The Middle Helladic period is in many respects the poorest epoch in Greek prehistory. Its material culture is certainly more impoverished than that of the age which succeeded it, quite wretched in comparison with the contemporary civilisation in neighbouring Crete, and, despite certain technological advances, one is left with the impression that the quality of life in Middle Helladic Greece was of a lower standard than it had been in the preceding Early Bronze or even Neolithic Ages.

Nevertheless, because it has long been felt that the cultural changes which occurred in Greece at the beginning of the Middle Helladic Age might indicate the advent of the first Greek-speaking peoples, considerable interest has been focussed on the period, for the Greeks have a name to conjure with. Consequently, despite the facts that excavations have been comparatively few, and often incomplete because of the limits imposed by later (usually Mycenaean) foundations on the same sites, a considerable amount of information and speculation concerning the Middle Helladic inhabitants of Greece has accumulated over the years.

We know, therefore, that they lived in rather small, separate houses, sometimes rectangular in plan like those of the Early Bronze Age, but often with a new and distinctive apsidal end; that they practised many forms of burial, including cist burials, pithos burials, cist and

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pithos burials enclosed in tumuli, shaft graves as in Grave Circle B at Mycenae, and, in particular, intramural burial for infants and small children; that they had two main types of pottery, one a matt-painted variety, usually geometric designs in brown paint on a pale matt surface, but sometimes the reverse, and the well-fired, wheel-made Grey Minyan ware, with its limited forms, carinated profiles, and metallic lustre; that to the domesticated animals already known in Greece, they made the valuable contribution of the horse; that their weapons included bronze swords, daggers, lance or spear heads, and arrow heads, the latter also flaked from chert or obsidian, and that the celebrated boar's tusk helmet was probably introduced by them; that their tools included well-made stone axes, serrated chert and obsidian blades probably used in sickles, and picks, hoes and similar agricultural implements of antler; and that attractively carved and polished pins of bone constituted one of their few forms of personal adornment.

To this list may be added their textile tools - or lack thereof. Pierced terracotta spools with flaring ends, somewhat like today's cotton reels, may have been concerned with the making of cloth. Evidence for their use of the warp-weighted loom is slight. Their spindle whorls, often smaller than those of the Early Bronze Age, were made in a variety of shapes, of which the biconical was the most popular. While some of the types are indistinguishable from the whorls of both earlier and later periods, there is one

which may reasonably be regarded as the hallmark of a Middle Helladic site on the Greek mainland. This is a biconical whorl, usually, though not always, asymmetrical. It has incised designs on its upper surface only, and these are often arranged around a central hollow.

What is not known about the newcomers is where they came from, and exactly when they arrived; and it is possible that the distinctive whorl mentioned above can make some contribution to both questions.

Almost every quarter of the compass except the south has been suggested as the place of origin of this new ethnic group, with routes via the north-west, the north, the north-east and Anatolia all commanding support. Whichever route is favoured, there can be no doubt that their settlements clustered thickest in the central sector of Greece - the north-eastern Peloponnese and the south-eastern part of northern Greece; furthermore, they were all either situated on, or easily accessible from, Greece's eastern seaboard.

Both the numbers of sites, and the quantities of the typical Middle Helladic Grey Minyan ware found in them, generally decrease in proportion to the distance from this 'centre',


2. R. J. Howell 1973 op. cit., Fig. 9.1.
whether the direction is the north, the north-west, the west, the south-west or the south. These areas seem to have evolved their own independent Middle Bronze Age cultures, which were only gradually and partially penetrated by that of the newcomers, whose attractive and unusual whorl apparently did not find favour in these outlying areas. Although it does not occur at every Middle Helladic site, those in which it is found are all within the central sector of Greece - the newcomers' main stronghold.

Until the site of Lerna was excavated in the early fifties, there were few doubts as to when the new immigrants reached Greece. They were responsible for the destruction level which terminated the Early Bronze Age at many sites, and therefore arrived at the very beginning of the Middle Bronze Age, stayed till at least the end of it, and probably lingered on to develop into the Mycenaeans.

At Lerna, however, Caskey found an unmistakable and wholesale destruction at the end of the E. H. II period (Lerna III - the 'House of Tiles' period). This was succeeded by Lerna IV, a settlement of an entirely different character - a small village of apsidal and rectangular houses, whose inhabitants used both painted and plain types of pottery, the latter including two-handled bowls in a grey fabric that the excavator felt to be indistinguishable from that of the later Grey Minyan ware. Similar vessels continued to be made in Lerna V, the succeeding full Middle Helladic settlement - and between Lerna IV and Lerna V there was no destruction level. The later settlement appears to have evolved peace-fully from the earlier.

The implication is obvious. Some forerunners of the Middle Helladic race inconsiderately arrived at Lerna at the end of E. H. II, and lived there in the E. H. III period. Among their whorls was one of the type described above - an asymmetrical bicone with a hollow top surrounded by incised decoration (Pl. XLVIIIc, Fig. 59c).

Caskey re-examined the evidence from other Early Helladic sites to see whether it might not need reinterpretation in the light of his findings at Lerna, and concluded that Tiryns, Asine, Zygouries, Aghios Kosmas in Attica, and possibly Corinth had suffered violent destruction at the same time as Lerna III - at the end of the E. H. II period; that the evidence from Asea, Prosymi, Mycenae and Korakou was inconclusive; but that at Eutresis the destruction did not in fact take place until the end of E. H. III. The impression given is thus not one of premeditated, well-organised, overwhelming invasion, headed by some prehistoric Xerxes, but of a series of individual attacks by small groups, whose manner of arrival was probably similar to that of the Etruscans at the Tiber, when "those behind cried 'Forward!' and those before cried 'Back!'". They may have been displaced persons" driven forth from an unknown homeland by an unknown disaster, desperate to obtain a new foothold somewhere, and their attacks must have taken place in different places, at different times, over a number of years. However much later they

3. Lord Macauley "Lays of Ancient Rome - the Legend of Horatius."
arrived, the destroyers of E. H. III Eutresis are likely to have been related to the destroyers of E. H. II Lerna. They used the same distinctive spindle whorls (Pl. XLVllla).

a) Spindle Whorls.

1) Incised Biconical Whorls. In 1931 Hetty Goldman, writing about her excavations at Eutresis, remarked that the small biconical clay 'buttons' decorated with incised patterns, common in Middle Helladic levels, but absent from both Early and Late Helladic strata, were as distinctive of the Middle Helladic period in Greece as Minyan pottery. With one qualification, her observation is as valid today as it was over forty years ago.

The qualification is that incised biconical whorls had been known in northern Greece since the latter years of the Neolithic period (pages 146 ff., 213 ff. above). There are, however, several distinctions which may be made between these and the Middle Helladic whorls. The upper and lower parts of the northern whorls are usually of equal size - they are symmetrical bicones. While this form is also seen among Middle Helladic whorls, the majority are asymmetrical - either the upper or the lower half may be the larger. The extremities of the northern whorls are only slightly, if at all, truncated; whereas the bases of the Middle Helladic whorls are usually either truncated or rounded, and the top is often flattened. The northern whorls are incised on both halves; but on Middle Helladic whorls the decoration is almost always confined to the upper half, and the designs are of a limited

variety, among which 'stacks' of chevrons and arcs of diminishing sizes are the most typical. Finally, the middle Helladic whorl may have a hollow round the hole at the top - and this feature is quite unknown in earlier incised whorls (cf. Fig. 26j, k, Pl. XXIXb, nos. 14 - 16, c, nos. 1 - 3, c - northern whorls - with Pl. XLVIII - middle Helladic whorls).

The above criteria for the recognition of incised biconical middle Helladic whorls are largely derived from the Eutresis group, which is the largest and best documented of any found so far in Greece. Only one of the twelve whorls illustrated is incised on both halves (Pl. XLVIIa, No. 4). All the rest (Pl. XLVIIa, nos. 1 - 3, 5 - 12) are decorated on the upper half only; three have designs incorporating 'stacked arcs' (Pl. XLVIIa, nos. 1, 6, 7), and three, 'stacked chevrons' (Pl. XLVIIa, nos. 2, 3, 11); one of the latter (Pl. XLVIIa, No. 2, Fig. 591) has a hollowed top.

Although these whorls are so typical of the middle Helladic period in Greece, both their numbers and their distribution are limited. The previously-mentioned whorl from Lerna (Pl. XLVIlic, Fig. 59c) is the only one so far reported from the Peloponnese which has both the hollow top and incised decoration on the upper half. Another plain biconical whorl of minyan fabric with a hollow top was found at the same site, however, and an asymmetrical biconical whorl of

2. L. G. Low - I should like to thank Prof. J. L. Caskey of the University of Cincinnati for permission to include it in the thesis.
Grey minyan clay from Asea in Arcadia has a pattern of two concentric rings and obliquely set lines incised on its upper half. In Attica, three were found in middle Helladic graves at Eleusis, two of which have the popular design of stacked arcs (nos. 2, 7); one of these (no. 2) appears to have a hollowed top; and the third has a zig-zag line arranged star-wise round the hole (no. 12). The whorls of Kirrhα received scant mention in the final publication, but there are some half dozen incised examples among the material from that site stored at Delphi, at least five of which are typical middle helladic specimens. Three have the stacked arc pattern (Pl. XLVIIib, left and right), two the stacked chevrons, and all are slightly hollowed round the top, although the hollows are neither as wide nor as deep as those of the Lerna and Eutresis whorls. One of the arc-decorated specimens (Pl. XLVIIib, left) shows a strong resemblance to a whorl from Eutresis (Pl. XLVilla, no. 6), while another, on which the arcs are divided from one another by upright lines (Pl. XLVIIib, right) has a pattern similar to that on one of the Eleusinian whorls. The sixth whorl from Kirrhα is spherical rather than biconical, and is covered with a design of three horizontal and many vertical incisions (Pl. XLVIIib, centre). One of the Eutresis whorls has a somewhat similar decoration, but on its upper half only (Pl. XLVilla, no. 9); the spherical Kirrhα whorl may or may not be middle Helladic. Two incised whorls are reported from Rafina, and in view of the date, and the

1. Erik J. Holmberg "The Swedish Excavations at Asea in Arcadia", 1944, p. 120, Fig. 114, no. 12.
2. G. E. Mylonas in K. Kourouniotsy "Eleusinian", 1932, pp. 142 - 143, Fig. 118, nos. 2, 7, 12.
4. G. E. Mylonas 1932 op. cit., Fig. 118, no. 2.
site's situation on the Attic coast, these may be of the type under consideration, but without illustration it is impossible to be sure. Finally, one of the pre-mycenaean whorls from the Chalcidice illustrated by Rey is different from the others (Pl. XXIXc, No. 4) - an asymmetrical bicone, incised on its upper half only, with a design which may be related to the stacked chevrons, but no sign of a hollow. The chances of this whorl's being a Middle Helladic rather than a northern type are increased by the fact that, probably when the Middle Helladic period was well-established in the south, minyan pottery did occur at a few Macedonian sites, mostly in or near the Chalcidice - and near the sea. Heurtley felt that one of these, polyvopyrgos, might have been an actual settlement of the newcomers, which acted as a distribution centre for minyan ware in the area.

