north-east of Greece, and probably also, if not exclusively, by sea across the northern Aegean; and the other from south-west Anatolia, down the Maeander valley to Samos, and perhaps from there westwards across the southern Aegean.

Plain biconical and spheroid whorls may fairly be called indigenous to all parts of the mainland; but an

1. Léon Rey, B.C.H. XII - XLII, 1917-1919, p. 236, Pl. XXI, Nos. 1 - 3, 5. They came from three sites just east of Thessaloniki, two on the sea, and one circa 20 kilometres inland.
interesting facet of the distribution of biconical and spheroid whorls, whether plain or incised, is that in the Early Bronze Age, and the Early Bronze Age only, there is a kind of 'bald patch' where they are as scarce as if forbidden by law. This is the third zone mentioned previously (page 196 above), the Peloponnese and central Greece, the very area that was the chief territory of the domed whorls. If Olympia is included with the western sites rather than with the rest of the Peloponnese, Aghios Kosmas may be the only site in the whole area to have even one biconical whorl (page 213 above). This is all the more surprising when it is remembered how numerous this type was at the Franchthi Cave in the Late Neolithic period (page 150 ff. above).

9) Flat Whorls. These are rare in the Early Bronze Age. One small one is recorded from Vardaroftsa, 1 (Fig. 24dd). The rather large, wide, thick and well-rounded one illustrated from Aphiona (Pl. XXXIa, No. 13) has a counterpart on display in the new museum at Olympia, and the type may be indicated in an early archaeological report from that site. The two illustrated from Syros 2 (Fig. 32b, c) are probably best regarded as local idiosyncrasies; the larger one is very rough, and probably unfired. Flat whorls (except for sherd whorls) are seldom seen after the end of the Neolithic period.

1. W. A. Heurtley "Prehistoric Macedonia", 1939, Fig. 67dd; W. A. Heurtley and R. W. Hutchinson, B.S.A. XXVII, 1925-1926, p. 34, Fig. 21, No. 5.  
2. In a case of Early and Middle Bronze Age material discovered while digging the foundations for the building.  
3. Fr. Weege, Ath. Mitt. XXXVI, 1911, p. 180, Par. II.  
10) **Singular Whorls.** There are a few whorls which occur only once or twice, and are local oddities. The vertically cruciform whorl from Kritisana (Fig. 24a) and the kite-shaped whorl from Ithaca (Fig. 32j) may be variations of biconical and tall conical whorls respectively. The large concave-sided cone from Kritisana (Fig. 24 ff) is not too large to be a whorl, and is not very suitable for a weight. The bell-shaped whorl from Tiryns (Fig. 30i) shares the same catalogue number as the domed whorls from that site (page 200, note 2 above), and is presumably of the same period. A somewhat similar whorl is published from Asea. Conical whorls with concave sides occur from the Middle Helladic period onwards, and these last three whorls may be forerunners of the type.

There are occasional remarks about disc-like objects with projecting hubs; these, while they could certainly be used as whorls, may in fact be miniature cart- or chariot-wheels, such as have been found in Mesopotamia.

11) **Sherd Whorls.** Sherd whorls are reported from almost every Early Bronze Age site which has produced made whorls. A selection from the recent excavations at Servia is given in Pl. XXXe, and one is illustrated from Paros (Fig. 31j).

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1. W. A. Heurtley "Prehistoric Macedonia", 1939, Fig. 67a.
2. W. A. Heurtley, B.S.A. XXXV, 1934-1935, p. 35, Fig. 30, No. 140. It came from Area IV - see page 206, note 3.
3. W. A. Heurtley 1939 op. cit., p. 87, Fig. 67ff.
4. Erik J. Holmberg "The Swedish Excavations at Asea in Arcadia", 1944, Fig. 115, No. 8.
5. C. Blegen "Zygouries", 1928, p. 190, Fig. 179, Nos. 9, 15; W. Dörpfeld "Alt-Olympia", 1935, p. 275, Fig. 24.
7. On display in the National Archaeological Museum, Athens, Case 70, bottom shelf.
12) Bone Whorls. Bone whorls, which had begun
to appear at the end of the Neolithic era (page 153 above),
became more popular in the Early Bronze Age than they were
to be in any other period.

They continued to be used in the Verde and Rosso
periods at Poliochni. Tsountas records them in Thessaly. One was found at Aghios Kosmas and several, of different
kinds, at Zygouries. Three from Lerna (undated) are
illustrated in Fig. 40e - g. One was found at Pelikata on
Ithaca.

b) Loomweights.

1) Pierced Cylinders (Map 7). These were perhaps
the most typical, numerous and widespread of all Greek Early
Bronze Age weights. They consist of large (lengths circa 8
- 20 cms.), thick (diameters circa 4 - 10 cms.) cylinders of
clay, pierced longitudinally with one or two holes. The ends
are sometimes rounded (Pl. XXXIIa), sometimes flat (Pl. XXXII
d), and the cross-section, though usually circular (Fig. 33c)
is sometimes oval (Fig. 33a). There do not seem to be any
instances of large numbers being found together in the Early
Bronze Age, but two or three in the one area are not unusual.

1. L. Bernarbo Brea "Poliochni", 1964, p. 669, Pl. CLXXXI,
Nos. 15, 17.
2. C. Tsountas, Α.Ζ., 1908, p. 357, Pl. 46, Nos. 11, 14.
3. G. E. Mylonas "Aghios Kosmas", 1959, p. 147, Fig. 170, No.
6.
4. C. Blegen "Zygouries!", 1928, p. 191, Fig. 181, Nos. 1 - 3.
158.
6. E.g. in House D.M. at Lerna; this also had post-holes,
stone supports, charred remains of wooden uprights, four
spindle whorls, and various stone and bone tools - J. L.
in view of their considerable weight, eight or ten would probably be sufficient to equip a loom, and as most are unfired or very poorly fired, many may have disintegrated. They often show very marked thread wear in their holes (Fig. 33a, b; Pl. XXXIIa; b, right; c), which indicates that they hung with their central holes parallel to the ground. The weights with two holes seem to have been used indifferently with the holes one above the other, or side by side (L5.586 from Lerna carries distinct marks of both types of wear - Fig. 33a), or slightly askew (the weight in Pl. XXXIIIId, from Tiryns, is shown hanging in accordance with the wear in its holes). Some of the holes, especially those in the one-hole weights, are large enough to have accommodated a bunch of warp threads direct, but in the case of the narrow perforations seen especially in two-hole weights (Fig. 33a), it would probably have been more practicable to pass a single cord through each hole, and fasten the bunches of warps to these. This was certainly the practice in classical times, when loomweights with narrow holes were fitted with rods or rings to which the warps were attached. It would be interesting to know whether there was any technical reason for the presence of two holes rather than one - whether it meant the use of two different colours, or whether the back warps were confined to one hole and the front warps to the other - but it is not possible to prove anything of such a nature.

Like the domed whorls, the chief territory of the cylindrical weights was the Peloponnese and central Greece.

1. The weight from Tiryns illustrated in Pl. XXXIIIId, which was 10 cms. long and had a maximum diameter of 5.6 cms., weighed 335 grams, chipped - its original weight may have been c. 350 grams.
Weights with two holes were found at Korakou (Pl. XXXlc, Nos. 1, 2, 3, 4, 5), Zygouries, Tiryns (Pl. XXXlc, d), Asine, Lerna (Fig. 33a, b), while Orchomenos and Eutresis had both varieties (Pl. XXXlc, Nos. 3, 6); at the latter site, their use, like that of the domed whorls, is said to have continued into the Middle Helladic period. The rather small cylindrical weight from Lithares has already been mentioned (page 210 above); this had only one hole. Only one single-hole weight was found at Asea, and this said to have been middle Helladic. The weights were found as far west as Leukas, and in publishing these, Dörpfeld mentions others at Olympia.

In the north, there are the vexatious undated cylinders from Tsani, and a few from Tsountas' sites. They continued to be used at Poliochni. Schliemann found them across the water at Troy (Pl. XXXlb), but they

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1. C. Blegen "Aorakou", 1921, p. 104, Fig. 129, Nos. 4, 5.
3. H. Schliemann "Tiryns", 1886, p. 146, No. 71. I should like to thank the Director and members of the German Archaeological Institute, Athens, for allowing me to examine Dr. Schliemann's weights, two of which appear in Pl. XXXlc, d, and for other kind assistance.
7. H. Goldman "Excavations at Eutresis in Boeotia", 1931, p. 192 - 193, Fig. 256, Nos. 3, 6.
8. Erik J. Holmberg "The Swedish Excavations at Asea in Arcadia", 1944, p. 120, Fig. 114, No. 1.
10. W. Dörpfeld loc. cit. The statement carries weight, as Dörpfeld was the excavator at both sites.
12. A. J. B. Wace and M. S. Thompson 1912 op. cit., p. 73.
do not appear to have been in general use in Early Bronze Age Anatolia.

