EXCAVATIONS AT POLATLI

A New Investigation of Second and Third Millennium Stratigraphy in Anatolia.

By SETON LLOYD and NURI GÖKÇE.

INTRODUCTORY. (By S. L.)

IN OUR 1949 BUDGET, the Directing Committee of the Institute put at my disposal a sum of one hundred pounds, for the purpose of an excavation in collaboration with the Turkish Department of Antiquities. On discussing the matter with the Director, Dr. Hamit Koşay, I found that the mound in which he was at the moment most interested was near the small modern town of Polatli, about forty miles from Ankara, on the main railway line to Istanbul. I understood from Dr. Koşay that a large part of this mound had been quarried away by peasants in need of earth for making bricks, and that, as a result, a number of whole pots and metal objects of the Copper Age had found their way to Ankara. I was subsequently shown these objects by Bay Nuri Gökçe, Director of the Hittite Museum, and a few days later visited the site in his company.

The *hüyük*, which takes its name from Polatli (Plate II), is situated on the outskirts of the modern town, near a spring of water. Its height is impressive, though the area which it covers suggests that the ancient settlement which it represents would have been hardly more than a village. Geographically it would be likely to have marked a stage in an important caravan route, skirting the salt-lake depression to the north, which, in the Second Millennium would have carried the Hittite traders westwards from their central province in the Halys area, though whether the Royal Road of later times passed Polatli on its way from Gordium to Ancyra, is still a matter of conjecture. An aspect of the mound, which struck us as of immediate practical interest, was the fact that the process of quarrying had produced on three sides, vertical cliffs, about ten metres high, and in the face of these, one could already see a remarkably clear cross-section of the successive occupations. The " floor " of the quarry was littered with a rich assortment of broken pottery, dating from the Copper Age and Hittite periods. Clearly then, this was the kind of mound from which one might expect only the modest antiquities peculiar to village communities, yet we were much attracted by the opportunity which it offered for an unusually clear stratigraphical check, at a minimum cost.

It was with Bay Nuri Gökçe that I made the final arrangements for a sounding at Polatli, and the direction of the excavations was shared between us, most of the practical organization and liaison with local officials necessarily falling to his responsibility. The Millî Eğitim Bakanlığı, through him, contributed a further twelve hundred Turkish liras, and by the first week in August we were installed in rooms lent us by the local Primary School.

and ready to begin work. The sounding lasted for eighteen working days, during which we employed an average of 35 unskilled labourers and two wall-tracers from the Turkish excavations at Alaca Hüyük.

We should here express our gratitude for much help and kindness received both from the Kaymakam of Polatli, Bay Muammer Tapuçı, and from the Director of Education, Bay Muzaffer Engin.

S.L.

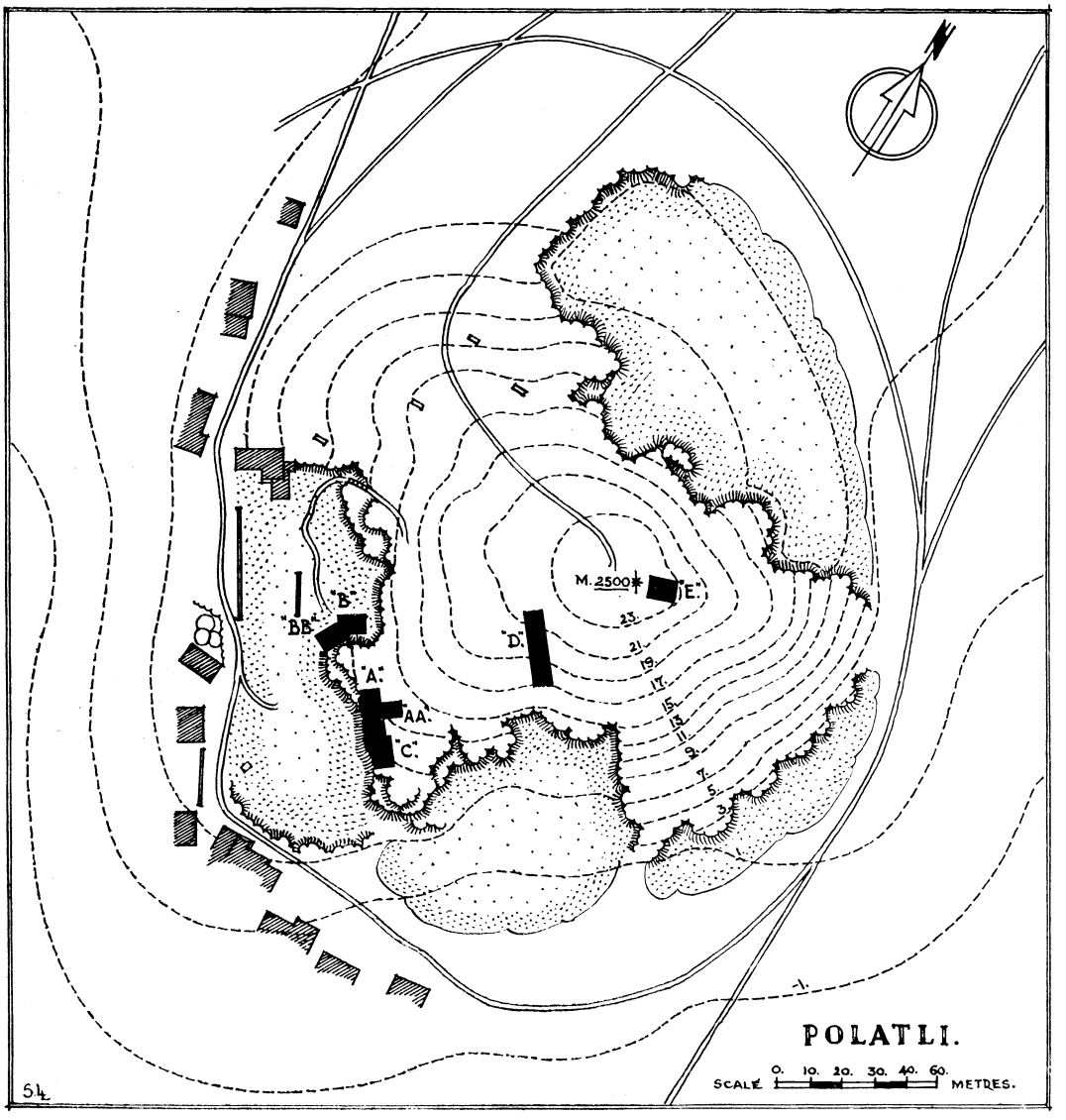


FIG. 1. Plan of the hüyük.

THE TRENCHES.

A series of five stratigraphical trenches were cut, at varying heights in the mound ; at least three, and sometimes four being in operation at the same time. At each building level, the walls and floors of the houses were cleared, and, while the results were being surveyed and photographed, before descending to the next level, the men were moved to whichever

of the other soundings was temporarily unoccupied. The stratigraphy fortunately proved to be uncomplicated and practically continuous ; so that, in the case of each trench, it was possible to carry it down stage by stage to the point where the next lower trench had begun. The lowest trench of all eventually encountered virgin soil, and, about a metre beneath it, the natural water-table (Plate IIIc). It proved to be twenty-four metres from the concrete bench-mark on the summit of the mound to the clean gravel on which the earliest settlers had built their houses.

The arrangement of the trenches was dictated by the formation of the mound, and it was here that the cliff-like quarries proved extraordinarily convenient. For two of the trenches (Trenches A & C) simply formed terraces, at different heights, in the face of the cliff, while the deepest of all (Trench B) was dug into the floor of a quarry beneath. The soundings on the untouched slope of the mound above (Trenches D & E) took the form of ordinary " step-trenches." Another convenience of the quarrying situation was the facilities which it provided for the disposal of excavated earth. From the terraces, the earth was simply thrown over the side into the quarry beneath (Plate IIIa), while that which accumulated beside the other trenches, was removed for us in wagons by the villagers, who were prepared to pay as much as 20 kuruş (6d.) per load for the privilege of taking it away.

The mound, then, represented nearly twenty-four metres of occupational debris ; but, by this rather complex system of excavating, we were able, in the eighteen days at our disposal, to clear and record the thirty-one principal building levels, to obtain plans and photographs of the buildings, where any coherent remains existed, and to accumulate a vast quantity of pottery, which was transferred to the school playground, so that the evenings could be spent in sorting and drawing. As one had half expected, no sensational finds were made, but the pottery, which itself constituted by far the most important result of the sounding, proved extremely rich and informative, and, owing to the stratigraphical continuity, susceptible of the most clear and interesting analysis.

As will presently be seen, our analysis enabled us to divide the occupation of the site into four distinct phases, the first two of which (Levels I-X & XI-XV) represented sub-periods of the Copper Age, the third (Levels XVI-XXII) a period corresponding to the early centuries of the second millennium, which may be called " Cappadocian ", and the fourth (Levels XXIII-XXXI) the true Hittite period.

SCHEDULE OF LEVELS EXCAVATED.

Field Reading	*Revised Reading*		(Concrete survey mark—M.25.00.)
E.1.	XXXI	Pavement at M.24.05.	Surveyed, but not reproduced. Stone pavement and parts of two stone walls.
E.2.	XXX	,, ,, M.23.25.	Surveyed and reproduced.
E.3.	XXIX	,, ,, M.22.75.	,, ,, ,,
E.4.	XXVIII	,, ,, M.22.00.?	Sounding in N. corner of Trench E. Not surveyed.

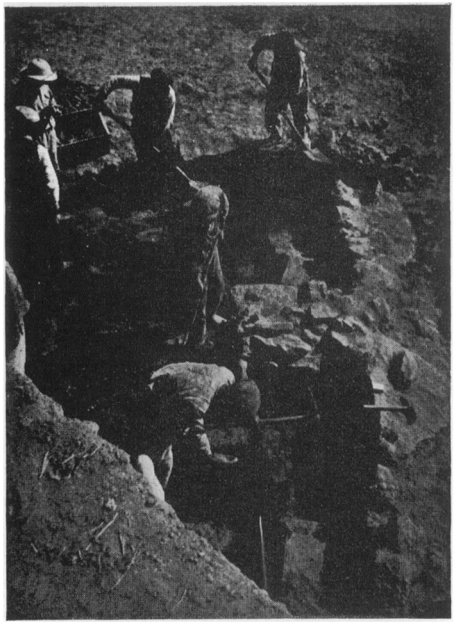
Field Reading	*Revised Reading*			(Concrete survey mark—M.25.00.)
D.1.	XXVII	Pavement at	M.21.25.	No walls. Not surveyed.
D.2.	XXVI	,,	,, M.20.75.	Surveyed, but not reproduced. Parts of two stone walls.
D.3.	XXV	,,	,, M.19.75.	Surveyed and reproduced.
D.4.	XXIV	,,	,, M.18.75.?	No walls. Not surveyed.
D.5.	XXIII	,,	,, M.18.00.	,, ,, ,, ,,
D.6.	XXII	,,	,, M.17.00.	Surveyed, but not reproduced. Parts of three walls.
D.7.	XXI	,,	,, M.16.00.	No walls. Not surveyed.
D.8.	XX	,,	,, M.14.75.	,, ,, ,, ,,
D.9.	XIX	,,	,, M.13.80.	Surveyed, but not reproduced. Part of a well-buiit house.
A.1.	XVIII	,,	,, M.12.75.	Surveyed and reproduced.
A.2.	XVII	,,	,, M.12.35.	,, but not reproduced. Rubbish-pits only.
A.3.	XVI	,,	,, M.11.65.	Surveyed and reproduced.
A.4.	XV	,,	,, M.10.75.	,, ,, ,,
C.1.	XIV	,,	,, M.10.25.	,, but not reproduced. Part of one stone wall and much fallen stone.
C.2.	XIII	,,	,, M.9.40.	Surveyed, but not reproduced. Parts of two stone walls.
C.3.	XII	,,	,, M.8.70.	Surveyed and reproduced.
C.4.	XI	,,	,, M.8.00.	,, ,, ,,
C.5.	X	,,	,, M.7.00.	,, but not reproduced.
C.6.	IX	,,	,, M.7.25.	,, ,, ,, ,,
C.7.	VIII	,,	,, M.6.50.	,, and reproduced.
C.8.	VII	,,	,, M.5.50.?	,, but not reproduced.
C.9.	VI	,,	,, M.5.00.	,, and reproduced.
C.10.	V	,,	,, M.4.25.	Not surveyed. Incompletely excavated. Complex of well-built stone walls.
B.1.	IV	,,	,, M.3.60.	Surveyed but not reproduced. Parts of several walls. Fallen stones and a modern grave.
B.2.	III	,,	,, M.3.25.	Surveyed but not reproduced.
B.3.	II	,,	,, M.2.50.	,, and reproduced.
B.4.	I	,,	,, M.2.25.	,, ,, ,,
		Virgin Soil.		(Water-table at M.1.00 above Datum.)

Architecture and other Features of the Occupation-levels.

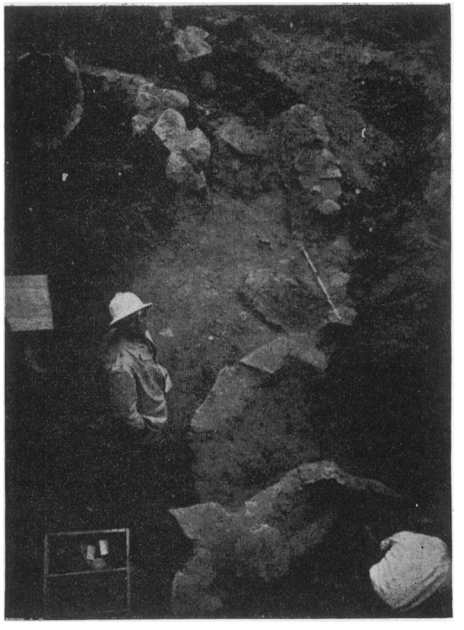
Level I.

Trench " B ", in its original form, encountered one corner of a well-built stone structure, founded directly upon the original virgin soil. The trench was accordingly extended, so that the whole building could be traced (Plate IIIc). It proved to have little character. A rectangle measuring 5.00 x 3.25 metres was enclosed by a stone wall 45 cms. thick, standing half-a-metre high. No traces of any door could be found, nor were there any signs of post-holes indicating roof-supports. The wall at the east end, however, was differently built from the remainder, much larger stones being used ; and it is not impossible that all or part of it constituted a secondary blocking. Outside the building, a few centimetres from its

Air-view of Polatli Hüyük and outskirts of the modern town.

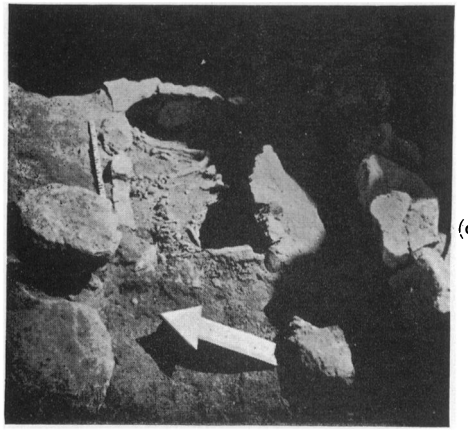


(a)



(b)

(c)



(d)

(*a*) Burnt Building at Level XV.
(*b*) Circular Structures at Levels VIII and IX.
(*c*) Building on Virgin Soil. Sounding to water in foreground.
(*d*) Cist-Grave at Level VI.
(*e*) Shaft-Grave at Level I.

(e)

southern wall, there was a shaft-grave containing a non-adult burial (No. 2 in Appendix I) (Plate IIIe). The body was contracted on its right side, and oriented a few points south of west. There were no objects or pottery associated with it. Also to the south of the building were rubbish-filled holes dug into the clean gravel (Fig. 2).

The building representing *Level II* was situated to the north of that already mentioned, and must have been built while it was still standing, though the level had by that time risen about thirty-five centimetres. It consisted of the much weathered remains of two parallel walls in sun-dried brick, with traces of a reed-strewn floor in between. It is one of the few examples found at this site of a building composed of sun-dried bricks with no stone foundation.

Level III.

A single wall of loose stones was all that remained to mark this occupational level.

Level IV.

This level, being directly beneath the floor of the modern quarry was not reliable for dating purposes, particularly as we discovered in the middle of the sounding a quantity of loose boulders covering a fairly modern grave.

Level V.

This level was excavated during the last few hours of our excavation, and unfortunately no time was left to plan it. We were, however, able to note particularly well-built walls, and to observe elsewhere in the mound, that carefully laid pebble pavements corresponded to this occupation, suggesting that it was a prosperous period.

Levels VI to X.

The corners of two buildings fell within the area of the trench at Level VI. One of these, which was of stone, had been broken through to make way for a burial descending from a higher level. This was a cist-grave measuring 110 x 50 cms. (Plate IIId), and it was lined and sealed over the top with thin slabs of flakey limestone. In this skeleton No. 5 lay partly contracted, on its right side, oriented, like the burial in Level I, twenty degrees south of west. The grave had not become filled with loose earth and was extremely well-preserved. Unfortunately again there appeared to be no accompanying objects or pottery. The grave occurred on the extreme edge of the sounding, and a clear cross-section of the stratification above it could easily be seen in the face of the trench. This showed that it had been sunk down from Level VIII, and, since the intermediate level, Level VII, contained nothing more interesting than a re-building of the earlier brick wall on the southeast side, it is Level VIII which must now be considered (Fig. 2).

In the centre of the sounding we encountered a structure of stone,

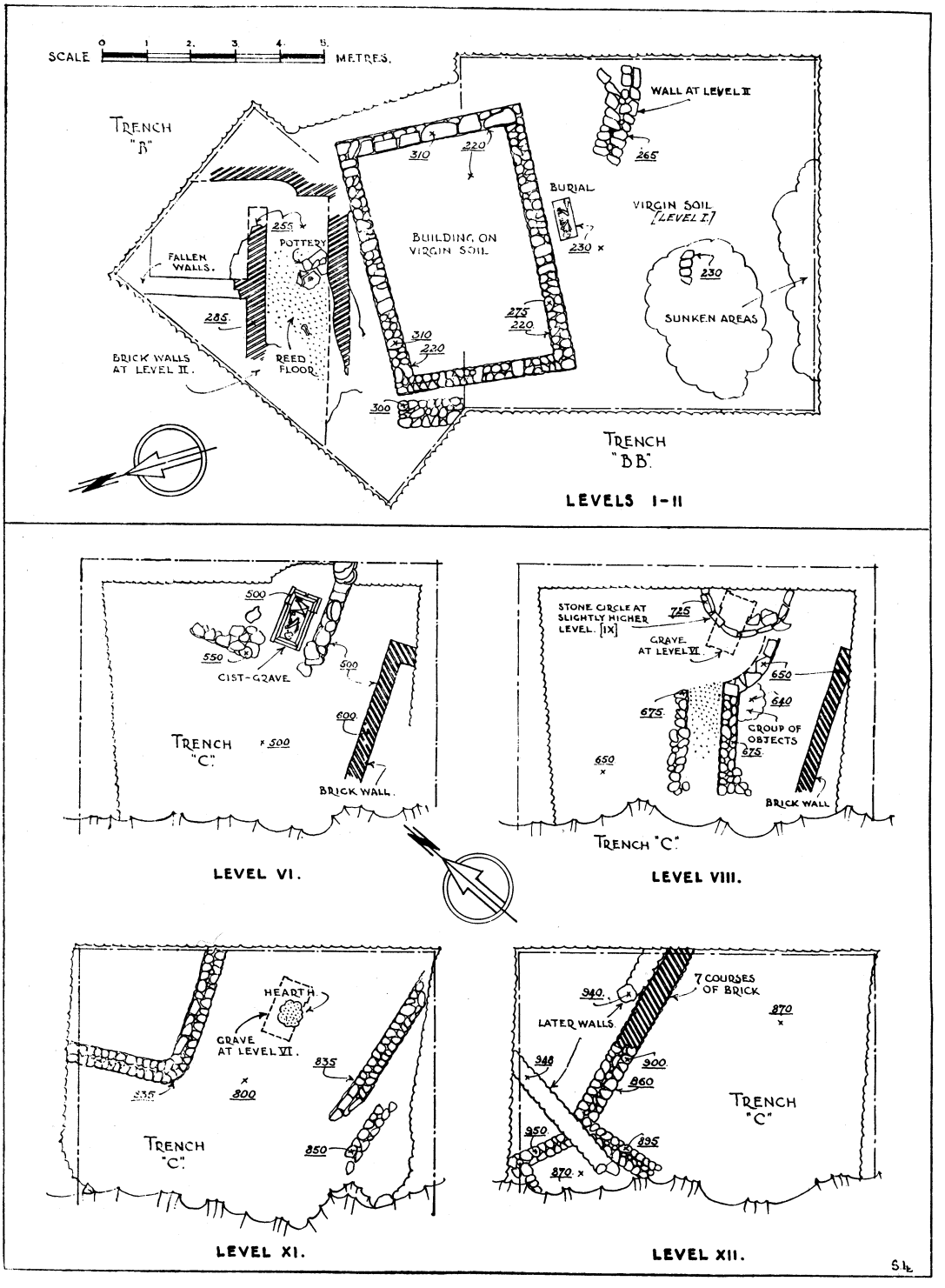


FIG. 2. Plans of Levels I, VI, VIII, XI and XII.

whose shape was at first puzzling (Plate IIIb). After careful clearing, it proved to be the fragmentary remains of a circular building with a narrow " dromos " approach—in fact, something in the nature of a *tholos*. The circular part would have had a diameter of about three metres, and the " dromos ", of which one wall was partially destroyed, was one metre wide and paved with gravel. A great quantity of pottery was found in the vicinity of the building, consisting almost exclusively of the red burnished " local " ware—especially the fine, fluted bowls and miniature pots, while outside the south-eastern wall, in the angle between the curved part and the " dromos ", there was a section of clean pavement, on which lay an interesting collection of small objects. These included a fluted miniature pot, several spindle-whorls of varying shapes (including Nos. 1, 2 and 3 in Fig. 15), with incised patterns, four stone " marbles " and a small flint blade. At the time these were considered to be the discarded playthings of a child, but as will be seen, an alternative significance should perhaps be considered.

When the plan of this level was superimposed on those of the levels beneath, it was discovered that the circular part of the " tholos " was located directly over the grave in Level VI; furthermore in the level above (Level IX) it had been replaced by a circle, about two metres wide, of large stones set up " on edge ". This also corresponded roughly to the original location of the grave; and again above, at Level X, its place was taken by a carefully built stone hearth, filled with ashes.