These whorls are frequently found in the Cyclades and other Aegean islands, although seldom in any numbers. A unique stone example is reported from Aegina; it was associated with Kamares pottery, but none of these whorls has ever been published from Crete, and it is questionable whether the incised marks arranged around the central hollow in its upper surface are really, as claimed, Linear A. A few have been found at the Aghia Irini site on Kea, including one with a zig-zag pattern surrounding a hollow (Fig. 59f), another with the same pattern, but merely a flat top, and a third, with a

4. G. Welter, Arch. Anz. 1937, p. 19 ff., Fig. 7.
sharply truncated top and base, both of which are decorated with an arrangement of diagonal and vertical strokes. The former pattern is not unlike that seen on the third Kleusinian whorl, and the latter design has affinities with that on the asea whorl (page 358 above), and on the whorl from Eutresis which was decorated on both halves (page 357 above, Pl. XLVIIia, No. 4). No date is as yet available for the above three whorls from Kea, but a group of twenty one unusually small (toy?) whorls was found in a child’s grave dating to approximately m. m. 11b - 11a, and of these all eight illustrated are of the same type. All have the central hollow to greater or lesser degree, and all are decorated either with the zig-zag pattern or with oblique strokes. Tsountas discovered one of these whorls, decorated with split stacked chevrons, in a tomb on Syros (Fig. 59k). Most of the tombs he excavated on the island were E. C. 11, but there does appear to have been some material of a Middle Helladic type also present. Such a whorl may have been found in early excavations on Thera, and there was at least one among the eight incised pre-mykenaeans whorls found on the earlier excavations at Phylakopi, though its hollowed top is surrounded.

1. Nos. K3.331, K -135, and K1.219 respectively. I should like to thank Professor J. L. Caskey of the University of Cincinnati for allowing me to examine these and include them in the thesis.
2. G. E. Mylonas in K. Κοινουλίτης "Ελλειψιμάτα," 1931, Fig. 118, No. 12.
5. C. Tsountas 1899 op. cit., Pl. 9, No. 27; see also J. L. Caskey, C.A.R. Vol. 11, Chap. IVa, 1965, p. 17.
7. T. D. Atkinson et al. "Excavations at Phylakopi", 1904, p. 213, Pl. XXXVIII, No. 15. This whorl, or another very similar to it, is on display in the National Archaeological Museum, Athens, Case 64, bottom shelf, No. 5846.
merely by dashes. Only the bare presence of the spindle
whorls from the 1911 excavations at the same site is recorded
in the preliminary report, but among those stored in the
museum at the island's capital, Plaka, are three of the rele-
vant type. The first, formed from smooth, grey, Minyan-type
clay, has a flattened top decorated with three groups of stack-
ed chevrons; the second has split chevron stacks, somewhat
like those on the Syros whorl, and again only on the upper
half; the third has the hollow top, surrounded by a very
worn pattern of what appear to be chevron stacks set facing
each other sideways, instead of apex upwards.

Beyond the Cyclades, a number of these whorls were
found in the Early Bronze Age levels below the Heraion on Sam-
os, with the hollow tops and the stacked arcs and chevrons all
present (Fig. 59j). Bernarbo Brea held the type to be char-
acteristic of the as yet unpublished 'Giallo' phase of Polioch-
hi on Lemnos, and because of the bowl-like depression round the
central hole, gave the whorl the nickname of "scodelletta" -
"little soup-plate".

These last two sites are instructive - both east
of Greece and the Cyclades, both with the 'Middle Helladic'
whorl occurring a little earlier than it did further west -
and both having connections with the Anatolian mainland.

There are some artifacts (such as bone points and

1. R. M. Dawkins and J. P. Droop, B.S.A. Vol. XVII, 1910-
1911, p. 22.
2. V. Milojćić "Samos Band I - Die Prähistorische Siedlung
35, 51, Pls. 23, Nos. 5 - 8; 32, some of those under No.
6; 43, Nos. 4, 7; 49, Nos. 3, 4, 12; note also a stone
whorl of this type from a prehistoric context at Tigani,
1936, p. 170, Pl. 55, No. 10.
stone hand-mills) which, through the similarity of certain human needs, will be produced at all times, in all parts of the globe, so that their occurrence in one civilisation may have nothing whatever to do with their appearance in another; but there are others so idiosyncratic that their presence, no matter where they may be found, or when, marks the passing of one particular group of people as surely as the line of small footprints marks the trail of a sandpiper on the beach at low tide. The 'scodelletta' whorls are of the latter kind; and the trail, initially at least, leads east.

Eastwards from Poliochni, Troy was one of the whorls' great strongholds. Schliemann appears to have found them in literal thousands, and Blegen, perforce content with the broken meats of the feast, was still able to publish nearly two hundred. To him we owe the knowledge that, though not the predominant type, (which was a plain, sharply-carinated,}

1. They are not easily made, or copied. Wishing to see whether the hollow top had any effect on spinning performance (which it does not appear to have), I made one of these whorls from plasticene, and found difficulty in forming the combination of carinated profile and central hollow; it was also difficult to preserve these features, once formed, while incising the simple stacked arc design. A friend who had access to a pottery offered to copy the whorl in terracotta. The result was a very attractive and serviceable spheroid whorl, with a zig-zag line arranged star-wise round the 'base'. Small circles filled the spaces between the points of the star, and also formed a ring around the 'top'. The points of the star and the centres of the circles bore incised dots. The hollow had not been forgotten, but the somewhat soft, damp clay had refused to hold the shape. The only feature that the plasticene 'original' and the terracotta 'copy' had in common was the fact that both were incised.


3. The relevant types are Nos. 17, 22 and 23 (when decorated) - G. Blegen et al. "Troy Vol. I", 1950, Fig. 129 (diagram of whorl types).
symmetrical bicone), either two or three scodelletta whorls were already in use in Troy I. One which appeared in the middle of the period may have been intrusive, but no such doubts are harboured about the two which occurred towards the end. Both of these had the hollow top, one wore the stacked chevrons, and the other the Eleusinian star-like zig-zag.¹

No more were found until the middle phases of Troy II (Fig. 59a), but in view of their earlier presence, the hiatus may be fortuitous. Thereafter, although plain whorls, and whorls with all-over incised patterns were also in use, the scodelletta whorl was no stranger in Troy, surviving the disaster which destroyed Troy II, and becoming increasingly popular in Troy III and IV (Fig. 59d, l, n), till in Troy V it constituted almost half of the total number of whorls found. The whorls exhibited a variety of designs, some of considerable complexity, but the simple stacked arcs and chevrons were perennially popular. In Troy VI spinning flourished as never before. Three hundred and eighty five whorls were found in Blegen’s excavations - yet of these the majority were plain, and of the thirty that were decorated, only fourteen were of the scodelletta type.²

One writer remarks that "about 2300 B.C. a great wave of Indo-European peoples, speaking a dialect known as Luvian, seems to have swept over Anatolia from the direction of the Bosphorus, occupying practically the whole south-

western part of the country up to a diagonal line drawn approximately from the Karmana to the Gulf of Iskanderun. Their progress was marked by signs of widespread destruction.\(^1\)

If 'scodelletta whorls' were to be substituted for the Luvian speakers, the statement would be equally true.

The excavators of Beycesultan noted "the abrupt change in spindle whorl shapes, like that in pottery, architectural methods etc. observed at the beginning of the E. B. III period, once more emphasises the complete break with tradition, resulting from the intrusion of new ethnical elements about 2,300 B.C."\(^2\) The new whorls were the scodelletta type (Fig. 59m). They were introduced in Beycesultan XII, the level in which Mellaart's 'protominyan' pottery \(^3\) also first appeared, and they were not superseded until the Late Bronze Age.

At Aphrodisias, situated near a tributary of the Maeander, west of Beycesultan, in Complexes E and I there occurred "a type of spindle whorl which seems more peculiar to these levels than others. It is flat on top, with a depression around the hole, and conical on the bottom. The top is often decorated with incised \(\xi\)mi-circles, singly or in multiples."\(^4\) Complexes E and I at this site are E. B. III (circa 2,200 - 1,900 B.C.), and contained pottery and artifacts quite different from those of the other levels; their predecessor, Complex II, was destroyed by fire.

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2. Seton Lloyd and James Mellaart "Beycesultan Vol. I", 1962, p. 277, Fig. F.6, Levels XII - VII.
At Tarsus, near the Gulf of Iskanderun mentioned above, a few of these whorls were found in E. B. III levels (Fig. 59g), but they did not become common until the Middle Bronze Age, and continued in use in L. B. I to such an extent that they were felt to be typical of that period.

It was from Tarsus perhaps that one or two of the whorls made their way to Cyprus at the end of the Early Bronze Age.

Now whatever the origins of the Middle Helladic people themselves, it is clear that their scodelletta whorls came from the east, as part of that same movement of peoples which swept Anatolia from north-west to south-east circa 2,300 B.C. The whorls could easily have progressed down the Maeander valley from Beycesultan and Aphrodisias to Samos, from Samos to the Cyclades, from those islands to Lerna and Eleusis, inland (up the Asopos valley?) to Etrusia, and finally westward to Kirthra; the whorls of Poliochni Giallo were presumably derived from those of Troy itself.

Troy, however, is an anomaly. Scodelletta whorls are used in Troy I and II; scodelletta whorls are the hallmark of the invaders; but Troy II is destroyed in that same catastrophe that ended E. B. II at Beycesultan and Aphrodisias. Despite this, scodelletta whorls show a significant increase in popularity in Troy III, IV and V. This suggests that the attackers of Troy II were related to a minority among those whom they were attacking within the city, and the whorls' 

2. P. Dikaios and James R. Stewart "The Swedish Cyprus Expedition. Vol. IV, Part 1a", 1962, p. 240, Fig. 96, Nos. 1, 2.
proportionate increase after the destruction may provide the answer. If the invaders were from a 'homeland' near Troy, the scodelletta whorls found at the end of Troy I and in the latter half of Troy II may only represent a small group of foreigners (foreign wives, perhaps?) who had percolated into the area some generations prior to the mass invasion.

James Mellaart's theory that there was an Indo-European invasion of Anatolia at the end of the E. B. II (Troy II) period which came via the Rumanian and Bulgarian west coast of the Black Sea, and presumably originated in the steppe country to the north of it, would fit the situation very well. In such a case, however, scodelletta whorls should be found in the mid third millenium B.C. in Rumania and Bulgaria - but so far I have not been able to find any examples.

1. This statement is based on the results of Blegen's excavations only. In Troy II, 186 whorls were found, of which 74 were decorated, and of these 39 were of the scodelletta type - 21% of the total (C. Blegen et al. "Troy Vol. I", 1950, pp. 216 - 217). In Troy III, 177 whorls were found, of which 69 were decorated, and of these 48 were of the scodelletta type - 27% of the total (C. Blegen et al. "Troy Vol. II", 1951, pp. 15 - 16). In Troy IV, 92 whorls were found, of which 63 were decorated, and of these, 30 were of the scodelletta type - 32.5% of the total (C. Blegen et al. 1951 op. cit., pp. 116 - 117). In Troy V, 88 whorls were found, of which 55 were decorated, and of these 41 or more were of the scodelletta type - at least 46.5% of the total, and the commonest type at the site (C. Blegen et al. 1951 op. cit., pp. 233 - 234). In Troy VI they had dropped right back to just over 1% of the total (C. Blegen et al. "Troy Vol. III", 1953, p. 32).
2. N.B. H. Schliemann "Iilos", 1880, p. 229, found both whorls of any kind, and incised whorls in particular, rarer in the first and second cities than they were in the others.
3. James Mellaart, Antiquity Vol. XXXIV, 1960, p. 270 ff., Fig. 1.
Scodelletta whorls occur further east, in the vicinity of Ankara. At Polatlı, after Phase I had been disposed of by a conflagration, the whorls made their first appearance in Phase II. This phase is assigned to the E. B. III period, and equated, with some reservations, to Troy IV and V. Polatlı II also saw the introduction of the potter's wheel, and the unusual pottery known as Cappadocian ware. The whorls continued to be used until the end of the site's final phase, Phase IV, the early Hittite period. Scodelletta whorls were also found at Gâvur Kalesi, a site where the main remains are Hittite, and at Etiyokuşu, which is predominantly 'Copper Age'.