Some of these weights are mentioned as having been found at Phylakopi, but no indication is given as to which city they came from, and in view of other finds in the Cyclades (page 292 below), they are just as likely to belong to the Late Cycladic period as to the early one.

There are sporadic reports of similar weights being found to the north of Greece: in an Aeneolithic context in the Devetaki Cave in Bulgaria, in an Aeneolithic level at Maliq in Albania (Pl. XXXVIIc, bottom row), from one of the Swiss Lake Villages, and even from Neolithic Poland.

It is difficult to date the examples from beyond Greece with any degree of accuracy. Greek prehistoric chronology may have its difficulties, but it is a paved road compared with the jungle of European prehistoric chronology. The Swiss and Polish examples may perhaps be assigned to the mid-third millennium B.C., and the Bulgarian and Albanian ones may be rather earlier.

In view of the exceptionally early occurrence of

4. F. Keller (tr. J. E. Lee) "The Lake Dwellings of Switzerland", 1866, p. 66, Pl. XXI, No. 7 (from Wangen).
5. Zdzislaw Sochaki in Tadeusz Wiślanski (ed.) "The Neolithic in Poland", 1970; the weight, p. 323, Fig. 108, No. 6; Aegean influences, pp. 303, 325; chronology, p. 445.
of the weights at Sitagroi (page 135 ff. above), they may perhaps be regarded as a Balkan type which spread northwards, and southwards within Greece, but not further south or east - at least within the Early Bronze Age.

At Sitagroi itself, where they had been in use for perhaps two millenia, they were replaced in the site's Early Bronze Age Level V by "pyramidal clay weights of various sizes, and with a single perforation." *(Additional Note 1).*

With the exceptions of Eutresis, and perhaps Asiae, mentioned above (page 220), cylindrical weights appear to have gone out of use at the end of the Early Bronze Age; but the type seems to have reoccurred in outlying parts of Greece and the Aegean in the Late Bronze Age. Heurtley found them to be typical of his Period C burnt stratum at Vardarofitsa (Pl. XXXIVd, Nos. 3, 5, 6, 9, 10). A large group has recently been discovered in the excavations at Akrotiri on Thera (Pl. XXXIIIa). Others are known from Mycenaean Miletus (Pl. XXXIIIb); and they are sometimes found in Late Minoan Crete (page 290 ff.).

2) Spherical Weights (Map 7). These weights, which are rare, have a similar history to the above, and may be simply a foreshortened version of the more rounded of the cylindrical weights (cf. Pl. XXXIIa, b, right, with Fig. 34a) and would have been used in the same way. Their sizes vary from that

1. Sitagroi I has a carbon date of c. 4,600 B.C.; Sitagroi IV, one of 2,440 - 2,360 B.C. - C. Renfrew "The Emergence of Civilisation", 1972, p. 70.
3. W. A. Heurtley "Prehistoric Macedonia", 1939, p. 87, Fig. 104q; W. A. Heurtley and R. W. Hutchinson, B.S.A. XXVII, 1925-1926, p. 54, Fig. 24, Nos. 3, 5, 6, 9, 10.
of a medium-sized orange to that of a grapefruit. In all cases except one, there is only a single hole, which usually shows marked signs of thread wear, even when, as is the case with Servia No. 395 (Fig. 34a; Pl. XXXIVb), the weight is quite well fired.

This weight was found in a context which, while technically unstratified, was actually almost certainly Early Bronze Age. Despite its moderate size, it weighs a compact 370 grams. Like the spit support of Late Neolithic Olynthus (page 105 above), it is burnt on one side.

It has a very close parallel from Lianokladhi in the Spercheios Valley (Pl. XXXIVA). This weight was one of a group of eleven found in a house belonging to the site's Third Period, the dating of which seems problematical.

Firstly it appears that the building had two phases, and there is no indication which phase the weights were associated with. Secondly the house contained both hand-made, matt-painted pottery, which is reminiscent of that from E. H. III Lerna; and a quantity of imported, wheel-made Grey Linyan ware; and pottery that resembled that of other sites in

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1. Servia was a rescue dig; the site is now covered by the waters of the Haliakmon Dam. When time became very short, it was found necessary to bulldoze the better-known Early Bronze Age top levels over a small area, to reach a less well-documented Late Neolithic destruction beneath. As the area in question had not been disturbed by Byzantine pits (page 202 ff. above), almost all the material turned up by the bulldozer (which included the weight) was Early Bronze Age. The only other possibility is Late Neolithic, which is less likely.
2. A. J. B. Wace and M. S. Thompson "Prehistoric Thessaly", 1912, p. 191, Fig. 126f.
3. A. J. B. Wace and M. S. Thompson 1912 op. cit., p. 187 ff., Fig. 137.
5. A. J. B. Wace and M. S. Thompson 1912 op. cit., p. 186, Figs. 130a - c; 135.
Thessaly, and in Macedonia, and Troy. The impression is of a late Early Bronze Age household existing in an era that was chronologically middle Helladic, and it is difficult to know which period to assign the weights to. It seems fair to say that they were probably an Early Bronze Age type.

The Lianokladhi weight illustrated is a little larger than the one from Servia, but rather smaller and better finished than some of its fellows on display in Athens, one or two of which are more like foreshortened cylinders than true spheres.

A single large, spherical, poorly-fired, roughly finished weight was found at Lithares, where the majority of the site's material was E.H. I and II. This weight has two holes.

Spherical weights occurred at one other Greek site, the surprising one of Early Minoan Myrtos (Fournou Korifi) on the south coast of Crete; they belonged to the site's second phase, circa 2,200 B.C. (page 286 ff. below, Fig. 48b, Pl. XLd, right). The type was also popular in Late Minoan Crete (page 288 ff. below, Fig. 47a, c, Pl. XLIIc).

Once again the few foreign parallels are to the north of Greece. Four spherical weights were found on a field survey at Galatin in Bulgaria, the sherds obtained on

1. A. J. B. Wace and M. S. Thompson "Prehistoric Thessaly", 1912, p. 185, Figs. 129a, b; Fig. 134.
2. Servia No. 395 has a height of 7.5 cms; the Lianokladhi weight, judging by the matchbox scale, is circa 9 cms.
3. In the National Archaeological Museum, Case 40, middle and bottom shelves, No. 8061; the diameters of these are circa 10 - 12 cms.
5. T. G. Spyropoulos 1969 op. cit., p. 35.
same survey being Aeneolithic.  One is illustrated from Cucuteni in Rumania.  Others were found at the same Swiss sites as the cylindrical weights (page 221 above).

3) Pyramidal and Conical weights (Map 8).  Although these two types of weight are often quite distinct in form in the Early Bronze Age, they are found in the same areas of Greece, sometimes at the same sites (Fig. 35; Pl. XXXV), and are probably related types.  The terms, besides, are loosely used, so that weights described as pyramidal in text will appear conical in illustration; and where no illustration is provided, it is not possible to determine how accurate terminology may be.  They will therefore be considered together.

These weights are probably related to the northern Late Neolithic tall oblong weights like those of Olynthus and Dikeli Tash (page 154 ff. above), which do not appear per se in the Early Bronze Age; and are almost certainly the successors of the Late Neolithic pyramidal weights (page 155 ff. above).

The most northerly occurrence of this type of weight is that at Sitagroi already mentioned (page 222 above), where pyramidal weights ousted the Neolithic cylindrical weights of the site, which, in the Early Bronze Age, established themselves further south (page 218 ff. above).

1. B. Nikolov, ARХЕОЛОГИЯ Vol. IV, Part 4, 1962, p. 71, Fig.12.
2. Hubert Schmidt "Cucuteni in der Oberen Moldau, Rumanien", 1932, Pl. 36, No. 4, bottom left.
5. Unless at Teami, where they are said to have occurred in all strata - see p. 136 above.
Saratse, just east of Thessaloniki, produced one large, rough conical weight (Fig. 35nn), and nine smaller, neater pyramidal weights (Fig. 35 11, mm) in its Early Bronze Age Period A, and its excavator, the ubiquitous Heurtley, considers these weights typical of the Early Bronze Age north.

Rey publishes some weights very similar in appearance, but, if the heights given are correct, these are large, even for Macedonia (Pl. XXXVa).

Two pyramidal 'spit-supports' are mentioned from Agios Namas, one of them being found in a kiln, and these are compared with others from Vardaroftsa, the reference given being to a plate illustrating loomweights. Two weights, "pyramidal, perforated horizontally about the middle", are reported from Period A at that site (Pl. XXXIVd, No. 1).