All this led to a good deal of speculation as to whether the *tholos* could not be some sort of memorial chapel, connected with the burial beneath ; in which case, the group of small objects in the angle of the wall, and even perhaps some of the pottery found in such abundance at this level, might have some votive significance. (Comparable circular structures were found in a Copper Age context at Etiyokuşu.) On the outer edge of the trench at Level VII there was an infant burial in a collapsed amphora, with flat triangular lugs (Group 24). Its orientation was similar to the cist-grave.

Level XI.

There was again a hearth marking the site of the burial at Level XI, and it will be seen from the plan (Fig. 2) that this occurs in a space between two houses, and would therefore be unlikely to have had a normal domestic function.

Levels XII & XIII.

Walls at Level XII, in one of which seven courses of mud brick survived on a stone foundation, are combined in the plan (Fig. 2) with later stone constructions at Level XIII. The early burial was by now forgotten ; a fact which accords well with the cultural change associated with Level XI in the pottery analysis.

Level XIV.

Was the uppermost level in trench " C ", and too near the surface for the finds to be stratigraphically reliable. A single wall fragment occurred

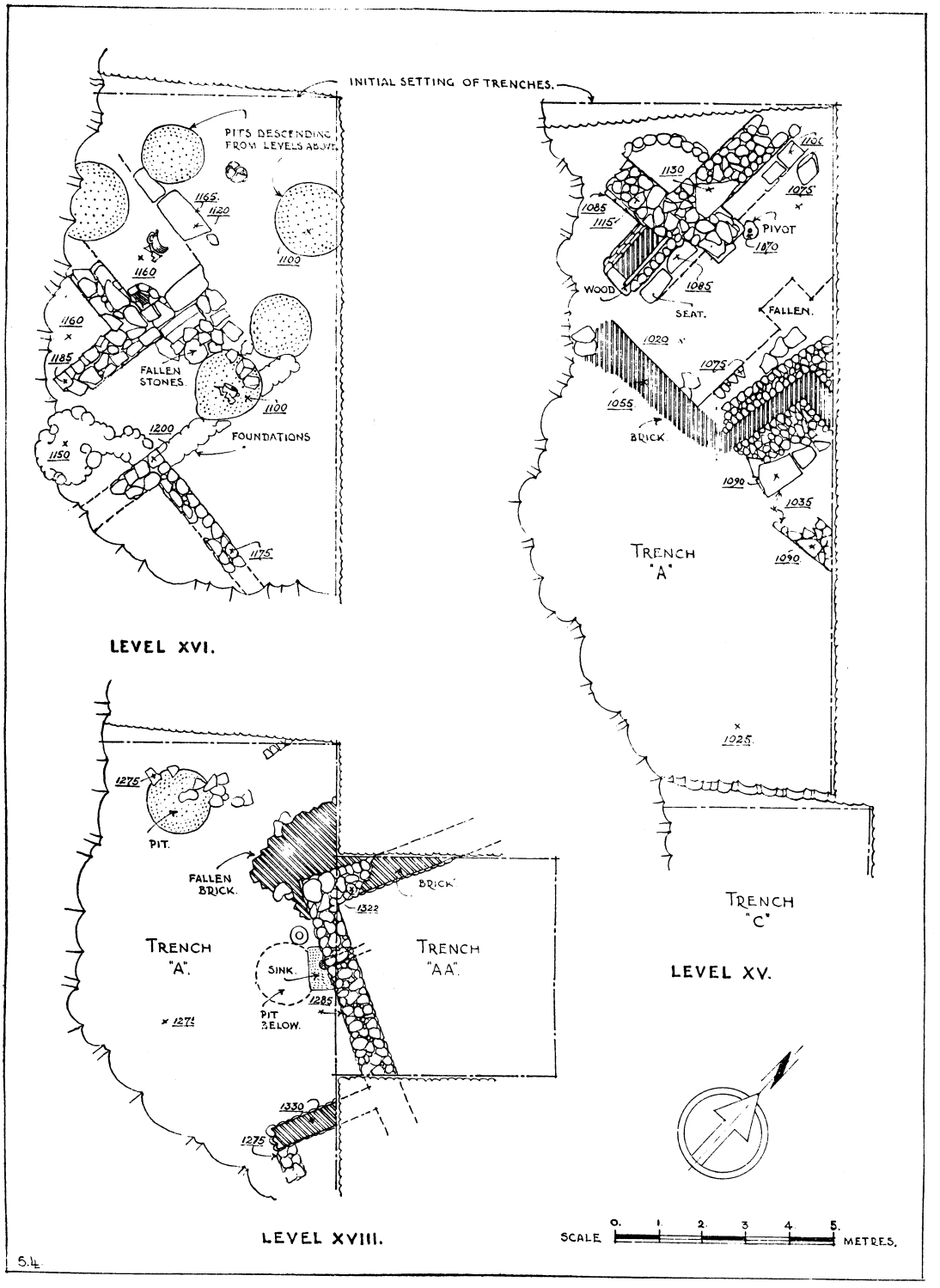


FIG. 3. Plans of Levels XV, XVI, and XVIII.

within the area of the trench, and there was a fragmentary burial among much fallen stone.

Level XV.

At this level (Fig. 3), the entire settlement had been destroyed by fire. Not only were the walls which fell within the area of our sounding (Trench " A ") buried in a mass of burnt debris, but a deep layer of such discoloured earth appeared in the faces of the cliffs created by quarrying, and could be traced all round the mound. In Trench " A ", the debris seemed largely to consist of the scorched and broken remains of a fallen roof, and mixed with it were many fragments of large clay vessels of the amphora type, which may also perhaps have fallen from above. The architectural remains were a little puzzling (Plate IIIa). There was one very substantial wall (1 metre thick), running diagonally across the trench, and standing over half-a-metre high. It was regularly built of stone, some very large boulders being incorporated in it, and showed signs at one end that the upper structure had been of crude brick, reinforced by a wooden beam, layed lengthwise in the thickness of the wall. There was a projecting pier on one side, which had evidently constituted the jamb of a doorway between two rooms, since there was a pivot-stone still in place beside it. Built at its base, inside the rooms, there had been low benches, constructed of large slabs of stone, some of which remained in place. The disconcerting fact was, that the opposite wall of the two rooms, as well as the second jamb of the doorway, had completely disappeared, leaving nothing but a single row of stones to mark the position which they originally occupied. The southern limit of the building was also hard to determine, since it appeared to be interrupted by a mud-brick structure, associated with a neighbouring building somewhat differently oriented. Unfortunately, the restricted area of the trench and the absence of skilled wall-tracers, made a further elucidation of the plan impractible.

Levels XVI, XVII & XVIII.

The stratification in these three levels was much confused by the presence of a number of circular rubbish pits, starting in Levels XVII and XVIII, and penetrating as far as the burnt debris in Level XV (Fig. 3). In Level XVI, there were stone walls belonging to at least two substantial buildings, but their ruins had been greatly interfered with by the pits, which suggested that in the two levels above, the area included in the sounding, represented an open space between houses. Indeed, whereas there were no walls at all at Level XVII, an extension of the trench (" A ") at Level XVIII revealed the corner of a building, substantially constructed of crude brick on a stone foundation and having a drain discharging beneath the wall into a kind of clay sink, from which the water could have soaked away into a pit beneath.

Levels XIX—XXVII.

Of the nine levels encountered in Trench " D ", only one, Level XXV, was of sufficient interest architecturally to justify reproducing the plan

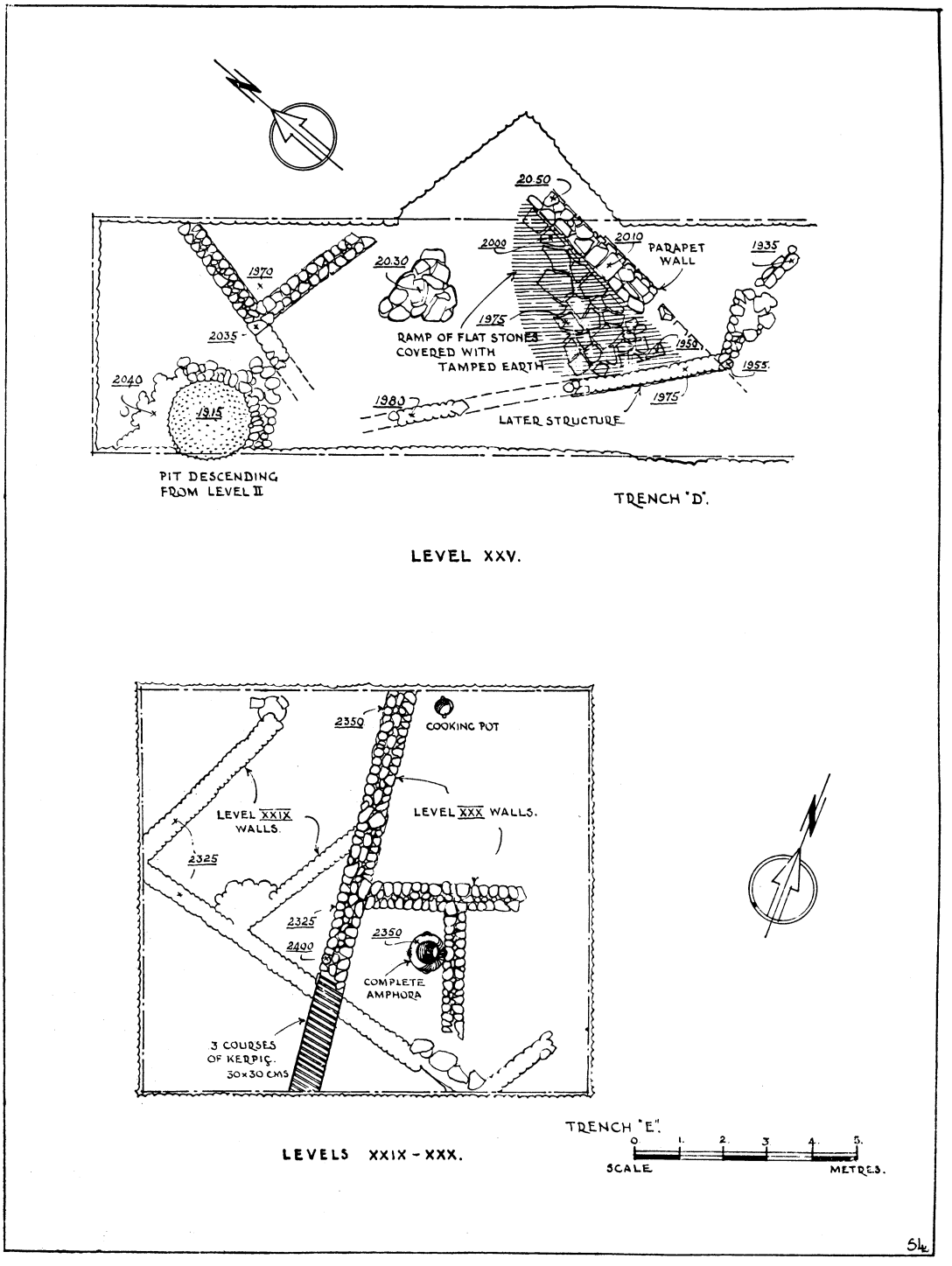


FIG. 4. Plans of Levels XXV and XXIX-XXX.

(Fig. 4). At the remaining levels, occasional stone walls appeared, crossing the trench diagonally ; but in some cases no structures were encountered and the occupation-levels themselves were ill-defined.

In Level XXV, there were several interesting features. The settlement, at this stage in the history of the mound, must have consisted of a small group of buildings crowning a considerable eminence, for, within the area of the sounding, we found an ascending ramp, paved with flat stones and supported by a strong stone retaining-wall, rising above the pavement to form a parapet. Further to the north-west was the corner of a stone building, and nearby an interesting circular pit or underground store. This latter seemed likely to have had the function of a grain silo, for it was packed out with stone to form a vertical face all round.

Levels XXVIII—XXXI.

There were walls at all four levels excavated in Trench " E ", at the summit of the mound. The plans of walls at Levels XXIX and XXX are reproduced (Fig. 4). Crude brick on a stone foundation was still the rule, and in one small chamber at Level XXX there was a fine large amphora type jar, almost intact. Beside the northern end of the long wall which crosses the trench diagonally at Level XXX, lay an intact cooking-vessel, and beneath it, in Level XXIX, a fragmentary burial, from which was derived the skull (No. 4) described in Appendix I. At Level XXXI, hardly more than a few centimetres beneath the surface, was a pavement of flat stones, on which lay an unbroken jar (Fig. 12, No. 1) of a type which appeared to be characteristic of these upper Hittite levels.

THE POTTERY

System of Analysis.

As one examined the pottery from each of the thirty-one main occupation-levels in turn, the process of making a typological analysis became increasingly easy. Eventually a total of fifty-nine principal types could be clearly recognised ; but as these came to include not only actual shapes, but distinctive methods of ornament and technical characteristics, the word " group " came to be considered a more explicit term and will be found to have been generally used in the following pages.

One or more examples of each group are illustrated among the line-drawings of pottery (Figs. 6 to 13), except in cases where a mere abstract quality is involved ; exigencies of space have, however, made it impossible to illustrate them in exact numerical order. Examples illustrated in each group are numbered individually, so that reference may easily be made to the descriptive schedule (pp. 35 ff.). The numbers of examples illustrated do not necessarily represent frequency of occurrence.

The first occurrence and subsequent survival of each group has next been noted, and the total of information thus provided, has been assembled in the form of a simple diagram (Fig. 5). In a vertical column at the left,

are the occupational-levels, numbered serially from Level I at the bottom to Level XXXI at the top. Beside these, for convenience, are the numbers originally attributed to the occupation-levels in the five separate trenches, where traces of them were found. Ranged against the levels are the survival-columns of each group of pottery ; and it should be noted that these cover only the levels in which there is positive evidence among our finds of the occurrence of the group concerned. It is entirely possible that in certain cases, a group may have appeared earlier and survived later than suggested by the evidence available ; yet the minimum survival to which the diagram testifies, is demonstrably unequivocal. The three levels, emphasised in the diagram by interlining, (Levels XI, XVI & XXIII), are inferentially distinguished on the basis of deductions suggested by the pattern of the diagram itself. It is at these levels that a maximum number of groups fall out of use, while others make their first appearance, and it will be seen that, on the extreme right of the diagram, they have been provisionally associated with the transition from one known historical or archaeological period to another. In the upper registers, the two main sub-phases of the Hittite period can so far be distinguished only rather arbitrarily, and consequently no transitional level has been emphasised.

The history of the mound has been in this way divided stratigraphically into four principal periods or phases, which have been numbered I-IV from the earliest onwards, and will henceforth be referred to in this way.

GENERAL.

When the whole volume of pottery from the thirty-one occupation-levels of the mound was assembled in piles in the school playground, the surprising overall uniformity of its appearance was one of the first impressions which one received. It was only on much closer examination that the variation of shapes and evolution of technique became easily perceptible. This primary illusion becomes more comprehensible when one comes to examine our diagrammatic analysis. For in dealing with broken pottery fragments in bulk, it is the prevailing colour and quality of finish which first catches the eye ; and our chart shows very clearly the fundamental conservatism of the Anatolian potter in this respect. For, in the group of survival-columns at the left-hand end of the diagram, which continue uninterrupted from bottom to top, are included such conspicuous features as the " burnished red slip " and " burnished red wash". And when one remembers that the basic clay is apparently derived from approximately the same source during the whole period concerned and that technical variations in tempering and levigation are comparatively infrequent, the illusion, as we have considered it, begins to gain substance.

Also significant in this respect, is the emphasis which our analysis must lay upon the prolonged survival of certain shapes. For, included in the group mentioned above, are vessels which have hitherto been found only in relation to one or other of the archaeological periods involved, and as such have been erroneously considered as characteristic of that period alone. For instance, simple jars with everted necks, with or without loop-handles

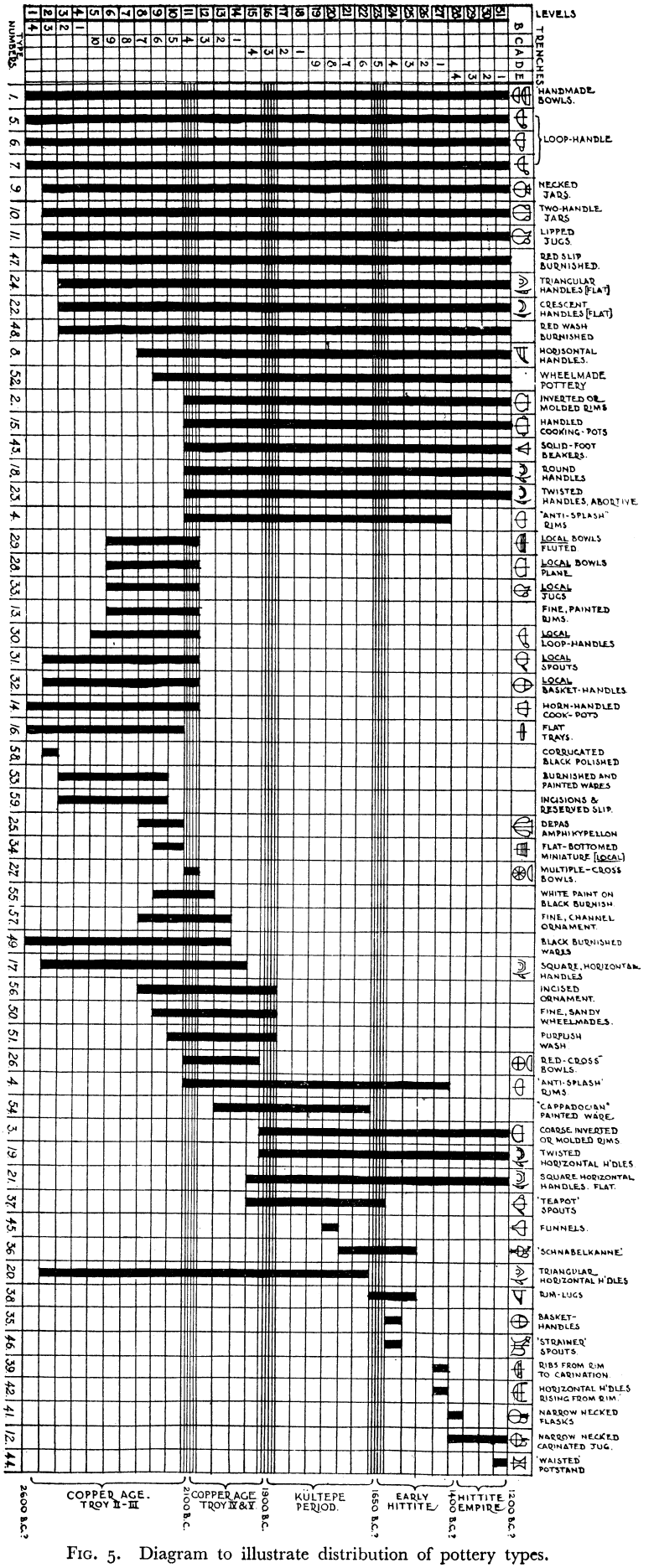


FIG. 5. Diagram to illustrate distribution of pottery types.

from rim to shoulder (Groups 9 & 10), can indeed reasonably be expected to occur at any period in any comparable range of Near Eastern pottery, while jugs with a single loop-handle and a rising lip-spout are so much a criterion of Anatolian taste, that their ubiquity in time and place is predictable; on the other hand a shallow bowl with a single loop-handle at the rim (Groups 5, 6 & 7), particularly when the handle leaves and returns to the rim itself, would till now have been confidently attributed to the Copper Age. Perhaps an even more conspicuous example is the somewhat roughly made burnished bowl (Group 1). This vessel was the preponderant shape in our deepest levels of all, and, on account of its primitive appearance and resemblance to those found elsewhere in a Chalcolithic setting, we were at first misled into attributing too early a date to our first settlers. A later examination revealed that precisely similar vessels were still being made, presumably by the more conservative village potters of Polatli, at the thirty-first occupation-level, directly beneath the summit of the mound.

Only the first occupation of the site, presumably to be associated with the earliest settlers, should perhaps be dissociated from any categorical generalization, on account of the paucity of types represented and the primitive character of the technique. For the rest, the preponderant appearance of the pottery from all levels, suggested a fairly well-levigated clay, varying in colour from orange, through all shades of red to dark brown, embellished with burnished or polished red slip or wash in a similar but somewhat brighter colour. The only major variation was, in the deeper levels, an admixture of black burnished ware, and, in the Hittite period (Phase IV), the usual burnished vessels of an " off-white " or yellow colour. As for the potter's wheel, it appeared to have been in general use only in the later phases of the mound's occupation. A single wheel-made vessel, the " depas amphikypellon ", appeared for the first time in the three final occupations of Phase I (Levels VIII to X), while a small, distinctive group of vessels, made of fine sandy clay on a fast wheel, began to be used almost simultaneously, and survived until the end of Phase II (Levels VIII to XVI). But the vast majority of vessels were still handmade, and it was not until Phase III that the use of the wheel had come to be understood and generally adopted. Even then, as we have already suggested, the more humble village potters persisted in the use of the more conservative technique, which continued to be popular for certain types of vessel until the site was finally abandoned.

THE ANALYSIS.

(1) *Types Appearing in All Four Phases.*

Some mention has already been made of the several shapes and techniques which, appearing in Phase I and surviving throughout the three subsequent phases, must now be accepted as criteria of Anatolian pottery in general. Perhaps the least distinguished of these is the *rough, burnished, handmade bowl* (Fig. 6, Group I). The clay varies in colour from

red, through brown to black, the latter predominating in the deepest levels only. Red or brown clay often has a black core, and are some signs of straw tempering. Almost all bowls have a wet-smoothed finish, and are lightly burnished. Various shapes are illustrated, rims being inverted or everted and occasionally flattened. Bottoms are either round or flattened and there are examples of simple excrescent ornament. (Nos. 5 & 10).

More distinctive are the *shallow bowls with a single vertical loop-handle at the rim* (Figs. 7 & 8, Groups 5, 6 & 7). These have been sub-divided for convenience into (Group 5) those with handles rising from the rim ; (Group 6) those with handles descending ; and (Group 7) handles leaving and returning to the rim. This shape has till now tended to be considered as characteristic of the Copper Age, having occurred with great frequency in settlements of that period at Ahlatlıbel, Karaoglan etc., but the discovery of numerous examples in the latest Hittite levels at Polatli (e.g. Group 7, No. 1) suggests a much longer survival. There was also a notable example in Group 5, No. 10, whose general appearance (handmade in almost black clay, wet-smoothed, burnished and with a nipple-lug at the base of the handle), would till now undoubtedly have been attributed to the middle of the Third Millennium. Yet its discovery in our Level XXV, under circumstances where a chance survival would be unlikely, must now place it definitely in the Hittite period. It had been anticipated that the shape of handles in section might have shown some signs of development from one period to another; but this proved not to be the case, circular, oval and even rectangular sections being represented at all periods. (It was only in Group 6 that round sections seemed to be the invariable rule.) The colour and finish of these bowls was widely varied. Those in the characteristic technique of the " local " Copper Age ware, will be discussed elsewhere.

