

THE ORIENTAL INSTITUTE OF THE UNIVERSITY OF CHICAGO  
*STUDIES IN ANCIENT ORIENTAL CIVILIZATION • NO. 43*



*A NEOLITHIC VILLAGE  
AT TELL EL KOWM  
IN THE SYRIAN DESERT*

*By*

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THE ORIENTAL INSTITUTE OF THE UNIVERSITY OF CHICAGO

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*To*

*My Father*



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## INTRODUCTION

A brief five day sounding was conducted at Tell el Kowm by the author for the Oriental Institute Syrian Expedition of which Professor Maurits van Loon was the director. The location of Tell el Kowm is indicated on the map, plate 1, and its geographic location is 38° 51'E, 39° 10'N. The sounding was conducted between May 2 and May 6, 1967. The staff consisted of Dr. Willem van Zeist and Sytze Bottema, paleobotanists, Dr. Pierre Ducos, paleozoologist, the author as field director and Mr. Khaled Jum'a as representative of the Syrian Directorate General of Antiquities. The sounding was made possible by a grant from the National Science Foundation and the reexamination and detailed study of the artifacts in February and March of 1971 was made possible with the support of the American Philosophical Society.

The plaster vessel and pottery profiles were drawn by Mr. William Dornemann and object photographs 14:18; 16:11, 14, 21, 22, 23; 20:40; 21:1, 11, 27; 24:40; 27:23 and 29:1-5 were taken by Miss Isabelle de Vallois. The section was drawn with the assistance of Dr. van Loon. The author is responsible for the remainder of the illustrations and photographs. I am also indebted to Dr. van Loon for his careful reading of the first draft of this monograph and for many useful suggestions. Finally, I would like to thank Professor Janet H. Johnson for expediting this publication, Professor Helene J. Kantor for her editorial suggestions and Dr. Thomas A. Holland for his editorial work on the manuscript.

The sounding took the form of a step trench on the south side of the high tell (pls. 1:3, 4:3). The top of the trench started just below the crest of the high tell (given as about 500 m above sea level). The slope distance of the trench was 56.2 m with a horizontal distance of 51.50 m and vertical distance of 19.05 m. The trench was arbitrarily divided into nine steps which were adjusted somewhat in length on the basis of the stratigraphy encountered in order to facilitate recording. The surface of the trench was cleared to a width of 3 m, but time did not allow for a uniform exposure at this width. Where important features were encountered, the excavation covered the entire three meters in order to obtain the maximum exposure but in all other places the trench was narrowed to one meter against the main eastern section so that a maximum depth and number of layers could be exposed against the section (pl. 5). In all areas where architecture was not exposed, excavations continued under erosion soil and into several superimposed layers of the tell's undisturbed deposits.

All the soil from the trench was put through a 5 mm<sup>2</sup> mesh screen and the contents of the building in step IV (1) (see pl. 5) were put through an even finer screen. Numerous soil samples were taken from the top to the bottom of the trench at the discretion of the paleobotanists. Three carbon samples (see *p. 54*) were taken where sufficient carbonized material was thought to be present.

In the following discussion the designations assigned to layers in the field have been retained. Any further refinement at this point would be misleading by indicating a more complete understanding of the site than is presently allowable. The purpose of this report

is to present as clearly and precisely as possible what was found and leave other assessments to the future when further excavation can provide the evidence for greater precision. The amount and striking importance of evidence from the sounding make it necessary to present fully what is now available.

Several general comments must be made at the outset. The first is an explanation of the use of underlined serial numbers in the illustration captions and text. These numbers have been underlined to indicate that both drawings and photographs of particular objects in question are included in the plate section; if the serial numbers are not underlined the object appears only in *either* a photograph *or* a drawing. The serial listings of pottery sherds and white ware fragments are given numerically on pp. 69–71 and pp. 71–74 along with the loci numbers and cross references between the drawn and photographic illustrations.

The system employed for recording of stratigraphy in the field was a modification of the Wheeler-Kenyon method with an emphasis on specific locus definition. The steps are designated from the top to the bottom of the trench by roman numerals. Stratigraphically distinguished subdivisions of the phases are designated by numbers within circles. Numbers with brackets represent loci which have been distinguished within a given subdivision of a step. The surface layer of each step is designated as (1) [1] but occasionally a lower feature protrudes through it. Walls and pits have been given alphabetic designations within a step but since they represent loci, are also placed in brackets. Since the main section, plate 5, is so long, it has been broken to make its size and proportions manageable and there has been no attempt to designate each of the different soils by conventional symbols. Instead we used shading, hatching, etc. for soils or materials which were encountered frequently and provided a numerical key for the remainder. In the upper portion of step IV, the section does not follow the line of the eastern side of the step trench, as elsewhere, but follows the section line shown on the plan, plate 7:1, section AA-A'A'.

## 1

## TELL EL KOWM, THE ANCIENT SITE

The high tell at el Kowm is by far the tallest pre-classical tell in the vicinity. A step trench was an obvious and quick way of obtaining information on the sequence of occupation on the site. The choice of the position of the trench was somewhat limited by the modern cemetery and the steep sides elsewhere (pls. 3:1, 2, and 4:3). The south slope, though steep, provided the most gradual surface available to avoid tombs from the cemetery. The trench was not located so as to be directly down the slope but slightly askew to a north-south orientation, which proved to be one of the major axes for orientation of architecture on the site.

The views of Tell el Kowm from the distance (pls. 1:2 and 4:1) indicate that there is more to the site than the high tell alone. The high tell stands at the south-west corner of the site (El Kowm 1, according to the terminology of the French expedition—M. -C. Cauvin, Coqueugniot and Nierlé 1982). The lower portion of the site rises 3–4 m above the level of the plain and covers an area of roughly 18.5 hectares. The rough sketch of the site (pl. 3:1) made by pacing some of the distances and contours, gives a basic idea of the layout of the tell though it is not an accurately surveyed plan. The center of the tell is lower than the surrounding area which seems roughly divided into five connected mounds. The high tell stands at the west end of the largest mound while a police post stands on the smallest (pl. 2:1—El Kowm 2 Caracol, according to the terminology of the French expedition—Stordeur, Maréchal and Molist 1982). The modern village of el Kowm covers a good portion of the remaining mounds (pl. 2:1, 2). A number of pits had been dug into the low tell by the villagers but only in one area did anything significant come to light. Very few flints or sherds were evident on the surface of the low tell, probably because the surface soil has been weathered to a hard crust. Several pits had been dug at the edge of the mound, behind the houses shown in pl. 2:2. Plate 2:3 shows these pits viewed from the north. Portions of two rooms are evident in pl. 2:4; Mr. Jum'a stands in the northernmost one. Both rooms were faced with plaster similar to that encountered in step IV of the sounding. The wall between the rooms was about 4 m long and the southern room was about 2 m wide. The filling in the room was of the same color and consistency as that encountered in steps IV and V on the tell, namely grey soil mixed with grey and black ash. These rooms are situated at the extreme right of plate 2:3 and seem to stand against a heavy wall running roughly north-south in this area. There seemed to be many courses of brick here amounting to a thickness of about 4 m. In the center (pl. 2:3) there is a horizontal line which represents a plaster floor with ash upon it. This floor seems to belong to a room, again about 4 m wide, which stands against a still heavier wall, about 8 m wide, to the east. Good brick courses are evident here with a face visible on the east side near where Mr. Jum'a stands. More brick is evident farther east but this is clearly tumbled. Unfortunately,

nothing in the way of sherds, plaster or flint was evident in the area to provide us with dating clues for the walls indicated by the brick work, but they seem to be Neolithic. The lines of the walls run along the edge of the lower tell in a location where one would in later periods expect to find a defense wall. The thickness of the walls clearly indicates such a purpose. The importance and implications for the Neolithic period to be drawn from the presence of remains that can be interpreted as fortifications are quite clear. Although this information is included here, further speculation about a defense system is impossible until it is substantiated by excavation.

Two springs exist today at the edge of the tell and both can be expected to have been in use in antiquity. At present, both springs are fitted with pumps and are used to provide water to irrigate the surrounding fields (pls. 2:2 and 3:3). One spring is situated on the west side of the high tell (just below the right edge of the mound on pl. 3:3). Ancient building remains were apparently encountered when the modern pump was installed. The occupation remains of the high tell come down close to bedrock here and the pipes which draw the water are put through a hole in the bedrock.

The second spring is situated near the middle of the north side of the low tell (just inside the edge of the tell, in the distance at the right of pl. 2:1). Here a ledge of bedrock about 30 cm thick is broken to provide a large opening into an extensive underground cavern. The cavern extends many meters to the south under the low tell and is filled with water to within about 30 cm of the ceiling. This level fluctuates with the amount of pumping and the source lies to the south with some blockage in between. After hours of pumping, the level becomes too low for continued use and one must wait a few hours for the level to rise again. The owners of the pump removed some of the blockage underground to the south and were able to increase the flow somewhat. An attempt was also made to remove the blockage by excavating from the surface but this was not carried through to completion. This excavation, however, seems to have run into an ancient ditch about 1 m wide, which was filled with many ash layers that formed arcs which sloped up at the sides. It is not clear whether the ditch cuts through bedrock or earth. The reason for the hesitation in clearing the blocking is that there might be opposition in the village to uncovering the source. The source was said to have been open sixty years ago and lay on the line of the ditch, 20–30 m south of the present pump. A woman was said to have been killed by falling into the well and the bedouin tribe to which she belonged filled it in. Only excavation can clarify the situation here but it is not at all unlikely that water may have issued out of the ground here in antiquity and even in the not too distant past. Similar springs are plentiful in the area; several can be seen in the villages to the north of el Kowm in pls. 3:1 and 2. At a site farther north, Umm et Tuleil, water was said to have issued out of the ground at a spring within the past decade. This no longer occurs since regular pumping with a motor pump keeps the water at a lower level.