Five pyramidal weights were found at Servia, and two of them, No. 238 and the miniature No. 301 (Fig. 360, c; Pl. XXXIVc, third and fourth from left) are so neatly shaped, and well-fired and finished, that upon a cursory glance they might be taken for classical. Their contexts, however, were securely Early Bronze Age, and they have steeper sides and more sharply truncated tops than the post-prehistoric pyramidal weights. No. 339 (Fig. 36a, Pl. XXXIVc, right, though a similar type, is squatter, coarser,

1. W. A. Heurtley, B.S.A. XXX, 1928-1929, p. 143 ('Spit Supports' - Period A); "Prehistoric Macedonia", 1939, p. 87, Fig. 67, 11 - mm.
5. W. A. Heurtley and R. W. Hutchinson, B.S.A. XXVII, 1925-1926, pp. 38 - 39, Fig. 24, No. 1.
and less well-fired. These three weights, though almost square in horizontal section, are all pierced through the slightly longer horizontal axis (Fig. 36a - c), and this tendency is seen even more clearly in the remaining weights Nos. 92 and 340 (Fig. 37a, b; Pl. XXXIVc, two on left). These are so flattened as to be tent-shaped rather than truly pyramidal, and the perforation passes through the distinctly longer axis. No. 92 is an interesting specimen, as only the base of the weight is fired. It must have broken in a manner somewhat similar to No. 340, and the missing top half was neatly replaced with unbaked clay. No. 340 and the more truly pyramidal No. 339 came from the same context in the same trench, and, in spite of their rather different forms and fabric, there is no technical reason why they should not have been used on the same loom. All the large Servian weights have holes well-marked by thread wear; and despite their comparatively modest size, are surprisingly heavy (269 - 392 grams - see Figs. 36 - 37).

Tsangli's "large, rough, pyramidal" weights were possibly Early Bronze Age; and Tsountas' large, unfired, conical weight was certainly Bronze Age (Pl. XXXVb).

South of Thessaly these weights are seldom found. There is one from Aghia Irini on the island of Kea (Pl. XXXIVc). The small finds from this site, which was occupied throughout the Bronze Age, are undated as yet.

2. C. Tsountas, Δ. Σ., 1908, p. 346, Fig. 277.
3. k3.725. I should like to thank Prof. J. L. Caskey, of the University of Cincinnati, for allowing me to study the small finds from Aghia Irini, and include them in the thesis.
One small (height 5.4 cm) conical weight was discovered at Kirrha (Pl. XXXVd, right). A small pyramidal weight from Steno on Leukas, dated by Dörpfeld to his 'Achaean' period, may perhaps be prehistoric, but the other pyramidal weights mentioned are obviously classical or later.

Finally, the 'Neolithic' pear-shaped weight from Asea, if it is indeed prehistoric, probably belongs to the period now under consideration, rather than the one assigned to it.

Of all these weights, those with the clearest foreign parallels are the 'tent-shaped' weights of Servia. It was this type of weight which equipped the loom which left its remains in Room 206 of Troy IIg (page 101 above; Pl. XXXVIa). The type continued to be used in Troy III and IV (Pl. XXXVIb, c); it had also been found, at a considerable depth, on Schliemann's earlier excavations (Pl. XXXVIIb, right, No. 1203). Similar weights may have been discovered in Bulgaria, at a site near Plovdiv, and at Karanovo IV, but the illustrations referred to are not very clear.

The more orthodox pyramidal and conical forms of weight do not seem to have been used in Troy's earlier levels; but one other type of weight was employed there beside the

2. W. Dörpfeld "Alt-Ithaka", 1927, p. 284, Par. 3.
3. Erik J. Holmberg "The Swedish Excavations at Asea in Arcadia", 1944, p. 117, Fig. 113, No. 3.
8. V. Mikov, АРХЕОЛОГИЯ Vol XI, Part 1, 1969, pp. 6, 12, Fig. 2.
'tent-shaped' one. These were flattish weights with outlines that varied from conoid to oblong, and a horizontal piercing through the shorter axis (Pl. XXXVIIc, top row; bottom row, left). Occasional examples were found in Troy I and II, none in Troy III, and a number in Troy IV. The larger examples look somewhat similar to the Greek Late Neolithic tall oblong weights (cf. Pls. XVIIc and XXXVIIc), but the resemblance is not marked.

The cultural connections between the north of Greece and the north-west of Anatolia are emphasised by finds at Thermi in Lesbos. A conical weight appeared in Town V, a stage contemporary with the earlier part of Troy II, and a "pyramidal form with a flat top and base" came from a mixed deposit.

In Bulgaria, the Devetaki Cave produced a pyramidal type of weight, as well as the pierced cylinders; a site near Dolny Lozen had an apparently conoid, or perhaps tall oblong weight in its second, or 'Late Neolithic' stratum; and pyramidal and conical weights, as well as other types, have been found in both Neolithic and Aeneolithic contexts at various other Bulgarian sites.

It is the Rumanian site of Sălcuța, however, which had weights of all the Macedonian types - conical, tall oblong, pyramidal - in its early Stratum IIc (Fig. 38a - e); they are

1. C. Blegen et al. "Troy Vol. 1", 1950, p. 104, Fig. 221, No. 35-458; p. 339; "Troy Vol. II", 1951, Fig. 150, Nos. 36-368, 37-136, 37-285, 32-483.
3. V. Mikov and N. Djambazov "Die Grotte von Devetaki", 1960, Pl. 52m.
4. N. Petkov, Археология Vol. II, Part 4, 1960, p. 47, Fig. 3, No. 1.
Weights from Sâlcuța III (Fig. 38f) were conical, although a pyramidal type with a slightly grooved top was also found (Fig. 38g); those from Sâlcuța IV were pyramidal (Fig. 38h - j), and very similar to those published by Heurtley and Rey (page 226 above), some approaching those of the latter in size. Rather small conical weights are illustrated from Cucuteni.

Conical and pyramidal weights also made an early appearance in the far south of Anatolia, at sites near the Iaken-deron Gulf. A 'weaver's workshop' found in Mersin XIIIB was equipped with large, heavy (page 156, note 1, above) conical weights with rounded rather than flat bases. The only Early Bronze I weight found at the neighbouring site of Tarsus looks similar to these (Pl. XXXVIIa, No. 1), and is compared with a Chalcolithic weight from Alishar. Three types of weight appear to have been in use in both the succeeding phases of the Early Bronze Age at this site: 1) a "flattened oval" kind (Pl. XXXVIIa, No. 4c) which differs from the site's flat oval Middle Bronze Age weights in having a flattened base and a conical rather than oval outline, like some Troy I - IV weights (page 229 Note 1 above); 2) a type described as "roughly pyramidal" which look roughly conical in illustration (Pl. XXXVIIa, No. 2a, b); 3) truncated pyramidal weights (Pl. XXXVIIa, Nos. 3, 4a, 6).

The first and third of these types were found together in a group. The Tarsus weights are compared with others from

1. D. Berciu "Contributii La Problemele Neoliticului in Romania in Lumina Noilor Cercetari", pp. 238, 239, Fig. 74, Nos. 1, 3; Fig. 75, Nos. 2, 3, 5.
2. D. Berciu op. cit., Fig. 73, Nos. 1, 2; Fig. 74, No. 2; p. 239 ff.
3. D. Berciu op. cit., p. 240, Fig. 75, No. 4.
4. D. Berciu op. cit., pp. 239, 241, Fig. 74, Nos. 4 - 6.
7. H. Goldman "Tarsus Vol. II", 1956, p. 323, Fig. 441, No. 1; cf. H. H. von der Osten "The Alishar Hûyük. Seasons of 1930 32"; 1937, p. 93, Fig. 99.
8. H. Goldman 1956 op. cit., pp. 319, 323, Fig. 441, Nos. 2 - 6.
1 Alishar and Kusura. The "vierkantigen" weights from the Subneolithic site of Tigani on Samos (page 156, note 2, above) should be recalled here as possible members of the Anatolian group, rather than the northern Greek.

The Middle Bronze Age (approximately the first half of the second millenium) saw "elongated, roughly pyramidal and conical forms" of loomweight in use further south, in Palestine, and they were to remain the standard Palestinian weight until replaced by the doughnut-shaped weights of the Palestinian Iron Age.

Similar types of weight were thus in use in northern Greece, south-east Europe, and Anatolia, in periods referred to as 'Late Neolithic', 'Aeneolithic' or 'Chalcolithic', and 'Early Bronze Age'. Such nomenclature is only meant to reflect the stage of development reached, and is not a very reliable chronological indication, as the 'Late Neolithic' of one country may be contemporary with the 'Early Bronze Age' of another. Cultural equivalences between neighbouring sites can be of assistance, but eventually a fixed date is needed; usually carbon dates are the only ones available, and they are anything but fixed. Nevertheless, something must be attempted.

The earliest occurrences of these weights seem to be to the north-east of Greece - Bulgaria or Rumania - and the far south of Anatolia.