The fragments composing Groups 9 & 10 (Figs. 8 & 9) represent various forms of *necked jar with or without a pair of vertical loop-handles at the neck or shoulder.* Little need be said of this shape, since it is by no means limited to Anatolia. Only certain peculiarities such as the handle (No. 9) which is kidney-shaped in section and has an indentation at the top, appears to be characteristically Hittite. Similarly *jugs with one handle from rim to shoulder and a rising lip-spout* (Group 11, Fig. 9) require little comment. Found with great frequency in the Copper Age, they might at first be considered the prototype of the more exaggerated " Schnabelkanne " vessel of the Second Millennium. But this would be wrong, since they continue parallel with the latter in Phases III and IV. Nor are twisted handles (No. 10) more common in one period than another.

Minor features which are common to all four phases, include two types of *abortive handle*, lying flat on the side of the vessel. One is semi-circular (Fig. 10, Nos. 13-17, Group 22) and varies from a semi-articulated horizontal handle (No. 14) to a mere crescent-lug (No. 13). The other (Group 24, Fig. 10, Nos. 19 & 20) is a triangular-shaped feature of the

[*Continued on p. 43*

Catalogue of complete, restored and fragmentary pots, illustrated in groups.

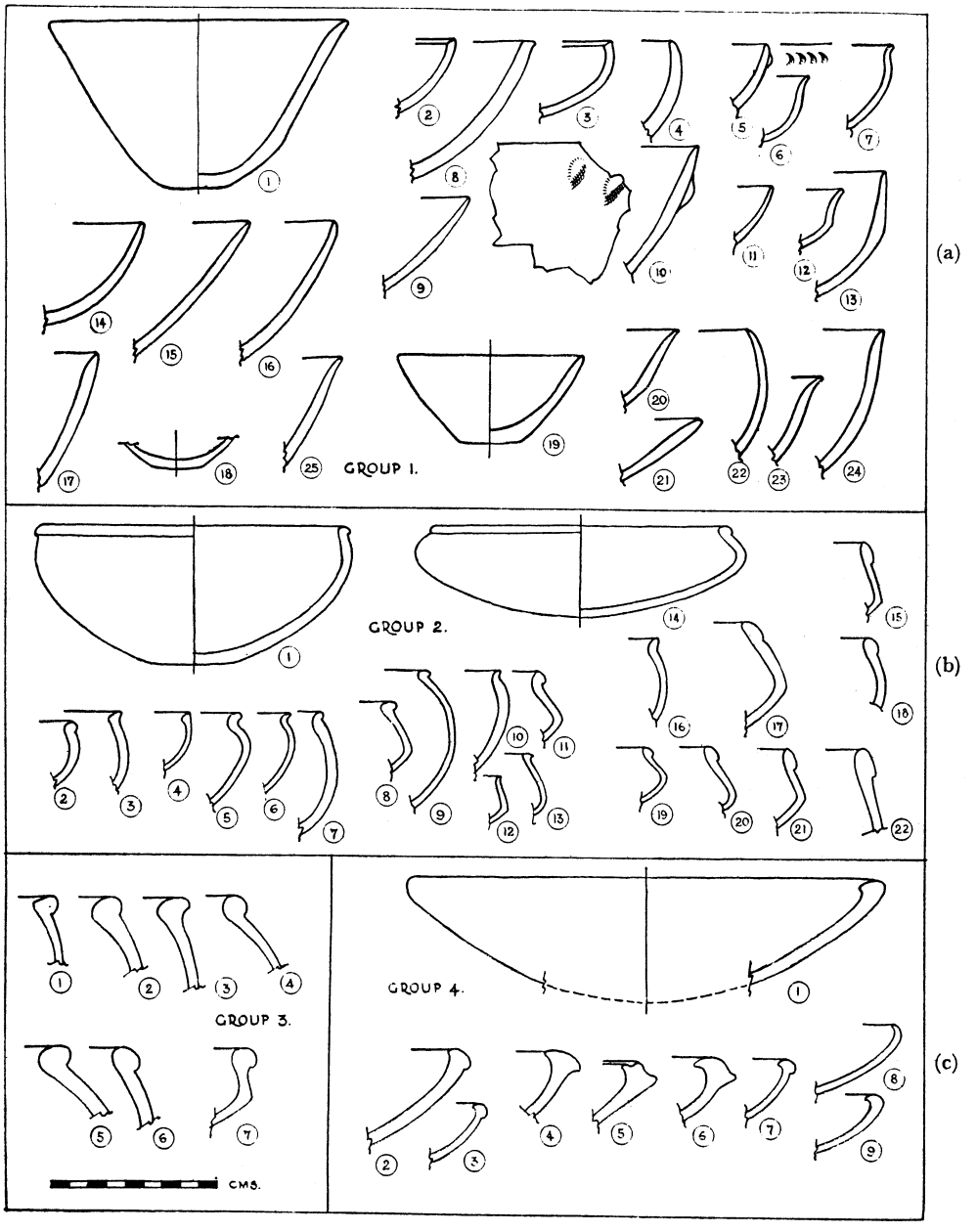


FIGURE 6 : SIMPLE BOWL TYPES.

Group 1 : Plain, hand-made, burnished or unburnished bowls.

No. 1. Level 3. Rough, pinkish clay. Wetsmoothed. Burnished inside and out.

No. 2. ,, 12. Biscuit-coloured clay, wetsmoothed. Burnished outside only.

No. 3. ,, 12. Light red clay. Wetsmoothed. Unburnished.

No. 4. ,, 12. Buff clay with pink blush. Wetsmoothed. Unburnished.

No. 5. ,, 10. Reddish clay. Wetsmoothed.

No. 6. ,, 10. ,, ,, ,,

No. 7. ,, 10. ,, ,, ,,

No. 8. Level 12. Brick-red clay. Wetsmoothed. Unburnished.
No. 9. ,, 13. Pinkish brown clay/slip. Burnished.
No. 10. ,, 13. Red-brown gritty clay. Mottled. Burnished.
No. 11. ,, 10. Reddish clay/slip. High polish.
No. 12. ,, 10. Reddish clay. Wetsmoothed.
No. 13. ,, 10. ,, ,, ,,
No. 14. ,, 2. Mottled dark clay. Unburnished.
No. 15. ,, 2. Jet black clay/slip. Straw tempered. Burnished.
No. 16. ,, 2. Black clay/slip. Well burnished.
No. 17. ,, 2. Mottled black and brown. Wetsmoothed. Slight burnish.
No. 18. ,, 2.
No. 19. ,, 2. Dark grey. Lightly burnished.
No. 20. ,, 2. Dark red clay/slip. Burnished.
No. 21. ,, 2. ,, ,, ,, ,,
No. 22. ,, 16. Venetian red clay/slip. Clouded black round rim. Polished.
No. 23. ,, 16. Purple brown wash. Unburnished.
No. 24. ,, 16. Black inside, brown out. Burnished.
No. 25. ,, 2. Mottled brown and black. Slight burnish.

Group 2 : Plain bowls with inverted and moulded rims.

No. 1. Level 16. Brown outside, pink in. Lightly burnished.
No. 2. ,, 31. Buff clay. Wetsmoothed. Unburnished.
No. 3. ,, 16. ,, ,, Burnished outside only.
No. 4. ,, 16. Pinkish clay. Wetsmoothed.
No. 5. ,, 16. Pink clay/slip. Burnished.
No. 6. ,, 16. ,, ,, ,,
No. 7. ,, 31. Buff clay. Unburnished.
No. 8. ,, 24. ,, ,, Pink wash outside only. Unburnished.
No. 9. ,, 24. Sandy pink clay. Unburnished. Wheelmade
No. 10. ,, 24. ,, ,, ,, ,,
No. 11. ,, 24. ,, ,, ,, ,,
No. 12. ,, 24. ,, ,, ,, ,,
No. 13. ,, 24. ,, ,, ,, ,,
No. 14. ,, 18. ,, ,, ,, ,,
No. 15. ,, 24. ,, ,, ,, ,,
No. 16. ,, 18. ,, ,, ,, ,,
No. 17. ,, 24. ,, ,, ,, ,,
No. 18. ,, 24. Pink clay. Unburnished.
No. 19. ,, 16. ,, ,, ,,
No. 20. ,, 16. Orange clay. Unburnished.
No. 21. ,, 16. Pink clay. Burnished outside only.
No. 22. ,, 16. ,, ,, ,, ,, ,,

Group 3 : Coarse vessels with mouded rims.

No. 1. Level 27. Coarse, sandy clay. Wheelmade. Unburnished.
No. 2. ,, 27. ,, ,, ,, ,, ,,
No. 3. ,, 27. ,, ,, ,, ,, ,,
No. 4. ,, 27. ,, ,, ,, ,, ,,
No. 5. ,, 25. ,, ,, ,, ,, ,,
No. 6. ,, 25. ,, ,, ,, ,, ,,
No. 7. ,, 27. ,, ,, ,, ,, ,,

Group 4 : Bowls with " anti-splash " type rim.

No. 1. Level 25. Gritty pink clay with own slip. Wheelmade.
No. 2. ,, 25. ,, ,, ,, ,, ,, ,, ,,
No. 3. ,, 25. ,, ,, ,, ,, ,, ,, ,,
No. 4. ,, 25. ,, ,, ,, ,, ,, ,, ,,
No. 5. ,, 25. ,, ,, ,, ,, ,, ,, ,,
No. 6. ,, 11. ,, ,, ,, ,, ,, ,, ,,
No. 7. ,, 11. ,, ,, ,, ,, ,, ,, ,,
No. 8. ,, 11. ,, ,, ,, Almost white slip. Unburnished. Wheelmade.
No. 9. ,, 11. Gritty pink clay. Almost white slip. Unburnished. Wheelmade.

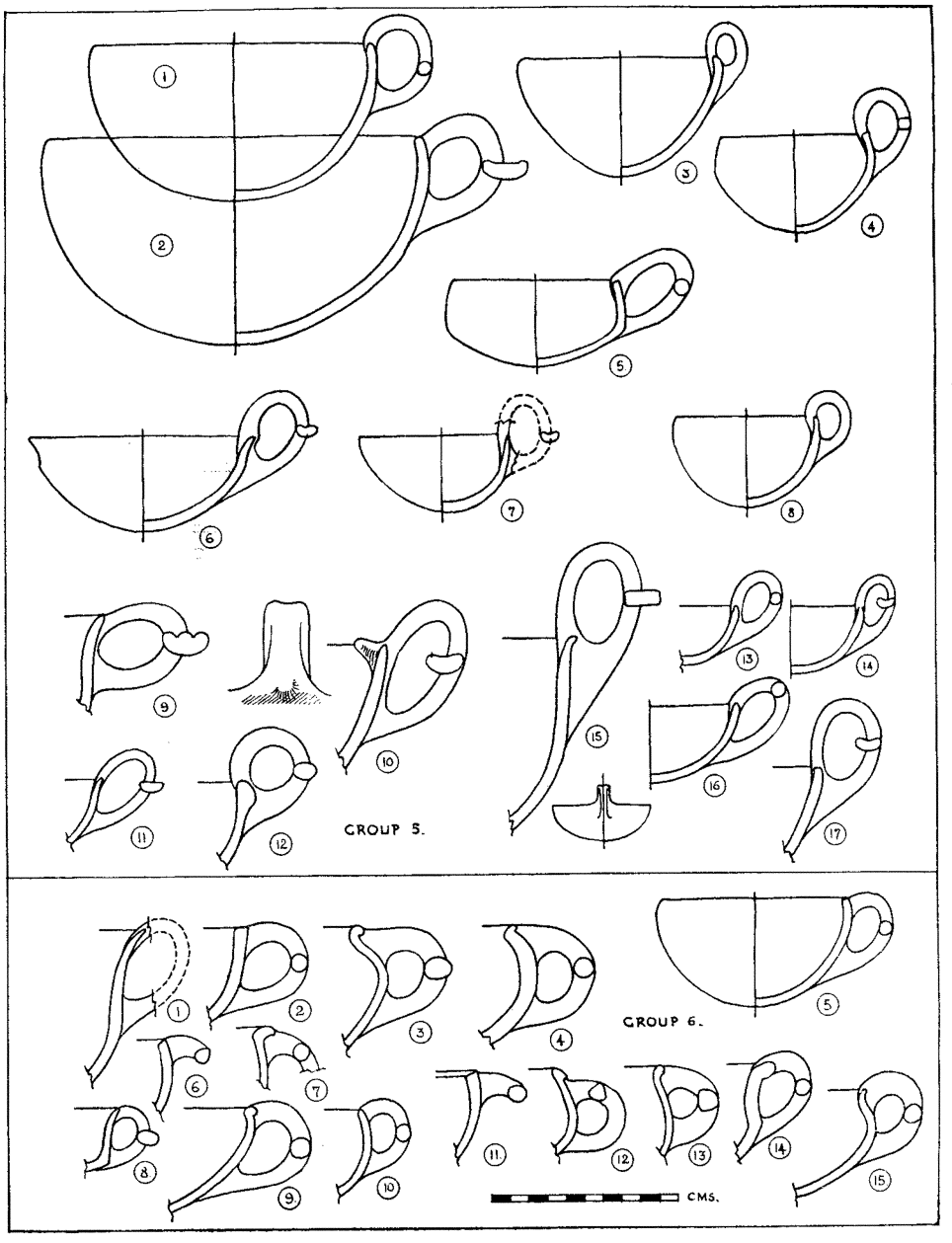


FIGURE 7: BOWLS WITH VERTICAL LOOP-HANDLES.

Group 5: Handles rising above rim.

No. 1. Level 31. Pinkish brown clay/slip. Burnished. Hand-made.
No. 2. ,, 31. Buff clay. Pink slip outside, black in. Burnished. Hand-made.
No. 3. ,, 23. Cream clay/slip. Unburnished.
No. 4. ,, 15. Pinkish brown clay/slip. Slight burnish. Straw-tempered. Hand-made.
No. 5. ,, 18. Reddish brown clay/slip. Burnished.
No. 6. ,, 11. Pinkish buff clay/slip. Lightly burnished. Hand-made.
No. 7. ,, 18. Pink, gritty clay. Wetsmoothed. Lightly burnished outside only. Hand-made.

No. 8. Level 31. Black inside red-brown out. Highly burnished. Hand-made.
No. 9. „ 11. Burnished red wash.
No. 10. „ 25. Rough, black clay. Wetsmoothed. Unburnished. Hand-made.
No. 11. „ 11. Buff clay. Red wash. Unburnished.
No. 12. „ 3. „ „ Unburnished.
No. 13. „ 12. Biscuit-coloured clay, pink blush. Burnished inside.
No. 14. „
No. 15. „ 12. Orange clay. Wetsmoothed. Unburnished.
No. 16. „ 12. Brown clay. Wetsmoothed. Unburnished.
No. 17. „ 12. Buff clay. Unburnished.

Group 6 : Handles falling below rim.

No. 1. Level 2. Pale buff clay/slip. Burnished.
No. 2. „ 2. Black clay/slip. Burnished. Straw-tempered.
No. 3. „ 24. Pink clay. Unburnished.
No. 4. „ 18. Buff clay/slip. Unburnished.
No. 5. „ 18. Brown clay. Unburnished.
No. 6. „ 24. Pink wash outside. Burnished.
No. 7. „ 24. „ „ „ „
No. 8. „ 2. Buff clay/slip. Burnished.
No. 9. „ 16. Pink clay. Smeary red wash inside, over rim and handle.
No. 10. „ 11. Red outside. Black in and over rim. Burnished.
No. 11. „ 24. Buff clay. Pink wash outside and over rim.
No. 12. „ 11. Pink clay. Unburnished.
No. 13. „ 11. „ „ „
No. 14. „ 25. Buff clay/slip. Unburnished.
No. 15. „ 18. „ clay Red slip. Unburnished.

FIGURE 8 : BOWLS AND JARS.

Group 7 : Bowls with vertical loop-handles. Handles attached to rim only.

No. 1. Level 31. Reddish-brown clay/slip. Well burnished.
No. 2. „ 15. Pink clay/slip. Unburnished.
No. 3. „ 14.
No. 4. „ 8. Pink clay. Red clip. Burnished.
No. 5. „ 16. Pinkish-buff clay/slip. Unburnished.
No. 6. „ 11. Buff clay. Red wash. Unburnished.
No. 7. „ 10. Black inside. Warm buff inside. Burnished.
No. 8. „ 8. Buff clay. Red slip. Burnished.
No. 9. „ 10. Pink clay. Red slip. Burnished.

Group 8 : Bowls with horizontal loop-handles at rim.

No. 1. Level 11. Buff clay. Red slip. Burnished.
No. 2. „ 11. Pink clay. Wetsmoothed. Unburnished.
No. 3. „ 16. Buff clay/slip. Burnished outside.
No. 4. „ 16. Orange clay/slip. Unburnished.
No. 5. „ 24. Buff clay. Red wash. Unburnished.
No. 6. „ 11. „ „ „ „ Burnished.
No. 7. „ 16. Gritty pinkish buff clay. Wetsmoothed. Painted with red wash to base of handle.
No. 8. „ 24. Pink clay/slip. Unburnished.

Group 9 : Necked jars.

Nos. 1 - 8. Level 2. Dark grey clay. Burnished.
No. 9. „ 12. Buff clay. Reddish slip. Burnished.
Nos. 10-12. „ 12. Brown clay. Burnished.
Nos. 13-14. „ 12. Pink clay/slip. Burnished.
No. 15. „ 2. Buff clay/slip. Unburnished.
No. 16. „ 16. „ „ „

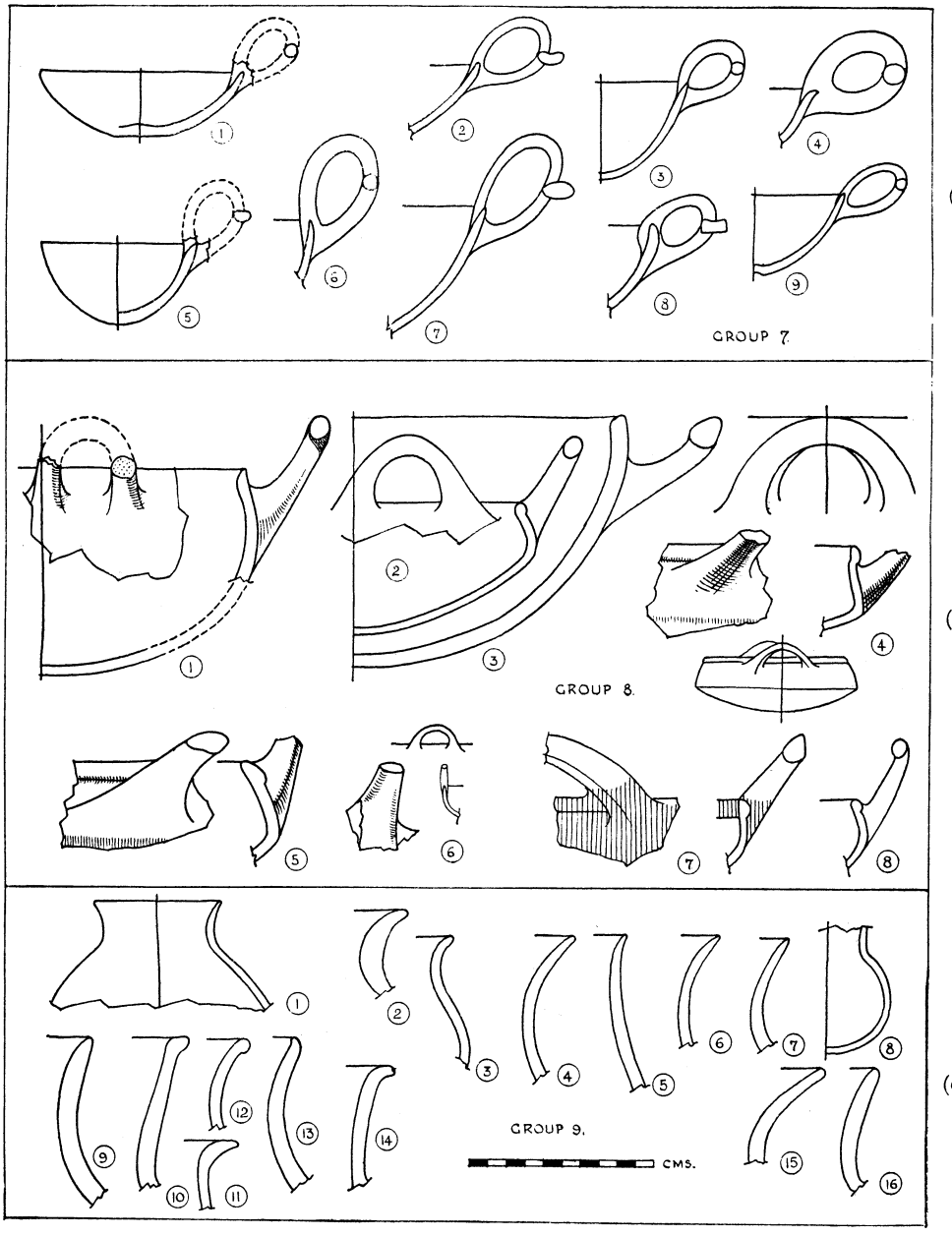


FIG. 8.

FIGURE 9: JARS AND JUGS WITH VERTICAL LOOP-HANDLES, ETC.

Group 10: Necked jars with vertical loop-handles.

No. 1. Level 30. Pinkish clay. Red slip. Burnished.
No. 2. „ 8. Gritty, dark brown clay. Unburnished.
No. 3. „ 2. „ „ „ „ „
No. 4. „ 2. Buff clay. Pink wash. Unburnished.
No. 5. „ 31. Buff clay/slip. Unburnished.