The northern and central provinces of Anatolia are said to have remained unaffected by the great invasion, but the scodelletta whorls are still found at sites within the great bend of the Halys river. At Alaca Höyük they first occur in the period of the Royal Tombs, and continue on into

2. Seton Lloyd and Nuri Gökçe 1951 op. cit., p. 52, Fig. 15.
3. Seton Lloyd 1956 op. cit., p. 95; Table of Sites, p. xx.
5. Seton Lloyd 1956 op. cit., p. 95.
6. Seton Lloyd and Nuri Gökçe 1951 op. cit., pp. 59 - 60, 62, Fig. 15, Nos. 11, 12, 13.
7. H. H. von der Osten et al. "Discoveries in Anatolia 1930 - 1931", 1933, pp. 82, 85, 86, Fig. 83, Nos. GK 5, Un 25.
9. Ş. A. Kansu "Les Fouilles d'Etiyokuşu (1937)", 1940, p. 101, Fig. 90, No. EY 255.
10. Ş. A. Kansu 1940 op. cit., p. 29; Seton Lloyd 1956 op. cit., p. 39.
the Hittite period (Fig. 59a, h). At Boghazköy one or two were found in pre-Hittite levels. In the difficult early days of the excavations at Alishar, spindle whorls proved to be of such distinct types in the different cultural strata, that they were found to be as useful as pottery for distinguishing one from another. The scodelletta whorls (E. F. Schmidt's 'mushroom' type) were typical of Alishar III (Fig. 59e, Pl. XLIXb), which, as at Polatlı, was characterised by the brightly-patterned Cappadocian pottery. As the whorls were also found in some Alishar II levels, their use must have continued into the early part of the Middle Bronze Age. Just south of the Halys, at Kültepe, a scodelletta whorl occurred in the 'Kolonistenperiode', presumably the time of the Assyrian merchants' settlement, and, if so, it too may have been associated with Cappadocian ware, which was still


4. E. F. Schmidt 1931 op. cit., p. 107, Fig. 153; E. F. Schmidt "The Alishar Höyük. Seasons of 1928 and 1929. Part I", 1932, p. 203, Fig. 262.


6. E. F. Schmidt 1931 op. cit., p. 84.

7. On the cultural sequence at Alishar, and the relationship of Alishar III and II, see Seton Lloyd "Early Anatolia", 1956, pp. 32 - 34.

in use in the karum's early years. This whorl was no
chance find; others from the same site had attracted the
attention of a French expedition before the turn of the
2
century (Fig. 59b).

This central group of sites also provides an
anomaly. Where they can be dated, the whorls usually make
no appearance until E. B. III, the period which, in this part
of Anatolia, is marked by the presence of Cappadocian ware.
At Alaca, however, not only do they occur in levels of the
same date as the Royal Tombs - there is at least one example
in one of the tombs. The Royal Tombs are usually dated to
the E. B. II period, rather than to E. B. III; indeed the
settlement was destroyed by fire at the end of this period,
and the tombs lay in and beneath this destruction level.
After the destruction, the site appears to have been unin-
habited until early in the second millenium; isolated sherds
of Cappadocian ware were found, but could not be associated
with any architectural remains. Once the site was re-
occupied, the whorls were used again, so, except for the gap
in occupation, the situation is similar to that at Troy.
Although the people of the Royal Tombs may have belonged
chronologically to the E. B. II period, some of their

1. Seton Lloyd "Early Anatolia", 1956, p. 121; Seton Lloyd
"Early Highland Peoples of Anatolia", 1957, pp. 43, 51,
Figs. 37, 44.
2. Ernest Chantre "Mission en Cappadoce 1893-1894", 1898,
p. 80, Pl. VI, Nos. 1, 3, 5. N.B. No. 3 is of stone; Pl.
VI is mis-printed as Pl. IV; the site is referred to by
its older name of Kara-Buyuk.
1951, p. 168, Pl. GLXXXIV, No. 3, bottom right.
xx; Seton Lloyd 1957 op. cit., p. 20.
6. Seton Lloyd 1956 op. cit., p. 38; Table of Sites, p. xx.
7. H. Z. Koşay et al. "Ausgrabungen von Alaca Höyük - 1940-
possessions were very different from those found elsewhere in the country. This led to theories about their being a foreign ruling caste, and finds in tombs at two sites some distance to the north-east of Alaca, in the vicinity of modern Tokat, suggest that there may have been "a culture indigenous to the Pontic province, and that the rulers buried at Alaca represent the temporary intrusion into Central Anatolia of an alien aristocracy from that source." It is also worth remarking that some other minor finds at Alaca, besides the scodelletta whorl, have parallels at Troy.

Before leaving the whorls in Anatolia, several points should be noted. Their arrival marks the advent, often destructive, of strangers. The two sites where they occur earliest, Troy and Alaca, not only lie in the north of the country, but are each supposed to have connections further north still. The whorls are often found in the same levels as Cappadocian ware. This pottery has a pale, usually matt surface upon which geometric patterns are painted in one or more darker colours. At least one archaeologist sees it as a possible source for the matt-painted pottery of Middle Helladic Greece, although he suggests as an alternative origin the 'geometric' pottery of the Cyclades. Scodelletta whorls occur in all three areas where these 'matt-painted' wares are found. Cappadocian ware has recently been declared an indigenous Anatolian development, but it is quite unlike the

usual Early Bronze Age plain burnished ware of the country. The fact that scodelletta whorls, which often first appear in the same levels, continued to be used in Hittite times, has echoes of an older theory that the presence of Cappadocian ware might indicate the arrival of the Indo-Europeans and/or the first of the Hittites.

Tepe Gawra is a site in northern Mesopotamia, situated east of the Tigris, a little to the north of Nineveh. Its Stratum XIII showed a great increase in whorl numbers, many of which bore incised decoration, and at least one of which, though not biconical, had a hollow top. In Stratum XII "spindle whorls became virtually ubiquitous", and undecorated whorls were a rarity. Conical and biconical shapes were the most usual; and while some of the latter were incised on both halves, others had only the upper surface decorated, and this was often combined with the hollow top (Fig. 59t). A biconical whorl, not of the scodelletta type, which had an antlered animal incised on it, was unique at Tepe Gawra, but would have been quite at home in Troy. Large numbers of incised whorls continued to be used in Strata XI-A and XI, and the illustrations belie the textual comment that there was no form which could be described as

6. A. J. Tobler 1950 op. cit., Pls. LXXXV, Nos. 1, 4, 5, 8; CLV, No. 35.
biconical (Fig. 59r). The total numbers of whorls fell off
in Strata X-A, X and IX, and the proportionate number of plain
specimens increased. - but hollow-topped, biconical whorls
with the incised decoration confined to the upper surface still
occurred. The type continued, although no longer strictly
biconical in shape, in Level VII. This means that it had a
history of approximately a thousand years at the site, from
the middle of the fourth millennium B.C., to the middle of the
third. A point to notice about the Tepe Gawra whorls is
that they are the only ones which do not display the stacked
are, or the stacked chevrons, or both, on some among their
number. The usual pattern is simply large numbers of radiat-
ing lines (Fig. 59r, t), and while this has parallels at Troy
(Fig. 59s), it is not a very distinctive design. The same
is true of the Eleusinian star, which also occurs, although
not on a scodelletta whorl. I have not so far succeeded in
finding any other whorls of this type in Mesopotamia.

Far to the east, beyond the Caspian Sea, and near

1. A. J. Tobler "Excavations at Tepe Gwara Vol. II", 1950,
p. 168, Pl. CLV, Nos. 39, 40, 42.
4. E. A. Speiser "Excavations at Tepe Gwara Vol. 1", 1935,
p. 78, Pls. XXXVII, No. 8; LXXVII, Nos. 9, 12.
5. Homer L. Thomas "Near Eastern, Mediterranean and European
6. Tools can be much more conservative than pottery - e.g.
the flat discoid loomweights used in Crete from circa
2,600 B.C. until at least 1,300 B.C.
10. None are mentioned in the preliminary reports on Chagar
were found at Qrān Resh, especially in Level II, but they
are not illustrated (Seton Lloyd, Iraq Vol. VII, 1940, p.
16). Mesopotamian whorls often have painted decoration, so
'ornamented' need not mean incised.
Ashkhabad on the Transcaspian railway in southern Turkestan, lie the two kurgans of Anau, which were excavated in 1904. The term 'kurgan' is misleading, because as the expedition leader rightly pointed out, "These hills are town sites." 1

The North Kurgan revealed two superimposed Neolithic cultures, Anau I and ll, and the South Kurgan also had two cultural stages, Anau III and IV; the bottom culture of the South Kurgan was later than the top culture of the North Kurgan.

The enthusiastic expedition leader compiled useful lists of the attributes of each culture. The Anau I people were already acquainted with the horse, although their relationship may have been that of hunter and prey; they had hand-made pottery, and buried their children under their house floors. 2 They had clay spindle whorls of various forms, among which the most popular was "conical, with and without raised edges, and with a deep impression on the upper side of the whorl." 3 One of the whorls used to illustrate this statement is in fact a bicone with a hollow top - the scodelletta shape. Many of the whorls were decorated with pricked-in points, finger-nail incisions, and short strokes made with a pointed instrument, arranged in simple patterns; some of these were filled with white encrustation. It is not clear from either text or illustrations whether any of these whorls combined all the scodelletta characteristics, but many examples

2. Raphael Pumpelly 1908 op. cit., p. 38.
3. Hubert Schmidt in Raphael Pumpelly 1908 op. cit., p. 163.
4. Hubert Schmidt 1908 op. cit., p. 163, Fig. 342.
5. Hubert Schmidt 1908 op. cit., pp. 163, 184, Figs. 346 - 351, Pl. 42, Nos. 5, 6, 9, 10, 11, 12, 13.
approached the type closely. The people of Anau II seem to have been a related race. Their pottery was still hand-made, they still practised intra-mural burial, and they are said to have domesticated the horse. Their whorls were similar to those of Anau I. These two settlements are currently considered to have flourished in the very early years of the third millennium.

The Anau III people (whose settlement constituted the bottom part of the South Kurgan) had made considerable technical advances. Much of their pottery was thrown on a fast wheel, and, curiously, one of their wares was a grey monochrome type, grey in the biscuit, with a dark grey, or occasionally a light grey slipped and polished surface; its shapes were limited to bowls, cups, dishes, beakers and some "columnal feet", some of which latter look startlingly like the pedestals of Minyan goblets; another type of ware, which may or may not have been derived from the decorated pottery of the earlier settlements, had designs in dark paint on a light ground. They had copper tools and weapons, and curious pins

1. Hubert Schmidt in Raphael Pumpelly "Explorations in Turkestan - Vol. I", 1908, pp. 163 - 164, NK 67, Fig. 342 (\_ decoration); NK 196, Fig. 345, Pl. 42, No. 11 (decoration consists of finger impressions, not incisions); NK 51, Fig. 346, Pl. 42, No. 6 (domed rather than biconical shape); NK 192, Fig. 348, Pl. 42, No. 9; NK 225, Fig. 349, Pl. 42, No. 12 (flat top instead of hollow); NK 191, Fig. 331, Pl. 42, No. 10 (incisions all over instead of confined to top).
3. Hubert Schmidt 1908 op. cit., pp. 163 - 164.
5. Hubert Schmidt 1908 op. cit., pp. 140 - 141, Figs. 168 - 178, Pl. 11, No. 4 - of. latter with E. J. Rosacky, J.A.S. Vol. XXXIV, 1914, p. 135, Fig. 8.
with double spiral heads; they practised intra-mural burial, and enjoyed all the advantages (such as the horse) of the earlier settlements. Their whorls were similar to those of Anau I and II, but in this level it is quite clear that fully-fledged scodelletta whorls were in use (Fig. 5ao, Pl. XLIXa). The predominant designs are stacked finger-nail impressions in lieu of stacked arcs, and stacked chevrons of diminishing size with a line down the centre, so that they look rather like pine trees; and radiating lines. Troy once again provides parallels (fig. 5yn). Anau III is at present considered to have existed in the earlier part of the second half of the third millennium B.C.

After Anau III was abandoned, the kurgans lay deserted until the iron age, when Anau IV was established. Few whorls were found in this settlement - and the scodelletta-shaped whorl that was amongst them was perhaps a stray from the ruins of Anau III beneath.