Garstang suggests a date of circa 2,800 B.C. for the level in which his weaver's workshop was found. The

2. W. Lamb, Archaeologia Vol. LXXXVII (2nd Ser. Vol. XXXVII), 1937, p. 256, Fig. 19, No. 2.
Tarsus loomweights were mostly in E.B. II levels, with only 1 one in E.B. III. A date in the mid-third millenium is probably reasonable for these. Troy II is usually held 2 to have existed in the second half of the third millenium; and the weights from Thermi should be contemporary with the 3 earlier part of Troy II.

Two carbon dates are available for Sitagroi Vb: 4

2,135 ± 150 B.C.; and 1,920 ± 100 B.C.

Sâlcuţa and Cucuteni seem to be approximately contemporary, and Karanovo III - IV slightly earlier than 5 either. Carbon dates of 3,689 ± 55 and 3,663 ± 55 B.C. are given for Sâlcuţa, and although the authority who quotes them considers that European carbon dates previous to 2,000 B.C. are "uniformly too old", it does suggest that the northern weights may have been in use earlier than the Anatolian ones. This is a reasonable conclusion as far as 6 the Greek weights are concerned, for they certainly seem to have entered the country from the north.

The general pattern of distribution thus assumes

the shape of an uneven wishbone, with the stem in the
countries bordering the west shore of the Black Sea, the
short arm penetrating only the northern half of Greece at
most, and the long arm stretching right across Anatolia
and eventually down to Palestine.

The only sites which disturb the logic of this
pattern are Mersin in the far south of Anatolia with its
comparatively early date, and Troy in the far north-west,
with its comparatively late one. Mersin cannot be entirely
explained away - but an unorthodox and interesting theory
concerning movements of peoples and interrelationships in
the Balkans and Anatolia advanced by James Mellaart is
worth considering in this context.

This updates Troy considerably, making Cucuteni AB
and B and 'late' Sâlcuţa the contemporaries of Troy II; and
Sâlcuţa and Cucuteni approximately contemporary with the
Early Bronze Age in Macedonia. Although there are other
objections to it, as far as loomweights are concerned, this
theory makes excellent sense.

4) **Flat Oval Weights (Map 10).** A group of sixteen
weights found at Aghia Irini on the island of Kea is of excep-
tional interest in both form and context.

The weights consist of flat oval pats of clay
with a small piercing through the smaller horizontal axis,
some little distance below the slightly narrower end. They
are quite well-fired, and so well-finished that their sur-
faces may almost be considered burnished. Their shapes

range from oval to squarish oval, the extremes being seen in Fig. 39a, b, but despite this slight variation of outline, they are so similar as to give the impression of having come from one set; and indeed a number were from the one trench. They are 8.5 - 10 cms. high, 6 - 8 cms. wide, just over 2 cms. thick, and the average hole diameter is a narrow 0.6 cms. The range of weights is also a very small one - 168 - 211 grams, with an average of 193 grams. Fourteen of the weights are illustrated in Pl. XXXVIIIa, and two in Fig. 39a, b.

The set came from a very well-defined context. It was a phase of the Early Bronze Age that was later than the standard Greek mainland E. H. II with its sauceboats, but it was not the E. H. III of, for example, Lerna IV with its matt-painted pottery - this type of material has not been found on kea. However at the comparatively nearby site of Lefkandi on Euboea, the earliest stratum, Lefkandi I, seems to have had material similar to that of the kea loomweight stratum, and this was succeeded by Lefkandi II, a phase which contained orthodox E. H. III material. The implication is that the loomweight stratum of kea was certainly later than E. H. II, but possibly earlier than E. H. III. Its pottery included black burnished beakers with Anatolian antecedents.

This is interesting, because very similar loomweights (Pl. XXXVIIIb) were in use at at least one Early Bronze Age

1. I should like to thank Prof. J. L. Caskey, of the University of Cincinnati, not only for allowing me to include these weights in the thesis, but also for taking considerable trouble to explain their exact context. I should also like to thank his assistant, Miss Leslie Preston, who excavated the weights, for her account of their finding. Re Lefkandi, see also L. H. Sackett and M. R. Ropham, "Excavations at Lefkandi in Euboea, 1964 - 66", 1969, p. 8.
Anatolian site, Aphrodisias, which is situated in the valley of the Dandala, a tributary of the Maeander. The weights, some of which were found lying in a line as they fell from the loom, came from a distinctive phase of the site's occupation known as Complex II, which succeeded a destruction which took place circa 2,300 B.C., and preceded another of circa 2,000 B.C. The weights were thus near contemporaries of the Aghla Irini set. They were probably in use earlier at Aphrodisias, as Complex IV at that site produced loomweights similar to those of Complex II, but after 2,000 B.C. "flattish oval weights" were seen no more at Aphrodisias, being replaced by a conical type. Curiously enough within the same century they appeared for the first time at Tarsus, where they supplanted the earlier conical and pyramidal weights, and were the typical Middle Bronze Age loomweight at that site (Pl. XXXVIIa, No. 8).

The excavator of Aphrodisias compares her Complex II weights with "similar" weights from Troy II and IV. As the 'tent' type is not illustrated, the reference must be to the flattish conoid or oblong weights which were particularly prevalent in Troy IV (page 229 above; Pl. XXXVIic, top row; bottom row, left). The resemblance of the Aphrodisias weights to those published by Blegen is not striking - in particular his Troy IV weights have a flat base, while the

5. H. Goldman 1956 op. cit., p. 319, Pl. 441, No. 8.
Aphrodisias and Aghia Irini weights have a rounded one. A Trojan weight published by Schliemann, however, does resemble them (Pl. XXXVIib, left).

A small, flat loomweight with a conical outline found in Late Chalcolithic Beycesultan is somewhat similar to the Trojan weights, although it is obviously earlier than they. Again, the resemblance is not marked.

Weights akin to the Kea ones, but rounder, are known from two Greek islands off the coast of Anatolia. Five discoid weights were found in the last three towns at Thermi (Fig. 39c). One similar loomweight, without provenance, but assigned to the Early Bronze Age, came from the prehistoric settlement under the Heraion on Samos.

Flat weights occurred in Rumania. Sălciuța IV had a discoid weight similar to, but slightly larger than the one from Thermi. Weights illustrated from Cucuteni are of a more oval shape, and a comparatively large size (circa 12 cms. high, 9 cms. wide).

Unlike conical and pyramidal weights, however, there

2. From Beycesultan XXVIII - Seton Lloyd and James Mellaart "Beycesultan Vol. I", 1962, p. 275, Fig. 2:22.
3. W. Lamb "Excavations at Thermi in Lesbos", 1936, p. 163, Fig. 44, No. 31:31.
5. D. Bercei "Contributii La Problemele Neoliticului in Rominia in Lumina Noilor Cercetari", Fig. 83, no. 4.
6. Hubert Schmidt "Cucuteni in der Oberen moldau, Rumanien", 1932, Pl. 36, Fig. 4, top row, two on left.
are no flat oval or discoid weights in northern Greece, and whether the Rumanian and Anatolian flat weights are related or not, the Greek flat weights of Kea, Thermi and Samos obviously stem from Anatolia.

The most typical of all the Minoan weights was a flat discoid one, and this type was in use in Crete as early as circa 2,600 B.C. (page 276 ff. below). Its form is similar to that of the Thermi and Samos weights in particular; and not too dissimilar from the Aghia Irini weights. The resemblance is sufficient to suggest a relationship, although differences also exist; but the exact nature of the relationship is difficult to determine (page 284 ff. below).

5) The Tiryns Crescent Weight. This type of weight has the form of a flattened clay banana with a hole at each end. One example occurred at Tiryns (Fig. 34b), the only one found in Greek lands except for a possible one from Thermi. The Tiryns weight should probably be assigned to the end of the Early Helladic period, a time when Tiryns had close connections with Anatolia - for the weight is almost certainly of Anatolian derivation.

Crescent weights are found at most Bronze Age Anatolian sites, apparently occurring first in the north, and progressing gradually southwards. At Alaca they seem

1. Kurt Müller "Tiryns Vol. IV", 1938, p. 64, Fig. 50, Pl. 64.
2. Winifred Lamb, who had crescent weights at Kusura, seems to favour the idea that this Thermi one was an amulet - W. Lamb "Excavations at Thermi in Lebos", 1936, p. 159, Pl. XXIV, No. 31,61.
4. Possibly at Troy II? - C. Blegen et al. "Troy Vol. I", 1950, Fig. 369, top right; also H. Schmidt "Schliemann's Sammlung", 1962, p. 297, Nos. 8258-8260; not until Level E (2000-1900 B.C.) at Aphrodisias - B. Kadish, A.J.A. Vol. 75, 1971, p. 135; nearly all from City C at Kusura - W. Lamb, Archaeologia LXXXVI, 1935, p. 34, Fig. 15, Nos. 1 - 4, LXXXVII,1937, p. 256; Fig. 19, Nos. 4 - 5; not until L.B.A.Tarsus - H. Goldman "Tarsus Vol. II", 1956, p. 324, Pl. 441, No. 11 - see Pl. XXXVIIa, No. 11, this thesis.
to have been used from the Early Bronze Age until the "Roman
and Phrygian" periods; there is even a report of similarly-
shaped wooden objects being used as loomweights in Turkey in
this century.