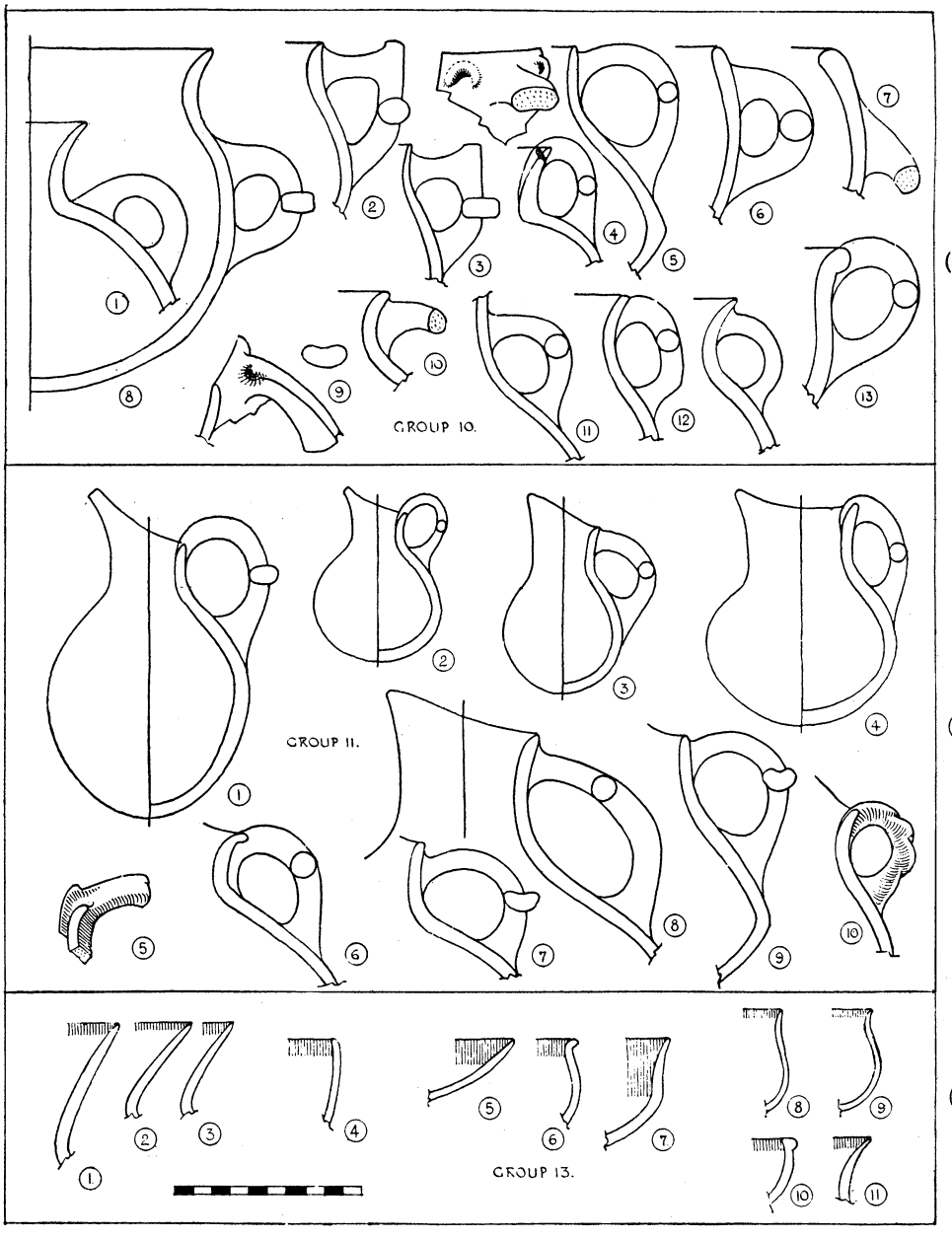


FIG. 9.

Nos. 6-7. Level 25. Cooking pot.
No. 8. ,, 31. Buff clay. Pink slip. Burnished.
No. 9. ,, 25. ,, ,, ,, ,, ,,
No. 10. ,, 11. Pink clay. Cream slip. Unburnished.
No. 11. ,, 2. Reddish clay. Wetsmoothed. Slight burnish.
No. 12. ,, 3. Coarse, blackened clay.
No. 13. ,, 16. Buff clay. Pinkish slip. Unburnished.
No. 14. ,, 3. ,, ,, ,, ,, ,,

Group 11 : Jugs with rising lip and vertical loop-handle.
No. 1. Level 7. Pink clay. Wetsmoothed. Black core. Hand-made.
No. 2. (Unstratified) Buff clay. Red brown to black slip. Polished.

No. 3. Level 3. Pinkish buff clay/slip. Burnished.
No. 4. (Unstratified) Pink clay/slip. Burnished.
No. 5. Level 24. ,, ,, ,, ,,
No. 6. ,, 24. Buff clay. Smeared red wash. Straw-tempered.
No. 7. ,, 30. ,, ,, Pink slip. Burnished. Black inside.
No. 8. ,, 10. ,, ,, Slightly burnished and much blackened.
No. 9. ,, 31.
No. 10. ,, 12. Pink clay-slip. High burnish.

Group 13 : Fine vessels with burnished wash outside and band inside rim.
No. 1. Level 10. Burnished red wash outside and band inside rim.
Nos. 2-4. ,, 9. ,, ,, ,, ,, ,, ,, ,, ,,
Nos. 5-7. ,, 12. ,, ,, ,, ,, ,, ,, ,, ,,
Nos. 8-9. ,, 8. ,, ,, ,, ,, ,, ,, ,, ,,
No. 10. ,, 11. ,, ,, ,, ,, ,, ,, ,, ,,
No. 11. ,, 10. ,, ,, ,, ,, ,, ,, ,, ,,

FIGURE 10 : MISCELLANEOUS HANDLES, ETC. (See also Plate IVa.)

Group 15 : Cooking pots with vertical loop-handles.
No. 1. Level 23. Rough, straw-tempered ware. Hand-made.
No. 2. ,, 11. ,, ,, ,, ,,
No. 3. ,, 30. ,, ,, ,, ,,
No. 10. ,, 16. ,, ,, ,, ,,

Group 14 : Cooking pots with " horn "-handles.
No. 5. Level 3. Rough, straw-tempered ware. Hand-made.
Nos. 6-9. ,, 1. ,, ,, ,, ,,

Group 17 : Square horizontal loop-handles.
No. 11. Level 2. Brown clay/slip. Lightly burnished. Smoke-stained.

Group 21 : Square handle (abortive).
No. 12. Level 15. Pink clay/slip. Unburnished.

Group 22 : Round horizontal handle (abortive).
No. 13. Level 15. Pink clay/slip. Unburnished.
No. 15. ,, 16. Red clay/slip. Burnished.
No. 16. ,, 12. Pinkish buff clay/slip. Light burnish. Straw-tempered.

Group 18 : Round horizontal handle.
No. 14. Level 18. Buff clay. Pinkish slip. Burnished. Hand-made.

Group 23 : Twisted handles (abortive).
No. 17. Level 16. Pink, straw-tempered. Red burnished slip inside.

Group 19 : Twisted horizontal loop-handles.
No. 18. Level 6. Gritty pink clay. Polished red slip.

Group 24 : Triangular handles (abortive).
No. 19. Level 9. Pink clay/slip. Unburnished.

Group 20 : Triangular loop-handles.
No. 20. Level 9. Pink clay/slip. Unburnished.

Group 16 : Rough, flat-bottomed trays.
No. 22. Level 7. Brown clay. Slight burnish.
No. 23. ,, 2. ,, ,, ,, ,,

Group 25 : Depas Amphikypellon. Plate IVa.
No. 24. Level 7. Brown clay. Bright orange slip. Burnished. Wheelmade.

Ungrouped.
No. 25. Level 11. Light grey clay. Dark grey slip. Burnished.

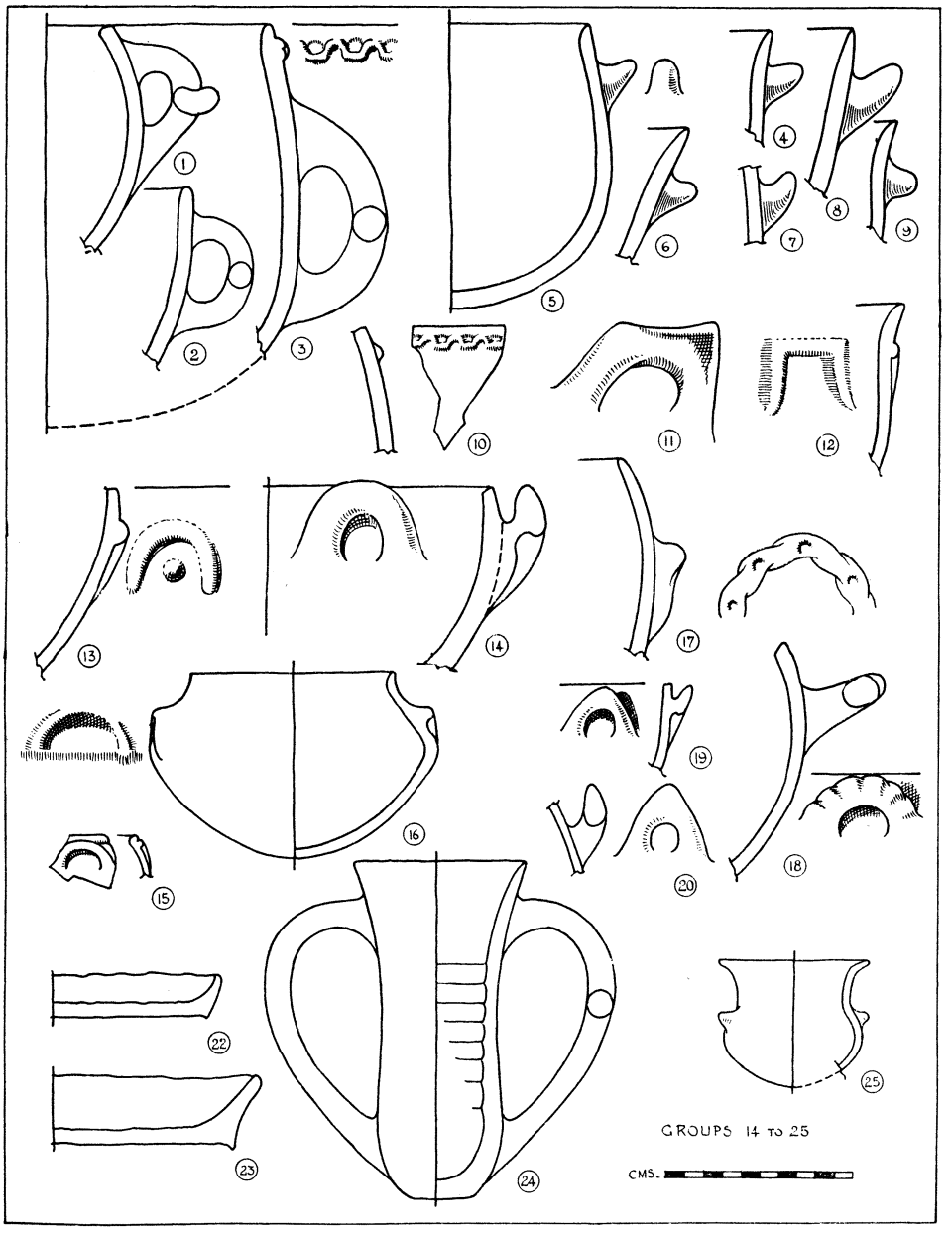


FIG. 10.

Continued from p. 35]

same sort. A fully articulated handle of this shape (Group 20, Fig. 10, No. 20) is employed simultaneously, except in Phase IV.

One other shape appears for the first time in the final levels of Phase I and is not afterwards discontinued. This is the *bowl with horizontal loop-handles*, rising above the rim on either side (Group 8, Fig. 8, Nos. 1 & 2). In the early stages this is a simple affair, round in section, and thickened considerably where it leaves and returns to the side of the vessel. Various distinctive characteristics which it develops from Phase III onwards, will be described later.

(2) *Types Characteristic of Phase I.*

Among the pottery types whose sudden disappearance helps to fix the transition from Phase I to Phase II at Level XI, by far the most important is the series representing a particular technique, which came to be known for convenience as " local ware " (Groups 28-33, Fig. 11). It cannot actually be claimed that this term was applicable in the strictest sense, since comparable ware has been found at Karaoğlan, Etiyokuşu and elsewhere. It came to be used on account both of its preponderance and its abundance in the early Copper Age levels. It is characterized by a fine, pink clay, with no perceptible grits, covered with a slip of darker and brighter pink, which in its turn is finished with a nice bone-burnish, or perhaps even polished. The favourite ornament takes the form of horizontal fluting or shallow channels, while handles are often twisted, cable-moulded or ribbed. Some characteristic shapes are as follows :—

(*a*) *A wide, shallow bowl with or without a slight carination.* In the former case it is most often ornamented with shallow horizontal flutings above the carination (Fig. 11). The rim is usually rounded, but is occasionally spirally moulded to give an interesting cable effect (No. 8). Some unfluted examples have small abortive handles (No. 2), or groups of minute pimples (No. 5). Bottoms are usually slightly flattened, and have a small circular depression made with a finger in the centre.

(*b*) *A squat miniature bowl with flat bottom.* These also are either plain (Nos. 12, 14 & 16) or ornamented with shallow flutings (Nos. 6 & 9) or corrugation (No. 15). Rims are everted and slightly flattened, and the slip extends only a short way below the rim inside.

(*c*) *A shallow bowl with a single vertical loop-handle* (Group 30). Examples of these in the " local " technique were usually distinguished by the characteristic circular depression in the bottom, and often by ornamental handles (e.g. No. 11). A favourite device (not illustrated) was a fan-shaped arrangement of flutings on the inward-facing upper surface of the handle.

(*d*) *A miniature pot with an upward-curving tubular spout* (Group 31). Since no complete vessel was found, this shape is hard to restore. But the spouts themselves (Nos. 4 & 10) were plentiful and characteristic.

(*e*) *Jugs with horizontal fluting at the base of the neck*, and channelled chevron ornament on the shoulder (Group 33, Fig. 11, Nos. 7 & 8). Other types of miniature jug, included in the tomb-group (?) found previous to our arrival (Nos. 2 & 5) are described in our index of pottery, as also are the small pots (Nos. 1 & 3) with tubular spouts and basket-handles, one of which has an interesting slip-treatment.

This idiosyncrasy of ornament, of which examples are found throughout Phase I (Group 59), appears to be a reliable characteristic of the " local " ware. The area of the pot-face on which the channelled

or scratched ornament is to be applied, is left free of slip, exposing the colour of the body-clay beneath. This is perhaps due to the fact that the slip is applied after the ornament, and, if continued all over, would tend to obscure the decoration.[1]

About the remaining pottery occurring only in Phase I, it is also possible to make certain generalizations. In the earliest levels, red and black pieces occur in about equal proportions, while the number of sherds with some sort of attempt at burnish represent about fifty per cent. of the whole. Red sherds have a black core and there are signs of both straw and grit tempering. Many sherds are mottled in colour, as though the firing were clumsy and uneven, and there are many large pieces of very coarse clay from amphora-type vessels. In later levels, parallel with the "local" ware in its perfection, black sherds are rare and the proportion of burnished pieces has risen considerably. Types represented include :—

Coarsely-made cooking pots with a slight burnish (Group 14, Fig. 10, Nos. 4-9). These are invariably furnished with projecting "horn" handles near the rim. In Phase I there is no single example of a vessel of this sort with loop-handles.

Roughly-made, shallow dishes, usually oval in shape, made on a rough surface, of which the bottom shows the impression (Group 16, Fig. 10, Nos. 22 & 23).

Vessels with corrugated ornament in black clay with a highly polished slip (Group 58, Fig. 13, No. 11). Fragments of two such vessels were found, both in the deepest level but one (Level XI).

Pottery with painted designs and an overall burnish (Group 53, Fig. 13, Nos. 17 & 18). These take the form of plain bowls with flattened base, or shallow bowls with loop-handle at rim.

Finely made jars and bowls, having a burnished red wash all over outside ending with a band inside the rim (Group 13, Fig. 9). Several varieties of these are illustrated, including bowls with inverted, everted and moulded rims. They constitute a distinctive type, being finely made of buff or brown clay, completely covered outside with a crimson wash and highly burnished. The wash extends over the rim and ends in a narrow band of colour inside. The remaining surface inside, is the natural colour of the body-clay.

The "Depas Amphikypellon" (Group 25, Fig. 10, No. 24). There were two examples of this very distinctive vessel in the later levels of Phase I (Levels VIII & X). It has the form of a tall, narrow calyx, with a slightly flattened base, from which two graceful loop-handles rise smoothly and return near the everted rim. The material is fine, pink clay, with a bright orange slip, highly burnished. Inside there are sharp horizontal channels

[1] These are noticed by W. Lamb in *Anatolian Studies presented to William Hepburn Buckler*, p. 134 and Pl. IV 5, and paralleled by examples (unpublished) from Karaoğlan and Hashüyük in the Ethnological Museum, Ankara.

made by the potter's fingers, which point to the use of a fast wheel. At Polatli, it is the earliest example of a wheelmade vessel.

(3) *Types common to Phase I and Phase II.*

Two important types mark the transition from Phase I to Phase II. One of these is the " multiple-crossed bowl," a vessel usually made of buff or brown clay with a corresponding slip, over which it is painted solid red outside and ornamented inside with radiating lines of the same colour. One example (Fig. 13, No. 13) still has the indented bottom characteristic of the " local " bowls. All our examples of this type were found at Level II.

Occurring in the latest levels of Phase I and the earliest of Phase II, are examples of a *black burnished ware, with ornament over the burnish in matt white paint.* One of these (Fig. 13, No. 9) is a loop-handled bowl shape, corresponding to Group 7. Another, also a bowl (No. 10), is evidently ornamented inside with multiple chevrons in white paint.

Two types which last throughout Phase I and into Phase II are vessels with the fine *channel ornament* such as appears in the " local " ware, and plain *burnished black* vessels (the latter in extremely small numbers after the earliest levels of Phase I).

(4) *Types characteristic of Phase II.*

There are a few types only which can be taken to be reliable criteria of Phase II. One is the "*red-crossed bowl*", so well known at other sites (Group 26, Fig. 13, No. 12), which in this case has a band of red or brownish red around the rim and crossed lines of paint inside only.

Another important type is a series of *small bowl-shapes, made on a fast wheel,* from fine, sandy clay with a pink, buff or orange slip, but no burnish (Group 50). These occur in two shapes ; a bowl with inverted and moulded rim corresponding to Group 2 (Fig. 6, Nos. 9-20), and a bowl with an " anti-splash " type rim (Group 4, Fig. 6, Nos. 1-7).

Simple incised ornament, mostly in the form of simple chevron patterns on the necks or shoulders of jars, also seems to characterize this phase, having started a little earlier, in Level IX (Group 56, Fig. 13, No. 15).

(5) *Types occurring from Phase II onwards.*

First appearing in Phase II, and surviving thereafter for the remaining period of the mound's occupation, are the following :—

An interesting series of very fine small *bowls, with moulded rims,* slightly inverted, and occasionally some carination (Group 2, Fig. 6). These are buff to pink or orange in colour, slipped or wetsmoothed but mostly unburnished.

Cooking pots with vertical loop-handles (Group 15, Fig. 10, Nos. 1, 2 & 3).

A *small conical beaker,* with a flattened, solid foot, made on a fast wheel, in dark brownish clay, wetsmoothed (Group 43, Fig. 12, No. 5).

Horizontal loop-handles, semi-circular in shape, used on the sides of jars (Fig. 10, Group 18), and an *abortive* version of the same handle, with a decorative twist (Fig. 10, Group 23).

Finally, a wide variety of *bowls with the anti-splash type rim* (Group 4, Fig. 6).

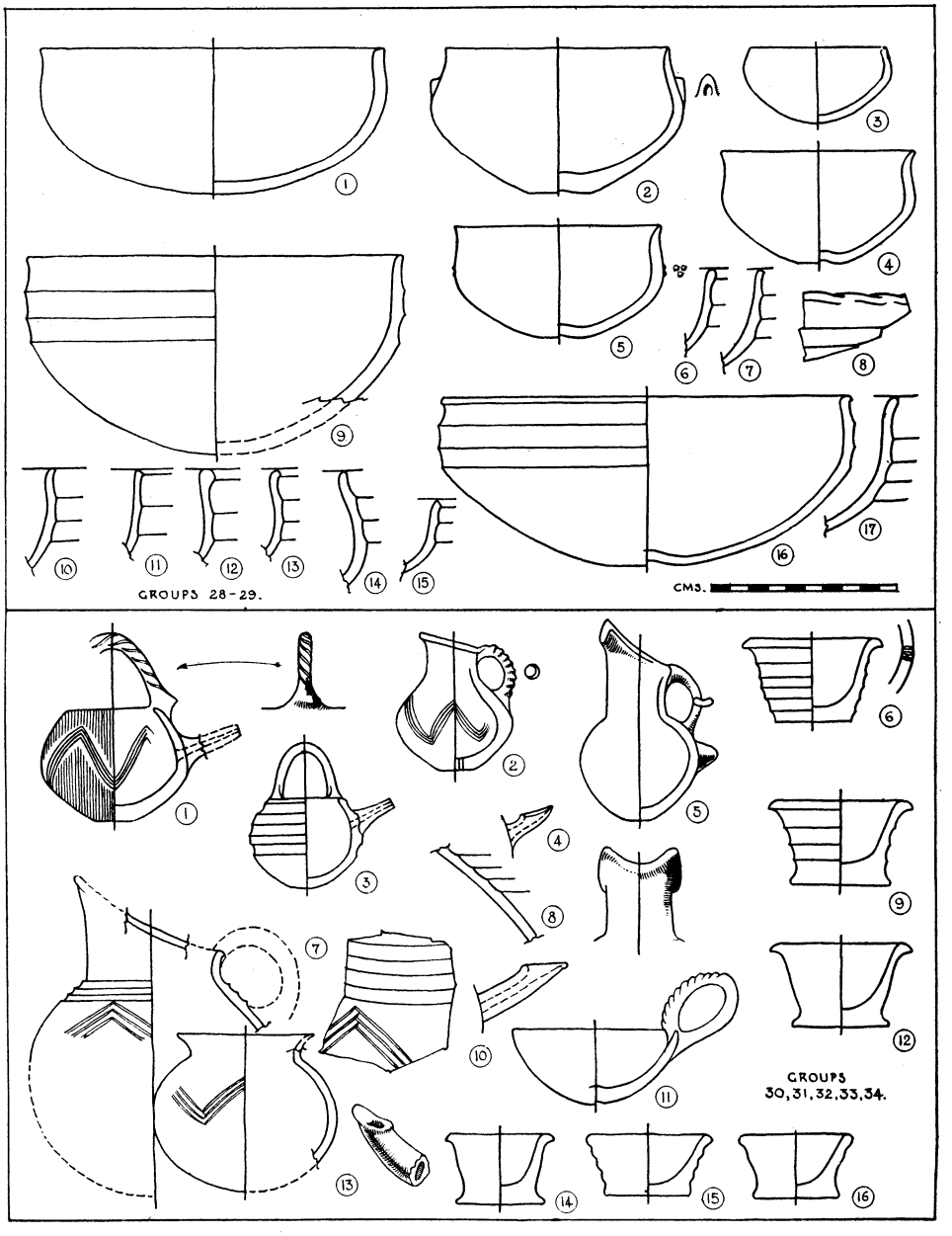


FIGURE 11: LOCAL WARES OF THE EARLY COPPER AGE.