The results of recent surveys and other studies of the el Kowm area, as well as additional excavation at el Kowm undertaken by the French expedition directed by Jacques Cauvin are published in volumes 2 and 3 of the *Cahiers de l'Euphrate*.

## 2

## STRATIGRAPHY ENCOUNTERED IN STEPS IX THROUGH I

## STEP IX

Only a shallow depth was cleared to a 3 m width in this step and deeper excavation was confined to a 1 m width. We attempted to penetrate as deep as possible at the south end of the step, with dimensions of the deepest exposure measuring 1 by 1.5 m. We did not reach virgin soil or bedrock. Below the sub-surface layer, a series of fairly horizontal white clay layers (usually continuous over the exposed area below a depth of 50 cm below surface) were encountered at 15–20 cm intervals. The soil between these layers was normally black and ashy, and contained large quantities of flint and bone.

## STEP VIII

The upper half of step VIII was excavated to the full 3 m width. The talis was very thick here where the slope of the tell is more gradual near the plain level. A series of grey and black ash deposits was separated by white and yellow clay layers. The horizontal clay layers in steps IX and VIII were not exposed in large enough areas to determine their function or origin. The thickest layers were undoubtedly floors and the others either re-surfaced floors or erosion material from structural elements spilled over floor areas during destruction. The clay layers beneath layers (1) [3] and (1) [4] were fairly horizontal but those beneath (1) [2] sloped down considerably to the southwest. All the clay layers just mentioned ran up against the badly preserved remains of a wall near the west balk of the trench. Beneath layer (1) [4] the excavation was again confined to 1 m in width (pl. 4:3). The thickest clay layer in this step, ca. 10 cm, was encountered beneath layer (2) [1]. Another clay layer was encountered under the black ash of (2) [2] and in this ash were found fragments of architectural plaster. This plaster was thicker, softer and lighter than the architectural plaster encountered in higher steps and one surface was covered with a red wash which had been burnished.

## STEP VII

Below layer (1) [1] excavation in this step was confined to 1 m in width. The section shows patches of yellow clay layers as well as various patches of different soil color and consistency. Unfortunately, the exposure was not great enough to permit a finer separation into distinct loci, so consequently, everything was considered together as layer (1) [2]. Steps VII and VI show little of the horizontal stratigraphy which was normally encountered elsewhere in the trench. The short, almost horizontal, clay layers in the middle of step VII may also be floor layers similar to those in steps IX and VIII, but at the bottom of this step the layers and ash are tipped and possibly show spill over wall stumps or other architectural features, probably not very far beneath. The yellow clay soil with stones continued up into step VI (see below).

## STEP VI

Only layer (1) [1] was excavated to the full 3 m width and everything beneath that to a 1 m width. In layer (2) [1] a large area of white architectural plaster was encountered, as was a smaller patch of red-burnished plaster. The plaster was associated with the remains of a large section of wall that must go with floors founded at levels considerably below the bottom of the excavation in this step. None of the layers exposed in this step was horizontal and thus all must be considered as destruction and erosion debris. It is either debris which had collapsed down the slope from a structure which stood on the foundations encountered in step V above or was earlier destruction debris upon which a later wall was founded. The ash would be from the destruction, as well as the reddish and greyish clay which may represent the remains of walls. The large piece of plaster may be a collapsed element from a higher structure or the upper portion of a building with a foundation at a lower level. A great quantity of broken architectural plaster from white ware fragments, as well as ash and yellow clay, was found above this plaster-faced wall fragment and also further down the slope. The pieces are broken into smaller fragments than in the step above and indicate extensive erosion from above. The presence of a considerable amount of small and medium sized stones near the bottom of this step and continuing into step VII seems to indicate that erosion continued until portions of the foundations of wall A of step V were denuded. It is questionable, then, whether any later occupation existed outside of wall A in step V, subsequent to that encountered in step VII.

## STEP V

A full 3 m width was excavated only for the shallow depth of level (1) [1]; beneath this the width was again confined to 1 m. There was a heavy scattering of brick fragments, medium sized stones and broken plaster over most of the step, for a depth of 15 to 25 cm. In the center of the step this debris continued but in some portions brick appeared to be still in place, indicating a very thick wall beneath (if it indeed extended under (2) [1] and (2) [2]). The tipped layers at the top of step VI began already in layer (2) [3].

The excavation at the top of step V was not extensive enough to provide certainty in the attribution of the layers encountered. Although several rebuildings of floors were encountered in the structure in step IV (2), immediately above, the depth at which the original floors were laid is uncertain. Two earlier floors were evident in the north section between steps IV and V, ca. 5 and 15 cm below the excavated floor of IV (2) [3]. A short portion of the lower of these is shown in the main section in the line above V (1) [3] (pl. 6:3). A broken plaster floor was preserved beneath V (1) [4] and possibly a higher, but less well preserved, floor beneath (1) [3]. Whether these latter were also floors of the IV (2) structure or belonged to an earlier structure cannot be determined, but they do represent the lowest horizontal stratigraphy encountered above step VII (or possibly step VIII, see above). The possible thickness of the wall, from which much of the debris in this and the lower steps is derived, ca. 2.80 m, is determined by the southern terminations of layers (1) [3] and [4] and the tipped layers of V (2) [3] and below. The southern wall foundations of the structure in IV (2) could not have lain very much higher than the foundations under discussion here. Though it cannot now be proven that the architectural remains of steps V and IV (2) belong to one and the same building unit, we have designated this wall as wall [A] of step V in the section (pl. 5) even though it is only a tentative reconstruction.

## STEP IV

The most characteristic feature of the small remaining sections of the two superimposed buildings is the extremely hard gypsum plaster which covers their walls and floors. The buildings encountered in step IV are illustrated in the section (pl. 5), and the plans: IV (1) (pl. 8:1) and IV (2) (pl. 6:1). The floor plaster of room IV (1) [2] runs over wall [H] which indicates that there are two superimposed structures and not one building in two levels on the slope of the mound.<sup>1</sup>

The entire 3 m width of the trench was excavated in this step and the roughly 1 m square area of step III (3) [1] brought to light the tops of walls which belonged to the IV (1) building. The walls of buildings IV (1) and (2) were of similar widths and orientation. They ranged between 40–50 cm in width and ran north-south, east-west. The east-west walls showed some curvature over extended stretches, in conformity with the contour of the mound. None of the walls were dismantled, so the nature of the building material could not be determined.<sup>2</sup>

Both the floors and walls were covered with a very fine, hard white plaster about 1 cm thick. The transition in the plaster at the intersection of wall and wall, or wall and floor planes, was slightly rounded.

*Lower structure (level 2)*

Portions of five rooms were excavated (pl. 6:1). Two small patches of plaster represented the latest floors to be encountered in this building. They occurred in the northwest corner of room [1] and the northeast corner of room [2]. Both floors were found at about 8.95 m. Only in room [3] was an earlier floor cleared completely. Immediately over this floor was a 5 cm thick layer of clean, fine yellow sand, like nothing else found in the excavation. Since none of the contemporary plaster floors were reached in IV (2), it is impossible to say if this is or is not an isolated occurrence. An earlier plaster floor was, as mentioned above, obvious in the section below (2) [3].

A small portion of the building's plan was uncovered. Two small rooms, [1] and [3], were flanked by larger rooms and seem to have been originally built against an outer southern wall positioned near the modern contour lines of the tell and possibly on the foundations encountered in step V. Another room stood north of [1] and [2]; wall [H] seems originally to have been an arch parallel to the outer, southern wall of the building. The dimensions of only one room, room [1], were uncovered and its roughly trapezoidal shape narrowed at the north (from 1.60 m to 1.40 m—the length was 1.30 m). A considerable amount of ash was encountered in this room, mostly in small fragments from what looks like brush-

<sup>1</sup>The plaster of IV (1) [2] is not preserved to the southern face of wall [H] and one could theorize that wall [H] came up to this floor level and was capped by the plaster above. Such a plaster capping seems to occur at the north end of room IV (1) [4] but this may be confused by plaster belonging to several building phases. At any rate, there is a possibility that IV (1) and (2) may form one unit but it would have to be an extremely complicated one. Level IV (1) is already quite complicated and until evidence from further excavation requires such an interpretation it is best avoided at this point.

<sup>2</sup>The fragments of building material in step V look like brick. By March of 1971, the plaster had eroded from the walls of step IV (1). The whitish mortar was still present over much of the area but in some places dark grey bands between 8–10 cm thick indicated the building material. The vertical breaks, however, were not evident so the brick size cannot be determined. The mortar between the layers is quite thin, less than a centimeter. The use of occasional fist-sized or larger stones in the construction was evident in wall [C].

like material. No doors could be discerned, though wall [L] did not stand to a great height and was not well preserved.

*Upper structure (level 1)*

The portion of this structure (pl. 7:1) that was cleared was considerably more complicated than that of level (2). The largest room, [3], was excavated to a depth of 1.60 m and was cleared in two parts so that a section could be created to check the stratigraphy (pl. 7:2 and 3). The room was filled with material from the collapse of the building. Replasterings of most wall and floor surfaces were evident, usually about 5 cm over the earliest floors, but no other rebuildings were observed in the section.