Crescent-shaped weights, but with flattened bases, were used, inevitably, at Sălcuta, (Fig. 38k, 1), a site which seems to have parallels for almost every type of weight ever invented. Similar ones were found at malik in Albania (Pl. XXXV11C, top and bottom right).

The weights are found further afield, in north-west Italy, and even in "Copper Age" Spain, the authority who mentions the latter stating elsewhere that "there seems a possibility that early Iberia was, at least technically, an outpost of Anatolia."

6) The Zygouries Weight. An approximately rectangular weight of moderate size was the only one of its kind found at Zygouries. All its sides were flat except one, which was slightly convex. It had two widely-spaced holes

2. W. Lamb, Archaeologia LXXVII, 1937, p. 256; see also Archaeologia LXXVII, 1936, p. 34. A warp-weighted loom, using weights of an unspecified type, was seen in the village of Ganca, south-west of Trebizond, as recently as August 1969 - I should like to thank Mr. John Haldon, a Ph. D. student of the University of Birmingham, for this information.
3. Sălcuta Ilb, IIc and III - D. Berciu "Contributii La Problemele neoliticului in Rominia in Lumina Noilor Cer-
cetari", in, p. 241 ff., Figs. 41, 76, 77, 78.
5. Lagozza di Besnate - site No. 439, H. Rölller-Karpe "Hand-
through its shorter horizontal axis, some little distance below its top. It had once been coated with a reddish-brown "glaze". It has no good parallels. A slight similarity to one of the middle Neolithic Knossian weights (Fig. 21b) is probably fortuitous.

7) The Lerna Weight. A small, rectangular object was found at Lerna in an E. H. II context (Fig. 34c). It resembles the small, neat cuboid Minoan weights, except that it has only two rather crookedly-bored holes through its longest axis, instead of the usual four. Two of its sides are decorated with seal impressions (too faint to be deciphered); and this again is like the Minoan weights, especially those from Palaikastro (page 293 ff. below). The Lerna weight, if that is what it is, is earlier than the Cretan ones, which are typical of the middle Minoan period - but they in turn may have been derived from the Neolithic Knossian weights (page 186 above), and, if so, could well be found in an Early Minoan context in the future.

c) Clay Bobbins or Spools.

A large unpierced clay cylinder with a slight waist is illustrated from Town IV at Therma (Pl. XVIIIic, left), and two others like it were found in or on a hearth (page 124 above). A slightly smaller unpierced, reel-shaped object (Pl. XVIIIic, right), also came from Town IV. Schliemann's sixteen large clay cylinders from Tiryns (page 124 ff. above) may possibly have belonged to the Early

1. C. Blegen "Zygouries", 1928, p. 191, Fig. 179, No. 12.
Bronze Age also, being mentioned in the same paragraph as pierced cylinders (Pl. XVIIIa). He refers to others from Lycenae. Objects similar to these, but with more pronounced 'waists', were used as loomweights in Bulgaria.

Smaller spools are occasional Early Bronze Age finds, but do not appear anywhere in great numbers.

d) Waisted Stone Weights.

These were still found in quite large numbers in Early Bronze Age contexts at Servia (Pl. XIXc). Their use also continued at Poliochmi throughout the Verde and Rosso phases of the Early Bronze Age, and on into the as yet unpublished 'Giallo' period. One was found in Troy VI, but the excavators were possibly right in thinking it a stray from a deeper deposit.

e) Clay 'Anchors' (Map 9).

These little objects, which owe their name to the fact that they are shaped like a modern anchor, with, however, only two 'flukes', are often said to have been connected

1. K. Schliemann "Tiryns", 1886, p. 146, No. 70.
2. P. Detev, Ann. Plovdiv Vol. VI, 1968, p. 24, Fig. 16.
3. E.g. Gösta Säflund "Excavations at Berbati 1936-1937", 1965, p. 127, No. 22; C. Blegen "Zygouries", 1928, p. 191, Fig. 179, Nos. 4, 5; J. L. and Elizabeth G. Caskey, Hesperia Vol. XXIX, 1960, p. 142, Pl. 52, No. III.21; Erik J. Holmberg "The Swedish Excavations at Asea in Arcadia", 1944, p. 120, Fig. 114, Nos. 14, 17.
4. W. A. Heurtley "Prehistoric Macedonia", 1939, p. 86; and nine from the recent excavations.
Both their numbers and their early appearance there
suggest that they were invented in Macedonia. They were "sin-
gularly frequent" finds in the two lowest settlements at Krit-
sana, which contained a large quantity of Neolithic pottery as
well as some of the Early Bronze Age. They may have occurred
in the earliest, Nero, phase of Poliochni, and were certainly
in use by the end of the succeeding Azzuro phase. Further
north at Sitagroi, however, they were not introduced until the
site's full Early Bronze Age Stratum V. They were found in
Early Bronze Age levels at Saratse, Servia (Pl. XXXIXe), and
Armenochori.

There are early examples of anchors both to the north-
west of Greece, at Maliq IIIa in Albania (Pl. XXXVIIc, top row,
second from right), and to the north-east at Michailitch in
Bulgaria, and Tartaria in Rumania. It as they do not appear
to be common finds in any of these countries, it seems possible
that the form was adopted from northern Greece.

   353; O. Frödin and A. Persson "Asine", 1938, p. 250; D. H.
2. W. A. Heurtley "Prehistoric Macedonia", 1939, p. 87, Fig.
   67g; 1.
4. L. Bernarbo Brea "Poliochni", 1964, p. 588, Pl. IIIe, f, h.
5. L. Bernarbo Brea 1964 loc. cit., Pl. CLXXXIIIa, b, d; poss-
   ibly also c - h and j, k.
7. W. A. Heurtley 1939 op. cit., p. 87, Fig. 67j; B.S.A. XXX,
   1928-1929, p. 143, Fig. 32, No. 1.
8. W. A. Heurtley 1939 loc. cit., Fig. 67f; plus sixteen from
   the recent excavations - Cat. Nos. 11, 15, 18, 20, 60, 65, 304,
   290, 292, 294, 309, 310, 335, 348, 349, 394, 529.
9. W. A. Heurtley 1939 loc. cit., Fig. 67h.
11. V. Mikov, Разкопки и Изследвания (Pouilles et Recherches)
   Vol. I, 1948, pp. 18, 24, Fig. 10.
   anchor)., Fig. 6, No. 5 "idol-shaped pendant". It appears
to have come from the same context as the famous tablets, the
date of which is the subject of dispute.
In Thessaly, six anchors were found at Argissa, associated with material which was probably contemporary with that of E. H. II - III further south; one was found at Tsani; five at Sesklo in Bronze Age Strata; and one at Pagasae, sometimes misdated to the Late Bronze Age because of a misreading of the German text, but in fact undated.

Anchors abounded in central Greece, being in use as early as E. H. I at Eutresis; other examples are known from Lithares, Kastron or Topolia Maghoula in the Copaiic Basin (Pl. XXXIXa - c), Schiste, Orchomenos, Kirrha (Pl. 10 XXXIXd), Galaxidhi, Rafina, and the island of Aegina.

Pelekata on Ithaca may have derived its anchor, like its pottery, from the Peloponnese, where nearly every major site, and many a minor one, used these objects:

1. V. Milojčić, Arch. Anz. 1956, pp. 148 - 150, Fig. 8.  
4. A. J. B. Wace and M. S. Thompson 1912 op. cit., p. 73, Note 1; F. Wolters, Ath. Mitt. XIV, 1899, p. 266 (he says "gleichzeitig gefunden, wenigsten gleichzeitig erworben" - "found at the same time as, or at least acquired at the same time as" some 'Mycenaean' vases.  
5. H. Goldman "Excavations at Eutresis in Boeotia", 1931, p. 196, Fig. 269, Nos. 1, 3. The five found were all in E. H. I or early E. H. II levels.  
7. in the collection of the British School of Archaeology at Athens. I should like to thank the School's director, Dr. H. W. Catling, for permission to include this anchor in the thesis, and for allowing me to experiment with it.  
12. D. R. Theochares, Praktika 1951, p. 92, Fig. 19.  
13. H. Goldman 1931 loc. cit.  
14. W. A. Heurtley, B.S.A. XXXV, 1934-1935, pp. 39 - 41, Fig. 31, No. 154. It came from Area II, which had only E. H. material.  
Corinth, near Cheliotomyllos, Berbati, Tiryns, Asine and Lerna. One was found in a "late Early Helladic layer" at Asea. Anchors were among the Early and Middle Helladic material unearthed during the construction of the new museum at Olympia. Finally, two anchors found at Nichoria in Messenia (Pl. XXXIXf) constitute the objects' southernmost appearance in Greece. Those found at or near Corinth seem to belong to the E. H. II period, but the excavators of Berbati and Asine assign their anchors to periods they refer to as E. H. III, and at Lerna they can certainly be attributed to the latest phase of the Early Bronze Age. At Nichoria they belong to a phase of the Middle Bronze Age defined as M. H. II; as the domed whorl already mentioned (page 204 above) also belonged to this phase, it appears that this site's Middle Helladic settlement was in some respects a relict of the Early Bronze Age culture further north.