Groups 28 *and* 29 *:* Plain or fluted bowls.

No. 1. Level 11. Polished red slip outside, black in. Hand-made. Plate Va.

Nos. 2, 3, 5.	Level 8.	Plate Vb.	
Nos. 4, 15, 16.	,, 11.		
Nos. 6, 8-11, 17.	,, 9.	Pink clay.	Polished red slip. Hand-made.
Nos. 7, 14.	,, 6.		
Nos. 12, 13.	,, 10.		

Groups 30 *to* 34 *:* Loop-handled bowls, spouted pots, basket handles, jugs, fluted miniatures with flat bottoms.

No. 1. (Unstratified) Pink clay. Polished red slip. Ornamented with incised lines. Ornamented area wiped clean of slip. Plate Vc.
No. 2. (Unstratified) Pink clay. Red slip polished. Incised ornament. Hand-made.
No. 3. (Unstratified) Pink clay. Polished red slip. Fluted, hand-made. Plate Vf.
No. 4. Level 7. Local red polished ware.
No. 5. (Unstratified) ,, ,, ,, ,, Plate Ve.
No. 6. Level 9. ,, ,, ,, ,, Plate Vd.
No. 7. ,, 9. ,, ,, ,, ,, with fluting and fine channelled ornament.
Nos. 8, 10, 12. Level 8. Local red polished ware with fluting.
No. 9. ,, 9. ,, ,, ,, ,, ,, ,,
No. 11. ,, 10. ,, ,, ,, ,, ,, ,,
No. 13. Level 8. Red polished outside, black in. Fine channelled ornament.
Nos. 14-16. (Unstratified) Local red polished ware.

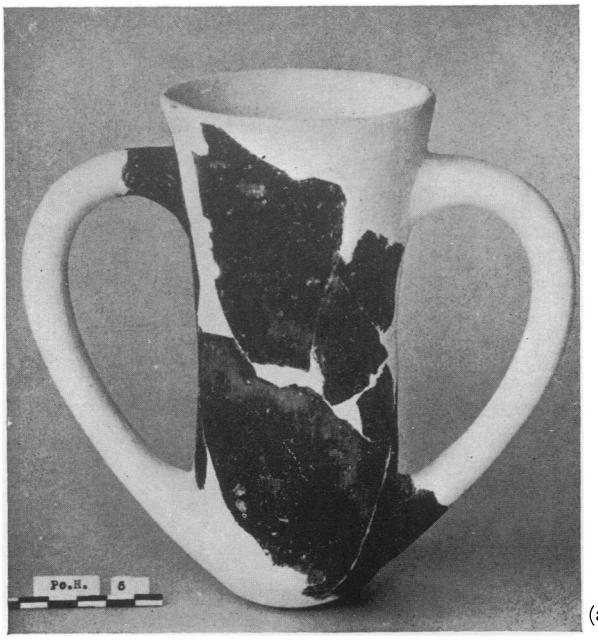
Again colours vary from biscuit, through orange-buff and orange to red-brick and scarlet. A burnished red slip is used or a quite thin, smudgy red wash, sometimes covering only part of the vessel, but there is almost no highly polished red, save for two or three sherds of bowls which are clouded to black around the rim and are black inside. There is both straw and grit tempering and the majority of wares are still hand-made. Cooking-pots are of coarse, straw-tempered clay and often have raised cable ornament near the rim and ledge-handles.

(6) *Types characteristic of Phase III.*

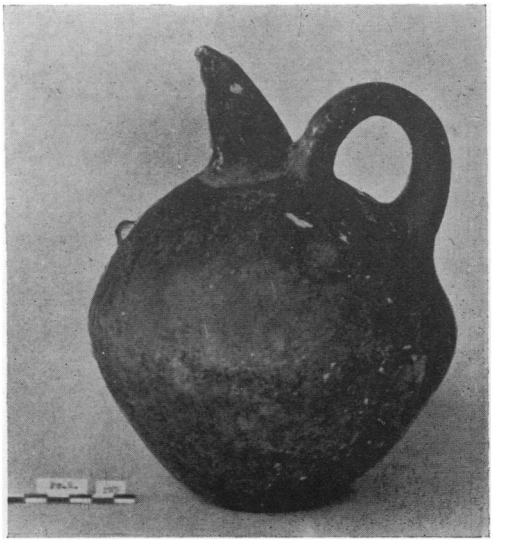
By far most important criterion of Phase III is the monochrome painted ware of the "*Cappadocian*" Type (Group 54, Fig. 13, Nos. 1-8). These are all fairly large, heavily made vessels, fashioned of gritty, pink or pinkish clay, wetsmoothed, with matt black paint, sometimes over a light burnish. The only shape which can be reconstructed from the fragments found, is one familiar both at Alişar and at Kültepe ; an oval jar with an everted neck, flattened base, and two small vertical loop-handles, oval in section, at the point of maximum diameter. The ornament appears to consist almost exclusively of multiple, interlacing chevrons. It will be seen from the diagram that an isolated fragment of this ware was found as early as Level XIII ; but the great majority occurred between Levels XVI and XXII.

Another characteristic type in Phase III was the "*teapot spout*" (Group 37, Fig. 12, Nos. 16 & 17). No whole examples of this vessel were found, and only the spout fragment could consequently be recognised. But the shape of the latter is unmistakable, and the type common to many other sites. There are examples in both red and black burnished ware.

About halfway through Phase III (Level XX) there occurred a single example of an ogee-shaped *funnel*, which also has parallels at other sites (Group 45, Fig. 12, No. 13).

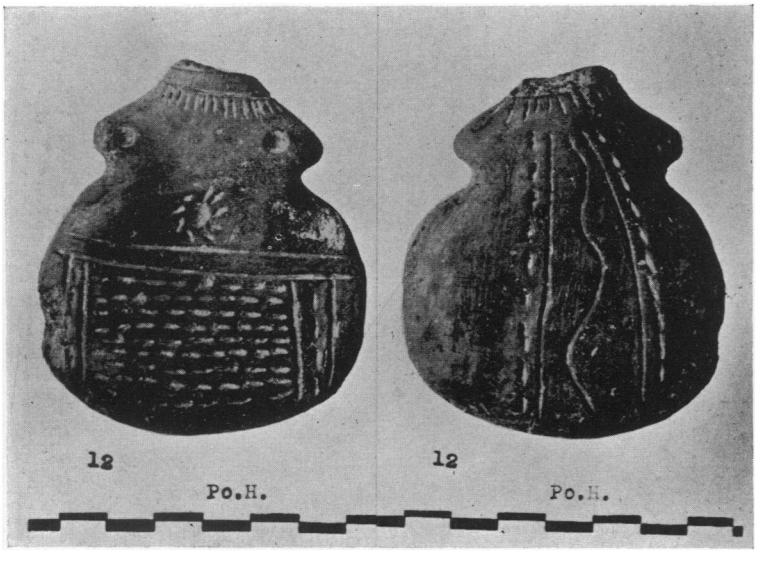


(a)

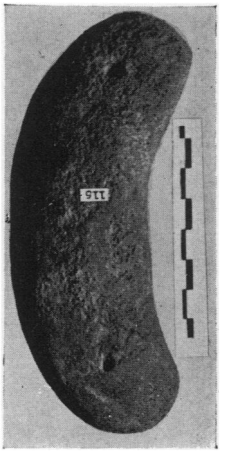


(b)

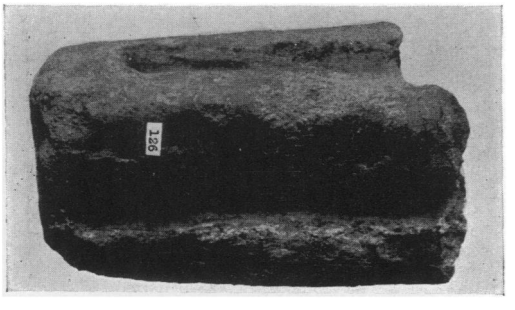
(e)



(c)

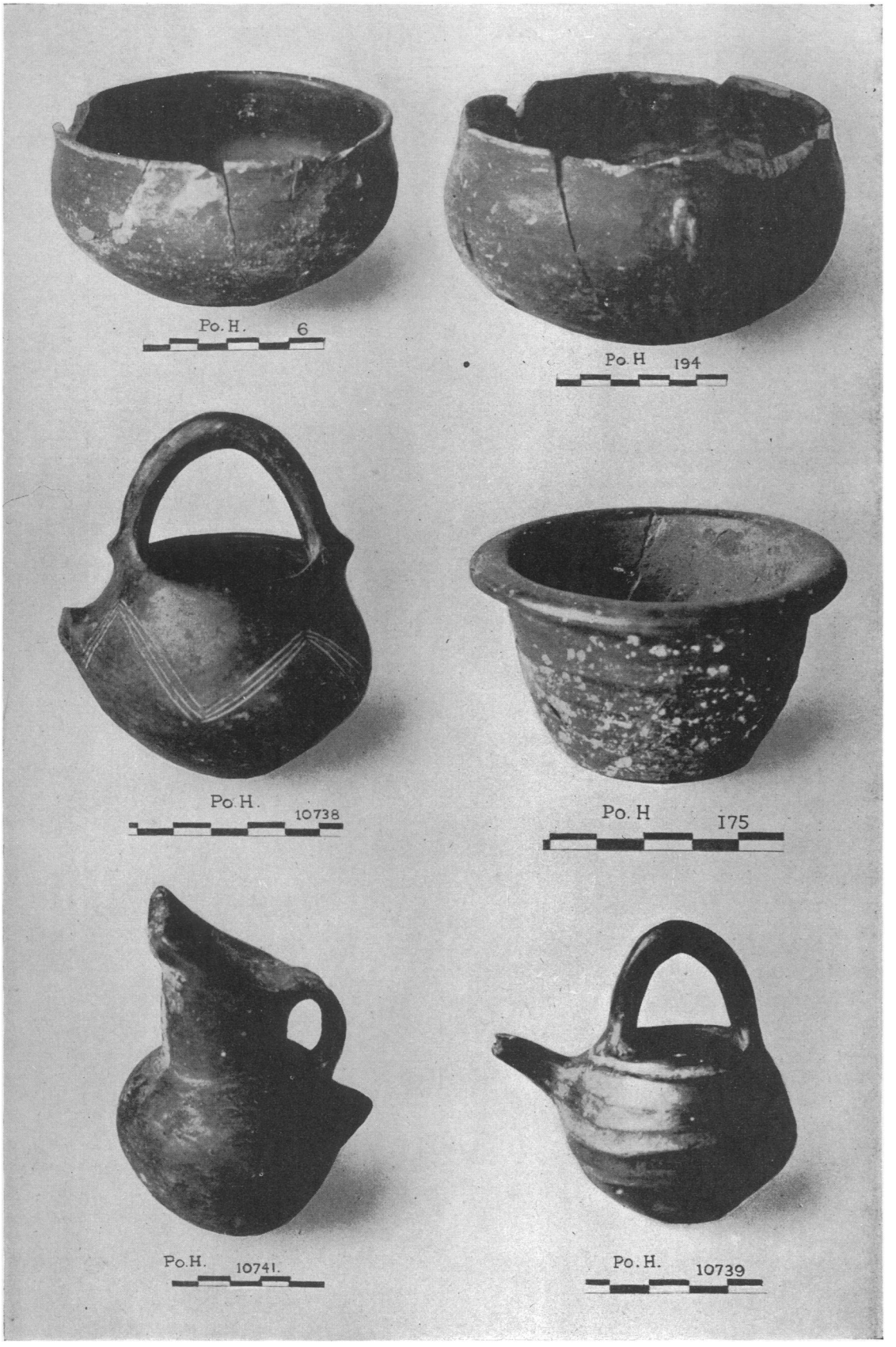


(f)



(d)

(a) The " Depas Amphikypellon." Level VII.
(b) Narrow-necked Jug. Level XXXI.
(c) Figurine. Level XI.
(d) Broken Mould in gray stone from Level III.
(e) Baked Clay Brush from Level XV.
(f) Baked Clay Loom-weight, characteristic of Phases III and IV.



(a) "Local" Bowl. From Level XI.
(b) "Local" Bowl. From Level VIII.
(c) "Local" Spouted Pot. Unstratified.
(d) "Local" Miniature. From Level IX.
(e) "Local" Jug. Unstratified.
(f) "Local" Spouted Pot. Unstratified.

Appearing for the first time in the final levels of Phase III, and continuing in the early levels of Phase IV, is the famous beak-spouted vessel (*Schnabelkanne*) (Group 36, Fig. 12, Nos. 18 & 19). There are two main types of these vessels, both of which are apparently represented by the fragments found. One (No. 18) has a tubular spout, ending in a beak-like lip ; the other (No. 19) merely has an open beak-lip. They seem invariably to be made of pink clay with a burnished pink slip or wash.

(7) *Types common to Phases III and IV.*

Two types correspond exactly to Phases III and IV. One is a heavy *bowl with an inverted and moulded rim*, being a much coarser version of Group 11 (Group 3, Fig. 6). These are wheelmade vessels of sandy clay and always unburnished.

The second is an articulated horizontal *loop-handle*, with a decorative *twist*, used both on heavy amphorae and on smaller jars (Group 19, Fig. 10, No. 18).

Almost corresponding (Group 21, Fig. 10, No. 12) is an *abortive* version of the " *square* " *loop-handle* (Group 17).

(8) *Types characteristic of the earlier Hittite levels (Phase IV).*

The *rim-lug ;* a kind of lip-excrescence projecting from outside the rim of an anti-splash type bowl (Group 38, Fig. 12, Nos. 8 & 9).

A *basket-handled bowl* (Group 39, Fig. 12, No. 14). This is a larger and coarser type than that represented in the " local ware " (Group 32). Only fragments were found, but the shape can be easily constructed from a parallel at Alaca. The bowl there has a carination and a ring base. It is finished with a slightly burnished red wash.

A jug with a *high channel-spout, containing a strainer* (Group 36, Fig. 12, No. 12). This type also can be reconstructed from examples found elsewhere. It is usually finished with a pink burnished wash.

Next come two types of *bowl*, which, as noticed elsewhere, have some importance as dating criteria. One is a carinated vessel, with a slightly inverted, moulded rim, and groups of *ornamental ribs, running vertically* from the rim to the carination (Group 39, Fig. 12, Nos. 10 & 11). The other is a similar *bowl, with a rising, horizontal loop-handle, laid flat against the side* of the vessel, above the carination (Group 42, Fig. 12, No. 22).

(9) *Types characteristic of the later Hittite levels.*

Finally there are three types which belong exclusively to the four uppermost levels. The first of these is the *narrow-neck flask* with a single loop-handle from neck to shoulder, the body being either spherical or lentoid (Group 41, Fig. 12, No. 21).

Secondly, and apparently in very common use, was a spherical or slightly carinated jug, having a *narrow neck with an almost vertical lip-spout* and a single, rising handle from neck to shoulder (Group 12, Fig. 12, Nos. 1-4).

Thirdly, there is a coarsely made *pot-stand*, of elementary shape (Group 44, Fig. 12, No. 6).

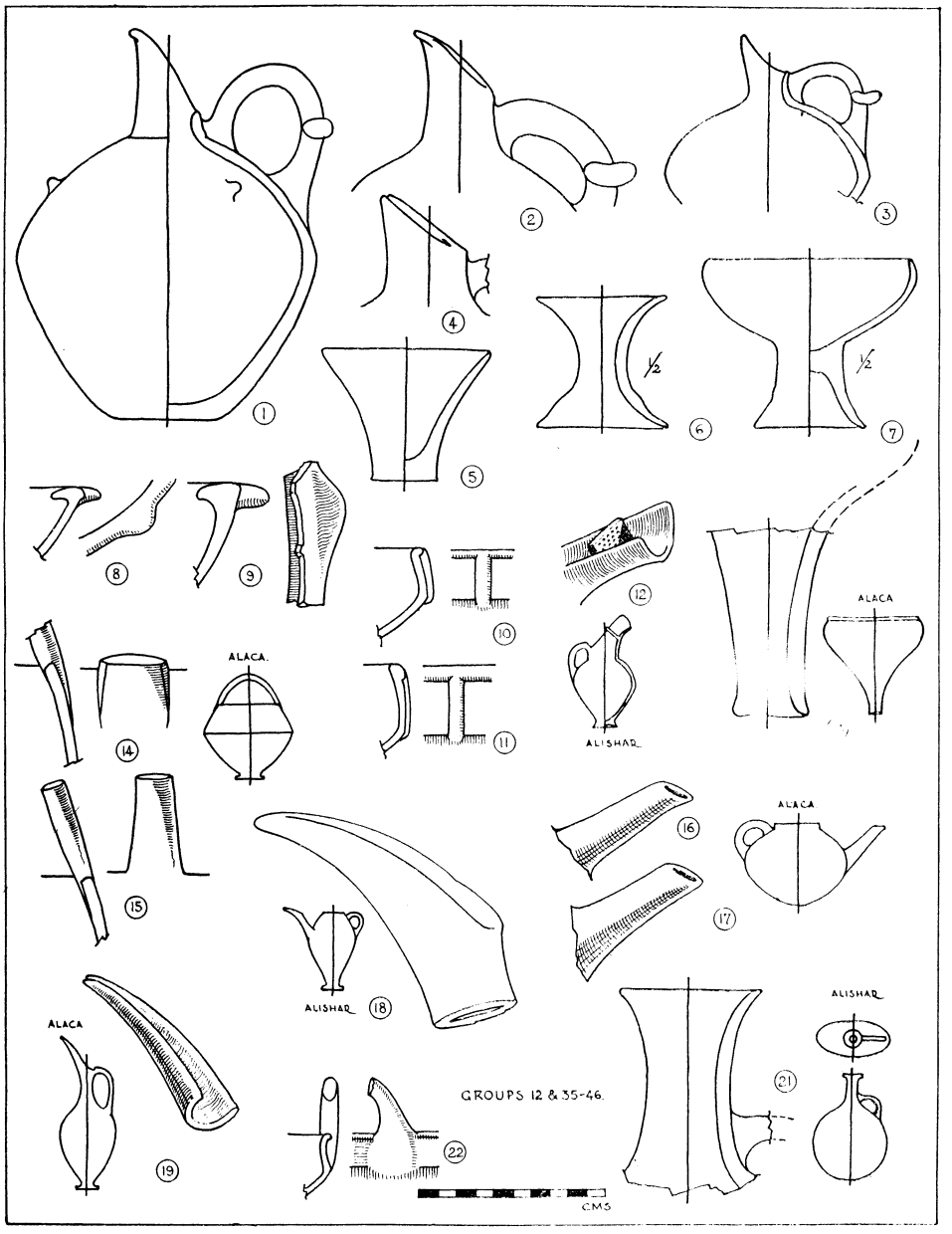


Fig. 12. Pottery of Groups 12 and 35–46.

FIGURE 12. HITTITE POTTERY.

Group 12 : Narrow-necked jugs with carination.
No. 1. Level 31. Pinkish clay. Burnished red wash. Hand-made. Plate IVb.
No. 2. ,, 30. ,, buff clay/slip. Lightly burnished. Incised ornament.
No. 3. ,, 29. Pinkish clay/slip. Unburnished.
No. 4. ,, 30. ,, ,, Lightly burnished.

Group 43 : Wheelmade beakers with flat foot.
No. 5. Level 25. Dark clay. Wetsmoothed.

Group 44 : Potstands.
No. 6. Level 31. Rough buff clay. Unburnished.

Group 40 : Fruit-stands.
No. 7. Level 22. Rough reddish clay. Burnished.

Group 38 : Rim-lugs.
No. 8. Level 25. Pink. Unburnished.
No. 9. „ 25. „ „

Group 39 : Vertical ridges from rim to carination.
No. 10. Level 25. Pink clay. Unburnished.
No. 11. „ 25. „ „ „

Group 46 : Strainer-spouts.
No. 12. Level 24. Pink wash. Burnished.

Group 45 : Funnels.
No. 13. Level 20. Pink slip. Unburnished.

Group 35 : Basket handles.
No. 14. Level 24. Red wash. Slight burnish.
No. 15. „ 24. „ „ „ „

Group 37 : " Tea-pot " spouts.
No. 16. Level 23. Red wash. Burnished.
No. 17. „ 15. Black slip. Burnished.

Group 36 : " Schnabelkannen."
No. 18. Level 22. Red clay. Pink slip. Unburnished.
No. 19. „ 25. Pink wash. Burnished.

Group 42 : Horizontal loop-handle rising from rim and carination.
No. 20. Level 27. Red wash. Unburnished.

Group 41 : Narrow-necked flasks.
No. 21. Level 28. Gritty, orange clay. Unburnished.

FIGURE 13 : PAINTED AND INCISED TYPES OF ALL PERIODS.

Group 54 : Cappadocian (Alişar III) painted ware. All gritty pink or pinkish clay. Wetsmoothed, with matt black paint, sometimes over a slight burnish.

No. 1. Level 17.
No. 2. „ 17.
No. 3. „ 15.
No. 4. „ 16.
No. 5. „ 22.
No. 6. „ 22.
No. 7. „ 16.
No. 8. „ 16.

Group 55 : Ornament in matt, white paint on polished black.

No. 9. Level 10. Burnished black inside. Burnished warm buff outside, turning black at rim. Decoration inside in matt white, paint over the burnish.
No. 10. „ 12. Burnished orange outside, turning black at rim. Black burnish inside with stripes of matt, white paint.

Group 27 : Multiple crossed bowls.

No. 13. Level 12. Pinkish buff clay. Red wash outside and forming pattern inside. Well burnished outside, slightly in. Hand-made.
No. 14. „ 12. Smeary red wash outside and pattern in.

Group 56 : Incised ornament.

No. 15. Level 16. Brownish clay/slip. Burnished. Incised ornament.
No. 16. „ 31. Pink clay. Cream slip. Burnished. Ornament incised through slip.
No. 19. „ 12. Pink clay, wetsmoothed. Incised ornament and panel of brown paint.