Most of the area excavated in level (1) contained a turning stairway, descending from the northwest. Only a small portion of the highest part was excavated. It was encountered near the surface at the west side of the trench (pl. 7:3). One had to make two right angle turns to the left and then turn to the right. With the last turn one would have to stoop to pass through a low opening which was built into both walls [B] and [D], and enter rooms which lay outside the area of excavation. Here the interpretation becomes difficult because the southern face of wall [B] was plastered to floor level and up to its corner with wall [D]. This plastering in part covered and obscured an apparent rebuilding.

A depression in the plaster about 45 cm below the preserved top of wall [B] (see northeast corner of (1) [3] in pl. 8:2) lines up with the top of the doorway in wall [D] (see pl. 8:5) and seems to represent the lintel of a doorway which subsequently was partially blocked. The erosion of the area, with the loss of some of the wall plaster, between 1967 and 1971 clarified the situation somewhat. An animal had burrowed against wall [D] and as a result the plaster face of the doorway could be traced against the north end of wall [D] for its entire width. At the northwest corner of (1) [3], plaster had fallen from wall [B] to reveal a facing of plaster continuing the line of the last face of wall [C] beyond the previously recorded corner, to the north. It is clear then that the doorway in wall [B] had been blocked, but whether this blocking extended all the way to the northeast corner is a problem since this would leave only a narrow (ca. 37 cm) opening through wall [D]. If a doorway existed in both walls [B] and [D] at the same time there would be a problem as far as the support of the northeast corner was concerned. Originally, it would seem that the stair continued its descent to the north through wall [B]. Whether or not the lowest step (turning to the right) already existed at this point cannot now be shown. The interpretation of the area would be simplified if the lowest step and the door in wall [D] were created when the doorway in wall [B] was blocked, but there is no evidence to adopt such a hypothesis at present and the configuration of room [4] suggests that this may be too simple an explanation. Only further excavation can clarify the matter. The second and third steps (these two intermediate steps in room [3] are indicated by hatching on the plan, pl. 7:1) were extended at some time, possibly when the doorway in wall [B] was blocked. The steps were extended between 40–50 cm. Their heights were 10–15 cm lower than the adjacent surfaces to the west and south respectively for the second and third steps (pls. 7:2, 3 and 8:1, 2, 4, 5).

Since the lowest point in step III (2) was not very high above the level 1 building in step IV, an area roughly 1 m square was excavated below it at the southeast. This layer, (3) [1], was taken down to a point where the lines of the IV (1) walls appeared. A plaster line marked the east face of wall [D] to a corner with the south line of wall [A]. A second line

of plaster was encountered parallel to the latter face and 40 cm to the north. A second corner appeared at the northeast, against the section, forming a corner between walls [A] and [E] in the northeast corner of room [4].

A few additional plaster surfaces were evident in 1971 after several years of erosion following the end of the excavation under discussion. The outline of wall [E] became clearer; its western plaster face seemed to continue over the top of wall [A] and indicated that this room may have paralleled room [5] (designated as such after the excavation) to the west. The position of the buttress in wall [E] seems to parallel that on the west side of wall [C].

If this is the case, then one could expect a step descending from a higher level at the north. South of wall [F] a section of a large room was cleared with a corner at the northeast (pl. 8:3-4). The plaster floor was very broken and considerably sunken away from the walls. There is no indication of how wide this room was or where the southern outer wall of this building had been located. The plaster faces on both sides of wall [F] could be traced on the surface of the mound outside the trench to the east for almost a meter. The southern face could also be traced to the west but only for about 30 to 40 cm.

### STEP III

The preservation of layers, walls and floors in this step was very poor. There were thick layers of ash and considerable pit-like material. The outlines of pits were not extremely clear in plan or several transverse sections. The entire area was dug to the full 3 m width, with the exception of the deepest portion, (3) [1], mentioned above.

Below layer (1) [2] a segment, ca. 1.50 m, of badly preserved wall was encountered. Bricks could not be outlined but the wall was about 40 cm thick and oriented roughly north-south. Patches of yellow clay floor were encountered in grey soil with patches of ash. The area east of the wall was designated as (1) [3] while that to the west (1) [4]. The material from under the most consistent clay layer (which also ran under the fragmentary wall) was designated (1) [5]. A floor was not reached in this layer which was excavated to a depth of about 20 cm. Toward the south the layers of (1) were interrupted by somewhat confused patches of soil (2) [1]-[4]. This deposit was heavy in ash, bone and pottery and some features were clearly portions of pits, though the outlines were not clear. At about -6.10 m, a roughly horizontal surface (possibly an earth floor) was encountered upon which lay a fairly heavy and continuous layer of bone, sherds and flat stones. The bottom of level (2) was formed by a grey ashy layer with a considerable amount of charcoal and an underlying layer of yellow sand. Layer (3) [1], discussed above, was excavated beneath this layer of sand.

The confused nature of step III and the limited exposure does not permit extensive commentary. Layer (3) [1] seems to represent the leveling of the IV (1) structure in preparation for the next settlement and the artifacts represent a mixture of what was found above and below. The shift in pottery and plaster vessel proportions is noticeable in (2) [5] but little can be said about the nature of the settlement. Remains of architecture were preserved in level (1) and destroyed patches were found in level (2), but not enough to provide a coherent picture. The wall fragments of level (1) indicate architecture on the same orientation as in steps IV-V. The preservation was so bad, however, that one cannot say with certainty whether the heavy use of architectural plastering with hard plaster on wall and floor surfaces continued or whether it was no longer used. No fragments of such plaster were encountered, however. Fragmentary building remains indicate that architecture also existed in level (2) but this was destroyed beyond recognition by pits.

## STEPS II AND I

These steps were confined, for the most part, below the upper layer (1) [1], to a 1 m wide trench. Only at the top of step I and in the middle of step II was a narrow band taken across to the full 3 m width but not to a great depth. There is no reason to repeat all of the information on composition of the different soil layers beyond what is illustrated in the section. Most of the features in these steps seem to belong to a single functional unit. Unfortunately, two pits (step I, pit [A], and step II, pit [A] which are portions of grave pits) break the section at strategic points. At the very top of the trench is a section of wall (step I, wall [A]), standing four courses high (brick size seems to range between 10 cm in height by 25–30 cm in width by 45–53 cm in length). The pit south of it (step I, pit [A]) destroyed its outer face so the orientation of the wall is uncertain (though possibly east-west across the trench). The relationship between this wall and a layer of yellow plaster is also uncertain because of the limited exposure. Beneath the pit, fallen brick and heavy grey ash was encountered and seems to be tumble from the destruction of the wall. Fallen brick and clayey material, probably derived from rain-melted brick, rested on what seems to have been a glacia. This glacia is surfaced with a white clay layer 15–20 cm thick and may well have extended down from the wall at the top of step I. The glacia may have terminated against a foundation at the bottom of step II but again a grave pit (step I, pit [A]) destroyed any evidence for such a connection. The grave pit seemed to have been faced with mud brick which stood on stone foundations but there was not sufficient time to disentangle this from the underlying mass of brick and stone. Excavations did not continue deep enough to be able to prove that this brick and stone continued all the way across the trench, since it was preserved to a greater height in the east. Bricky material continued across the trench, indicating that this was the case, but it was not possible to establish a good face or line to the wall.

Despite the sieving, very few sherds were found in these steps. Only 31 sherds and 11 white ware pieces came from the upper disturbed layer I (1) [1] and II (1) [1] while 31 sherds and 1 fragment of a white ware vessel were found below this within both steps. Most of the sherds from the lower portion came from pits.

Three small 1 m square areas were marked out on the top of the tell on the line of the trench. In each case, only 5–10 cm of soil were cleared and it was felt that there was not enough time to investigate further in these areas. In each case mud brick was encountered and twice the outlines of portions of grave pits became evident. It seems that the cemetery, which covers the eastern slope of the high tell (pls. 3:2 and 4:3) once reached the summit, though there is now no clear surface indication. The amount of mud brick encountered suggests a platform. What its nature may have been and whether any structure stood upon it remains a problem which will present a considerable challenge for future excavation.

## 3

## PLASTER VESSELS

One of the most interesting classes of artifacts found at Tell el Kowm is that of white ware. Fragments of similar ware have been found to the southwest in the Lebanese Beqaa (Besançon and Hours 1968, Copeland 1969, Copeland and Wescombe 1965, 1966 and Kirkbride 1969) and 'Ain Ghazal in the Transjordan (Rollefson 1984); along the coast at Byblos (Dunand 1961), Tabbat al Hammam (Hole 1959), Tell Soukas (Riis and Thrane 1974), and Ras Shamra-Ugarit (de Contenson 1962 and Kuschke 1962); in inland Syria at Hama (Fugmann 1958), and Tell Ramad (de Contenson 1971); at numerous sites in the el Kowm region and as far away as Palmyra (Hanihara and Azakawa 1979, 212); along the Euphrates at Bouqras (de Contenson and van Liere 1966a, and Akkermans and Roodenberg 1979, and Akkermans, et al. 1983), and Baghouz (du Mesnil du Buisson 1948); and possibly farther east. White ware is referred to by various designations in the reports cited above. Technical analysis of some fragments from Byblos, Ras Shamra and Tell Ramad was published in 1969 (Balfet, et al. 1969), but a detailed analysis of fragments from el Kowm are now published by Maréchal. The results of this analysis shows that the el Kowm white ware is made of gypsum (Maréchal 1982).