The picture is thus very clear. Anchors, occurring at the very outset of the Early Bronze Age in West Macedonia, spread rapidly to the north-west and the north-east, and to the south, to Thessaly, central Greece, and the north-

1. Leslie Walker-Kosmopoulos "The Prehistoric Inhabitation of Corinth", 1948, p. 59, Fig. 41a, b.
5. O. Frödin and A. Persson "Asine", 1939, pp. 250 - 251, Fig. 177, No. 1.
7. Erik J. Holmberg "The Swedish Excavations at Asea in Arcadia", 1944, p. 117, Fig. 111, No. 5.
8. On display in the new museum, Olympia.
9. N201, N202. I should like to thank Prof. W. A. McDonald, of the University of Minnesota, for allowing me to include them in the thesis.
10. The responsibility for this conclusion rests with me. No Early Helladic settlement has been found at Nichoria, but E. H. sherds made into whorls are found in M. H. levels.
eastern Peloponnesse. South of that point their progress was slower, as witnessed particularly by Lerna and Naucoria. Except at the latter site, they do not occur after the end of the Early Bronze Age - at least, not in Greece.

They reappear, however, in Late Bronze Age Malta, the Lipari islands, and Iron Age Italy. The word 'reappear' is used advisedly, for anchors from the settlement of Barija in Malta bear grooves or incisions exactly like those found on some Greek examples, and their similarity is so marked as to exclude the possibility of fortuitous reinvention. Furthermore, the loomweights of Late Bronze Age Malta, including those from Barija, were conical or pyramidal, and sometimes of considerable size - like those of Early Bronze Age Macedonia. Pottery may be indicative of chronology, but tools mark the paths of people. In view of such finds, it seems possible that Malta may have preserved a fossilised remnant of the Early Bronze Age culture of northern Greece.

The negative evidence is interesting. No anchors


3. J. D. Evans loc. cit.

4. I should like to thank Dr. William Phelps for drawing my attention to the Maltese anchors, and for allowing me to study his drawings of those from Barija.

have been found in Anatolia, none in the Cyclades, and none in Crete.

Clay anchors are circa 5 - 10 cm. high, and as many wide from the tip of one 'fluke' to the tip of the other. The shaft is horizontally pierced a little below the top, usually through the axis which is at right-angles to the line of the flukes (Pl. XXXIXa, c; e top right and bottom left and right), but sometimes through the parallel axis (Pl. XXXIXd; e top left). Though a single hole is most commonly found, examples with up to four holes are not unknown, and these may be set side by side, or one beneath the other, or a combination of both.

In spite of the fact that most anchors are quite well-fired, there are often slight signs of wear on the flukes at the angle of their junction with the shaft - the type of wear to be expected from fine thread; and some examples have two incised lines apparently designed to accommodate thread. One incision passes vertically over one fluke, horizontally round the back of the shaft, and vertically down over the front of the other fluke. The other does the same, but on the opposite side, so that the incisions cross each other at the junction of fluke and shaft on each side (Pl. XXXIXa, b).

1. The single hooks which sometimes occur in both Greece and Anatolia, are often grouped with anchors, but seem to me to be a different artifact. See W. A. Heurtley "Prehistoric Macedonia" 1939, p. 87, Fig. 67k, and his references, for examples.
3. E. g. Lerna L6.80 - on display in Argos Archaeological Museum, in showcase containing material from Lerna IV.
4. O. Frödin and A. Persson "Asine", 1939, p. 251, Fig. 177, No. 1.
5. E. g. Leslie Walker-Kosmopoulos "The Prehistoric Inhabitation of Corinth", 1948, pp. 59 - 60, Fig. 41; the anchor from Kastron or Topolia Maghoula, page 242 note 7 above.
many anchors are found broken through the shaft at
the hole, or at the junction of fluke and shaft, or both (Pl.
XXXIXf), suggesting that they were subject to strain at these
points. It was this that caused D. H. Trump's tentative sug-
gestion that they might have been a type of heddle hook or
pulley, an essential part of the horizontal treadle loom
commonly used in rural Greece today. The theory is inval-
idated by the facts that the treadle loom seems unlikely to
have been in use before the Middle Ages, and that the types
of loom known to have been in use in the ancient world (page
33 ff. above) do not require heddle pulleys.

The reasoning behind the suggestion is nonetheless
sound, and did not deserve the scorn heaped on it by M. A.
4 Murray, whose theory that the objects were votive anchors is
equally untenable, not only because some sites at which anchors
occur are far from the sea, but also because in prehistoric
times anchors had not assumed their present shape. It also
seems unlikely that they were model Dionysiac thyrsoi, or
3 idols, or garlanded bulls' heads, or amulets, or ornaments.

2. These have two to four heddles, which are connected in pairs.
The connecting cord passes over a small, wooden pulley wheel
with a groove round its circumference, or quite often merely
over a hooked stick, which is attached by a rope to the top
of the loom framework. When one heddle is raised, by means
of a treadle, the other is lowered, and vice versa, so that
the connecting cord 'saw' back and forth over the hook or
wheel.
5. Large pierced stones or boulders were used — see P. M. II (1),
19, Pl. 29; Lionel Casson "Ships and Seamanship in the Anci-
ent World", 1971, p. 48, Note 45, pp. 252 - 253, Notes 112,
113, Fig. 137; A. Nikolau and H. W. Catling, Antiquity
XLIII, 1968, pp. 225 - 229, Pl. XXXIV.
7. Leslie Walker-Kosmosopoulos "The Prehistoric Inhabitation of
Corinth", 1948, pp. 59 - 60.
and Frödin and Persson's "disinclination to attribute religious significance to coarse objects" shows a very proper spirit. The circumstances in which they have been found in Greece indicate that they were household objects, equally at home in seaside, riverside or inland settlements. They seem to be single objects, for, although numerous at some sites, no two are exactly alike, nor are they found lying together as though used in sets.

There is no way in which these clay anchors could have been usefully employed on the warp-weighted loom which was the one in favour in both Early Bronze Age Greece and Late Bronze Age Malta, nor indeed on either of the other major types of loom in use in the ancient world (cf. page 83 ff. above; M.B. page 90 ff., Figs. 7a, b, 8a). Their hypothetical connection with weaving must therefore have been at best a peripheral one.

Frödin and Persson illustrate a conjectural use for their four-hole anchor from Asine, which shows it being employed to make four-ply cord. This method, however, makes no use of the object's flukes, and, when the work was finished, the anchor would have to be cut out from the centre of the cord (which is being twisted in a different direction on each side of the anchor), whereupon it would almost certainly unravel.

I experimented with the anchor from Kastron (Topolka Maghoulia) (Pl. XXXIX a - c - page 242, note 7, above),

2. Four found in two successive strata in the one trench at Servia,Nos. 309, 310, 348, and 349, but each showed individual characteristics.
3. O. Frödin and A. Persson 1938 loc. cit., Fig. 177, Nos. 1 - 2.
equipping it with thread in the manner indicated by its incisions. It was then tied to a fixed object by a string through the hole in its shaft, and used to preserve tension while the threads were plaited into braid or twisted into cord - but in each case this pulled the threads inwards in a manner at variance with the incisions. The same objection applied when it was used for a form of tablet-weaving (page 186 ff.; 187, note 1 above). If it is accepted that the incisions were designed to hold thread, then that thread was intended to hang straight downwards, even more vertically than indicated in Pl. XXXIXc.

It is therefore difficult to see how anchors could have been connected with weaving in either a primary or a secondary capacity.

Kurt Müller's suggestion that they are hooks for objects intended to be suspended probably comes nearest the truth. If two loops of thread were fastened to an object such as the cloth of a cheese which needed to be hung up to drip, and these loops were hooked over the shaft of an anchor, one from each side, they would cross each other just where the flukes join the shaft, and hang straight down on either side, in a manner exactly corresponding with the wear marks or incisions. This form of fastening has the advantage of being particularly secure - there is no way the suspended object can slip off, as can happen with a single loop over a single hook. The hole in the shaft would of course be used to attach the anchor to a convenient branch or rafter. Such a use would put stress on an anchor in the three places in which such objects are usually found broken.