Anau seems to be the easternmost site at which the whorls occur. Greece, however, was neither their latest

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1. Hubert Schmidt in Raphael Pumpelly "Explorations in Turkestan - Vol. 1", 1908, p. 151, SK 281, Fig. 251, Pl. 37, No. 3.
2. Raphael Pumpelly 1908 op. cit., p. 43.
3. Hubert Schmidt 1908 op. cit., pp. 166 - 167; SK 113, Fig. 367, Pl. 43, No. 8a, b (decorated on both halves); SK 366, Fig. 368, Pl. 43, No. 10; Figs. 369, 371, not mentioned in text; SK 51, Fig. 372, Pl. 43, No. 12 (additional decoration in hollow); SK 229, Fig. 373, Pl. 43, No. 13 (additional decoration in hollow); SK 357, Fig. 375, Pl. 44, No. 1; SK 122, Fig. 376, Pl. 44, No. 2; SK 209, Fig. 377, Pl. 44, No. 3 (decorated on both halves); SK 226, Fig. 376, Pl. 44, No. 4; SK 148, Fig. 379, Pl. 44, No. 7.
6. Hubert Schmidt 1908 op. cit., p. 170, Fig. 411.
7. A claim that the whorls of Sari Dheri near Peshawar resemble the whorls of Anau III is not well founded (Simone Corbiau, Iraq Vol. IV, 1937, pp. 7 - 8, Nos. 18, 19).
nor their most westerly home. As far as one can tell from present evidence, they ceased to be used there at the onset of the Mycenaean period - and just at the time they disappear from Greece, they appear in northern Italy, in the Terremare settlements of the Po valley. As at Troy, they are neither the only type of whorl used, nor the only type of incised whorl, but they are present, and with the old, familiar stacked arc pattern (Fig. 59p), radiating lines, and a comb-like design familiar at Troy (Pl. XLIXc). Furthermore, two of the whorls without the hollow top have close parallels at Eutresis (cf. Pl. XLIXc, No. 21 with Pl. XLVIIIa, No. 10; Pl. XLIXc, No. 18, with Pl. XLVIIIa, No. 5). This collection of whorls is also associated with a characteristic grey pottery. A recent assessment of chronology sets the Terremare culture at circa 1,500 B.C.

One last whorl of the scodelletta type, though not a very characteristic example, occurs, along with other incised types, at Hidau-Steinberg on the Lake of Bienne in Switzerland (Fig. 59q). Judging by the weapons found at the same site, the Bronze Age was well advanced there.

The scodelletta whorls thus mark a trail which extends between 7° and 60° east longitude, and 35° and 48° north latitude (Fig. 60), and has a chronological span of at least one millennium (Troy I to the Terremare settlements), and

1. G. Säflund "Le Terremare delle Provincie di Modena, Reggio Emilia, Parma, Piacenza", 1939, pp. 146 - 147, Pl. 42.
possibly two (Tepe Gawra XIII to the Terremare settlements). This seems so improbable that the question must arise as to whether similar whorls might not have been independently invented in various places at various times. This can be answered in the negative for two reasons. The first is that the whorls are of a much more specific and distinctive type than most tools, and are quite difficult to make (page 362, note 1, above). The second is that certain other features also recur in settlements where they are found. The whorls may be associated with cultural change, very often preceded by destruction; with grey wheel-made pottery and/or handmade pottery with dark patterns on a light ground; with intramural burial; with the horse; with stags; with bronze weapons; with spiral-headed pins; and with Indo-Europeans. All these features do not occur together at every site where the whorls are found, but enough of them appear with sufficient frequency to exclude mere coincidence. They are worth reviewing.

The arrival of scodelletta whorls is heralded by destruction in the south-west sector of Anatolia, from Troy to Tarsus, and at Greek mainland sites. With the exception of Polatli, the sites where the whorls first occur in the same levels as Cappadocian ware do not seem to have suffered violence, but do exhibit some cultural change; the same is true of the Terremare settlements.

Grey, wheel-made pottery was used by those who spun with scodelletta whorls at Anau III, Troy II onwards.

2. The potter's wheel was introduced in Troy IIb, and wheel-made pottery was common from Troy IIc onwards. A handmade grey ware was present in Troy IIa, and wheel-made types of grey ware from the time the wheel was introduced - C. Blegen et al. "Troy Vol. I", 1950, pp. 205, 219, 220, 225, 255).
middle Helladic Greece, and the Terremare settlements. Pottery which displayed patterns, often of a geometric type, in dark paint on a pale surface, was used at Anau I, II and III, in eastern and central Anatolia, in the Cyclades, and in middle Helladic Greece. It is only fair to say that both the grey wares and the painted wares show differences as well as similarities, but this is to be expected, because even in a stable situation (e.g. Minoan Crete), pottery styles do develop and change in a comparatively short period of time - whereas tools do not.

Intramural burial was practised at Anau I, II and III, and in Middle Helladic Greece. The Alaca tombs, though not intramural, were crowded into an area which was presumably in the centre of a settlement, and therefore surrounded by buildings.

Horses were a constant factor in the Anau settlements. They were used by the Hittites, and are said to appear very early on 'Cappadocian' seals - but this still means that they entered Anatolia later than the earliest scodelletta whorls. The situation at Troy is disappointing; horses arrived suddenly, and apparently in numbers, in Troy VI, the settlement in which the scodelletta whorls virtually disappeared. Their presence in Middle Helladic Greece has recently been re-emphasised by the spectacular horse-burial in a tumulus at Marathon. They were used by the inhabitants of the Terremare settlements; and horses of the Anau breed are said to be known from the Swiss Lake Villages in the Late Bronze Age.

5. V. G. Childe 1926 op. cit., p. 68.
The antlered animal on one of the Tepe Gawra whorls is not necessarily a stag - it could be a long-horned mountain goat. The beasts on the Trojan whorls, however, are unquestionably stags (page 371 above). Stags decorate many of the 'standards' found in the Royal Tombs at Alaca. A later, rather unusual Hittite wall relief from the same site shows a hunted stag, and the stag was the sacred animal of one of the Hittite divinities. It has been suggested that the use of the stag as a decorative motif may indicate people of a mountain mentality. The Middle Helladic people had tools made of antler (page 352 above).

Bronze weapons, though not necessarily very alike, were used in all the areas where the scodelletta whorls occurred, except in the early levels of Anau and Tepe Gawra.

The spiral-headed pin has a history as extraordinary as that of the scodelletta whorl itself, its geographical range extending from India to Denmark. It "originated in the third millennium in the Mediterranean, the Near and Middle East, and had its great time in the Early Iron Age." Such pins were found in Anau III, at Alaca (where there was one in the same..."
tomb as the scodelletta whorl), at Alishar, Troy, and Syros.

There is no means of knowing what language was spoken in Anau. In east central Anatolia the whorls are usually found in the same levels as the Cappadocian pottery which used to be thought to indicate the arrival of newcomers (page 371 above), and later, when the same territory is that of the Hittites, whose language belongs to the Indo-European group, the whorls are still used (pages 368, 371 above). The invasion which ends E. B. II in south-west Anatolia, and introduces the scodelletta whorl, is supposed to be mounted by Indo-European Luvian speakers (page 383 above). The middle helladic people, if speaking Greek, were using an Indo-European language (page 351 above); and the people of the Terremare settlements are held to be the first Indo-Europeans in Italy.

It will be noticed that one site has played no part in the above review - Tepe Gawra. This site's whorls are the weakest link in the chain, both because of their very early date, and because they are the only ones without the stacked arcs and chevrons. The horse was eventually introduced at the site, but not until long after the whorls; models of horses occur in Level VI, and in this level the first copper was found. The potter's wheel had been introduced in Level IX.
and a dark bluish-grey pottery, exceptionally well-fired, appeared in Level VII (the last level in which non-biconical scodelletta-type whorls were used - page 372 above). Use of this pottery increased in Level VI.

Several hypotheses are possible. The first is that, for the reasons given in the previous paragraph, the whorls of Tepe Gawra are not related to the other scodelletta whorls - but for the reasons given on pages 362 (note 1) and 377 above, it is probably wiser to include them in, rather than exclude them from any theories. A second hypothesis is that the whorls were indigenous to Tepe Gawra, were used there for a millennium, and then spread north-eastwards to Anau, and north-westwards to Anatolia. The weak points in this interpretation are that the heyday of the whorls at Tepe Gawra is Level XII, not Levels VII - VI, and that their earliest appearance in Anatolia is in the north-west, at Troy I, not in the south-east, as one would expect. A third theory is insecurely based on the apparent non-occurrence of the whorl at neighbouring, contemporary sites, and on Tepe Gawra's geographical position, in the north of Mesopotamia, east of the Tigris, and uncomfortably close to the foothills of the Zagros mountains, from which, in later times, undesirables such as the Guti were inclined to swoop down. It is likely enough that a similar situation existed earlier, and, if so, the whorls might once again represent 'foreigners'. The 'antlered animal' on the Level XII whorl is a straw in this particular wind. The inhabitants of the Iranian Plateau had delighted in the ibex, mouflon and stag as decorative motifs

from very early times. A last possibility is that the users of the bluish-grey pottery were intruders who admired and adopted an indigenous Tepe Gawra whorl, and took it with them when they departed. There are difficulties with the chronology of the last suggestion, and it must be admitted that none of these hypotheses is entirely satisfactory.

Anau has one thing in common with Tepe Gawra. It, too, is near the mountains which border the Iranian Plateau. Many of the features which are both found at Anau, and are commonly associated with the scodelletta whorls, have a long history in Iran. Intramural burial was the established practice before the beginning of the fourth millennium. The norse, which did not reach most of the other regions with which we are concerned until early in the second millennium, was known in the Iranian Plateau in the fourth. Local copper was being hammered into a 11 objects at the beginning of the same 2 millenium, and was being cast well before the end of it; 3 bronze, however, made rather a late appearance. Stags and other horned beasts have already been mentioned. Painted 4 pottery was another very early development, and it may be 5 from the Iranian Plateau that the painted wares of the Anau 6 district were derived. The pottery was hand-made at first, 7 but the potter's wheel was also introduced in the fourth millenium. Though it varied very much from centre to centre, all

1. R. Ghirshman "Iran", 1954, pp. 33, 36, Figs. 9, 10, 19; James Mellaart "Earliest Civilizations of the Near East", 1965, p. 74, Fig. 45.
3. R. Ghirshman 1954 op. cit., p. 34, Fig. 8.
8. R. Ghirshman 1954 op. cit., p. 44.
Iranian pottery in this millennium bore painted decoration.

Early in the third millennium, however, plain greyish-black or grey wares appeared at sites in the north-east of Iran. At first they were used alongside the painted wares, and it was only gradually, over a period of some hundreds of years, that eventually they virtually replaced them. During such a period, the newcomers would have had time to absorb many of the above-mentioned benefits of the older civilisation, as well as making contributions to it, such as, perhaps, bronze-working.

The origins of the new grey ware culture are obscure, but there is reason to suppose that it might have come from "districts near the Oxus and Jaxartes, in the plains of Russian Turkestan", and if its people were moving from that direction towards the south-east of the Caspian Sea, Anau would have been right in their path.

Although it was in Anau III that the wheel-turned grey pottery and fully developed scodelletta whorls first appeared, a grey ware was used as well as painted ware in Anau II, and the component factors of the scodelletta whorl, the unusual form, and the idea of incised decoration, were both present in Anau I and II, although not necessarily combined. Anau, therefore, may be somewhere near the original homeland of the whorl, and it is noteworthy that it lies closer to the suggested place of origin of the grey ware culture than any of

the other grey ware sites.