The white ware material is illustrated here in considerable detail because so little is currently published. This seems to be due partially to its greater abundance at Tell el Kowm, in the area excavated, than at the other sites mentioned. Very few white ware fragments have been found on the surface of the lower tell and may indicate a difference between this area and the high tell, with the low tell possibly being more in keeping with the other Syrian sites that have been excavated. There seems to be little doubt that these vessels had a distinct, limited period of use in a restricted geographical area. The period of use seems to coincide with the earliest stage of the manufacture of pottery vessels, but unlike the latter, the white ware in time did not prove as satisfactory for use as containers and was abandoned as an unsuccessful neolithic experiment.

The discussion is limited here to the types of vessels found at Tell el Kowm and the peculiarities of manufacture and distribution that can be noted from level to level. The finds are also related to those from other sites but the discussion of how the white ware relates to the remaining artifactual inventory is presented in the conclusions of chapter 7.

The white ware vessels to which the fragments and few complete examples belonged have been divided morphologically into six groups. A total of 688 pieces were tabulated as coming from the test trench. Their distribution according to type and locus is shown by actual count in table 1 and by percentage distribution of type within each locus in table 2. The plates illustrating this material have been made as comprehensive as possible.



PLASTER VESSELS

Table 1.—Continued

Forms					Flat Pieces					Platters, low bowls			Rough, low bowls		Totals			Percent by Phases					
					1	2	3	4	5	Frag- ments with Holes	Total	Plain	with Mat impres- sions	Total					Frag- ments	Total	*	†	‡
Low, Flare	Low, Straight	Base Frag.	Spout Frag.	Total																			
0	0	0	0	0	2	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	11
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	5	0	0	0	1	0	7	13	0	1	1	0	0	0	0	0	0	0	42
5	5	4	1	19	0	5	6	0	0	1	0	12	4	1	5	0	0	0	0	0	0	0	41
16	9	6	10	41	2	4	6	0	0	5 + 1*	2	20	3	3	6	2	2	1	0	1	113	113	
3	0	2	2	7	3	1	1	0	0	0	2*	7	0	0	0	0	0	0	0	0	0	0	24
0	0	0	1	1	0	0	1	0	0	0	1	2	0	0	0	1	1	0	0	0	0	0	5
0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	7
24	14	12	14	68	12	10	14	0	1	7	16	60	7	5	12	3	3	6	0	1	243	35	
				28								25			5		1						
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	2	3	2	1	0	0	3	11	1	5	6	1	1	0	1	0	29		
0	0	0	0	0	2	3	2	1	0	0	3	11	1	5	6	1	1	0	1	0	30	4	
												37			20		3						
0	0	0	0	0	1	0	0	0	0	1	0	2	0	1	1	0	0	0	0	1	6		
0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	9		
0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	24		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3		
0	0	0	0	0	0	0	0	0	0	6	0	6	0	0	0	0	0	0	0	0	15		
2	0	5	0	10	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	23		
2	0	5	0	10	2	0	1	0	0	9	0	12	0	1	1	0	0	5	0	16	80	12	
												15			1								
11	4	3	0	25	1	2	3	0	0	3	0	9	1	2	3	2	2	0	0	0	46		
3	5	3	2	19	1	3	3	0	1	6	0	14	0	0	0	0	0	0	0	0	41		
0	0	0	0	0	3	2	1	0	0	0	0	6	2	0	2	0	0	0	0	0	19		
12	6	12	2	39	0	8	2	1	0	2 + 4‡	4	21	6	0	6	2	2	0	0	6	96		
1 + 1‡	6	1*	6	15	5 + 1*	3	3	0	0	2	0	14	0	0	0	1	1	7	0	1	53		
0	3	1	0	4	0	2	1	0	0	0	0	3	2	0	2	0	0	0	0	1	23		
0	2	2	1	5	3	0	0	0	0	1	0	4	0	0	0	0	0	0	0	0	18		
28	26	22	11	107	14	20	13	1	1	18	4	71	11	2	13	5	5	7	0	8	296	43	
												24			4		2						
0	0	0	0	0	0	0	0	0	0	9*	0	9	0	0	0	0	0	9	0	0	9		
1*	0	0	3*	4	0	0	0	0	0	8*	0	8	0	0	0	0	0	14	0	0	14		
1*	0	0	0	1	0	1*	1*	0	0	3*	0	5	0	0	0	0	0	7	0	0	7		
1*	0	0	0	1	0	0	0	0	0	6*	0	6	0	0	0	0	0	9	0	0	9		
3	0	0	3	6	0	1	1	0	0	26	0	28	0	0	0	0	0	39	0	0	39	6	
												72											
57	40	39	28	191	30	34	31	2	2	60	23	182	19	13	32	9	9	57	1	25	688	100	
												26			5		1						

## TELL EL KOWM

Table 2.—Frequency of White Ware Forms by Stratigraphic Location

Layers	Jars		"Pots"		"Basins"		Flat Pieces		Platters Low Bowls		Rough Low Bowls		Total Count	% by Layer	% Burned	% with Red or Yellow Wash
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%				
Surface	0	0	8	73	0	0	3	27	0	0	0	0	11	5	0	0
II(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
III(1)	0	0	28	67	0	0	13	31	1	2	0	0	42	17	0	0
IV(1)	0	0	5	12	19	46	12	30	5	12	0	0	41	17	0	0
V(1)	0	0	44	39	41	36	20	18	6	5	2	2	113	47	0	0
VI(1)	0	0	10	42	7	29	7	29	0	0	0	0	24	10	1	1
VII(1)	0	0	1	20	1	20	2	40	0	0	1	20	5	2	4	0
VIII(1)	0	0	4	57	0	0	3	43	0	0	0	0	7	3	0	0
Total	0	--	100	--	68	--	60	--	12	--	3	--	243	--	--	--
%	--	0	--	41	--	28	--	25	--	5	--	1	--	35	2	0.4
Phase E																
I(1)[2]	0	0	1	100	0	0	0	0	0	0	0	0	1	3	0	0
II(1)[2]	0	0	11	38	0	0	11	38	6	21	1	3	29	97	0	3
Total	0	--	12	--	0	--	11	--	6	--	1	--	30	--	--	--
%	--	0	--	40	--	0	--	37	--	20	--	3	--	4	0	3
Phase D																
III(1)[2]	1	17	2	33	0	0	2	33	1	17	0	0	6	8	0	17
III(1)[5]	1	11	7	77	0	0	1	11	0	0	0	0	9	11	0	0
III(2)[1]	0	0	23	96	0	0	1	4	0	0	0	0	24	30	0	38
III(2)[4]	0	0	3	100	0	0	0	0	0	0	0	0	3	4	0	0
III(2)[5]	0	0	9	60	0	0	6	40	0	0	0	0	15	19	33	0
III(3)[1]	2	9	9	39	10	44	2	9	0	0	0	0	23	29	0	26
Total	4	--	53	--	10	--	12	--	1	--	0	--	80	--	--	--
%	--	5	--	66	--	13	--	15	--	17	--	0	--	12	6	20
Phase C																
IV(1)[3]	0	0	7	15	25	54	9	20	3	7	2	4	46	16	0	0
IV(2)[1]	0	0	8	20	19	46	14	34	0	0	0	0	41	14	0	0
IV(2)[3]	0	0	11	58	0	0	6	32	2	10	0	0	19	6	0	0
IV(3)[1]	0	0	28	29	39	41	21	22	6	6	2	2	96	32	0	6
V(1)[2]	0	0	23	43	15	28	14	27	0	0	1	2	53	18	13	2
V(1)[3]	0	0	14	61	4	17	3	13	2	7	0	0	23	8	0	4
V(1)[4]	0	0	9	50	5	28	4	22	0	0	0	0	18	6	0	0
Total	0	--	100	--	107	--	71	--	13	--	5	--	296	--	--	--
%	--	0	--	34	--	36	--	24	--	4	--	2	--	43	2	3
Phase B																
V(2)[3]	0	0	0	0	0	0	9	100	0	0	0	0	9	23	100	0
VI(1)[2]	0	0	2	14	4	29	8	57	0	0	0	0	14	36	100	0
VII(1)[2]	0	0	1	14	1	14	5	72	0	0	0	0	7	18	100	0
VIII(2)[2]	0	0	2	22	1	11	6	67	0	0	0	0	9	23	100	0
Total	0	--	5	--	6	--	28	--	0	--	0	--	39	--	--	--
%	--	0	--	13	--	15	--	72	--	0	--	0	--	6	100	0
Grand Total																
Total	4	--	270	--	191	--	182	--	32	--	9	--	688	--	--	--
%	--	1	--	39	--	28	--	26	--	5	--	1	--	100	--	--