Group 53 : Painted ornament applied before burnishing.

No. 17. Level 16. Pink clay. Red wash outside and pattern inside. Burnished.
No. 18. „ 12. Pink clay. Red wash outside and pattern inside. Burnished.

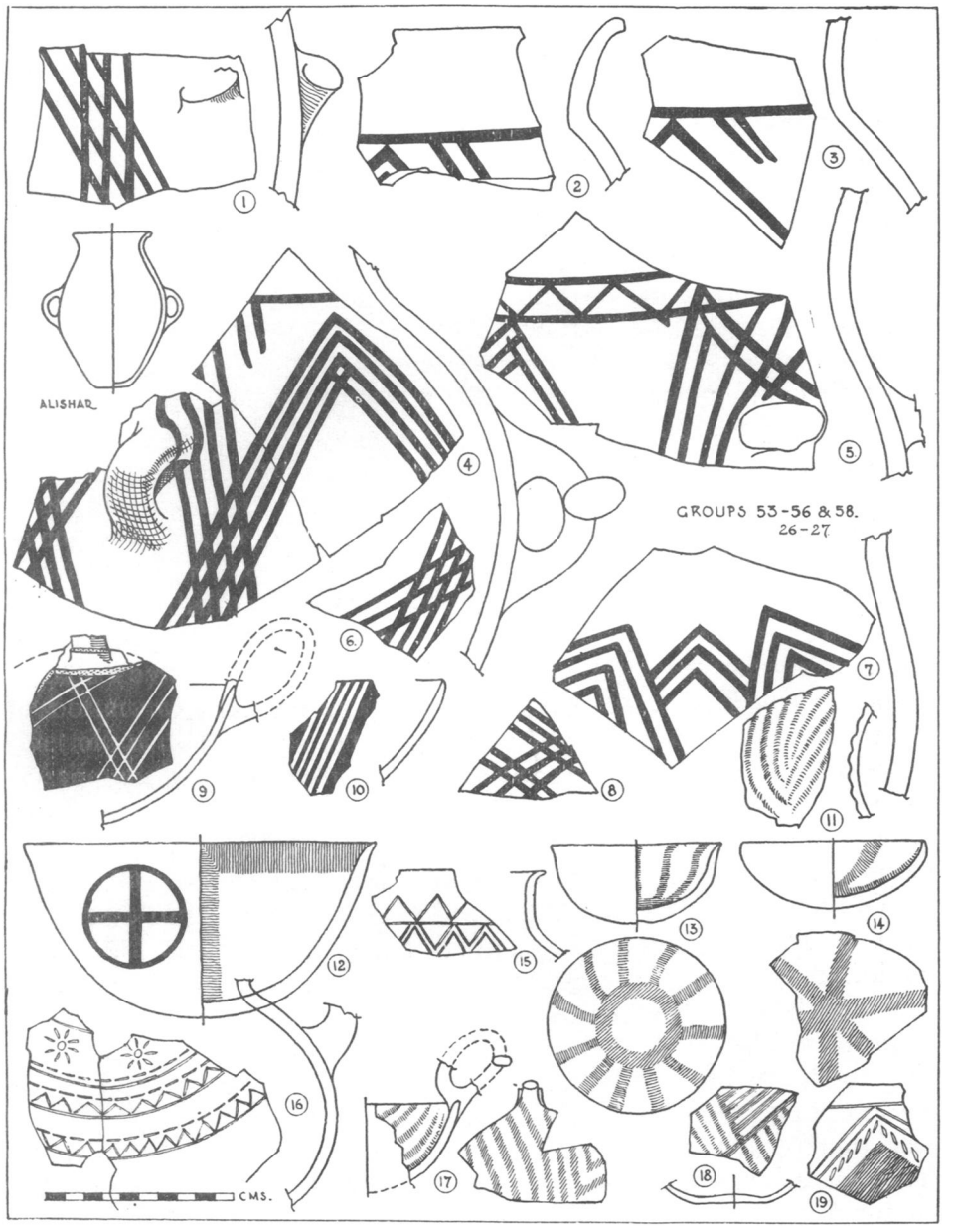


FIG. 13. Decorated pottery.

Group 58 : Polished black, corrugated ware.
No. 11. Level 2. Grey clay. Polished black slip. Corrugated.

Group 26 : " Red-cross " bowls.
No. 12. Level 11. Pink clay. Wetsmoothed. Smeary red wash all over outside and forming pattern inside. Burnished.

STRATIGRAPHIC CONCLUSIONS

Inferences drawn from the diagrammatic analysis of our ceramic typology have enabled us to divide our thirty-one occupation-levels into four main cultural phases, with a probable subdivision of the fourth and latest phase into two parts. As has been explained elsewhere, these divisions are based on unusually clear archaeological evidence, corresponding, as they do, to the points of maximum interruption in the pattern of typological survival. Yet it will presently be seen that, when they are considered in relation to the known stratigraphy of other comparable sites in Asia Minor generally, the historical identity of the phases themselves becomes easily recognisable, and a new contribution is made to the elucidation of the whole complicated problem of Bronze Age chronology.

It thus appears that our two earlier phases, comprising Levels I-XV (Phases I & II), represent the cultural period in the Third Millennium B.C. which in Anatolia has come to be known as the " Copper Age " (a designation which, as has recently been observed, is not always justified by the chemical analysis of its characteristic metal products.)

A peculiar aspect of the Polatli mound, distinguishing it from the majority of comparable sites on the plateau, lies in the fact that the Copper Age culture is here not apparently preceded by an earlier " Chalcolithic " occupation. Admittedly, amongst the pottery of our earliest settlers, who built their houses upon the clean gravel of an unoccupied site, few of the well-developed criteria of the Copper Age are yet present, and the potter's technique is in the elementary state which one would expect to find following some ethnic disturbance. Yet there is no trace of the distinctively pre-Copper Age shapes and types of decoration which at sites such as Büyük Güllücek have rightly been assumed to imply an earlier culture. To us, this fact has appeared to justify the assumption that our earliest occupation may reasonably be taken as coinciding with the beginning of the new epoch. If, then, we are to accept Blegen's latest dating of the transition from the first to the second prehistoric phase at Troy as corresponding to the beginning of the Copper Age on the plateau, the earliest occupation of our site would be about 2600 B.C., and Phases I & II would between them cover some five centuries in time.

Next, it is interesting to find the Copper Age at Polatli divided by a clearly marked cultural change, which occurs at our eleventh occupation-level, into two separate phases (I & II) ; for we shall see that such a division may equally be recognised both in the levels of this period at most other Anatolian sites, and in the corresponding occupations of mounds excavated in the maritime provinces to the south and west.

Sites on the plateau, for instance, at which two sub-periods of the Copper Age have been recognised, include Dündartepe (*Belleten*, Vol. IX, 1935, p. 360 ff.), near Samsun, Etiyokuşu (Kansu, *Etiyokuşu*. Ankara, 1937), on the outskirts of Ankara, Karaz (*Belleten*, Vol. IX, 1933), near Erzurum, Karaoğlan (*Belleten*, Vol. III, 1929) and Maşat Hüyük (*Belleten*,

Vol. X, 1937). At Ahlatlıbel it would appear that Phase I only is represented, while in the larger-scale excavations at Alaca Hüyük and Alişar, our Phase II is less clearly defined. In the maritime provinces, at Troy and Tarsus, comparable periods are easily recognisable, being sub-divisions of what, in this case is more often known as the Early Bronze Age. At the former site Towns II and III would correspond to our Phase I, and IV and V to Phase II. At Tarsus Phase I is represented by Periods III 2 and III 3, while Phase II would correspond to the earlier strata Period II.

At Polatli the transition from the Copper Age to the first truly historical period, is prefaced in Level XV by a general destruction of the whole settlement by fire. It is tempting to associate this episode (perhaps suggesting a military conquest) with the corresponding destruction which appeared to mark the termination of the Copper Age occupation at Alaca. But a more detailed discussion (*see* p. 57) will show that the difficulty of dividing the pre-fire levels into an earlier and later phase, accords more nearly with the occurrence of the fire after our Phase I, and the absence of any ruins representing Phase II.

Our third phase (Levels XVI to XXII) represents the interval of about two-and-a-half centuries between the end of the Copper Age and the foundation of the old Hittite Kingdom. The culture of this period may be considered as archaeologically, if not historically, Hittite in character, and in some circles is consequently designated as " Proto-Hittite ", though " Cappadocian " is perhaps a more convenient term. Indeed, at Polatli it is characterized by the appearance of Cappadocian painted pottery, and other types associated with the Assyrian " Karum " at Kültepe. The upper levels in this phase, in which the painted pottery still survives, while the elaborate burnished vessels of the " Alişar II " type are beginning to appear, would thus be exactly dated to the time of the Kültepe tablets.

The final phase at Polatli (Levels XXIII to XXXI) must be taken to represent the true Hittite period beginning in the mid-seventeenth century B.C.; and since, during the final occupations, there are pottery types in use which may be associated exclusively with the Hittite Empire, we have considered it reasonable to suppose that the final abandonment of the site corresponded to its fall in about 1200 B.C. This means that, somewhere in the course of Phase IV, a dividing line should occur between the early Hittite Kingdom and the Empire ; but, owing to lack of ceramic evidence, we have been unable to locate the stratigraphical transition.

COMPARATIVE TYPOLOGY.

It will already have become clear that a close study of the Polatli pottery must afford frequent opportunities for significant cross-dating with other sites in Asia Minor, and that such typological comparisons may lead to interesting speculations on the subject of stratigraphy in general. Here, therefore, it may be convenient to take each of our phases in turn, and to examine such parallels as present themselves, in the light of their chronological implications.

PHASE I.

The preponderant class of pottery in our early phase of the Copper Age, is that which came to be referred to as " local ware ". A parallel for this ware must first be sought at several sites in the neighbourhood of Ankara, where excavations by Turkish archaeologists have revealed the early Copper Age culture peculiar to the Anatolian plateau. Most notable of these is perhaps the site of Ahlatlıbel, (" Türkiye Cumhuriyeti Maarif Vekâletince Yaptırılan Ahlatlıbel Hafriyatı " in *Türk Tarih Arkeologya ve Etnografya Dergisi*, No. 2, 1934 ; also in *Archiv für Orientforschung* XI, 1936-1937) where, in a single occupational level, such pottery was found in great profusion. These small, squat jugs, with corrugated handles and channelled or corrugated surface ornament (*Ahlatlibel*, p. 49) and shallow bowls, similarly decorated, with plain or twisted loop-handles on one side only (*ibid.* p. 52) are easy to compare with shapes from Polatli such as Nos. 1, 2, 3, 5 & 11 in Fig. 11b, where the small tubular spouts projecting from the shoulder are also paralleled. Yet a discrepancy lies in the fact that the great majority of these vessels at Ahlatlıbel are finished with a polished black slip, in contrast to the warm red of the Polatli ware. Indeed, the only examples of a corrugated ware with a polished black slip exactly similar to the Ahlatlıbel technique, were found at a deeper level (II) than the majority of the local types (Fig. 13, Group 58, No. 11). A distinctive feature in both bowls and jugs which creates another incontrovertible link, is the small round depression made in the centre of the base by pressure of a finger-tip. (Compare, for instance, bowl-bases in *Ahlatlıbel*, p. 53 with those in our Fig. 11). Another ornamental feature, characteristic of the " local ware ", is a finely channelled ornament under a burnished slip, usually taking the form of multiple chevrons on the shoulders of jugs and necked jars (Fig. 11 B, Nos. 7 & 13). There is a good parallel for this at Ahlatlıbel, where AB. 13 on p. 51 should be compared with one of the above.

Vessels of comparable character from a number of other sites serve to confirm the chronological position of the Polatli " local ware ". Etiyokuşu, on the outskirts of Ankara (Şevket Aziz Kansu, *Etiyokuşu Hafriyatı Raporu*, 1937, Ankara, 1940) produced a mass of similar pottery from the earlier of its two Copper Age levels. Here again are the characteristic squat jugs, with slightly flaring rim and sharply rising lip (*Etiyokuşu*, Figs. 74-75), and here also the popular finish is a burnished red slip, rather than black. The same jugs, again ornamented with the lightly channelled chevron ornament come from an unstratified context at sites on the extreme west of the plateau, such as " Senirdje" and Punarbaşı Göl (Ormerod in *B.S.A.* XVIII, 93). The Copper Age levels (Phase B.) in Dr. Winifred Lamb's excavations at Kusura (*Archaeologia*, Vol. XXXVI, 1937) combine the same shapes with ornamental features such as channelled chevrons, incised ornament in areas wiped clean of slips (see note at foot of p. 45), twisted handles and horizontal fluting, which are characteristic of our "local" ware (Kusura, Fig. 7). Perhaps the furthest westward extension of such wares is to be sought at Thermi, where jug-shapes are strikingly similar.

(Lamb. *Excavations at Thermi in Lesbos*, Cambridge, 1936, Plate XII), while, at the other extreme they are easily recognisable in the Copper Age levels at Alaca Hüyük (there are good examples in the Alaca Museum), and in Level I at Alişar. (Schmidt, *The Alishar Hüyük: Seasons of 1928 and 1929, O.I.P.* XIX, Part I, Fig. 46 b, 507).

A most important dating criterion, two examples of which were found among the " local " ware pottery at Polatli, is the " depas amphikypellon ". This distinctive vessel has been much discussed elsewhere, (e.g. by the excavators of Troy and more recently by Schaeffer in *Stratigraphie Comparée et Chronologie de l'Asie Occidentale.* Oxford 1948). At Troy itself, where it was first identified in Asia Minor, exact replicas of our examples occur in Towns II and III, which we have correlated with our Phase I (*op. cit.*, Figs. 163 & 166). A similar double-handled goblet appears in subsequent levels, but the form has by then undergone some modification. There are examples at Tarsus in Level III (Early Bronze Age ; see Schaeffer, *op. cit.*, Fig. 173) ; at Alişar in Level Ib, (*The Alishar Hüyük: Seasons of 1930-1932, O.I.P.*, XXVIII, Plate VIII b, 139 b, 37 & b 332) and at Alaca in a Copper Age setting, the exact provenance being omitted in the publication (Hamit Koşay, *Alaca Höyük*, Ankara, 1944, Plate XXXIV, AI/A 261).

In the final occupations of Phase I at Polatli we find the first examples of a decorative technique, which has aroused much interest elsewhere. In certain vessels, matt white paint is applied to a burnished or polished black surface, the ornament being again usually in the form of chevrons (Fig. 13, Nos. 9 & 10). Some problems of dating have been raised by the appearance of this technique at other Anatolian sites in widely varied contexts. At Büyük Güllücek, for instance, where the matt white paint is used on both black and red surfaces alike (there are examples in the Alaca Museum), the setting is paralleled by a pre-Copper Age level at Alaca nearby, and is justifiably considered Chalcolithic. It appears in the same setting at Alişar, (*O.I.P.*, XXVIII, Plate I, No. 6) and at sites further west in levels contemporary with the first city at Troy. Amongst the latter are Kusura, where it is considered characteristic of Period A (Kusura, Fig. 6), at Mersin, where it immediately succeeds the painted pottery of the Syro-Mesopotamian Chalcolithic type (Garstang and Goldman, " A Conspectus of Cilician Pottery ", in *A.J.A.*, LI, No. 4, Fig. 8, Nos. 6 & 7), and at Thermi especially but not exclusively in " Town III " (*Thermi*, Plate XXX). At Yortan (*Comptes Rendus de l' Académie*, 1901, p. 810) and Fraktin, however, the provenance is less unequivocal, while in Bay Remzi Arık's excavation at Karaoğlan (*Belleten*, Vol. III, —9) and at Tekeköy, south-east of Dündartepe (*Belleten*, Vol. IX, 1935, p. 382 ff.), we understand that it was found among conclusively Copper Age material. Its discovery now at Polatli at the transition from the early to the late Copper Age, would finally bring us to the conclusion that we are concerned with two distinct occurrences of the same ware—importations, perhaps, from some inadequately explored region, where it remained constantly in use over a long period.

The only remaining ware which appears as a feature of our Phase I,

is that with a pattern painted in red beneath the burnish. (Fig. 13, Group 53, Nos. 17 & 18). Examples of this technique have been found elsewhere in Anatolia, but in so fragmentary a state and so doubtfully stratified that we prefer, for the moment merely to record its provenance for future comparison.

PHASE II.

Phase II at Polatli is somewhat less easy than Phase I to define in relation to the stratigraphy of other Anatolian sites. Its most conspicuous feature is perhaps the distinctive vessel, which has come to be generally known as the " red crossed " bowl, (Fig. 13, Group 26, No. 12), and this alone lends some conviction to the correlation of our late Copper Age, at least with sites in the west. At Troy it occurs in " Town V ". The upper limit of the fifth city is apparently still uncertain, but Schaeffer would terminate it at the end of the twentieth century. This would accord with the appearance of red-crossed bowls at Tarsus (Garstang and Goldman, *loc. cit.*, Plate XCV, No. 1) at the beginning of " Stage B ", that is in the early years of the Second Millennium, and at Kusura, towards the end of "Phase B " (Kusura, Fig. 6.), where Dr. Lamb would date them about 2000 B.C.

As has already been suggested, the correlation of our Phase II with the Alaca Hüyük stratification is particularly problematical. At Alaca, the excavators have recognised twelve principal occupation-levels (two are divided into sub-periods), which are numbered downwards from the summit of the mound to virgin soil. The four lowest of these (XII to IX) are attributed to the Chalcolithic period, and the next three (VIII to VI) to the Copper Age. Level V is represented by a deep deposit of burnt debris, resulting from the destruction of the city by fire. Post-dating the destruction there are three so-called Hittite levels, corresponding more accurately to the Proto-Hittite (Cappadocian) period, Old Hittite Kingdom and Hittite Empire respectively (IV to II), and directly beneath the surface, a mixed level representing the occupation of the mound from Phrygian times onwards. This is the excavators' own dating of the levels, and the thirteen famous tombs, with their gold and silver ornaments, which occur in Levels V to VII are attributed by them to the Copper Age.

It is here, however, necessary to mention Schaeffer's conclusions on the subject, (*op. cit.*, p. 286 ff.) which are on somewhat different lines. The subject is complicated by his adopting the Alişar assumption of an " Anatolian Early Bronze Age " in the transition from Copper Age to true Hittite. And it is to this period that Schaeffer would attribute the tombs, identifying it with Level IV and concluding that it was from this level that the tomb-shafts were sunk. Quite apart from the Copper Age typology of the metal objects in the tombs, an objection would appear to be that one would here be dealing with the period of the Cappadocian-Alişar III painted pottery ; whereas, as far as one knows, no single fragment of such ware was found, either associated with the contents of the tombs or in the undisturbed deposits of Level IV. Admittedly, in the absence up to the moment of any detailed publication of the pottery in

these levels (Koşay, in "The Pottery of Alaca Höyük", *A.J.A.*, Vol. LI, No. 2, 1947, p. 152, mentions the existence of a few Cappadocian sherds, but does not specify their provenance), any categorial opinion about Level IV would be premature ; yet a personal inspection of the vessels from this source in the Alaca Museum show some monochrome pieces of undoubtedly proto-Hittite character, and serves to confirm the excavators' assessment. Similarly in regard to the tombs, it is their conclusions which one is inclined to accept, as having more detailed evidence at their disposal.

Having therefore some reason for correlating the Alaca tombs and the three levels in which they occur with our Phase I at Polatli, we are faced with the absence of any occupation comparable to Phase II, and must assume an hiatus following the fire, which put an end to the early Copper Age culture.

At Alişar a similar difficulty arises, owing to the absence of continuity in the stratification between Levels Ia and Ib (where examples of the "depas amphikypellon" make a significant link with our Phase I—*O.I.P.* XXIX, Fig. 43 ; *O.I.P.* XXVIII, Plate VIII, Nos. b 139, b 37 & b 332—and Level III with its unmistakably Cappadocian affinities. Level II, of course, post-dates Level III.

PHASE III.

The most characteristic feature of Phase III at Polatli is the occurrence of Cappadocian monochrome painted ware. From the point where the first isolated sherds appear in the final levels of Phase II, to its maximum occurrence in the middle of Phase III, there is a striking uniformity both in shape and design. Curiously enough, while it is easy to find parallels for the technique and pattern of the ornament among the true Cappadocian pottery (compare de Genouillac, *Céramique Cappadocienne.* Paris 1926), the single shape (Fig. 13, No. 4), which we have been able to reconstruct, is more familiar among the polychrome vessels of Alişar III (e.g. *O.I.P.* XXVIII, Plate IX. d 2494). It should be added that Dr. Tahsin Özgüç has been good enough to point out to us a similar vessel among the recent finds from Kültepe, whose provenance relates it in date to the famous tablets.

Two other shapes occur in Phase III, and may perhaps be considered typical of the Cappadocian period. One is the " teapot ", with tubular spout and one handle (Fig 12, Group 37, Nos. 16 & 17). At Alaca, as with us, the first occurrence of this vessel is in the final levels of the Copper Age (Koşay, *A.J.A.* LI, No. 2, Plate XXXVc). At Tarsus, however, there are many examples of a similar vessel in " Stage B ", contemporary with types exactly dateable to the Kültepe period, (Garstang & Goldman, Plate XCV, No. 9). At Alişar it appears to be dated somewhat later. (*O.I.P.*, XIX, Plate IV, c 2126).

Another type is the ogee-shaped funnel (Fig. 12, Group 45, No. 13). A similar vessel in the Alaca Museum is labelled " Middle Hittite ", which suggests that it derives from Level III, the period of the old Hittite Kingdom.

At Tarsus there is a comparable object with one loop handle, which is again dated later (Garstang & Goldman, Plate XCVIII, No. 2).

In the final levels of Phase III, the elaborately shaped vessels with a polished slip, of the Alişar II type, begin to appear, parallel to the final occurrence of the painted Cappadocian (Alişar III), and here we must have reached the period of the Kültepe tablets. In this connection, Dr. Tahsin Özgüç has kindly provided us with the following schedule, indicating the appearance of the tablets in relation to these two types of pottery :—

	Level I. *c.* 1600—1700 B.C.	Alişar II wares.	
TABLETS	*Level II.* *c.* 1800 B.C.	,, ,, ,,	
	Level III. *c.* 1850 B.C.	,, ,, ,,	plus a little Cappadocian.
	Level IV. *c.* 1950—2000 B.C.	Alişar II and Cappadocian painted.	

This would appear to suggest that our Levels XXI and XXII are contemporary with the Kültepe tablets.

PHASE IV.