The grey ware culture is frequently recognised as the first manifestation of the Indo-Europeans, or at least the Indo-Iranians, in Iran. Towards the end of the third millennium they apparently began to desert their new home, and again the suggestion is that they moved westwards. As Indo-European grey ware cultures so often seem to be associated with the scodelletta whorl, it may be worth while considering the reason for this restlessness. Of all the many hypotheses put forward, it is one of the oldest which seems to make most sense. This is the 'desiccation of Asia' theory, expounded at length in Pumpelly's two volumes, which also occurred independently in other works. Certainly Anau, where crops once grew, and sheep, cattle and horses once grazed, is desert today. It is more difficult to see why the sites to the south-east of the Caspian Sea, today a fertile area, should have been abandoned - it may have been for any of the reasons put forward by the excavator of Tureng Tepe - soil salinisation, or loss of trade, or the threat of fiercer nomads from the steppe.

Whatever the reasons, the grey ware culture moved westward, perhaps along the southern Caspian shore, Once west of that sea, though the terrain is mountainous, there are good routes to Anatolia up the valleys of the Araxes and Kura.

rivers, after which the east-west orientation of the mountains and valleys leads towards the Pontic province from which that "alien aristocracy" in the Royal Tombs at Alaca may have originated (page 370 above). Now if these aliens originally came from somewhat further east than the Pontic province, it would explain why their grave goods look foreign, why they had so much precious metal, including bronze, why they had the 'mountain mentality' which was so fond of producing stags, and why they had scodelletta whorls. Their eventual destruction might have been a gesture on the part of the 'locals' simply because they were aliens, and rich ones, too. A later, but presumably related people, probably following similar routes, re-introduced the whorl in E. B. III, the period of the Cappadocian pottery, in the latter years of which era, or very shortly after, the presence of Indo-Europeans in Anatolia is confirmed by the Kültepe tablets. The Hittites too may have arrived in Anatolia from a north-easterly direction. It is not possible to say whether they adopted the scodelletta whorl when they settled in the country, or whether, as a possibly related race of Indo-European origin, they, also, brought it with them.

This still does not explain the whorl's earliest appearance in Anatolia, at the end of Troy I, and it is from the whorls that came with the 'north-west to south-east' invasion that the Middle Helladic whorls must have been derived.

1. V. G. Childe "The Aryans", 1926, p. 115. The south Caspian shore plus Kura valley route shows up with great clarity from the air.
3. On the mineral wealth of Iran, R. Ghirshman "Iran", 1954, pp. 25, 58; however metals were also available in central Anatolia - Seton Lloyd 1956 op. cit., p. 100.
Despite the apparent lack of scodelletta whorls in Rumania and Bulgaria, it is difficult to see where else the invasion could have come from. A possible solution lies in the likelihood that it originated not in the lands on the west coast of the Black Sea, but in the steppe country to the north of them.

'Steppe' is the operative word. The grey ware people of north-east Iran may have come from steppe country in the region of the Aral Sea. Anau is on the southern edge of the steppe country. Troy II is destroyed, and presumably Troy III settled by people using grey pottery and scodelletta whorls, who may be from the Pontic steppe. To judge by both whorls and pottery, Troy II may have been partially inhabited — and perhaps Troy I destroyed? — by an advance group.

If the grey wares are the preferred pottery of the steppe peoples, and the scodelletta whorl is one of their whorl types, and they are a numerous folk forced by steadily worsening conditions to assume an ever more nomadic life to save their animals and themselves, it explains most of the enigmas. Here are our 'displaced persons' driven from their homeland by disaster (page 355 above). While one group moves south-westwards, and leads a settled existence for a time in the painted ware settlements of north-eastern Iran before moving further, another group travels west more rapidly, either round the north of the Caspian, and north of the Caucasus, or by the route round the southern shore of the Caspian, up the Kura valley, and south of the western end of the Caucasus Range, and so round the northern shores of the

that reaches Troy.

If the scodelletta whorl sites marked on the map (Fig. 60) are regarded as the trailing southernmost skirts of a great storm-cloud of nomadic grey ware peoples, it explains the very wide east-west distribution of the whorls. It also accounts for the gaps in distribution, for nomads are often obliged to move on without leaving any archaeological remains, and we know them only from the places in which they were able to settle for a while. It provides a reason for the 'false starts' in the arrival of the whorls in several places - Alaca, Troy, Lerna - followed by a more numerous establishment later; and it explains the varied nature of approaches - slow infiltration in some areas, destructive invasion in others.

There are anomalies in the theory. The Tepe Gawra whorls are virtually excluded from it unless the steppe people, by means unknown, derived one of their whorl types from mesopotamia, as they are said to have derived their battle-axe; or unless the whorl is an Iranian Plateau type, carried down to Tepe Gawra on the one hand, Anau on the other, and adopted by the steppe peoples from the latter. Why do the whorls, which are contemporaries of the horse in Anau, Middle Helladic Greece, Italy, and perhaps Switzerland, and may almost be taken as the symbol of the horse-taming Indo-Europeans, precede the beast by as much as five hundred years in Anatolia? The horses of the Middle Helladic people cannot have crossed from Anatolia via the islands like the

whorls, not so much because this might have been difficult, as because there do not appear to have been any in Anatolia at that stage to be shipped. The horse and a fully-developed Greek type of grey ware, the Grey Minyan, only arrive at Troy in Troy VI, when the scodelletta whorl is replaced by a collection of plain whorls which could almost be mistaken for a Greek group - it might well be wondered whether Troy VI was not settled by Greeks.

This brings forward the fact that, in Middle Helladic Greece and elsewhere, scodelletta whorls are always a minority group. They do not occur at all contemporary sites in related cultures, and at those sites where they are found, they seldom form a majority. They represent, therefore, only some minor sub-tribe of the Indo-European race.

Another curious characteristic is their habit of disappearing after a certain period. In central and southern Anatolia they managed to linger on into the early years of the Late Bronze age, but they seem to have vanished from Greece as completely as they did from Troy. Although future excavations may reverse the conclusion, at the moment there do not seem to be any from the Mycenaean period. In this connection it may be pointed out that although the Terremare whorls presumably arrived overland, there was also a sea route available. The westernmost occurrence of the whorls in Greece was at Kiriha, a harbour on the west-oriented Gulf of Corinth. From there it would not be many days' sail up the Adriatic to the mouth of the Po; if the whorls arrived in Greece by sea, there seems no reason why they

1. But not impossible - see P.M. II (1), p. 244, Fig. 14la.  
(and their owners) should not have taken to the water again.

Despite its imperfections, this theory that the scodelletta whorls were brought to Greece by an offshoot of the Anatolian branch of the great tree of Indo-European migration is the one that makes best sense of the available evidence.

Theories about Indo-European migration are not only not new, but, on the contrary, quite embarrassingly old-fashioned; and the idea of a connection between the various grey ware cultures and the Indo-Europeans likewise is not original. The authority of both hypotheses, however, is much enhanced by the evidence obtainable from the scodelletta whorls.

It is difficult to give a clear and definitive account of the other Middle Bronze Age whorls in Greece, because there are so very few collections published that are unequivocally confined to the period. Material that might belong to the Middle Bronze Age must be considered as well as that which actually does - or there would be very little left to consider - but distinctions between the two will be made. The situation is further complicated by the fact that some Early Bronze Age types continue into the Middle Bronze Age, many of the latter continue into the Mycenaean period, some are common to all three, and some may even go back to the Neolithic Age. Nevertheless, it is possible to draw some conclusions.
2) **Plain Biconical Whorls.** These were being used throughout the country. They are definitely assigned to Middle Bronze Age or Middle Helladic levels at Vardaroftsa (Fig. 61m - o), Agios Mamas, Lianokladhi, Eutresis, Kirra and Nichoria in Messenia (Fig. 61e). Asea's claim that they were common in the period may for once be correct. Though the whorls from Malthi are not chronologically distinguished, both the biconical and related spheroid types were numerous there (Fig. 62B, Nos. 2 - 5, C, Nos 1 - 6), and if the site in fact has only Middle and Late Bronze Age material, it is probable that most of the whorls, like the greater part of the site's remains, belong to the Middle Bronze Age.

Biconical whorls which may be either Early or

1. W. A. Heurtley "Prehistoric Macedonia", 1939, p. 87, Fig. 63m - o.
4. H. Goldman "Excavations at Eutresis in Boeotia", 1931, pp. 192, 198, Fig. 265, Row 2, Nos. 6 - 7; J. L. and Elizabeth G. Caskey, hesperia Vol. XXIX, 1960, Pl. 53, X (1) and X (2).
6. Nos. N.286 (m.H./L.H. 1), N.321 (m.H. ?), N648, N.619 (m.H. /early L.H.), N.700 (m.H./early L.H.), N.1221 (early m.H.). I should like to thank Prof. W. A. McDonald of the University of Minnesota for permission to include these in the thesis.
7. Erik J. Holmberg "The Swedish Excavations at Asea in Arcadia", 1944, p. 117 ff., Fig. 113, Nos. 18 - 20.
8. N. Valmin "The Swedish Messenia Expedition", 1938, pp. 335 - 336, Fig. 71B, C, Pl. XXV:1. I was allowed a glimpse of the whorls in the Kalamata museum, and the biconical ones were particularly numerous, many of them, as Valmin remarked, having a polished surface that was "'minyan' to the touch", although the colour was often brownish-grey.
middle Bronze Age are known at Tsani, and Olympia, Leukas and Ithaca (pages 212 - 213 above). Sites which have both middle Bronze Age habitation, and numbers of biconical whorls, but no date available for the latter, include Lerna, Aghia Irini on Kea, and Phylakopi on Melos.

In the north, the biconical whorls of Vardaros and Agios Mamas are remarked upon as being typical of this and following periods rather than preceding ones, but they were used earlier at both places, and were certainly found in numbers at other northern sites in the Early Bronze Age (pages 211 - 212 above; cf. Fig. 24 l - n, q, with Fig. 61m - o), so there is no reason why they should not have been a local development. Other northern examples are well-illustrated by Rey, but cannot be assigned to any one period.

The biconical whorls at Eutresis, many of which were of Grey Minyan fabric, were unusual in being confined to the Middle Helladic period; at other sites the type

2. I should like to thank Prof. J. L. Caskey of the University of Cincinnati for allowing me to see the whorls from both sites.
5. Nine from Period A at Agios Mamas - W. A. Heurtley and C. A. R. Radford 1928 op. cit., pp. 126 (Period A), 150 (distribution table, Type 3); eight spheroid ones from Period A at Vardaros - W. A. Heurtley and R. W. Hutchinson 1926 op. cit., p. 34 (distribution table, Type 3; it is true that there were no strictly biconical ones - Type 5 - however).
usually continues into the Late Bronze Age.

Two of the Nichoria whorls are interesting because, despite the site's remote position, they belong to the early years of the Middle Helladic period. One is biconical, the other a rather formless spheroid shape.

It is worth noting that in the Middle Bronze Age, biconical whorls are found in some parts of that 'bald patch' from which they seemed to be excluded in the preceding period (page 216 above).

3) Conical Whorls. Conical whorls are as widespread as the biconical ones, and the two types are often found at the same sites. Examples which may be assigned to the Middle Bronze Age with a fair degree of confidence have been found at Vardaroftsia (Fig. 61) in Macedonia, Lianokladhi and Zerelia in Thessaly, Eutresis, Athens, Korakou, Prosymi, Asine, probably Asea and Malthi (Fig.

2. W. A. Heurtley "Prehistoric Macedonia", 1939, Fig. 83 1; W. A. Heurtley and R. W. Hutchinson, B.S.A. Vol. XXVII, 1925–1926, p. 34 (Type 2), Fig. 21, No. 6.
5. H. Goldman "Excavations at Eutresis in Boeotia", 1931, p. 192, Fig. 265, Row 2, Nos. 1–3.
7. C. Blegen "Korakou" 1921, p. 106.
8. C. Blegen "Prosymi", 1937, Grave XXVI, p. 45, Fig. 79, No. 669.
9. O. Frödin and A. Persson "Asine", 1938, p. 250. This is based on the text, which does not agree with the illustrations in Fig. 177.
10. Erik J. Holmberg "The Swedish Excavations at Asea in Arcadia", 1944, p. 117 ff., Fig. 113, Nos. 15 – 17.
62A, Nos. 1 - 6, D, Nos. 1 - 4, E, Nos. 1 - 6), and the island of Leukas. Other, which may be either early or middle Bronze Age come from Olympia, Ithaca (page 206 above), Orchomenos, and Tsani; and some may have been found at Dodona.