## PRODUCTION TECHNIQUES

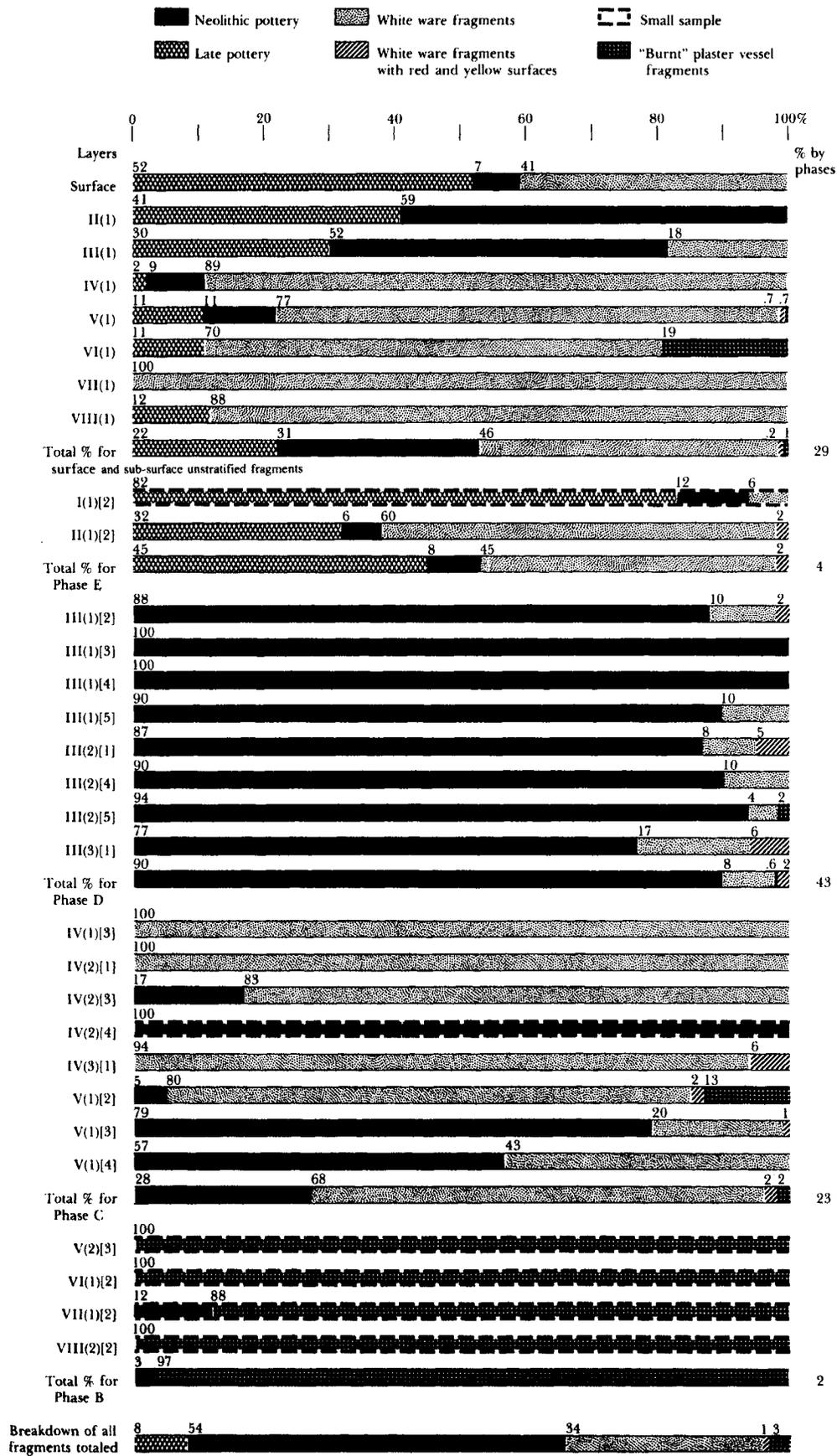
A majority of the vessels were formed within a container or excavated hole in the ground to hold the lime mixture in the desired shape until it had set. All of the basins seemed to have been formed in this way. Their outer surfaces are rough and inner surfaces wet-smoothed. The effort expended on shaping these vessels (particularly some reworking on the sides and often on the base) indicates that they were not just built-in architectural features but portable objects. Similarly, the quantities in which they were produced indicate that they were portable.

A portion of the trays were formed inside woven containers. Impressions of baskets formed both by coiling and by simple weave patterns are preserved. In several cases layers of matting had been used, resulting in a combination of patterns on a single vessel. In some instances we have merely basket liners but this does not seem to be the general rule. In one case there is evidence of replastering where a second layer was clearly placed over an earlier layer. The use of several pieces of matting as a retainer (11:10; 13:21; 15:5, 13, 15, 25; 16:25) argues against the use of these vessels as liners, as do the plastered-over mat impressions (15:4, 10 and 16:17) and the use of matting only at the side and not on the base (11:10; 15:4, 6, 7, 11, 14; and 16:17). The writer has no good functional explanation for the three fragments (16:17, 24 and 25) with mat impressions on inner surfaces.

The basin-like vessels were hand-molded on the inside and on the sides, but the bases are rough where they were probably formed on the ground or in shallow pits (15:29–35, 36–38; 17:1, 3, 10, 13, 14, 16, 17, 21–23, 26–30, 2, 4–9, 11, 12, 15, 18–20, 24, 25; 18:11, 22; and 19:1, 7–13, 15, 17, 18, 22). The plastic qualities of the material were tested to the greatest extent in the pot-like vessels. The earliest fragments were, on the whole, thicker than in step III and low, very thick-walled examples were very common early in the sequence. In step III when the proportion of white ware to pottery vessels decreased sharply in comparison with earlier levels (see table 3), there are numerous white ware fragments which are very similar in shape, diameter and thickness to pottery vessels. In step III then, the white ware fragments are, on the whole, rather thin and some wall and base fragments are quite delicate. It seems that in step III we have an illustration of active competition between the use of pottery and white ware as the material for common containers. In earlier levels, the occurrence of vessel forms in different materials is not as common as later and certain forms are confined to a single material. This situation changes markedly by step III. The overlap of features previously associated solely with a particular material is further illustrated in step III by the use of red wash on several white ware fragments and specialized forms like the loop handle (22:24), which otherwise are found only on pottery (though none were present in our sounding). Adaptation in the opposite direction is demonstrated by several pottery sherds which show plaster washes (26:14) or layers of plaster (26:8) (Dunand 1961, de Contenson 1962, Kuschke 1962, and Riis and Thrane 1974). A final illustration of the overlap between pottery and white ware forms is the appearance of three white ware fragments which clearly belong to jar forms (9:1–3 and a possible fourth example, 9:4). Such forms appear in white ware versions only in step III.

The photographs on plates 10, 14 and 15 show numerous examples of the method by which the vessels were constructed. Balfet (Balfet, et al. 1969) indicates that the procedure used in the construction of these vessels was to build up layer upon layer until the desired thickness was obtained (9:9–11; 11:13; 12:13; and 13:3, 6, 17, 1). In many cases, however,

Table 3.—Stratigraphic Distribution of White Ware and Pottery Vessel Fragment Occurrences by Percentage



it seems as if the vessels were merely resurfaced, often only on the inside (9:18, 20, 14, 15; 11:2, 16, 19, 8, 11, 15; 12:1, 2, 4, 10, 27; and 13:10, 19). Many examples show finger or tool marks, demonstrating the manner in which the ware was worked.

Numerous flat pieces of white ware were found which had been shaped on the ground or on a flat surface. A variety of surface treatments is illustrated on plate 20. Chaff impressions are evident on 27; numerous examples have reed impressions on one face, (7, 9, 14, 18, 25, 32, 39 and 21:5, 6, 9, 10) and others seem to have been reinforced with reeds through the body (20:19, 11 and 21:4). A few pieces were smoothed on both surfaces and intentionally roughed up in various ways: impressed with small holes (20:21); reed-incised lines (20:12 and 22); parallel impressed wavy lines (20:8, 15 and 21:15) and other impressions (20:13, 23 and 21:12 and 13). The fragment shown on 21:7 has impressions on both sides and is extremely interesting in that the impressions seem to have been made with seals, probably stamp seals. This fragment was, unfortunately, found on the surface of the mound. The pattern is quite complicated with a concentric series of line segments. Only a portion of the pattern is preserved and it is unclear how this fit into the larger pattern. The line segment organization is very reminiscent of the seals from Çatal Hüyük (Mellaart 1967). Additional white ware fragments with seal impressed geometrical patterns from el Kowm are published from the recent excavations (Maréchal 1982, figs. 3:3 and 4:1, 2, 5, 6 and seven fragments from Bouqras (Akkermans, et al. 1983, 356).

Many white ware fragments, from vessels of various shapes, were pierced with holes and were possibly used as weights. A variety of hand formed pieces were also found and these will be discussed below.

A final group of fragments has been distinguished because its dark grey-brown color and gritty texture is significantly different from that of the normal white ware fragments. These fragments were not confined to any particular form but had been parts of basins, pots and flat pieces. The distribution of such fragments was quite limited.

The evidence from the sounding at el Kowm indicates that the production of white ware continued side by side with the production of pottery. The small quantity of pottery from some of the levels in step V would seem to reflect a specialized function for the part of the building in which they were found. White ware fragments continue to appear below V (1) [4], which is the lowest pottery bearing level. In these lowest levels, by far the most numerous specimens are flat pieces. Only a scattering of "burnt" plaster pieces appear above V (2) [3] and these are predominantly in pot shapes, which previously had been the least numerous. It is interesting to note several "burnt" plaster pot fragments still occurring as high up as III (2) [5], where pottery vessels had nearly displaced white ware vessels. If they were other than pot shapes, one could argue that they had worked up from lower levels but since they are not, it is impossible to make a judgment.