It is in our Phase IV that the full complement of early Hittite (Alişar II) wares begin to appear. Most typical of all is perhaps the beak-spouted vase ("Schnabelkanne"—Fig. 12, Group 36, Nos. 18 & 19). There are many varieties of this shape. For one with a tubular spout, found at Polatli, an Alişar parallel may be found (*O.I.P.*, XIX, Plate XI. b 1425), and for the simpler form (No. 19) from Alaca Level III (Alaca Museum). Several examples appeared of the variety with a channel spout and a small strainer inserted in it (compare *O.I.P.*, XIX, Plate XII, b 2544, as well as examples from Alaca, Kültepe and elsewhere, all dating from the Old Hittite period).

A rather deep bowl with a basket-handle (Fig. 12, Group 35, Nos. 14 & 15) has a parallel dating from the Old Hittite Kingdom at Alaca (Alaca Museum). The carinated bowl with groups of vertical ribs between carination and rim, (Fig. 12, Group 39, Nos. 10 & 11) we have ourselves seen in a Troy VI context, among unpublished material from the prehistoric sounding at Bayraklı ; while the similar bowl, with two horizontal loop-handles laid flat against the side of the vessel above the carination (Fig. 12, Group 42, No. 22) is also dated to Troy VI by a fragment in the possession of the Türk Tarih Kuruma at Ankara, again by fragments from Bayraklı and from Boğazköy (Bittel, *Boğazköy*, Plate XXXVc). The narrow-necked flask, with handle from neck to shoulder, either round or lentoid in shape (Fig. 12, Group 41, No. 21), has many parallels. It occurs in Level III at Alaca (Alaca Museum), amongst Mycenaean material at Tarsus (Garstang & Goldman, Plate XCIX, No. 8), in Level IV (Alişar II) at

Boğazköy (Schaeffer, Fig. 182) and in the period of the Hittite Empire at Mersin.

Finally there is the slightly carinated jug with one handle, a narrow neck and almost vertical lip (Fig. 12, Group 12, No. 1), which we have considered as characteristic of the Hittite Empire, mainly on the strength of a comparable vessel from Level II at Alaca (Hamit Koşay, *Alaca Höyük*, 1944, Plate XXVI, A/I.195).

METAL OBJECTS

All recognisable types of metal object from Polatli appear in Fig. 14. Unfortunately the three best-preserved examples (Nos. 12, 13 & 14) have no stratigraphical provenance, as they were found during the quarrying operations before our arrival at the site. Nevertheless, local enquiries have shown to our satisfaction that they originate in the early Copper Age levels, and suggest that some or all of them are derived from a tomb-group.

Perhaps the most striking piece is the small, ovoid jug, with high neck, beak spout and twisted handle (No. 14, Hittite Museum No. 11030), whose strong resemblance to a golden vessel of the same form from the famous tombs at Alaca (Koşay, *Alaca*, 1944, Plate CLXXI) seems so effectively to confirm the alignment of dating between the two sites, which we have suggested elsewhere (cf. p. 57). Notable in this respect is the raised collar around the neck.

For the well-made shaft-hole hammer-axe or " battle-axe " (No. 13, Hittite Museum 11031) we have not succeeded in finding an exact parallel ; but the shape is again reminiscent of a copper " battle-axe " from Yortan (*A.f.O.*, XIII, 1939-41, p. 21, Fig. 16), a silver object from the Alaca tombs (Schaeffer, Plate XLII b.) and the celebrated stone battle-axes from the probably contemporary " Depot L " at Troy (Schaeffer, Fig. 167). The dagger with flattened midrib (No. 12, Hittite Museum 11032) is of the same date.

Among stratified objects from the excavation, perhaps the most common type is the simple needle (Nos. 5-8). At Polatli these are found only in strata representing the Second Millennium, though elsewhere they are in use at an earlier period. Almost all the remaining objects have parallels at Kusura, Alişar and elsewhere. The roll-headed pin (No. 4) comes from an early Copper Age level, but might be dated at any time from the Chalcolithic to the Hittite periods. The pins with ornamental heads (Nos. 2 & 3) are late Copper Age, as also is the drill " bit " (No. 11). The crude metal ring (No. 9) is Hittite Empire and has a parallel at Alişar (*O.I.P.* XXIX, Fig. 295), where the flat knife-blade (No. 1) would be dated to Level II (*O.I.P.* XIX, Fig. 194).

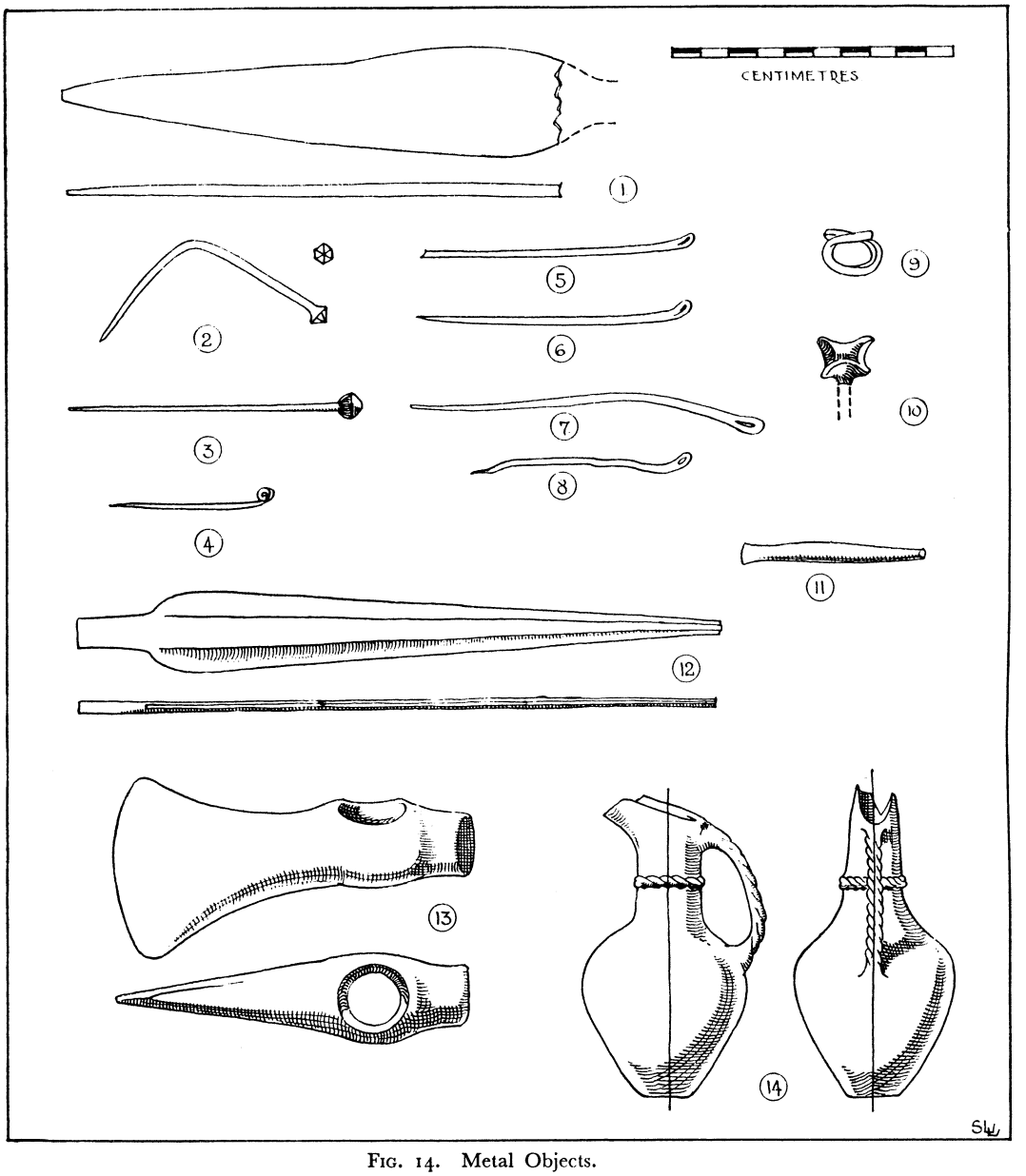


FIG. 14. Metal Objects.

FIGURE 14. METAL OBJECTS.

No. 1.	Simple knife-blade.	Level XV.	
No. 2.	Pin with ornamental head.	,,	XVIII.
No. 3.	,, ,, ,, ,,	,,	XVIII.
No. 4.	Roll-headed pin.	,,	VI.
No. 5.	Needle.	,,	XXXI.
No. 6.	,,	,,	XVI.
No. 7.	,,	,,	XXIII.
No. 8.	,,	,,	XXIX.
No. 9.	Crude ring.	,,	XXXI.
No. 10.	Ornamental pin-head.	,,	XVI.
No. 11.	Drill " bit ".	,,	XVI.
No. 12.	Spearhead. (Hittite Museum No. 11032)		Unstratified.
No. 13.	Hammer-axe. (,, ,, ,, 11031)		,,
No. 14.	Necked jug with handle (,, ,, ,, 11030)		,,

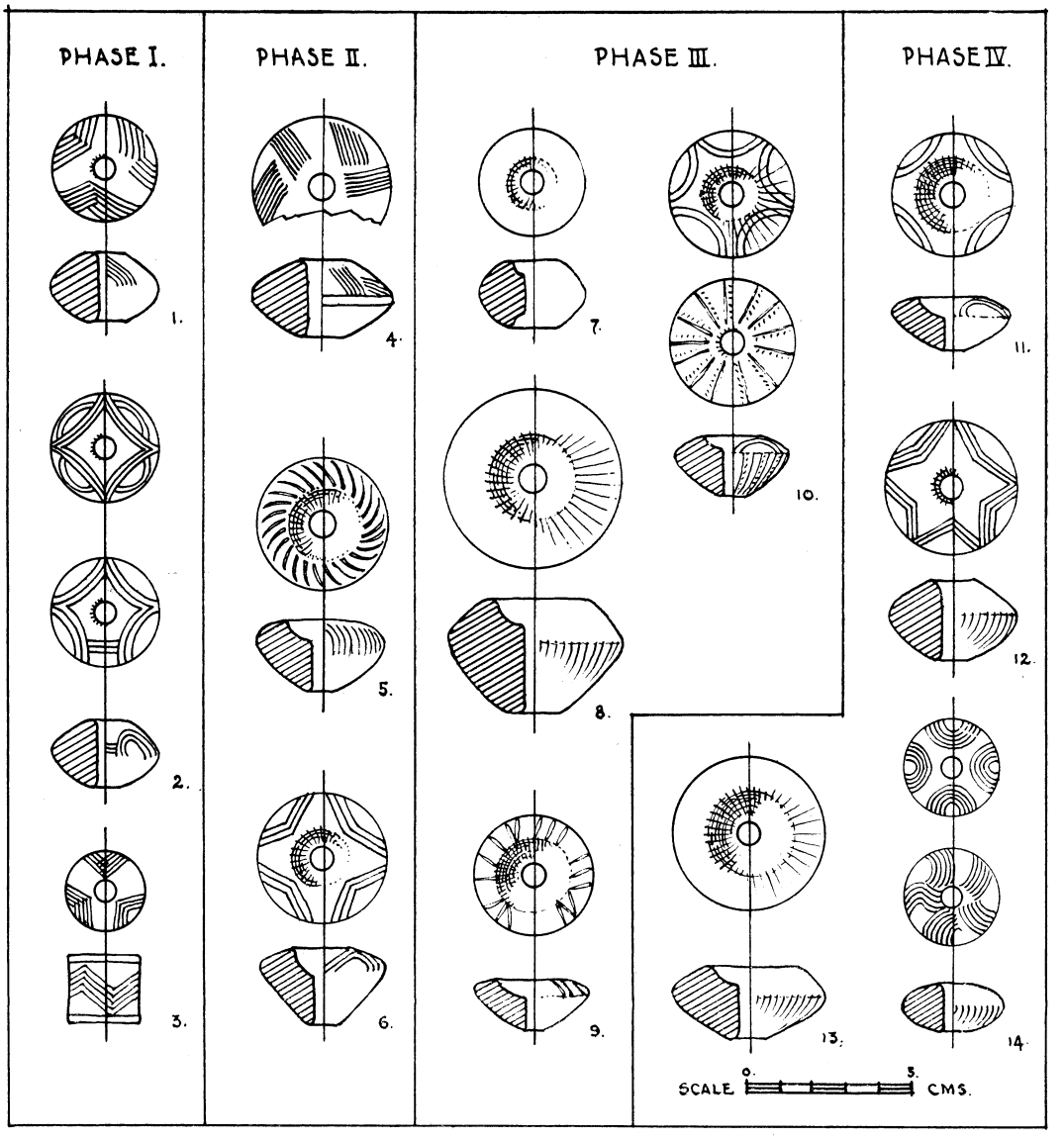


FIG. 15.

FIGURE 15. BAKED CLAY SPINDLE-WHORLS.

No. 1. Level VIII.
No. 2. ,, VIII. Black clay with white-filled incisions.
No. 3. ,, VIII. Black clay, lightly burnished after decoration.
No. 4. ,, XVI.
No. 5. ,, XII
No. 6. ,, XI.
No. 7. ,, XX.
No. 8. ,, XVI.
No. 9. ,, XX.
No. 10. ,, XVI. Light red clay.
No. 11. ,, XXIII.
No. 12. ,, XXXI.
No. 13. ,, XXX.
No. 14. ,, XXXI.

NOTE : Unless otherwise noted, all these objects are of red or black clay, with a wet-smoothed finish and incised ornament.

APPENDIX I.

A STUDY OF THE HUMAN SKULLS FROM POLATLI HÜYÜK

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During the excavation of this site remains of several skeletons were found and brought to me to study. I wish to express my thanks to the excavators for entrusting the description of these skeletons to me.

The collection of bones submitted to me, included the remains of five individuals, three only of which, (Nos. 2, 4 and 5) are described in this report, since the remains of the other two (Nos. 1 and 3) are too fragmentary[1], and since, as they were found in close proximity to the surface, their provenance makes their authenticity unreliable.

Skeleton No. 2 comes from a shaft-grave directly in contact with virgin soil at Level I, and consequently belongs to the earliest cultural period represented in the mound. Skeleton No. 4 is from a fragmentary burial at Level XXIX, and should be dated to the end of the Hittite Empire, late in the XIIIth century B.C. Skeleton No. 5 is from the cist-grave at Level VI, which dates from the earlier part of the Copper Age.

POLATLI NO. 2

(Plate VI, 1, 3 and 5.)

This individual is represented by a calva, teeth, mandible fragments and some post-cranial bones. With the exception of wisdom teeth, all the other permanent teeth had erupted. The second permanent molars have apparently been in use for only a comparatively short period, as the enamel alone has been abraded and no dentine is still exposed. The fragmentary long bones also show that the epiphyses were still open. It would appear that this individual was of 13 to 15 years of age.

The determination of the sex of a skeleton belonging to a young individual, particularly in the absence of the pelvis, is difficult. As the teeth of this individual are of moderate size, the sex cannot be determined accurately. But from the size of the skull, I am inclined to attribute this skeleton to a male.

In this calva are preserved the mid-part and the right half of the frontal bone, and the greatest part of the right, and a considerable portion of the left, parietal bones. A considerable portion of the right temporal bone and a small part of the left temporal bone, the uppermost portion of the squamous section of the occipital bone and the right zygomatic bone are also preserved.

[1] Skeleton No. 1 is represented by only a cranial fragment from the anterior part of the right parietal bone and skeleton No. 3 is represented by the lower two-thirds of a right humerus and the upper part of a right ulna.

This calva has been greatly distorted. The posterior part of the parietal bones and the occipital bone have been thrown backward and the left temporal bone has been pushed backward and downward (Plate VI, 1, 3 and 5). Therefore, the measurements taken are not exact.

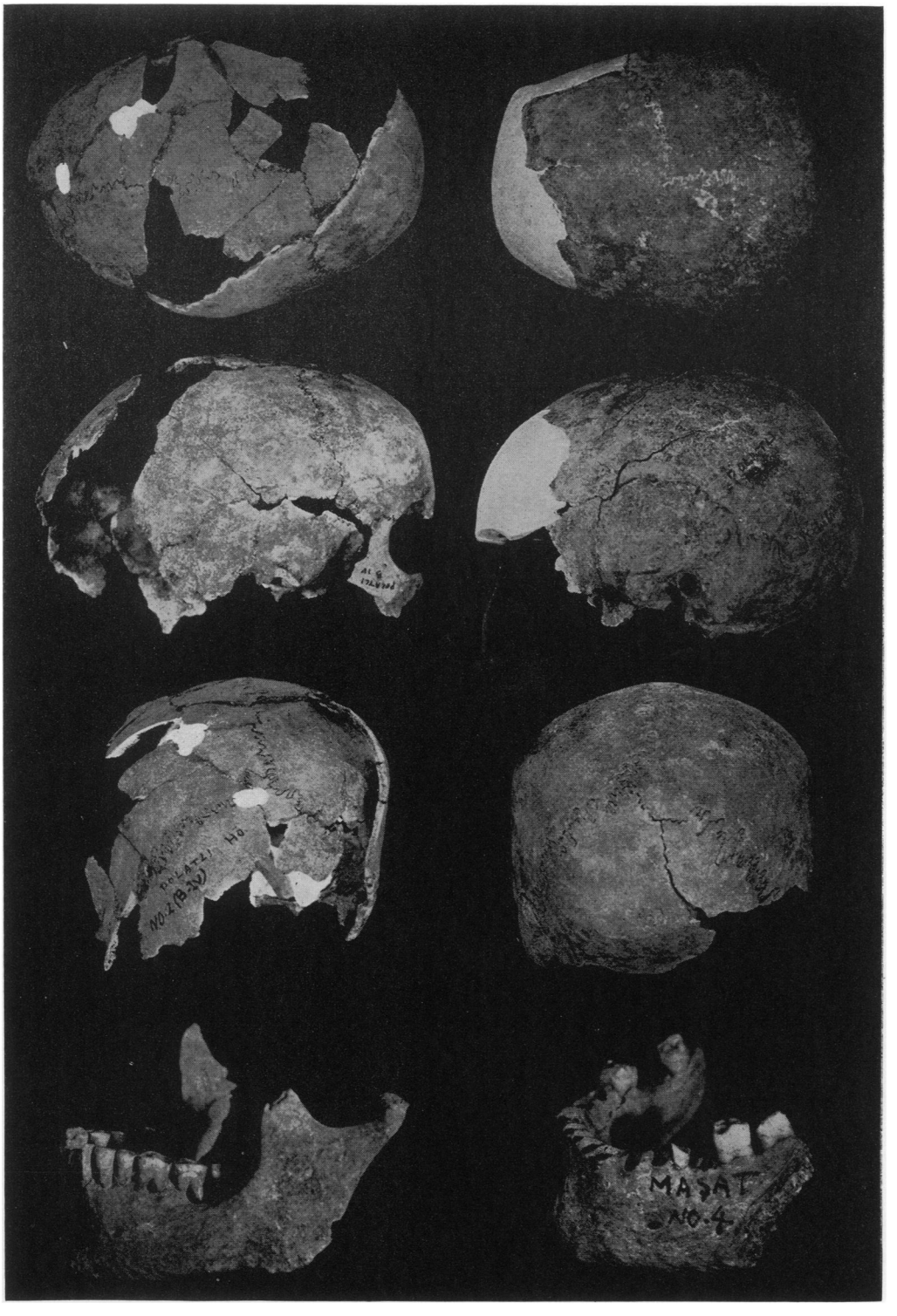
The measurements of this calva are shown in Table I. The measured maximum skull length is 199 mm. (?) and the maximum width 139 mm. (?). The cranial index calculated from these measurements is 69.34 (?), that is, dolichocephalic. However, as the skull is distorted, the measured skull length is probably in excess of the actual length. The estimated skull length of this individual is 185 mm. (?), yielding with the width a cranial index of 75.13, which is slightly mesocephalic. Indeed, the cranial index (75.13) is almost on the border of dolichocephaly. As this individual had not yet completed his development, it can be assumed that if he had lived longer, the cephalic index would probably fall into the dolichocephalic category. At any rate, the morphology of this skull shows that we are here dealing with an individual of the longheaded type. The auricular height-length index is, with the measured length, chamaecephalic, and, with the estimated length, orthocephalic. On the other hand, the auricular height-breadth index is metriocranic, thus putting it in the middle category.

The form of the skull, in norma verticalis, is pentagonoid. The forehead is of submedium elevation and of submedium slope. The brow ridges and glabella are still weak. The frontal eminences are pronounced and the post-orbital constriction is of submedium development. The temporal fullness is of medium degree. There is a post-coronal depression of submedium extent. In the parietal region the sagittal elevation is of submedium development. The parietal eminences are pronounced. The mastoid process and the supramastoid crest are still of submedium development. In norma lateralis the occiput is well-curved. There are no wormian bones observed in the coronal suture. There is a fairly large wormian bone on the sagittal suture, just above the point lambda, slightly to the left side. On the lambdoid suture there are traces of two wormian bones on the right and left sides.

The measurements of the teeth are shown in Tables II and III. The following teeth of this individual have been preserved : right upper first and second incisors ; right and left upper canine ; right and left upper first and second premolars ; right first, second and third molars ; left lower first incisor ; right and left lower second incisor ; right lower canine ; right lower first and second premolars ; right first and second lower molars ; with the exception of lower right first and second molars, all teeth are isolated.

The upper incisors show a slight degree of Hrdlička's[1] shovel-shape. The first upper premolar has two roots, one buccal and one lingual. The upper second premolar has a single root. The first upper molar has four well-developed cusps. The hypocone of this tooth is well-developed.

[1] Hrdlička, A. "Shovel-shaped teeth," *American Journal of Physical Anthropology*, 3, 1920.



ANTHROPOLOGICAL DOCUMENTS.

1, 3, 5, Polatli No. 2 ; 2, 4, 6, 7, Polatli No. 4 ; 8, Maṣat No. 4.

Though the root is damaged, there appear to have been three roots. The upper second molar also has four cusps, but the hypocone of this tooth is reduced. There appear again to have been three separate roots. The upper third molar is represented by a germ of the right side without the root. This tooth has four cusps, too, but the hypocone is smaller than that of the upper second molar.

The lower central and lateral incisors are not shovel-shaped. The roots of the lower first and second premolars are damaged, but they seem to have single roots. The lower first molar has five cusps. In this tooth the mesoconid (hypoconulid) is well-developed and lateral in position. This tooth exhibits a modified Dryopithecus pattern. Though the tooth is in situ, it can be seen that there are two separate roots. The lower second molar has only four cusps and shows Milo Hellman's[1] plus pattern. This tooth also has two separate roots.