The commonest form is a straight-sided, truncated cone, in which the height measures nearly as much as, or a little more than the diameter.

Whorls of similar proportions but with a rounded or pointed rather than a truncated base are also fairly common.

Concave-sided cones are known from a number of sites, including Prosymna, Asine, Asea and Malthi (Fig. 62 E, Nos. 1 - 5). Although there is one clumsy example from the Early Bronze Age north (page 217, Fig. 24 ff above), generally speaking the type is not seen before the Middle Bronze Age. Once established, however, it continues throughout the Mycen-
aean period and on into the Dark Age.

4) **Incised Conical Whorls.** In occasional cases, the wide flat top of a conical whorl is decorated with incisions, the whorls selected usually being medium or tall truncated cones. One example published by Tsountas has already been mentioned (page 207 above, Pl. XXIXb, No. 13). Others are illustrated by Rey. There is a whorl of this type from Kyrin in the Delphi museum, which bears the "scodelletta" pattern of three groups of stacked triangles (Fig. 61a). At Asine, there was "a pointed cone, the base of which is altogether covered by small circles... found in an H. H. stratum" (Fig. 61b), and another, similar one, decorated with a ring of small circles with central dots, was from a mixed middle Helladic/Late Helladic context, while a third, decorated only with five raying lines, is said to be Mycenaean. Finally, three are illustrated from Malthi, one with raying lines, one with rings of dots, and one incomplete one with lines of dots on both top and sides (Fig. 62A, Nos. 1 - 3).

Unfortunately the dating of most of these whorls is uncertain. When it is remembered, however, that the type has excellent parallels in Early Bronze Age Bulgaria (page 207 above), is found in the north of Greece and central

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2. It may of course be either Early or middle Helladic - though the pattern favours the latter.
3. O. Frödin and A. Persson "Asine", 1938, p. 252, Fig. 177, fourth from left in row of decorated whorls.
4. O. Frödin and A. Persson 1938 op. cit., p. 252, Fig. 177, third from left in row of decorated whorls.
5. O. Frödin and A. Persson 1938 op. cit., p. 252, Fig. 177, second from left in row of decorated whorls.
6. N. Valmin "The Swedish Messenia Expedition", 1938, Fig. 71A, first, second and third on left.
Greece, and then seems likely to be Middle Bronze Age or later at two Peloponnesian sites (Asine, Malthi), a theory that these whorls, like the clay anchors, worked gradually southwards, seems plausible. One of the Malthi whorls (Fig. 61c) is almost identical both with one of the Bulgarian ones (Fig. 61d), and with one of the Macedonian ones illustrated by Rey.

5) Domed Whorls. The old Early Helladic domed whorl (page 199 ff. above) occasionally survived into the Middle Bronze Age. It continued at Eutresis. There were two, together with a cylindrical loomweight, in a grave at Corinth, and one incomplete one has been found at Nichoria (Fig. 61f). The latter is interesting when it is remembered that Early Bronze Age clay anchors were also found in Middle Helladic contexts at that southerly site (page 243 above).

Other domed middle Helladic whorls of a slightly different type, are discussed in the following paragraphs.

6) Hollow-topped Whorls. Whorls were found at Eutresis, Athens, and Zygouries which resembled the Early Helladic domed whorls, but with one notable difference - they had hollow tops.

It is difficult to determine whether this feature

2. H. Goldman "Excavations at Eutresis in Boeotia", 1931, p. 192, Fig. 265, Nos. 4 - 5.
4. N.185, from an M. H. II stratum, like the anchors. I should like to thank Prof. W. A. McDonald of the University of Minnesota for permission to include it is the thesis.
5. H. Goldman 1931 loc. cit.
is significant or not, because of the insufficiency of closely dated evidence. An Early Helladic domed whorl with a slightly concave top is known from Corinth (page 199 above, Fig. 28e), and two others (undated) have been mentioned from Lerna (page 200 above). All the Early Helladic domed whorls of Eutresis had flat tops (‘bases’) except one, which had the centre hollowed out to a depth of 1.5 cms. The hollow-topped domed whorl from Servia, a site with no Middle Bronze Age remains, may be recalled (page 202 above, Fig. 26a, Pl. XXXd, left); and all the whorls of Early Bronze Age Armenochori, whether domed or conical, had hollow tops ( pages 202, 205 above, Fig. 25w - z, aa).

Two whorls with hollows, but otherwise undefined, are mentioned in a preliminary report on one of the Middle Helladic tumuli at Marathon.

In another direction, there are the pre-Mycenaean whorls of the earliest excavations at Phylakopi, which had the form of a low cone with convex sides, often with a hollow; there are six of the same kind among the whorls from the 1911 excavations, another six similar, but with almost straight sides, and many plain biconical examples with hollow tops, often formed from fine, well-smoothed grey clay. Two of the very low conical, or very asymmetrical biconical

1. H. Goldman "Excavations at Eutresis in Boeotia", 1931, p. 192, Fig. 265, No. 7.
4. Stored in the museum at Plaka, Melos. ‘Many’ of the biconical type means at least twelve individually recorded in my notes, but the actual number is probably above 30. I did not realise when studying the whorls that the hollow top would prove to be significant.
whorls with hollow tops are illustrated from Malthi (Fig. 62 D, Nos. 5 - 6).

There are therefore three areas where hollow-topped whorls may have originated. The feature could have developed from the slightly concave tops occasionally seen on Early Helladic whorls (e.g. Fig. 28e); it could have been derived from the north (Armenochoori, Servia); it could have arrived, like the scodelletta whorls, via the islands. Although it is difficult to distinguish between a slight concavity of outline and a hollow top in theory, there is a clear difference in practice, and I do not believe that the hollow tops were an indigenous development. Both the other theories, however, probably contain a measure of truth.

It is possible that we are dealing with not one but two classes of hollow-topped whorl. Those from Malthi and Phylakopi, despite the slight ambiguity in the date of the former, and the almost total lack of dating for the latter, have the appearance of plain 'poor relations' of the scodelletta whorls. Those from Eutresis, Athens and Zygouries, however, look like derivatives of the "typical Danodric form" of whorl at Early Bronze Age Armenochori.

The latter group once again suggests a slow drift from the north. The whorls at Armenochori are Early Bronze Age. A whorl from Servia closely resembles the E. H. II domed whorls of the Peloponnese, but has the hollow top which is a feature of other Early Bronze Age whorls to the north. One example of the Armenochori type of whorl is found as far

1. N. Valmin "The Swedish Messenia Expedition", 1938, pp. 335 - 336, Fig. 71D, second and third from right.
south as Eutresis in the Early Helladic period, and several occur there in the Middle Helladic period. Finally the type is found in good Middle Helladic contexts at Athens and Zygouries.

Were there more evidence, this hypothesis would be stronger, but when the similar histories of the clay anchors and the incised conical whorls are considered in conjunction with it, it is not unimpressive.

The reason for hollow tops in whorls is an enigma. It cannot be for convenience in the making, because they are quite difficult to fashion; the hollow may perhaps aid rotation a little, but not to any significant degree (page 362, note 1, above). The hollow would allow a little extra thread to be wound on the spindle - but again, scarcely a significant amount. It is unlikely that such a feature would exist without cause, but the motive remains obscure.

7) Cylindrical Whorls. The cylindrical whorl found at Agios Kamas demonstrates the continuing use of a type that was known at both this and other northern sites in the Early Bronze Age (page 209 ff. above, cf. Fig. 24bb, cc). One, said to be Middle Helladic, is illustrated from Asea, and several nearly approaching the type, from Malthi (Fig. 62 A, No. 6, E, No. 6, F, No. 1).

8) Flat Whorls. Grey Minyan pottery found in the

2. Erik J. Holmberg "The Swedish Excavations at Asea in Arcadia", 1944, p. 117,ff., Fig. 113, No. 22.
3. E. Valain "The Swedish Messenia Expedition", 1938, pp. 335 - 336, Fig. 71A, second from right, E, right, F, left.
third period at Lianokladhi makes it likely that the middle
Helladic period was well established - yet among the finds in
the house were flat whorls, which perhaps represent the con-
tinuation of the old Neolithic tradition in the area (page
147 ff. above). All the whorls found at Zerelia save two
were flat, and if any of these came from the latest levels, it
would reflect the same situation.

9) **Unusual Whorls.** As well as providing examples
of nearly every type of whorl found anywhere in Middle Bronze
Age Greece, Malthi produced one which seems to be exclusively
its own, shaped like a round-bottomed flask (Fig. 62F, Nos.
3 - 6). Schliemann found some somewhat similar ones at
Troy, but the resemblance is not close.

Among the whorls from the 1911 excavations at Phy-
lakopi is a wide, very low conical one made of fine, pale
clay, decorated with six ray-like lines in dark paint on its
flat upper surface. Its fabric and decoration suggest that
it may belong to the period under consideration.

10) **Sherd Whorls.** Whorls made from discarded
potsherds continued to be used. There are some interesting
examples from Nichoria, where, despite the fact that the site
does not appear to have been inhabited in the Early Bronze
Age, the Middle Helladic population made whorls out of

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3. N. Valmin "The Swedish Messenia Expedition", 1938, pp. 31, 335 - 336, Fig. 71F, four on right.
5. In the museum at Plaka on Melos. Dia. 6.0 cms., ht. 1.2
   cms., Hole Dia. 0.7 - 0.8 cms. No. 463.
of Early Helladic pot bases, which are certainly very suitable for the purpose.

11) A Bone Whorl. A bone whorl of the type more commonly found in the Early Bronze Age (page 218 above; and cf. Fig. 40e) was reported from a Middle Helladic context at 2 Asine.

12) Steatite 'Whorls'. Although these objects were known in Crete from the Early Minoan period onwards, they are not usually found on the mainland until L. H. III. At Kirrha, however, there were a number in graves dating to the later years of the Middle Helladic period. As well as the usual conical and truncated conical shapes, there were biconical and cylindrical examples. The fact that only one was discovered in each grave led the excavators to suggest that they might have served as cloak buttons, or perhaps amulets.

b) Loomweights and Looms.

The most interesting thing about Middle Bronze Age loomweights is that there are so very few of them.

One pyramidal/conical weight was found at Vardaroftsa (Fig. 63t, Pl. XXXIV, No. 12), proving that the type was in use at that site in all three phases of the Bronze

1. E. g. N. 378, N. 989, N. 1565. I should like to thank Prof. W. A. McDonald, of the University of Minnesota, for allowing me to experiment with these, and include them in the thesis.
Age. Its low-set hole recalls the other type of weight used at Troy VI beside the 'Minoan' flat discoid one; this was a well-defined, tall, narrow pyramid with a horizontal piercing about half-way up its length.

It is claimed that pierced pear-shaped objects were found in both Middle and Late Helladic levels at Eutresis; but the one illustrated (Pl. XXXIIIc, No. 1) has the appearance of a conical loomweight of the classical or Hellenistic period; and two piriform weights from Malthe are certainly of that date.