Several of the layers in which these fragments were found, namely VI (1) [2] and VII (1) [2], seem to be debris from destruction so the question arises as to whether or not the visual appearance of these fragments was the result of an intentional production technique or whether they were burnt during the destruction of a part of the settlement. Although the evidence cannot be considered conclusive, it seems to be weighted toward intentional treatment. The arguments for intentional firing are: 1) the pieces from VIII (2) [2] were found in occupation debris above good floor levels, 2) the use of sun baked white ware vessels and pottery starts abruptly and virtually replaces the "burnt" plaster pieces and 3) the shape attribution of the surviving "burnt" plaster pieces is radically different from those present later in white ware.

The "burnt" plaster is preserved in a very friable condition with a surface which rubs off easily. The surface texture is extremely sandy and pockmarked. The grit inclusion is clearly visible because the material has turned to a dark or medium brown color. All these characteristics would seem to be attributable to burning. Though the material was quite hard otherwise, the surface condition would seem to present some problem in use. If the firing were accidental, this would, of course, make no difference, but since it may have been done intentionally we would in that case have to see it as the product of an experimental stage. The problem seemed to have been overcome in the next phase. The sorting out of the most successful procedures of manufacture for the white ware and pottery can be seen as a logical development in solving a practical problem and indicates a more complicated process in the development of pottery technology than one might have supposed.

#### JAR RIMS

Only four white ware fragments could be classed as having come from jars. Fragments 9:2, 3 and 4 have profiles which are similar to those common on pottery jars, like 22:26, 28, 30-32, 36, 35, 37 and 23:2, namely straight line profiles with fairly sharp bends. The vertical rims, as well as rims with a slight out-tilt, were produced in white ware as well as in pottery. Several profiles that have been classed as pots are somewhat intermediary and could be placed here (11:18, 20; 12:13; and 13:23). We have, however, included only those which were clearly turned outward and which have relatively narrow necks in proportion to their vessel heights and diameters. Fragment 9:1 is clearly a jar rim but its out-curved flare has no parallel among the pottery shapes. It seems instead to conform more to the profile of some of the basin rims, which, however, never show the curve of the vessel sides as here.

#### "POT" RIMS

The most common group of white ware vessels belongs to a category designated here as pots. They are not subdivided further into specific types because of the difficulty in creating satisfactory typological distinctions, though a variety of shapes were found. No matter what features were used to define specific types, too many pieces were, in effect, transitional forms which corresponded only partially with any defined type, while at the same time illustrating a composite of features used to define several separate, distinct types. There are a number of profiles in step III which could clearly be classed within the range of bowl forms. Related forms in earlier layers could not, however, be classed in a similar manner because their proportions were not similar; either their diameters were too narrow in relation to their height or they were too closed at the top in relation to their height.

The majority of the forms, as in pottery, have vertical rims or have a slight inward or outward tilt from the vertical. Such variations seem to be far too basic to provide the basis upon which to build a typology and no clear pattern emerged when these variations were traced through the stratigraphic sequence. In view of this the illustrations are organized stratigraphically rather than typologically, so that we can demonstrate the variety of forms which are present within loci and also the consistency which exists from layer to layer.

The general change in the normal thickness of white ware forms has been noted, with a preponderance of heavy forms in early levels (9:9, 16, 18, 22 and 13:6, 14; though such vessels continue to be found later 11:10, 13; 12: 3, 22 and 13:21, 18) and some very delicate vessels with pottery-like thicknesses occurring primarily in step III (12:6, 8-10, 17, 20, 23 and 24; though thin pieces were also found in earlier levels, 9:12, 8; 11:1, 20 and 13:5).

The very thick forms like 9:9, 16; 11:10, 13; 12:22 and 13:6, 21, 14 have no pottery parallels, probably because the weight of such wall thicknesses in clay would not be structurally sound and the vessels would sag or collapse before they reached the leather-hard stage. The thicknesses of these vessels range between 26 and 37mm while the thickest pottery wall sections range between 16 and 20 mm. Where there is an inward tilt it is extremely slight and in most cases the rim is also curved back out again. It would seem that the vessel walls either had to be able to support their vertical weight or had to be held in a position close to vertical (usually from the outside with a slight outward tilt) until the gypsum had set. If the vessel walls had been tilted toward the inside at a steep angle, they would seem to have invited disaster because they could not easily be supported.

Closed forms like 9:24 and 11:18, 20 are rare. Though there are variations in the treatment of the tops of vertical rims, there is no indication that these variations were created intentionally to serve specific functions. Rims were finished so that they tapered to a point like 11:17 or 12:13, 17; were rounded at the top like 9:6, 11:21 or 12:1, 4, 8, 18, 5; were formed as club rims like 11:18 and 12:28; were flat topped like 9:13 and 13:4, 11, 15, or variations of these possibilities might occur.

When white ware and pottery vessel profiles are compared, a number of differences demonstrate the peculiarities of the two materials. First, of the two materials, the white ware seems to be more difficult to shape and does not lend itself easily to the creation of complicated profiles. This is demonstrated by the common occurrence of near vertical sides, the fact that the sides are commonly formed in straight segments rather than arcs and that where arcs exist they are much smaller than in pottery. Secondly, rims and angles are seldom sharp but usually rounded or thickened; the greatest angles of carination on pottery are about 106° on 22:27, 117° on 29:5, and 121° on 23:17 and 28:34, as opposed, on white ware vessels, to 138° on 9:24, a unique example, and 143° on 9:16, and 132° on 13:3, though the latter angle may be a transition from vessel sides to base and not a side carination angle. Thirdly, the thicknesses are less consistent than in pottery, and quite often there is a characteristic thickening just below the top of the rim (9:17, 20, 22; 11:3, 16, 9, 11; 12:4, 14, 21, 5 and 13:3, 6, 9, 13, 15, 18) where in pottery there is a gradual taper from the rim.

Sharp angles at the junction of base and side are found but normally they are rounded, even in the smaller pieces from step III (12:6, 10, 25 and 26). One unusual piece shows a large, well-rounded base, 13:17. A majority of the bases are flat, though some are considerably rounded, and a few show a concavity on the underside (9:10, 18 and 13:25). The sharp junction between side and base is well illustrated on vessels with straight sides (12:2, 6, 10 and 11), while rounded bases are sometimes found on vessels with curving profiles. In the latter case, there is often a carination low down on the vessel side (9:16, 11:15, 3, 13, 16, 17; 12:3, 22, and 13:3).

The similarity between the thin-walled white ware vessels of step III and the pottery vessel profiles should be stressed again, particularly in the range of small to medium sized bowl shapes which are common here. The similarities are particularly clear when one compares 12:6, 9, 10, 17, 24, 19, 20 with 23:3, 6, 7, 10, 11, 14, 15, 29, 30, 5, 31; 25:1, 15, 26, 31, 35; 28:9, 12, 16, 19, 20, 27, 31, 32; and 29:2, 7, 8, 9.

#### “BASINS”

The second most numerous group of vessels have been designated as “basins.” For the major period of use of white ware vessels, through III (3) [1], this group is by far the most

numerous; only the great concentration of pot forms in step III is responsible for the change from first to second place when all white ware vessel fragments are totaled. The absence of basins above III (3) [1] represents the most significant shift in the distribution of white ware vessels. This radical change in vessel use, the decrease in the number of white ware vessels present and the changes in pot forms noted above are sufficient evidence to document a cultural shift to a new period.

The "basins" are rectangular vessels which range from 7 to 15 cm in height. In steps VI and V, only low basins were found; the tallest of these, which are few, have a maximum height of 13 cm but the usual height is around 10 cm. The pieces below V (1) [4] had all been burned, a peculiarity which is noted above. The very tall examples were only found in step III. Profiles varied in all levels from forms in which the walls are tilted out slightly, to those which are flared out or bent out. Several base fragments are illustrated and give an idea of the size of the vessels, since none were found complete enough to allow reconstruction. The photographs on plates 18 and 19 complement the profile drawings in giving an impression of the variety of rims and surface textures. The corner angles are illustrated on 15:31, 34, 35; 17:1, 13, 14, 16, 17, 21-23, 2; and 19:1, 7. The fragments 19:8-12 are not corner pieces but what are tentatively considered as spouts. The base fragments, 19:13 and 22, show how such spouts jugged out from the sides of vessels.

#### FLAT PIECES

The third most numerous and last major group of white ware fragments consists of flat pieces. Below V (1) [4] these fragments were the most common white ware forms and, as table 3 shows, most of the fragments in these layers were "burnt" plaster. Only in III (3) [1] do the percentages shift, but unlike the basins, these pieces continue to occur in higher layers.

The manufacture and surface treatment of the flat pieces are described above. The profiles on plates 17 and 22 illustrate the different edge types: rounded ends, flat ends, ends tapered to a point at one side and ends with a very slight curve. Many corner pieces were found but the profiles are not always identical on both edges. The pieces with curved ends, illustrated in 17:48, 50, and 22:2, 18, 19, are thinner than the normal pieces. Here again is another feature present in step III which did not occur previously. The piece mentioned above (p. 17) with seal impressions on both sides, 21:7, is of this type.

There is no evidence from el Kowm to indicate how these pieces were used; possibly they were used architecturally. The roughened surface indicates a functional feature needed for grinding or some other activity. The photographs of step IV (figs. 6:4, 7:2, 3; and 8:1, 2) show a number of pieces as they were found in wall C but they seemed to have been re-used in the construction of that wall. The thickness of these pieces, even the thinnest, was much greater than the architectural plaster on the walls and floors of the buildings of steps VI-IV, so only a very specialized architectural use would have been possible. The specific formation of the edges of these pieces illustrates that their shape was intentional. The use of reeds in the body of some pieces and as edging material in others suggest a possible connection with roofing material. At Bouqras, gypsum slabs were used to construct bins built into or against walls. Gypsum plaster was used to join and coat these slabs (Akkermans, et al., 1983, 346).