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f) **Flax Seeds and Cloth.**

Although flax may have been in use in final Neolithic Greece (page 162 above), or even earlier, there is no incontrovertible proof of its existence.

In the Early bronze Age, however, its presence is attested by a hoard of two hundred flax seeds found in an E. H. II context at Lerna. The plant may, of course, have been cultivated for either oil or fibre, but its occurrence in Greece at this time lends credence to the report that a scrap of cloth, found adhering to a dagger from an Early Cycladic tomb on Amorgos, is of linen. No description of the method used for identification is given, but the cloth certainly displays a 'linen' weave. It is not possible to give a thread count, but it is comparable with the Kephala cloth impressions (page 160 ff. above) in fineness. Shreds of thread were also found clinging to the heads of pins found in graves on Syros; no identification of the material is given, and probably none was possible.

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3. E. H. II context at Lerna. The plant may, of course, have been cultivated for either oil or fibre, but its occurrence in Greece at this time lends credence to the report that a scrap of cloth, found adhering to a dagger from an Early Cycladic tomb on Amorgos, is of linen. No description of the method used for identification is given, but the cloth certainly displays a 'linen' weave. It is not possible to give a thread count, but it is comparable with the Kephala cloth impressions (page 160 ff. above) in fineness. Shreds of thread were also found clinging to the heads of pins found in graves on Syros; no identification of the material is given, and probably none was possible.

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**g) Mat Impressions (Map 6).**

The practice of standing or making pots upon matting, which was becoming prevalent at the end of the Neolithic period (page 163 ff. above), continued and increased in the Early Bronze Age. There is scarcely an Early Cycladic site that has not yielded mat-impressed sherds — they have been found on

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3. The scrap of cloth, though clearly visible, is very small, and has been coated with lacquer or varnish — Case 72, top shelf, No. 4720, National Archaeological Museum, Athens.
the islands of Amorgos, Naxos, Paros, Melos (Pl. XXII), and Syros. The sites in which they have been discovered on the mainland - Corinth (Pl. XXIe), Zygouries, Phlius near Nemea, Tyrins, Asine, Rafina, Orchomenos and Lianokladhi (Pl. XXIf) - are all, significantly, on the east coast, or up river valleys easily accessible from the coast, the only exception to this being Galaxidhi, which is on the coast, certainly, but somewhat west of Delphi. The obvious conclusion is that the custom was a Cycladic one which spread to the mainland (page 166 above). It apparently lingered in the Cyclades for slightly longer than on the mainland, as mat impressions were found at Phylakopi on a type of pottery said to be associated with the Second City as well as the First.

The only mainland site which produced a mat impression of post-Early Bronze Age date was Lianokladhi. This was found in the same phase of occupation as the spherical loom-weights (page 223 ff. above), and, like them, suggests a

2. N. Kondoleon, Fraktika 1949, pp. 119 - 120, Fig. 13; C. Zervos "L'Art des Cyclades", 1957, Pl. 90.
7. Leslie Walker-Kosmopoulos "The Prehistoric Inhabitation of Corinth", 1948, p. 61, Fig. 45.
8. C. Blegen "Zygouries", 1929, pp. 116 - 117, Fig. 109.
12. D. R. Theocares, Fraktika 1951, p. 91, Fig. 18.
15. R. C. Edgar 1904 loc. cit.
continuance of Early Bronze Age practices in a period that was chronologically the Middle Bronze Age.

The materials and techniques differed little from those of the preceding period. Both straight and radial warps were used, as is apparent in the examples illustrated from Phylakopi (Pl. XXII). Warps and wefts were employed both singly and in multiples. Simple twine (Pl. XXIe, bottom left; Pl. XXII, No. 7) and split twine (Pl. XXII; Pl. XXII, No. 6) remained popular. Plain weaves on straight warps occurred less frequently (Pl. XXIe, top; Pl. XXII, No. 2), but were quite often used on radial warps in apparently stiff single strands (Pl. XXII, Nos. 3-5, 8, 9). Coiled and wrapped matting was rarely found, the only Early Bronze Age examples coming from Asine. The flat twilled weaves of the early Neolithic north (page 127 above) are not represented, either in the islands, or on the mainland.

Because information about matting is entirely dependent, in Greece, upon pot impressions, its existence appears to cease after the end of the Early Bronze Age. This of course is not the case; it is simply that after the advent of the fast potter's wheel, there is no more evidence. It is reasonable to suppose that mats of exactly the same types as those already seen continued to be part of each household's furniture throughout the prehistoric period and later. The finds from the ship wrecked off Cape Gelidonya, though admittedly not Greek, underline the continuing usefulness of matting in the Late Bronze Age.²

¹ O. Widmark and A. Persson "Asine", 1939, p. 229, Fig. 172.
h) Needles etc.

Needles are seldom mentioned in Early Bronze Age reports. Copper or bronze ones like the one from Dikelli Tash (page 166 above) are known from Servia, Cheliotomyllos near Corinth and the Cyclades, and may well have been in general use. It is easy enough for such fine metal objects to be totally destroyed by corrosion.

Bone needles, which are more likely to have been used in weaving, continued to be found at Poliochni in the Verde and Rosso periods, but it is significant that they were neither as fine nor as numerous as they had been in the preceding period. A wide, flat bone needle head, decorated with two incised lines, was found in an Early Bronze Age context at Servia (Fig. 40b). Some of the Lernaean bone needles (Fig. 40a) may belong to the site's Early Helladic settlements (page 167 above).

At Early Bronze Age Kritsana, two spatulate bone objects were found; one is like some of those from the Poliochni Azzuro assemblage, and would be useful as a weaving needle (Fig. 40j); but the other has slightly serrated edges which make it somewhat unsuitable for such a purpose.

Two comparable objects were found at Lerna (Fig. 40 b, c), but these not only have serrated edges, but also seem

1. No. 345 from the recent excavations.
4. L. Bernabò Brea "Poliochni", 1964, p. 669, Pl. GLXXIX, Nos. 7, 9, 10, 17; see also flat bone tools with eyes, Pl. GLXXX, Nos. 17, 18.
5. No. 531 from the recent excavations.
6. W. A. Heurtley "Prehistoric Macedonia", 1939, p. 87, Fig. 66c, ff.
too flimsy for any utilitarian purpose. Others were found at Asine.

Another Lernaean bone tool (Fig. 40d), with a hole near its pointed end, was almost certainly a weaving or netting tool of some kind - its date is of course still unknown.

The distribution patterns of Early Bronze Age textile tools in Greece are complex, and when it is considered that such material remains as these are all that is left of the people who once used them, fascinating. They reflect the advent of a number of different cultural groups, their partial and gradual intermingling both with each other, and with the native (Neolithic) population; and, finally, the origin and diffusion of new forms of tool suited to the common needs of the people who became, albeit with regional differences, the Early Bronze Age Greeks.

In the north, two different Balkan groups, one using cylindrical (or spherical) weights, and the other pyramidal (or conical, or tall oblong ones), began infiltrating into Greece towards the end of the Neolithic period. The former established themselves at Sitagroi, and at Poliochni in its Assuro

1. L5.230, L5.86.
2. O. Frödin and A. Persson "Asine", 1938, p. 255; Fig. 181, No. 1.
3. These objects, which may be, as they are often said to be, idols or amulets, or may have some function quite unconnected with weaving, have reasonably close parallels at: Thermi (W. Lamb "Excavations at Thermi in Lesbo", 1935, p. 199, Fig. 366, No. 36.372; Troy, especially Troy I (U. Blegen et al. "Troy Vol. I", 1950, Fig. 220, Nos. 37.721, 37.526, 37.573; Fig. 365, No. 36.372); from the Salcota, Gumeiniţa and Boian cultures of the Balkans (D. Berciu "Contribuţii La Problemele Neoliticului in România in Lumină Noilor Cerceiari", Figs. 157, No. 2, 188, No. 18, 189, No. 5, 244, No. 3); also, disconcertingly, from Byblos (Z. Dunand "Fouilles de Byblos" Tome II, 1958, p. 455, Levée XI à XV, Fig. 538.
4. L5.287
phase, while the latter settled at Dikeli Tash and Olynthus, and perhaps, disconcertingly, at Tigani on Samos (page 164 ff. above). At Sitagroi, the 'cylindrical weight folk' of Phase IV were ousted by the 'pyramidal weight folk' of Phase V, and this situation may have been repeated elsewhere in the north in sites as yet unexcavated, for while pyramidal and associated types of weights became typical of the Early Bronze Age north, cylindrical weights, only retaining a foothold on the island of Lemnos, had moved to the centre and south of Greece by the E. H. ii period, if not earlier. The two hypothetical Balkan peoples were apparently not over-friendly, as the two types of weight are virtually never found in contemporary use at the one site - except perhaps at Tsani, with its tall oblong weights supposedly in all strata, and its undated cylinders. Its geographical position is significant, for it represents the approximate southern boundary of the pyramidal and conical weights, and the northern boundary of the cylindrical weights, in the Early Bronze Age.