Two cylindrical weights found in middle Helladic levels at Eutresis support the whorls' evidence that some of the district's older stock survived the disaster at the end of E. H. III. The same remark applies to a "large spool" found in the Middle Helladic grave which had the two domed whorls at Corinth. A cylindrical weight from Asea, which

1. W. A. Heurtley and R. W. Hutchinson, E.S.A. Vol. XXVII, 1925-1926, pp. 38 - 39, Fig. 24, No. 12; W. A. Heurtley "Prehistoric Macedonia", 1939, Fig. 83t.
3. H. Goldman "Excavations at Eutresis in Boeotia", 1931, p. 192, Fig. 266, No. 1. The larger conical object, Fig. 266, No. 5, is not pierced right through, and is therefore not a loomweight.
5. Cf. Gladys R. Davidson "Corinth Vol. XII - The Minor Objects", 1952, p. 149, Fig. 23, especially types IX and X. Note also p. 154, Fig. 25, No. 1145 (a loomweight on a stamp on a loomweight) as a parallel for the Malthe loomweight with the raised base.
6. H. Goldman 1931 op. cit., p. 192, Fig. 266, Nos. 3, 6.
7. Theodore L. Shear, A.J.A. Vol. XXXIV, 1930, p. 408 and Note 4. The reason for supposing that the "large spool" is a loomweight of the cylindrical type is that the comparison quoted from Korakou is an illustration showing three whorls and two pierced cylindrical weights (Pl. XXXIc, this thesis).
8. Erik J. Holmberg "The Swedish Excavation at Asea in Arcadia", 1944, pp. 119 - 120, Fig. 114, No. 1.
is mentioned among the Middle Helladic whorls, may be of this period, but if it is assigned to it on style alone, as seems possible from the text, it would be better classified as Early Helladic.

A warp-weighted loom was certainly in existence in the Middle Helladic period in the Lianokladhi III house - but its eleven spherical loomweights were of an Early Bronze Age type (page 223 ff. above; Pl. XXXIVa).

"Three heavy lumps of clay, which were too much weathered to be identifiable" are recorded from the lowest level of the apsidal-ended house A2 at Malthi. Valmin thought that they could have been very primitive whorls or net-sinkers, and the former suggestion implies a rounded shape with an approximately central hole, so it is just possible that these may have been loomweights of the Lianokladhi type.

That completes the list. There is thus firm evidence for three warp-weighted looms in Middle Bronze Age Greece - one at Vardarofitsa, one at Lianokladhi, and one at Eutresis. All three were using weights of Early Bronze Age types. Even if one allows a loom each to Asa and Malthi (but not to Corinth, for no textiles are produced in the tomb), the number is so small that, were it not for the hundreds of whorls, one could develop the erroneous impression that most of the population must have been dressed in skins.

One site, Malthi, demonstrates the situation very well. Over three hundred and fifty whorls were found, of which the majority are likely to have belonged to the Middle

Bronze Age, so that considerable quantities of thread were being produced. The fact that numbers of whorls were often found in one room may even indicate that there was some organisation of production; yet the only evidence for cloth-making at the site consists of three doubtful lumps of clay.

There are three possible explanations. The first is that the apparent dearth of Middle Helladic weights is owing to chance. This seems unlikely; sufficient excavation has taken place by now for weights to have been found if they existed. The second is that the weights did exist, but were of such poor quality that they have not survived, or have been thrown out, unrecognised, as lumps of mud. This is not impossible, and certainly "lumps of baked clay" are recorded in two other instances at Kalthi. The third is that the Middle Helladic newcomers did not use the warp-weighted loom.

This also seems unlikely, for the warp-weighted loom was in use in contemporary countries all around Greece - to the north, in Anatolia, in Crete. Furthermore, scodelletta whorls were used in the same levels as conical and tall oblong weights in Troy II - V, and flat discoid weights and pyramidal weights with Greek-style Grey Minyan pottery in Troy VI (pages 228 - 229, 235 - 236, 285 - 286, 401 above). No loomweights, however, were found at Anau.

If, for the sake of argument, it be assumed that

1. N. Valmin "The Swedish Messenia Expedition", 1938, pp. 29, Fig. 8; 31, 35, 41, 50, 87, 91, 93, 104, 137, 142, 147, 158, 160, 336.
The middle Helladic people were using another kind of loom, the only other major type known in the contemporary world was the horizontal ground loom, for the earliest record of the vertical two-beam loom is in Egyptian wall-paintings of the XVIIIth Dynasty (page 89 ff. above).

The horizontal ground loom was, and still is, the most convenient loom for a nomadic or semi-nomadic people. Despite its low and apparently awkward working position, it seems to be an efficient machine, for the very fine linen of early Egypt was produced on it. The only archaeological remains which might be expected, however, would be two pairs of postholes some distance apart, and a pair of stones between them (page 87 ff. above).

c) Pierced Spools or Reels.

Although, for the reasons given above, the use of the horizontal ground loom in middle Helladic Greece seems rather unlikely, there is a typically middle Helladic terracotta object which gives some support to such a hypothesis. This is a clay reel, not unlike a modern cotton reel in form, and readily distinguishable from the clay 'spools' which are found from the Early Neolithic period onwards (page 123 ff. above). The most important difference is that these reels are pierced longitudinally; in addition, they have narrow 'waists' and flaring ends, which are generally a hollow cup or bell shape, but sometimes flat (Fig. 63a - c; Pl. La). Sometimes they are made in grey or yellow minyan fabric; sometimes of brown, buff or orange clay with a thin black

wash; and, on Melos, of pale clay decorated with dark paint. All are carefully formed, well fired, and, almost invariably, very smoothly finished.

As usual, there are very few of these reels that can be closely dated, but there are none which can be proved not to belong to the Middle Bronze Age, except in the far north.

No fewer than thirty-six of these reels were found at Lerna, and "considerable numbers" are mentioned in a preliminary report as coming from Middle Helladic levels (Fig. 63b, c). Approximately the same number have been found at Aghia Irini on Kea, of which some at least are certainly of Middle Bronze Age date; three variations on the theme are shown in Pl. La. No date is available for the twenty reels found at Phylakopi, but the fabric and the unique decoration in dark paint (Fig. 63a) suggest the Middle Cycladic period. Beside the ray-like ornament mentioned in the excavation report, other fragmentary examples show the stacked arcs and cross-hatched (?) triangles.

These reels are unusually well-attested in the west. There is a probable example at Olympia, although only the shaft remains. The two found at Pelikata on Ithaca

1. J. L. Caskey, Hesperia Vol. XXVI, 1957, pp. 146, 147, 148, Fig. 3.
3. I should like to thank Prof. J. L. Caskey of the University of Cincinnati for allowing me to study both the Lerna and the Aghia Irini reels and include them in the thesis.
5. On display in the National Archaeological Museum, Athens, Case 64, bottom shelf. There is also one plain example in red fabric.
were both from Area IV, the area which had the site's greatest quantity of Minyan sherds. A number of fragments, both shafts and flaring ends, occurred in Middle Helladic graves as well as less closely dated contexts on Leukas. They were numerous at prehistoric Dodona, which may be contemporary with Middle Bronze Age Macedonia; and, curiously enough, there appears to have been one, of grey clay, from Aphiona on Corfu, although the remains of the site are usually classified as Sub-neolithic/Early Bronze Age.

In central Greece, a reel was found at Eutresis, (Pl. XXXIIIC, No. 2), and although the excavator thought it was probably Early Helladic, she noted that it came from a level in which there were some Middle Helladic sherds. Another was found in the Lianokladhi III house.

Further north, the reels were characteristic of the Third and Fourth periods at Sesklo, and two were found in Middle Bronze Age graves. Others occurred in "Middle Thessalian" contexts in both a burial and a dwelling at Petra, on Lake Karla. No date is mentioned for two from Tsangli, but one from Tsani is said to be from "early strata". One

1. W. A. Heurtley, B.S.A. Vol. XXXV, 1934-1935, p. 35, Fig. 30, Nos. 142, 143.
2. W. Dürpfeld "Alt-Ithaka", 1927, p. 284, Par. 2, Pl. 59a, three on right in bottom row; Pl. 73, No. 12.
5. H. Bulle, Ath Mitt. Vol. LIX, 1934, p. 167, Fig. 4, No. 20.
6. H. Goldman "Excavations at Eutresis in Boeotia", 1931, p. 193, Fig. 266, No. 2.
8. G. Tsountas, Δ. Σ. 1908, pp. 132 - 133 (Tomb 7), 146 (Tomb 53), Fig. 31; A. J. B. Wace and M. S. Thompson 1912 op. cit., pp. 66, 68, 73.
9. V. Miloječić, Arch. Anz. 1960, p. 159, Fig. 8a, f, g.
is reported from an Early Bronze Age level at Vardaroftsa, 1
and, oddly, four from the Late Bronze Age or later.

At Therma on Lesbos, one of these reels was found in a Middle Bronze Age context, and similar ones are mention ed in the same report as having been seen in the museum Lemnos. 2 Reels of characteristic grey clay, with incised decoration, were found in Schliemann's Sixth City at Troy.

There do not seem to be many parallels for these reels beyond the Aegean area, so it is interesting that there should be one from the Cernavoda culture in Romania, 3 for Cernavoda grey ware is thought to be related to the grey ware of Troy II - V, of Greece, and perhaps even to the grey ware culture of northern Iran. Like the Trojan reels, the Romanian one has incised decoration.

These reels, so explicit in form, must have been made for a set purpose.

A modern cotton reel has a central hole so that it may rotate round a small rod on a sewing machine. If it did not have to be placed on this rod - if its function were merely to hold thread - there would be no need of the central hole. One of the Lerna reels, L5.155, is conveniently broken in half lengthways, so that the interior surface of the

1. W. A. Heurtley and R. W. Hutchinson, B.S.A. Vol. XXVII, 1925-1926, pp. 35 - 36, Fig. 21, Nos. 17, 18.
2. W. Lamb "Excavations at Therma in Lesbos", 1936, p. 204, and Note 3, Pl. XXIV, No. 32.2.
3. W. Dürpfeld "Troja und Ilios Vol. I", 1902, p. 400, Fig. 394; Hubert Schmidt "Schliemann's Sammlung", 1902, p. 299, 8439 - 8445.
4. D. Berciu "Contributii la Problemele Neoliticului in Romania in Luminca Noilor Cercetari", - , p. 525, Fig. 280.
perforation may be seen, and this shows faint wear marks of the type to be expected if the object had had to revolve around something, such as a stick or a piece of cord.

Although it is fast disappearing, there is still to be found in Greece today a device for the preparation of warps, called a θηναία or κλωγέ - a warping-creel, warping-frame or spool-rack. In its simplest form, this consists of a wooden rod stuck into a crack between stones in a wall, so that it juts out horizontally. To this three ropes are attached, each weighted with a piece of old iron or a stone. Crosspieces, either of cord, or of thin wooden or iron rods, are attached to the ropes, so the effect is that of a double rope ladder - and on each of the 'rungs' is mounted one or more spools of thread (Pls. Lb, c, Lla, b). The spools used today are usually lengths of hollow cane (Pl. Lla, b), but wooden reels very similar to the Middle Helladic clay ones are sometimes seen (cf. Pl. La, centre reel, with the spare empty reels in Pl. Lb, and with those left centre in Pl. Lc).

A θηναία holds twelve or more reels, and the threads are drawn off in a bunch, to be passed round a revolving drum in more sophisticated circumstances (Pl. Lc), but round a series of shorter pegs stuck in the wall in simpler practice. The purpose is the same in either case - to measure off the correct length of warp. When this has been done, the threads are cut, and a new bunch drawn from the reels - and so on, until sufficient warps of the desired length are obtained. The division of the warps into two groups (page 85 ff. above) can also be made at this stage. As the warp threads are drawn off, the reels naturally re-
The *šášep* found in Greece today are being used to prepare warps for horizontal pedal looms. They were employed for the same purpose in mediaeval Europe, and Marta Hoffmann points out "we may perhaps assume that any system of warping with a number of threads at a time.....belongs to the horizontal loom and to warping for long lengths" - in other words, a *šášep* would be of no use to a weaver using a warp-weighted loom, the warp for which is prepared in an entirely different manner (page 93 ff. above, Fig. 8b).

Warping-frames are known to have been used in conjunction with the horizontal ground loom in Egypt. In the Middle Kingdom model of a weavers' shop (page 88 ff. above, Pl. VIb), the pegs stuck into the wall at the far end have warp threads passed round them which are already divided into the two necessary groups; and in a spinning and weaving scene from the tomb of Tehuti-Hetep, two workers (one very fragmentary) are shown drawing off threads.