#### PLATTERS AND LOW BOWLS

A small number of very low vessels of two distinct types were found. Most of these are very flat with the upper surface curved upwards slightly at the edge to form a rim, but

some have distinct but very low sides. The majority of these vessels were formed in a woven container with the impressions remaining in the white ware. The examples which were not formed in this manner have profiles which resemble some of the flat pieces discussed above (15:2, 7, 12 and 13) but here all examples clearly show the arc suggesting the sides of the vessels.

Vessels of this type range in size from quite small vessels of 8 cm in diameter to fair sized vessels of 32 cm in diameter. Both coiled and simple cross-weave matting is illustrated by the impressions. Coiled matting was consistently used as a retainer for the sides of vessels and in many of these examples the bottom was roughly smoothed and left without an impression (15:4, 6, 7, 9, 11, 14, 16 and 18). In two examples a woven pattern occurs and covers the bottom and sides of the vessels, indicating that they were formed in woven reed baskets (15:13 and 15). One was formed in a coiled basket, with impressions on the base and side (15:16). On 15:5, two types of impression are found on the outside while 16:17 illustrates a different weave on inner and outer surfaces. Plate 16:25 illustrates the other example with mat impression on the inside. Several pieces show replastering over the impressed surface (15:10 and 16:17).

No indication of the function of these vessels is illustrated by the traces of wear or other surface treatment. The rough surface of 15:14 would indicate a grinding surface but the vessel is very small and there is no indication of wear. In most cases the vessels without mat impression have higher sides but are still very low when compared with the pots discussed above. Traces of hand working and smoothing are found on the surface of many of these vessels. A majority of these vessels are quite small. Plate 15:19 is unique with its elongated rectangular shape.

#### ROUGH LOW BOWLS

These rough vessels illustrate another very distinct, though not very numerous, vessel type which was characteristic of the major phase of white ware vessel production. Tables 1 and 2 show that the one piece from II (1) [2] can be considered intrusive, since it is found high up and together with post-Neolithic pottery. The remaining examples were found below III (2) [5] and as early as V (1) [3]. Some variation in profile is indicated on 15:22–28. The examples with straight sides range between 12–15 cm in diameter while those with sloping sides are somewhat larger, ca. 18 cm in diameter. The hole at the base of 15:25 represents a curious feature which may supply a key to the function of such vessels. The drain hole on a vessel of such narrow diameter (2 cm inside) is, however, difficult to explain without context or functional parallel.

The possibility of illustrating these vessels in reversed attitude, as bases, was considered but this was deemed unlikely, particularly for 15:22, 23, 25–27, since their exterior and bottom surfaces (as shown) are extremely rough. There is no indication of a break on the bottom revealing a surface that had been broken or sheered from the sides of a vessel. It would seem that these vessels were built up on a rough surface, probably on the ground, and were intended to have the shape illustrated. Fragments 15:24 and 28 have smoothed surfaces both inside and on the exterior of the sides. There is no indication that the more complete profile 15:24 was a base, broken from a larger vessel, and that the use surface of the container is the one which was oriented upward in the drawings.

#### MISCELLANEOUS FRAGMENTS

A number of statistically insignificant but interesting pieces were also found. As mentioned above they are the flat pieces with seal impression, 21:7, and red wash, 22:7, as well

as the pieces with holes pierced through them, 22:2, 20:16, 17, 26, 34, 36–38, 40, 41, 44 and 21:1, 11, and the knob and handle fragments 18:2 and 3. Plate 22:22 and 23 illustrate very unusual and elaborate profiles quite different from the others. Plates 22:25 and 21:20, 21 represent elongated curved strips of plaster where sections of two edges are preserved on each piece. The length is undetermined in each instance. Four fragments of rectangular section, which fit together to form two pieces, 22:14 and 23 (=21:24 and 23), are interesting but also of unknown function. It is possible that these or some other of the above mentioned pieces originally served architectural purposes but there is no evidence which would indicate such use. The last mentioned pieces may have been used as window frames. Plate 22:21 clearly shows the layering process by which these pieces were formed. Plate 21:25 and 26 are unique tapered pieces.

Several of the fragments which bore mat impressions may not have come from vessels which had been formed within a matted enclosure but rather may have served as liners for vessels made of woven plant materials. On the whole thin fragments are involved and most have the mat impression only on the exterior surface, 15:5, 8, 15 and 3. One has a mat impression on the inner surface, 19:11. One fragment had a mat impression on both the interior and exterior surfaces, 16:35, where the exterior surface had become dysfunctional and the impressed surface covered with a coat of plaster.

Finally, another unique plaster object, 21:27, is a heavy stamp with raised X design. Traces of red color are preserved on the flat surface below the raised X. It would seem that the stamp was intended for a painted rather than an impressed design. The nature of the surface to be decorated, whether cloth, leather, wood, plaster or some other, is of course, unknown.

## 4

## POTTERY

The excavation of the step trench yielded 1117 pottery sherds for tabulation (table 4). Eighty-eight percent of this total was Neolithic and the remainder ranged from the surface from the top through step V and in the wash layer VII (1) [2], while later pottery was found between the top and step VIII on the surface. No post-Neolithic pottery was found below the surface disturbance layer (1) [1] in step III, or lower. Step III and lower were thus purely Neolithic deposits. This chapter will deal with the main body of the material, the Neolithic pottery, as well as the significant sherds of the later wares.

The Neolithic pottery occurs in two distinct wares: a normal ware, to which 88.5% of the sherds belong and a "hard ware" to which the remainder belong. The number of profiles are few and the variation within and between types is limited. The pottery, however, from a technical point of view, is quite well made.

## NORMAL WARE

The surface color of the pottery ranges from light grey and light tan, to a medium red orange with a brown cast and a "café-au-lait" brown or medium brown. The differences here, often noted on the same sherd, seem merely to be differences resulting from variations in firing atmosphere and vessel placement during firing. Only one example of a very dark brown color was found which could correspond in an exact sense with dark-faced burnished ware common in the Amuq. Roughly half of the sherds are not fired uniformly through the thickness of the vessel and as a result have a medium grey core. Chaff temper is found consistently in medium to heavy inclusion. Stone inclusion is also consistently found in light to medium amounts. Only rarely is this inclusion consistently fine grained, while grains as large as 7 mm are very common. The ware is fired quite hard and is very compact. There is a range of vessels from quite coarse and heavy to well-made, fine, decorated vessels. The latter are by far in the minority. More detailed technical discussion and description of each illustrated sherd will be left for later systematic analysis when more pottery is excavated from the site. The various surface colors found and the proportional distribution is indicated by locus in table 5.

On normal wares there is little difference in shape or manufacture between plain surfaced vessels and those with red or brown wash or thin colored slip. Table 5 shows that almost half of all the Neolithic sherds have a red surface wash or slip. Unslipped sherds form the next most numerous group and those with a brown surface finish form the third most numerous. Locus III (3) [1] is shown separately, as it is in the other tables, since it forms a transitional layer and does not show a consistent progression between earlier and later layers. As with the plaster and flint materials, a statistical shift is often evident between the layers above and below III (3) [1]. Here there is a marked decrease in the percentage

of both the red and brown surfaced sherds. The proportional presence of various types of sherds from surface debris is consistent with that found in stratified contexts except for the plain and red-surfaced wares. The difference here seems simply to be the result of erosion, with a proportion of the red washed or slipped surfaces having been eroded off, decreasing the percentage of this group and increasing that of the plain wares.

Horizontal burnishing is found on the outside of jars, as well as on the inside and outside of bowls. It is most clearly seen on the washed and slipped surfaces, but not in all instances. The individual burnishing lines are distinct, except in rare instances where the surface is highly polished. Only on the one dark brown (dark-faced burnished) sherd is close vertical burnishing evident.

#### HARD WARE

This ware is consistently better levigated, more compact and harder than the normal ware, and the size of grit and straw inclusion is well controlled. The sand inclusion is light to medium and no large grains are found; it is uniformly fine grained. The chaff inclusion is usually medium but occasionally quite heavy. The ware has a very flaky texture. This seems to account for considerable surface flaking and disproportionate wear in unburnished surface areas. Medium to light orange-tan is the normal color. A medium to light grey core is found occasionally but it is not common. In cases where the surface color is brown or dark red-brown, the color of the core is medium brown, though a range from orange-tan to medium brown can be found on most sherds of this description.

The forms of this ware are generally finer, thinner and more elaborate than those found in the normal wares though some quite fine pieces of normal ware were found. Since the hardness is more characteristic of this group of sherds, we have used this criterion for the designation of this group rather than any other. Few fragments of thick or heavy vessels were found. The surface color ranges from a medium orange to a light brown while that covered by a colored slip has a range from dark red-orange to medium purplish red or medium brown. The colored slip is almost always burnished to a good luster with fairly closely spaced burnishing. The red surface finish is far more common than the brown, as is indicated in table 5, but a number of sherds are reddish-brown. The variation from higher to lower levels on the tell is not great enough to be considered significant.

#### POTTERY SHAPES

The proportions of body sherds, rims and bases are indicated in table 4. It is difficult to say whether the higher percentage of body sherds in the later levels and lower percentage of rims in the same layers is significant. The number of rim sherds in proportion to body sherds seems to be good for the Neolithic material but extremely low for the later sherds. It is interesting to note that in both cases when one compares the percentage of body sherds with rim sherds, the latter are much less frequent on the surface than in the stratified layers. It is possible that this may be the result of several surveys conducted in the area in recent years.