Although other varieties were also used, the most prevalent type of spindle whorl in the Early Bronze Age north was the plain biconical one, and the general area in which it was used corresponds closely to that occupied by the 'pyramidal weight folk'. The actual number of sites at which both pyramidal weights and biconical whorls were found in the same phases is, however, relatively small - Sitagroi, Saratse, Agios Namas, Servia and Tsangli. The whorl may have been

1. A. J. B. Wace and M. S. Thompson "Prehistoric Thessaly", 1912, p. 149. Five weights were found in Strata I - XIII - therefore some strata had no weights.
2. A. J. B. Wace and M. S. Thompson 1912 loc. cit.
3. Exceptions: Kirirha, Leukas, Aghia Irini, all of insecure date.
4. Exception: Poliochino.
5. Exceptions: Aghios Kosmas?; Olympia and the Ionian islands.
adopted from the 'locals', who had certainly been using it since the Middle Neolithic period (page 133 ff. above), or, like the pyramidal weights, may have been introduced from further north. The finds at Sitagroi suggest that there the latter was the case, for whereas the cylindrical weights of Sitagroi IV had been accompanied by a conical whorl, often incised, this was replaced by a "heavier, more solid biconical whorl" in the Early Bronze Age.

The chief whorl of central and southern Greece was the heavy domed one, apparently a local invention, possibly derived from the earlier conical whorl. Its distribution pattern and that of the cylindrical loomweights show an even greater correspondence than do those of the pyramidal weights and biconical whorls of the north. Sites which had both domed whorls and cylindrical weights include Lithares, Eutresis, Korakou, Corinth, Zygouries, Tiryns, Aine, Lerna, Asea, and, possibly, Phylakopi. The domed whorls, however, after originating in east-central Greece or the north-east Peloponnese, found some acceptance in the north as well (page 202 ff. above).

The western islands and Olympia seem to have derived their textile tools from both of these major groups.

The incised biconical whorls, which admittedly do not seem to have gained more than a foothold, are indicative of some settlement from Anatolia, both in the north-eastern islands of Lesbos and Lemnos and in the area of the Chalcidice, and in the south-westerly island of Samos and perhaps some of the Cyclades (page 213 ff. above). Other indications of Anatolian elements are to be found in the banana weight
from Tiryns, and in the flat oval weights of Lesbos, Samos and Kea. The latter will be further discussed in the following section (page 284 ff. below).

The relationship between Greece and Anatolia in the Early Bronze Age was probably a twofold one, with similarities in tools resulting both from direct contact, and from emigrants from common sources who settled in both countries (e.g. pages 232 - 233 above).

Mat impressions, like the northern loomweights, started infiltrating into Greece at the end of the Neolithic period. Setting aside the much earlier northern mat impressions (pages 127, 141 above), the Final Neolithic/Subneolithic/Early Bronze Age group is interestingly limited in area. The easternmost Greek finds are at Tigani on Samos, the southernmost at Phylakopi on Melos, while the strictly middle Bronze Age impression at Lianokladhi III is both the most northerly and, with the exception of Galaxidhi (page 250 above), the most westerly occurrence. As stated previously, this is obviously a custom spreading westwards through the islands to reach a limited area of the mainland.

Saul Weinberg has called attention to a number of resemblances between Aegean Early Bronze Age finds and those of the Ghassul culture of Palestine, and suggests immigration to the Aegean from that general area. Among the many parallels he advances in support of this theory are mat impressions on pot bases. The custom of building pots upon mats is one...

that occurs in many unconnected civilisations, and is therefore not sound evidence for the movement of peoples if considered alone; but when so many other similarities are listed, it does at least seem possible that a people at the 'mat-impression' stage of pottery technology spread from the Levant via the Aegean islands to a limited part of the Greek mainland.

The unifying factors among this diversity of finds, are the conical whorls of various kinds, and the clay anchors. The conical whorls may have been derived from several sources. Some must be the descendants of Neolithic whorls, while others may have had northern origins (pages 204 - 208 above). The clay anchors have a distribution pattern quite different from that of any of the other tools mentioned above - and tools the anchors almost certainly were, even if not necessarily connected with textile manufacture. After their invention in the north of the country, their at first rapid and then more gradual distribution southwards till they occupied the whole of the Greek mainland, indicates that they fulfilled a common need amongst the diverse types of Greek in Early Bronze Age Greece.

The Late Neolithic inhabitants of the country, who were by no means an originally homogeneous race themselves, thus probably had to try to assimilate at least two different

groups from the Balkans, some immigrants (not necessarily all of the same race) from Anatolia, and some new blood from the Aegean islands, which may have originated in the Levant.

Among the Greek regional groups which evolved from this miscellany, the most influential, and, as their title suggests, the most typical of Early Bronze Age Greece were the Early Helladic people, whose territory was east-central Greece and the Peloponnese, and whose language was probably that pleasantly sibilant 'pre-Greek' one which named Tirynthos, Corinthos, Parnassus and even Anossos. Like Portia's English suitor, they acquired their fashions from many different sources. They used the cylindrical loomweights that had originally been a Balkan type, but had had several generations' acclimatisation in northern Greece. Their main whorl was the heavy domed one they seem to have invented themselves, and the widely scattered sites at which it has been found attest the influence its inventors exercised on the rest of the country. They also used conical whorls of all kinds, but biconical whorls found no favour with them, nor did pyramidal loomweights. Clay anchors, however, whatever their purpose, were readily adopted from the north. Their homes were furnished with mats upon which they often formed their pottery, a habit they derived directly from the Aegean islands, and perhaps indirectly from the Levant. They were dressed in fine cloth in a plain or tabby weave, which was probably made of linen. It is likely that they also wore patterned cloth and woollen cloth, but there is no evidence for or against this.

in spite of the changed and increased repertoire of

2. "Merchant of Venice", Act I, Scene 2.
textile tools, there is little to suggest that the production of textiles in Early Bronze Age Greece was on a different footing from that of the Neolithic period (pages 176 - 177 above). The textile arts were certainly being practised at numerous sites in all parts of Greece, and many of these were well-equipped to supply their own needs - but the numbers of loom-weights found are a limiting factor. Saratse's ten (page 220 above) and Aghia Irini's sixteen (page 233 above) are apparently the largest totals, and in no case is there anything to indicate the existence of more than two looms at any one site.

Whorls are usually fairly numerous; but at Corinth and Lerna they appear to have existed in numbers in excess of the sites' requirements. Leslie Walker-Kosmopoulos' opinion concerning an early manifestation of the textile industry which was to enrich classical Corinth has already been noted (page 199 above). Over two hundred and sixty made whorls were found at Lerna, plus more than a hundred others formed from potsherds. Although the Lerna material is not yet dated, and the site has Neolithic and Middle Helladic habitation and Mycenaean burials, the greater number of its finds belong to the early Bronze Age. The forty domed whorls assigned to that period on typological grounds (page 200 above) would alone be sufficient to indicate considerable textile activity, for the site is not large, but the total number of Early Bronze Age whorls of all types must be considerably greater. In addition, there are the few cylindrical loomweights, possibly from two different sets (Fig. 33a, b), and the E. H. II hoard of flax seeds.

The latter may be the most significant single
archaeological find of the whole era in regard to textiles.

The most notable difference between Neolithic whorls and Early Bronze Age whorls lies not so much in their forms, as in their sizes. There must have been a reason why larger, heavier whorls became popular in the Early Bronze Age, and that reason may very well have been supplied by the arrival of flax in Greece. Its presence is suggested by the type of weave and the smooth thread indicated in the cloth impressions of Final Neolithic Kephala, and at the very outset of the Early Bronze Age heavy domed whorls, eminently suitable for spinning flax, make their appearance (page 201 above), and many other forms of whorl display an increase in size. There is an apparent over-supply of the domed whorls, particularly, at Corinth, at Lerna, perhaps at Eutresis. It is just possible that these sites' inhabitants were manufacturing linen thread, if not cloth, for, for want of a better word, export.

1. Cf. the heavy domed limestone whorls which the Egyptians found suitable for flax-spinning - Fig. 4. See also Grace M. Crowfoot "Methods of Hand-Spinning in Egypt and the Sudan", 1931, p. 30.
2. If flax was used at Çatal Hüyük, these conclusions on the date of its introduction into Greece are almost certain to be false; but if it did not appear until the Early Bronze Age, the situation is curiously paralleled in Palestine at Jericho, where, although other domestic plants made a much earlier appearance, flax was not found until Early Bronze Age levels - M. Hopf in P. Ucko and G. W. Dimbleby (eds.) "The Domestication and Exploitation of Plants and Animals", 1969, pp. 356 - 357.