1. I have never had the good fortune to see a *šášep* in operation, largely because it is now possible to buy 'ready-made' warps, measured, and with the 'crossing', or division of threads into two groups, prepared. I have seen the simpler 'wall' *šášep* in Poteino, Epirus, and Tylissos, Crete, the former belonging to one family, the latter situated in the churchyard, and used by anyone in the village at need. I should like to thank Mrs. I. Vrentzou, of Tylissos, and her daughters, for explaining the use of the *šášep* to me, and for demonstrating the warping-up of their horizontal loom. I have seen the more sophisticated wooden frame *šášep* with the rolling drum in a private house at Eretria, and in the convent of the Good Sisters at Kalamata. I should like to thank the Sisters for allowing me to photograph their *šášep*, and for their kind explanations and demonstrations of many textile processes.

2. Marta Hoffmann "The Warp-Weighted Loom", 1964, p. 275; see also pp. 269, 296, Fig. 111, No. 5 on p. 273. The underlining is mine.
from warping frames which hold twelve balls or spools each (Fig. 62g).

There is no way of proving that the Middle Helladic clay reels were used in warping-frames, but it is a reasonable theory which provides an explanation for the particular form of the objects. If the theory is correct, the absence of loomweights combined with the presence of a tool which is associated with horizontal looms is of obvious significance.

d) Bone Pins.

The smoothly-polished bone pins with carved heads that are frequently found in Middle Helladic contexts, are only possibly and indirectly concerned with textiles, in that they may have been used to fasten clothing. If they did serve this purpose, it indicates that thick, comparatively coarse cloth was being woven, for, with an average diameter of 0.4 - 0.6 cms., the finest fabric the pins could penetrate without damage would be like that seen in Pl. LIIa. Such cloth is very likely to have existed in the form of cloaks and other coverings, the most suitable material being wool. Greek winters, though short, are to be respected, and this fact, as well as the presence of the bone pins, makes the existence of woollen homespun a virtual certainty. Finds in Grave Circle B at Mycenae, however, prove that it was not the only type of cloth available.

1. Percy E. Newberry "El Bersheh (Part I - The Tomb of Tehuti-Hetep)", 189-, Pl. XXVI.
2. E.g., J. L. Caskey, Hesperia Vol. XXIV, 1955, p. 21, Pl. 47a - d.
3. This has a thread count of 8 warps x 3.5 wefts per sq. cm. (20 x 9 per sq. in.), and it was just possible to fasten it with the bone pin illustrated, which was 0.6 cms. in diameter. (The pin is No. M.57 in the collection of the British School at Athens, and I should like to thank the Director, Dr. H. W. Catling, for permission to photograph it.)
e) Cloth.

The recently published Grave Circle B at Mycenae was in use during the century that saw the final years of the Middle Helladic period, and the beginning of the Mycenaean Age. The tombs it enclosed are divided into five chronological groups, of which the first three contain remains which, on the whole, pre-date the finds from Schliemann's Grave Circle A. Cloth remains were found with five of the Grave Circle B burials, in Tombs Alpha, Beta, Gamma, Delta and Nu, and of these, Tomb Alpha belongs to the oldest group, Tombs Beta and Nu to the third oldest group, Tomb Gamma to the fourth group, and Tomb Delta to the fifth group. The cloth from Tomb Alpha, therefore, certainly falls within the Middle Helladic period, and that in Tombs Beta and Nu may also do so.

All the cloth remains are in fine, plain weave, and are now stained green from the bronze weapons round which they were wrapped; the original colour was probably plain white. The cloth, possibly oiled, was wrapped round the weapons to preserve them, and it is poetic justice that they

2. George E. Mylonas 1973 op. cit., Tomb Alpha, pp. 22, 32, Pl. 20g; Tomb Beta, p. 38, Pl. 25; Tomb Gamma, p. 49; Tomb Delta, p. 88; Tomb Nu, pp. 171, 172, Pl. 150w, z; also pp. 314, 326; see also George E. Mylonas and John K. Papademetriou, Archaeology Vol. 8, 1955, p. 44, Figs. 3, 5; J. Papademetriou, Praktika 1953, p. 223, Fig. 15; George E. Mylonas "Mycenae and the Mycenaean Age", 1966, p. 102.
3. Some large pieces are on display in the National Archaeological museum, Athens, in the Mycenaean Room, Case 5, wrapped round weapons with Cat. Nos. 8591, 8589, 8592.
in turn should have preserved the cloth.

The oldest fragments, those in Tomb Alpha (Pl. Llib), have an approximate thread count of 10 x 14 threads per sq. cm. (25 x 35 per sq. in.), which is very similar to that of the Kephala cloth impressions (page 160 above), while those from Tomb Beta, with a count of 12 x 15 cms. per sq. cm. (30 x 38 per sq. in.) are very slightly finer (Pl. LlIc).

f) Linen and Wool.

The cloth found in Grave Circle B is said to be of linen, and the nature of the weave, the thread counts, and the smoothness of both individual threads and the surface of the fabric, much of which is quite well-preserved, all tend to confirm this, as does the microscopic examination to which the remains from Tomb Alpha were submitted.

The fact that it has only been found in a context belonging to the final years of the Middle Helladic period, when the alchemy which was to convert its comparative poverty to the riches of the following Mycenaean Age was already at work, might suggest that the fabric was imported, distant Egypt being perhaps the most likely source; and there are suggestions of contact with that country at this time. It is equally possible, however, that flax was being grown, and linen woven, locally. Ever since the closing years of the Neolithic era, there had been slight, but persistent indicat-

2. George E. Mylonas 1973 op. cit., p. 22, Pl. 20g; J. Papa-
demetriou, Praktika 1951, p. 203.
ions that this might be the case - the cloth impressions of Kephala, which had at least the appearance of linen (page 162 above), the flax seeds of E. H. II Lerna, and the scrap of cloth on the Amorgos dagger (page 249 above). Necessity obliges nomadic people to dress in wool, as that is the only textile fibre that travels on its own feet; and therefore the Middle Helladic people, when they first entered Greece, may well have been wearing woollen cloth. It is unlikely, however, that at such a comparatively late date they would have been unaware of the existence of flax, and if, when they arrived in the country, they found linen cloth being produced, nothing is more probable than that they would have adopted the art from the older inhabitants, with whom, by the time the tombs in Grave Circle B were being dug, they would have been thoroughly integrated.

Conclusions about textile production in middle Bronze Age Greece are as nebulous as a landscape seen through shifting mist, and the paths of prose are bestrewn with 'ifs' and 'possiblys'.

It is reasonable to imagine the population dressed in undergarments of fine linen, and outer wear of thicker woollen cloth, perhaps fastened with bone pins, but we do not know what form those garments took, or whether there was patterned cloth as well as plain. If patterned cloth did exist, its designs, like those on matt-painted pottery, may well have been confined to very simple geometric motifs.

A small proportion of the age's cloth was woven on warp-weighted looms equipped with the weights of a by-gone
era. The rest of it may have been so produced, although present evidence does not support such a conclusion. The alternative is that it was being made on a loom which left no recognisable archaeological remains, the horizontal ground loom being the likely candidate. Pierced clay reels, if they were indeed used on warping-frames, increase this possibility, which otherwise depends on negative rather than on positive evidence.

It may also be lack of information which conveys the impression that cloth production was on a very homely basis, each family providing only for its own requirements. The only suggestion of organisation on a larger scale comes from malthi, where numbers of ten or more whorls in a single room caused Valmin "to see in such collections either the 'store' of some manufacturer or salesman, or the instruments used by some number of women (slaves?)."

Spindle whorls are the most interesting objects in the Middle Helladic textile repertoire, not so much for the part they played in the production of thread, as for the light they cast on the origins of the Middle Helladic people. The sites in which the different types are found form a cruciform pattern on the map of Greece. The clearly defined east-west lateral bar is marked by the distinctive scodelletta whorls, but there are also less clear-cut, but recurring indications of an 'upright' extending from north to south.

This north-south distribution pattern is repeated by a number of different whorls and other artifacts, and although none would be convincing alone, together they assume

significance. Plain biconical whorls, though known in earlier periods, increase in numbers in the Middle Bronze Age north, and are seen again in the 'bald patch' from which they were missing in central Greece in the Early Helladic period (pages 390 - 393 above); conical whorls with incised tops, found in Early Bronze Age Bulgaria, have extended to the Peloponnese by the Middle Helladic period (pages 394 - 395 above); plain domed or conical whorls with hollow tops, used in the Early Bronze Age far north, also move southward to central Greece and the Peloponnese, where they are found in Middle Helladic contexts (pages 397 - 398 above); clay reels, known from the Cernavoda culture in Rumania (page 407 above), occur early at Vardaroftsa (pages 406 - 407 above), and perhaps at Aphiona on Corfu (page 406 above), and these, taken in conjunction with the Eutresis reel which was thought to be Early Helladic, but found in a level in which Middle Helladic sherds were already appearing (page 406 above), may indicate a southward progression. Finally the clay anchors, whether they were concerned with weaving or not, demonstrate the same southward drift (pages 243 - 244 above). This infiltration from the north would explain certain facets of the Middle Helladic culture which, on present evidence, could not have been introduced from Anatolia, notably the horse (pages 387 - 388 above), which may have been present in central Macedonia in the Early Bronze Age.

On the evidence of textile tools, therefore, the

1. The terminal date of the Cernavoda culture is uncertain - Homer L. Thomas "Near Eastern, Mediterranean and European Chronology", 1967, p. 99 - and the Rumanian reel therefore may not necessarily be older than the Greek ones.
population of middle Helladic Greece was the result of a combination of three major groups: the 'original' Early Helladic people who were already in the country; the scodelletta whorl users, who, though they came via Anatolia, may have originated much farther east, in the steppes of Russian Turkestan; and the inhabitants of the Early Bronze Age north, moving gradually southwards, possibly obliged to do so by pressure behind them.

Now the Early Bronze Age inhabitants of northern Greece, though they do not appear to have used the scodelletta whorls themselves, may nonetheless have been related to those who did. They seem to have entered Greece from the north, and the question is from how much further north - were they too originally from the steppes? Their whorls have two features in common with scodelletta whorls - incised decoration, and hollow tops. The occurrence of the 'scodelletta' stacked chevron design on a conical whorl may be significant (page 394 above, Fig. 61a); and the hollow tops are a very definite feature. It is perhaps worth recalling that hollow-topped domed whorls as well as biconical ones were found in Anau I (pages 373, 374, note 1, above). The 'tent-shaped' weights of Early Bronze Age, West Macedonian Servia (page 227 above, Fig. 37a, b, Pl. XXXVc, two weights on left) were also those of Troy II, III and IV (page 228 above, Pl. XXXVib), levels in which scodelletta whorls were prevalent (page 363 above). Even if scodelletta whorls were the tools of one ethnic subgroup, and the 'tent-shaped' weights those of another, the fact that they were in the same area at the same time is revealing. The 'tent-shaped' weights may have had their origin to the north of both Troy and Servia (page 228 above).
it has been suggested that scodelletta whorls were brought to Greece by an offshoot of the Anatolian branch of the great tree of Indo-European migration (page 359 above). The image must now be extended to include other branches and offshoots of the same tree which penetrated Greece from the north. The two related groups, each probably speaking an Indo-European dialect (or dialects) which would be contributory factors in the formation of the language later to be known as Greek, probably crossed each other's paths in east central Greece, in Boeotia, Locris and Phocis, the area often considered to have seen the development of that peculiarly Greek form of grey ware, Grey Minyan pottery.

The textile tools used in the Middle Helladic settlement at Boeotian Eutresis indicate the synthesis that must have taken place. Cylindrical loomweights and combed whorls bear witness to the survival of the earlier local population; the presence of plain biconical whorls, which were not used at the site in the Early Helladic period, the occurrence of plain whorls with hollowed tops, and the clay reel, may all indicate arrivals from the north, while the scodelletta and related incised whorls represent newcomers from Anatolia.