The attrition plane of the incisors shows that the bite of this individual was of the over-bite nature. There are no caries in any of the teeth preserved.

There are a number of post-cranial bones, but they are all broken and with parts missing. Of these the best preserved are pieces of a right and a left femur, the latter being better preserved than the former. But even these bones are broken badly, so that the length measurement could not be taken. The following measurements could be taken on the fragment of the left femur :

Antero-posterior diameter in subtrochanteric region :	20.00 mm.
Breadth (lateral) in subtrochanteric region :	26.00 mm.
Antero-posterior diameter in the middle of the diaphysis:	21.00 mm.
Breadth (lateral) in the middle of the diaphysis:	22.00 mm.
Circumference in the middle of the diaphysis:	65.00 mm.

Index platymericus = 76.92
Index pilastricus = 95.45

This femur is platymeric. The pilaster index is very low.

Polatli No. 5.

Polatli No. 5 is represented by three cranial fragments ; a part of the right half of the mandible consisting of a part of corpus mandibulae and a portion of ramus mandibulae, and some very fragmentary post-cranial bones.

The largest of the cranial fragments consists of a part of the right temporal bone and the zygomatic bone of the same side, which I have glued together. There is no doubt that an adult individual is dealt with here but his exact age cannot be determined. The large mastoid process and the strongly developed supramastoid crest show that these bones belong to a male. But because of its fragmentary nature, nothing can be said about the physical type to which it belongs.

[1] Hellman, M. "Racial characters in human dentition." *Proceedings of the American Philosophical Society*, 67, No. 2, 1928.

In the mandible the mental foramen is single. The alveolar border is damaged, but there is no doubt that at least the last two right molars had fallen off long before death.

In the fragments of femur a strong pilaster development is observed.

Polatli No. 4.

(Plate VI, 2, 4, 6 and 7).

This individual is represented by a calva and a lower jaw. There are no long bones associated with them. In this calva the anterior part of frontal bone is missing, only its upper portion being preserved. The two parietal bones have been kept intact. The left temporal bone is preserved, but the right temporal bone is missing. The left great wing of the sphenoid bone and the greater portion of the occipital bone are also preserved. The anterior part of the frontal bone which is missing, has been restored with plaster of paris, without modelling the brow ridges in detail. In the mandible the posterior part of the right ramus mandibulae is missing together with the mandibular condyle.

The sagittal suture is synostosed for the most part on the endocranial aspect of the calva, while on the ectocranial surface this suture is mostly open with only partial closures. The pars bregmatica and pars complicata sections of the coronal suture are open both on the endocranial and ectocranial aspects of the skull, while the pars temporalis of this suture is completely obliterated both on the inside and outside. The lamboid suture is still open both on the endocranial and ectocranial surfaces of the calva. The sphenofrontal, sphenoparietal, sphenosquamosal, squamosal, parieto-mastoid and the occipito-mastoid sutures are open on the external and internal surfaces of the skull. According to the state of synostosis of the cranial sutures this individual is of about 30 years of age. Some features of the calva and the mandible indicate that it is a male that is being dealt with here.

The measurements of the calva are shown in Table IV. This skull is very long and of moderate width. Though the glabello-occipital diameter has been measured on the restoration, a glance at Plate VI, 2 and 4, will show that the length of this skull is very large indeed, and that the measured length cannot be inferior to the actual one. The absolute basion-bregma and the porion-bregma heights also are considerable. The skull is dolichocephalic, as is also clearly shown by its form. The basion-bregma height-length index is orthocephalic and the basion-bregma height-breadth index is metriocephalic. The auricular height-length index is also orthocephalic, but the auricular height-breadth index is tapeinocranic. The mean thickness of the parietal bone, measured about one centimetre above the squamosal suture, is quite high.

As for the morphological peculiarities of the calva, in norma verticalis, its form comes closer to the pentagonoid. In the upper part of the frontal bone the metopic suture has completely disappeared. But as the anterior part of the frontal bone is missing, I cannot say whether it was altogether

closed in that part or not. Though the pars temporalis of the coronal suture is closed, it is clear that pterion was in the form of an H. There is a slight degree of postcoronal depression. The temporal fullness is of medium extent and the parietal eminences are of average development. The mastoid process is below average in development and the supramastoid crest is of medium degree. The typmpanic plate is of moderate thickness and the post-glenoid process is of medium development. A pathological bony outgrowth is observable in the glenoid fossa.

Though there is a moderate degree of lambdoid flattening, the occiput, in norma lateralis, is well-curved and protuberant. There is a strong ridge-shaped occipital torus. There are no wormian bones in the coronal and sagittal sutures, but there is a very large wormian bone on the lambdoid suture to the right of the point lambda. There is a smaller wormian bone at pars media of the lambdoid suture on the right side. In addition there is a small wormian bone at the right and left asterion region.

The measurements of the mandible are shown in Table V. This mandible is considerably long. The index of ascending ramus is conconsiderably low, as in the Europeans.[1] The height-thickness index of the corpus mandibulae is quite low,[2] which is due to a relatively large height as well as the relative thinness of the corpus. The mean angle of the mandible is quite large[3]. The chin is positive and projects to a moderate degree. Some alveolar prognathism is observed. The mental spine is small. There is no mandibular torus. The gonial angle is strongly everted. On both the right and left side there is a large mental foramen under the second premolar. But a smaller orifice is seen below this and another one is observed under the interalveolar septum between the second incisor and the canine on both sides. In addition there is a very tiny orifice at the symphysis region on each side.[4]

In this mandible the following teeth have been preserved without damage : right and left first and second premolars, right and left first and second molars, and the left wisdom tooth. The left second incisor and the right wisdom tooth have fallen off after death. All the other remaining teeth have been damaged post-mortem. All teeth are considerably worn.

[1] See: Schulz, *Zeitschrift für Morphologie und Anthropologie.* Band XXXII, Heft 1/2, Table 5, 1933.

[2] See: Martin, *Lehrbuch der Anthropologie*, 1928, Vol. 2, p. 979.

[3] See: Martin, *op. cit.* p. 984.

[4] For the occurrence of an extreme case of multiplicity of foramina mentalia and its significance see: Şenyürek, " The multiplicity of foramina mentalia in a human mandible from the Copper Age of Anatolia ". *Nature*, 157, 1946. In this Kusura mandible (No. V, 94.76) there are five foramina on the right and four on the left sides. Another mandible of interest in this respect is Maşat No. 4 (See: Şenyürek, Türk Tarih Kurumu adına yapılan Maşat Höyük kazisindan çikarilan kafataslarinin tetkiki. Study of the skulls from Maşat Höyük, excavated under the auspices of the Turkish Historical Society. *Belleten*, X, 1946). This mandible (Fig. 8) was described as having three orifices on the left side, but subsequently my student, Mr. Fikret Ozansoy, has drawn my attention to a fourth and extremely tiny pore, under the anterior root of the first molar, which had been at the time of description plugged with mud and thus overlooked.

From Table VI it is seen that the length of the crown diminishes in passing from the first toward the third molar. However, there is a slight difference between the right and left sides in this respect. On the right side the second molar is slightly longer than the first, while on the left side the reverse is the case. With the exception of the wisdom tooth all the measured teeth are very large[1]. As the masticating surfaces of the teeth are worn, it is difficult to determine with certainty the number of the cusps and the cusp patterns in the molars. Though it is not certain, the first molar may have five and the second may have four cusps. The third molar has only four cusps. The second molar seems to have plus pattern. The first and second molars have two separate roots. The alveolus of the right wisdom tooth, which is a single hollow without the septum, indicates that the roots of this tooth were fused. But the left wisdom tooth has two roots.

As for the pathology, no mandibular teeth had been lost before death. The second left molar had an abscess in the root region. The alveolar process shows signs of pyorrhea.

Summary and Conclusions

Of the remains of five individuals from Polatli Hüyük, only two skulls are available for racial determination. One of them (No. 2) is that of a long-headed juvenile which, from the view-point of morphology, does not differ from the majority of the Chalcolithic and Copper Age inhabitants of Anatolia which were long-headed.[2] However, as this individual had not yet completed his development, it is difficult to say with certainty whether he belonged to the Eurafrican or Mediterranean type, which are the two longhead elements present in the Chalcolithic and Copper Ages in Anatolia.[3] The skull from the Hittite period (No. 4) belongs to the large-headed Eurafrican type. Thus this skull shows that in Central Anatolia the Eurafrican type has survived from the Chalcolithic until, at least, 1200 B.C. From this skull it can further be concluded that, as in the Chalcolithic and Copper Ages, in the Hittite Empire period also, in central Anatolia there were long-heads of Eurafrican and Mediterranean types, the latter being exemplified by the long-headed skulls from the Hittite stratum of Alişar Höyük.[4] Some of these Alişar long-heads have mixed with the Hittite invaders, a large proportion of whom were roundheaded.[5]

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[1] Compare with: Şenyürek, *op. cit.*, 1946, Table 2.

[2] See: Şenyürek, "Anadolu Bakır çağı ve Eti sekenesinin kraniyolojik tetkiki. A craniological study of the Copper Age and Hittite populations of Anatolia." *Belleten*, V, 1941.

[3] Şenyürek, *loc. cit.*

[4] For the description of these skulls see: Krogman, W. M. " Cranial types from Alishar Hüyük and their relations to other racial types, ancient and modern, of Europe and Western Asia ". In von der Osten's: *Alishar Hüyük*, Part III. *O.I.P.* XXX, 1937.

[5] Şenyürek, *loc. cit.*

TABLE I.

The measurements of Polatli Hüyük No. 2: The Calva *.

Glabello-occipital length	199.00?—185.0?
Maximum width	139.00?
Porion-bregma height	115.00 (Right)
Mean thickness of parietal	3.30
Cranial Index	69.84?—75.13?
Po-b-length index	57.78?—62.16?
Po-b-breadth index	82.73?

* In this report all measurements are given in millimetres.

TABLE II.

The measurements of Polatli Hüyük No. 2 : The Permanent Teeth.

Maxillary Teeth	Length	Breadth	Height (Crown)	Robustness Value *	Crown Index†
I^1	8.6	6.7	—	57.62	77.90
I^2	6.3	6.1	—	38.43	96.82
C^1	8.2	8.3	11.0	68.06	101.21
P^3	7.4	9.3	8.2	68.82	125.67
P^4	7.0	9.2	7.5	64.40	131.42
M^1	10.1	10.8	7.0	109.08	106.93
M^2	9.6	11.6	7.4	111.36	120.83
M^3	9.4	11.1	7.2	104.34	118.08

* Robustness value = Length x breadth.

$$\dagger \text{ Crown index} = \frac{\text{Breadth x } 100}{\text{Length}}$$

TABLE III.

The Measurements of Polatli Hüyük No. 2 : The Permanent Teeth.

Mandibular Teeth	Length	Breadth	Trigonid Breadth	Talonid Breadth	Height (Crown)	Robust-ness Value	Crown Index	Trigonid-Talonid Index*
I_1	5.2	6.0	—	—	—	31.20	115.38	—
I_2	6.3	6.2	—	—	—	39.06	98.41	—
C_1	7.1	7.6	—	—	11.4+	53.96	107.04	—
P_3	7.3	7.6	—	—	9.1	55.48	104.10	—
P_4	7.6	8.8	—	—	8.6	66.88	115.78	—
M_1	11.4	9.9	9.7	9.9	6.5+	112.86	86.84	102.06
M_2	11.1	9.6	9.6	9.5	7.3	106.56	86.48	98.95

$$\text{* Trigonid-talonid index} = \frac{\text{Talonid breadth x 100}}{\text{Trigonid breadth}}$$

TABLE IV.

The Measurements of Polatli Hüyük No. 4 : The Calva.

Glabello-occipital length ...	198.0?
Maximum width	147.0
Basion-bregma height* ...	142.0?
Porion-bregma height	116.0
Mean thickness of parietal ...	6.6
Cranial index	74.24?
Height-length index	71.71?
Height-breadth index	96.59?
Po-b-length index	58.58?
Po-b-breadth index	78.91?

* This height has been measured in front of the damaged right occipital condyle.

TABLE V.

The measurements of Polatli Hüyük No. 4 : The Mandible.

Condylo-symphyseal length	110.0?
Height of ascending ramus (From Gonion to the highest point of the condyle)...	62.0
Height of ascending ramus (Projected)	49.0
Minimum breadth of ascending ramus	31.5
Height of corpus (At the level of foramen mentale)	34.5
Thickness of corpus (At the level of foramen mentale) ...	12.0
Bimental width (Distance between the two foramina mentalia)	46.0
Symphysis length	34.0
Mean angle mandible	129°
Index of ascending ramus	50.80
Height-thickness index of the corpus	34.78

TABLE VI.

The measurements of Polatli Hüyük No. 4 : The Permanent Teeth.

Mandibular Teeth	Length	Breadth	Trigonid Breadth	Talonid Breadth	Robust-ness Value	Crown Index	Trigonid-Talonid Index
P_3	7.2	8.4	—	—	60.48	116.66	—
P_4	7.8	9.0	—	—	70.20	115.38	—
M_1	11.4	11.5	11.0	11.5	131.10	100.87	104.54
M_2	11.3	11.2	10.8	11.2	126.56	99.11	103.70
M_3	8.9	9.3	9.3	8.8	82.77	104.49	94.62

APPENDIX II

THE FLINT AND OBSIDIAN IMPLEMENTARY

By Dr. John Waechter.

(See Fig. 16)

Early Copper Age. (Phase I)

Materials : flint, chert, chalcedony, obsidian and milk-white quartz.

Javelin heads. No. 1. Made on grey-black obsidian. The piece is unfortunately broken, the flake on which it is made is quite broad with the bulb of percussion at the pointed end. There is flat retouch on both edges of the upper face and also at the tip on the underside to reduce the bulb. At the base two flakes have been removed which, if the implement was originally tanged, must have been added after it was broken.

Sickle-blades. All have marked lustre, four are well made parallel-sided blades. In the majority of cases the blades have been snapped to the required length, but on two specimens the ends are retouched (Nos. 2 & 4). Two specimens are curved, one with steep retouch on the back (No. 3).

Blade-flakes. These blade flakes have no lustre and are probably waste flakes from the manufacture of the sickle-blades ; one specimen made of quartz has retouch down the back.

Inventory

Javelin Heads	1
Sickle-blades	10
Blade flakes	8
Flakes	1
Total	20

Late Copper Age. (Phase II)

All six specimens are made either on flint or chert.

Sickle-blades. A neatly made, parallel-sided specimen ; one end is retouched straight across and the other end, also retouched, is concave. One edge has marked lustre and signs of use (No. 6).

Side scrapers. (No. 5). A very well made scraper on a broad flake of purple flint, one edge has a semi-steep scraper retouch and there is also slight retouch on the outer edge.

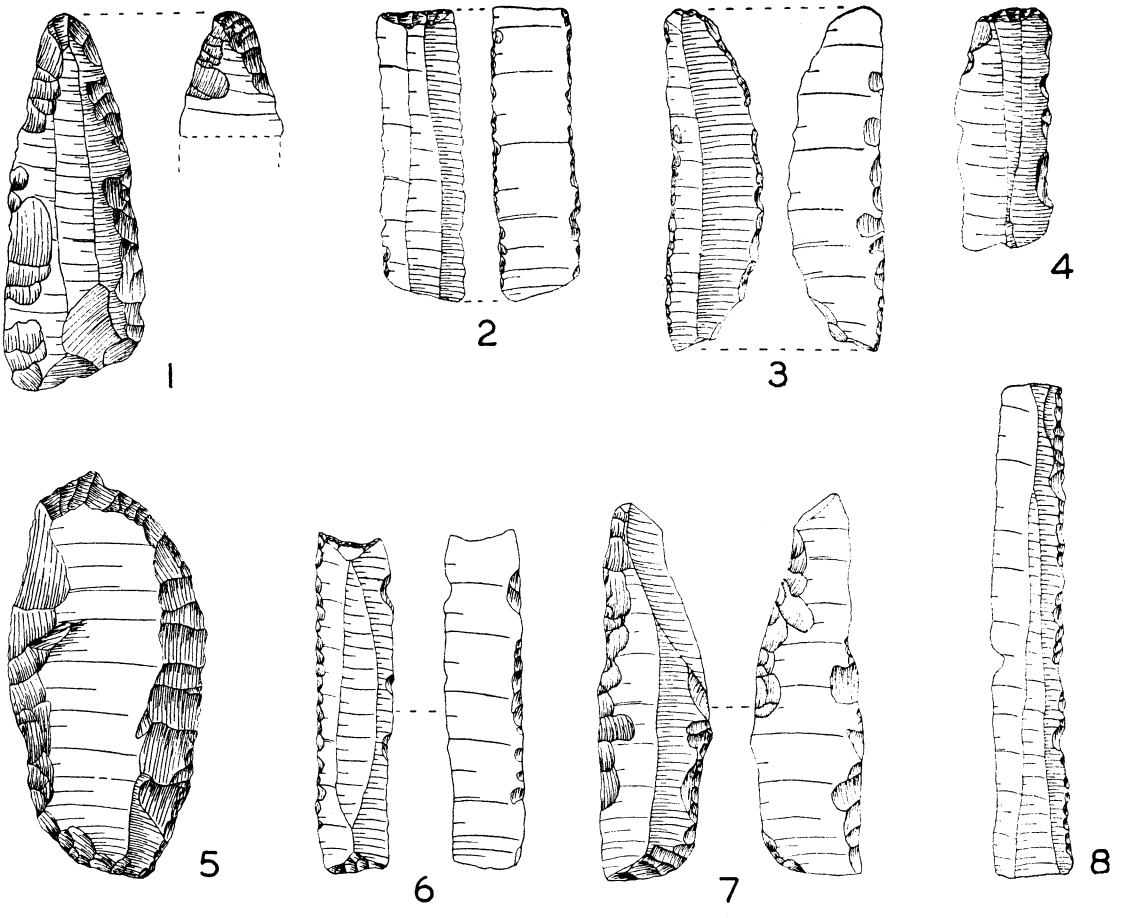

FIG. 16. Flint and obsidian artifacts 1/2.

Blades. A parallel-sided blade of brown chert without retouch or lustre.

Inventory

Sickle-blades	1
Side-scrapers	1
Blades without retouch or lustre	1
Flakes	3
Total ...	6

LATE COPPER AGE—CAPPADOCIAN PERIOD (PHASES II—III)

At the junction of these two phases was a group of five pieces, four of them blades and one a small flake. Two are made on light coloured chalcedony and the remainder on flint.

One sickle blade (No. 7) is unusually long and thin (9.6 x 1.3) with marked lustre and signs of use. One specimen is curved and the edges are much battered on the upper face and also on part of the lower. (No. 8).

Cappadocian Period (Phase III)

A small section of a sickle blade with roughly blunted back and slight lustre.

Hittite Period (Phase IV)

One sickle blade, one small blade and two blade flakes. The sickle blade is of grey flint with an extremely high lustre. The blade is very small only 3.5 x 1 cm.; it has a fine nibbled retouch on one edge and very slight lustre ; the edge suggests that it has been used for cutting something rather hard and not as a sickle-blade.

CONCLUSION

Unfortunately the material from all levels is insufficient to permit a satisfactory comparison with the other sites on the Plateau whose sequences cover these periods. One point of interest which emerges is the variety of material used, this also being the case in other of the Plateau sites. It would appear that flint was not readily obtainable and as a result less suitable material had to be employed.

It seems reasonable to assume that sickle-blades were still in use even as late as the Hittite period, though by this time metal must have been taking its place. Whether we are justified in considering all blades with lustre as having been sickle-blades, remains to be seen. The conclusions reached by Spurrel (*Arch. Jour.* XLIX), Curwen (*Antiquity*, June 1930) and Graham Clark (*Proc. Prehist. Soc. E. Anglia*, 1932), point very strongly to the fact that lustre is due to cutting corn, but as Curwen remarks, the absence of it on any given tool, does not mean that it has not been used for this purpose. It is also evident that certain materials, such as the fine grained cherts from Palestine, produce a high lustre, whereas many forms of flint do not. The possibility of some of these implements having been used as the teeth of threshing boards, particularly in the later metal periods, cannot be overlooked, but until these teeth, which incidentally are still made and used, are examined with this in view, the point cannot be clearly settled.

APPENDIX III

ANIMAL BONES

By Prof. H. Dilgimen

(Translated from Turkish)

Species Represented.

(1)	Ox	Bos Taurus brachyceros (Level II).
(2)	Sheep	Ovis vignei (Levels XII and XIV).
(3)	Deer	Cervus elaphus (Level XI).
(4)	Pig	Sus scrofa (Level IX).
(5)	Dog	Canis familiaris (Level XVI).
(6)	Donkey	Equus asinus (Level XXXI).
(7)	Oyster	Ostrea.

FURTHER NOTES :—

(1) *The ox-bones* in the deeper levels are thicker and heavier than those from the upper levels, which are as thin and slender as the skeletons of our present-day black oxen.

(2) *Sheep-bones.* As these were poorly preserved it is uncertain whether there were goats' bones amongst them. Both lambs and adult animals were represented.

(3) The presence of *deer* was confirmed by the occurrence of numerous antler fragments as well as recognisable bones.

(4) *Pigs.* Bones of very large boar appear at all levels.

(5) *Dogs.* Skull-fragments, mandibles and molars, as well as other bones belong to small-framed animals.

(6) *Donkeys.* These were evidently plentiful, but no horse-bones occur.

(7) *Oyster-shell.* This specimen may be assumed to be a tertiary fossil.

Signed: Prof. H. Dilgimen.

APPENDIX IV

ANALYSIS OF METAL OBJECTS

By C. GÖKSAN and E. ONAT, Analysts.

(Translated from Turkish)

Only six of the 15 metal pieces found during the excavations made at Polatli and sent to the Directorate of the Archaeological Museum under cover of the Ministry of Education's letter No 331/17—950, dated 22nd February, 1950, could be examined, as the others were almost completely corroded.

Museum No.	*Copper*	*Tin*	*Provenance*
164	83,27%	11,8	Unstratified
165	96,56%	—	Level VI
166	97,70%	—	Level XVI
169	95,20%	—	Level XII
170	94,53%	—	Level XII
Narrow-necked jug	87,20%	4,5	Unstratified (No. 14 in Fig. 14)

As can be seen from the above results piece No. 164 and the jug are bronze, the rest copper. Of these especially the jug contains in addition to the tin, arsenic, antimony, lead, bismuth, zinc and nickel which is always fused with copper due to the primitive smelting methods ; silicon and carbon are also present.

Every sample contains without exception approximately 0.5% iron.

Signed: C. Göksan. *Signed:* E. Onat.
(Analysts.)