It is difficult to make many typological distinctions because of the overlap of forms. The majority of the rim profiles are derived from bowl shapes with larger variants that come close to hole-mouth jar forms. A clear group of simple, low-necked jars could be distinguished in the normal wares, but no such distinction has been attempted in the illustrations of the hard ware profiles.

Table 4.—Stratigraphic Distribution of Pottery Forms

Layers	Neolithic												Later Periods						Grand Total	by Layers					
	Body Sherds		Rim Sherds										Rim Totals		Body		Rim				Base				
	Sherds	%	7	7	7	7	7	7	7	7	7	7	Totals	%	Sherds	%	Sherds	%			Sherds	%			
Surface	1	6	0	0	0	0	0	0	0	0	0	1	0	1	6	0	--	6	38	7	44	1	6	16	6
II(1)	13	59	0	0	0	0	0	0	0	0	0	0	0	0	--	0	--	9	41	0	--	0	--	22	8
III(1)	94	49	2	3	17	3	1	0	0	0	0	26	14	3	15	69	36	0	--	1	0.5	193	71		
IV(1)	4	80	0	0	0	0	0	0	0	0	0	0	0	0	--	1	20	0	--	0	--	5	2		
V(1)	13	41	0	1	0	0	0	0	0	0	0	1	3	2	6	16	50	0	--	0	--	32	12		
VI(1)	0	--	0	0	0	0	0	0	0	0	0	0	--	0	--	1	33	2	67	0	--	3	1		
VII(1)	0	--	0	0	0	0	0	0	0	0	0	0	--	0	--	0	--	0	--	0	--	0	--		
VIII(1)	0	--	0	0	0	0	0	0	0	0	0	0	--	0	--	1	--	0	--	0	--	1	0.4		
Total	125	--	2	4	17	3	1	0	0	0	1	0	28	--	5	--	103	--	9	--	2	--	272	--	
%	--	46	--	--	--	--	--	--	--	--	--	--	10	--	2	--	38	--	3	--	1	--	100.4	--	
Phase E																									
I(1)[2]	2	13	0	0	0	0	0	0	0	0	0	0	0	--	0	--	12	75	2	13	0	--	16	47	
II(1)[2]	4	22	0	0	0	0	0	0	0	0	0	0	--	0	--	11	61	3	17	0	--	18	53		
Total	6	--	0	0	0	0	0	0	0	0	0	0	--	0	--	23	--	5	--	0	--	34	--		
%	--	18	--	--	--	--	--	--	--	--	--	--	--	--	0	--	68	--	15	--	--	--	100	--	
Phase D																									
III(1)[2]	33	72	0	0	6	0	1	3	2	0	0	12	26	1	2	0	--	0	--	0	--	46	7		
III(1)[3]	18	55	0	2	0	6	1	1	4	0	0	14	42	1	3	0	--	0	--	0	--	33	5		
III(1)[4]	19	58	0	1	2	0	7	0	0	0	0	10	33	1	3	0	--	0	--	0	--	30	4		
III(1)[5]	60	78	0	1	8	0	0	2	0	0	11	14	6	8	0	--	0	--	0	--	77	11			
III(2)[1]	110	68	1	8	17	5	16	4	0	1	52	32	0	--	0	--	0	--	0	--	162	23			
III(2)[4]	12	43	0	4	7	0	0	5	0	0	16	57	0	--	0	--	0	--	0	--	28	4			
III(2)[5]	180	75	5	6	15	8	19	2	0	0	57	24	2	1	0	--	0	--	0	--	239	34			
III(3)[1]	50	64	0	1	10	0	7	1	0	0	19	24	9	12	0	--	0	--	0	--	78	11			
Total	482	--	6	23	65	19	51	18	6	1	1	1	191	--	20	--	0	--	0	--	0	--	693	--	
%	--	70	--	--	--	--	--	--	--	--	--	--	28	--	3	--	--	--	--	--	--	--	102	--	
Phase C																									
IV(1)[3]	0	--	0	0	0	0	0	0	0	0	0	0	--	0	--	0	--	0	--	0	--	0	--		
IV(2)[1]	0	--	0	0	0	0	0	0	0	0	0	0	--	0	--	0	--	0	--	0	--	0	--		
IV(2)[3]	3	75	0	0	1	0	0	0	0	0	0	1	25	0	--	0	--	0	--	0	--	4	3		
IV(2)[4]	1	100	0	0	0	0	0	0	0	0	0	0	--	0	--	0	--	0	--	0	--	1	1		
V(1)[2]	2	67	0	0	1	0	0	0	0	0	1	33	0	--	0	--	0	--	0	--	3	3			
V(1)[3]	65	77	1	0	5	1	12	0	0	0	19	22	1	1	0	--	0	--	0	--	85	73			
V(1)[4]	16	67	1	0	0	0	5	0	0	0	6	25	2	8	0	--	0	--	0	--	24	21			
Total	87	--	2	0	7	1	17	0	0	0	27	--	3	--	0	--	0	--	0	--	117	--			
%	--	74	--	--	--	--	--	--	--	--	--	--	23	--	3	--	--	--	--	--	--	101	--		
Phase B																									
V(2)[3]	0	--	0	0	0	0	0	0	0	0	0	0	--	0	--	0	--	0	--	0	--	0	--		
VI(1)[2]	0	--	0	0	0	0	0	0	0	0	0	0	--	0	--	0	--	0	--	0	--	0	--		
VII(1)[2]	1	100	0	0	0	0	0	0	0	0	0	0	--	0	--	0	--	0	--	0	--	1	100		
VIII(2)[2]	0	--	0	0	0	0	0	0	0	0	0	0	--	0	--	0	--	0	--	0	--	0	--		
Total	1	--	0	0	0	0	0	0	0	0	0	0	--	0	--	0	--	0	--	0	--	1	--		
%	--	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100		
Grand Total																									
Total	701	--	10	27	89	23	69	18	6	1	2	1	246	--	28	--	126	--	14	--	2	--	1117	--	
%	--	63	4	11	36	9	28	7	2	0.4	1	0.4	--	22	--	3	--	11	--	1	--	0.2	--	100.2	

Table 5.—Stratigraphic Distribution of Neolithic Sherds by Ware and Surface Color

Layers	Normal Ware														
	Plain					Red Surface					Brown Surface				
	Body	Rim	Base	Total	%	Body	Rim	Base	Total	%	Body	Rim	Base	Total	%
Surface	1	1	0	2	3	0	0	0	0	--	0	0	0	0	--
II(1)	13	0	0	13	21	0	0	0	0	--	0	0	0	0	--
III(1)	27	10	2	39	64	43	6	0	49	98	20	6	0	26	93
IV(1)	2	0	0	2	3	0	0	0	0	--	0	0	0	0	--
V(1)	3	0	2	5	8	1	0	0	1	2	2	0	0	2	7
VI(1)	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--
VII(1)	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--
VIII(1)	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--
Total	46	11	4	61	--	44	6	0	50	--	22	6	0	28	--
%	75	18	7	--	--	88	12	--	--	--	79	21	--	--	--
% Comparing Categories	--	--	--	--	39	--	--	--	--	32	--	--	--	--	18
Phase E															
I(1)[2]	2	0	0	2	40	0	0	0	0	--	0	0	0	0	--
II(1)[2]	3	0	0	3	60	0	0	0	0	--	0	0	0	0	--
Total	5	0	0	5	--	0	0	0	0	--	0	0	0	0	--
%	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--
% Comparing Categories	--	--	--	--	100	--	--	--	--	--	--	--	--	--	--
Phase D															
III(1)[2]	2	0	0	2	2	13	4	0	17	5	14	7	0	21	15
III(1)[3]	2	0	0	2	2	14	14	1	29	8	2	0	0	2	1
III(1)[4]	3	0	0	3	3	11	3	1	15	4	5	7	0	12	9
III(1)[5]	10	2	1	13	12	35	8	5	48	13	14	1	0	15	11
III(2)[1]	14	6	0	20	18	51	35	0	86	23	34	8	0	42	31
III(2)[4]	3	0	0	3	3	6	13	0	19	5	1	3	0	4	3
III(2)[5]	35	8	0	43	39	97	24	2	123	34	20	15	0	35	26
III(3)[1]	14	5	4	23	21	21	5	3	29	8	4	1	1	6	4
Total	83	21	5	109	--	248	106	12	366	--	94	42	1	137	--
%	76	19	5	--	--	68	29	3	--	--	69	31	0.7	--	--
% Comparing Categories	--	--	--	--	16	--	--	--	--	53	--	--	--	--	20
Phase C															
IV(1)[3]	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--
IV(2)[1]	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--
IV(2)[3]	1	1	0	2	7	1	0	0	1	2	1	0	0	1	6
IV(2)[4]	0	0	0	0	--	0	0	0	0	--	1	0	0	1	6
V(1)[2]	1	1	0	2	7	0	0	0	0	--	0	0	0	0	--
V(1)[3]	9	7	0	16	55	41	8	0	49	86	13	1	0	14	77
V(1)[4]	7	2	0	9	31	7	0	0	7	12	0	2	0	2	11
Total	18	11	0	29	--	49	8	0	57	--	15	3	0	18	--
%	62	38	--	--	--	86	14	--	--	--	83	17	--	--	--
% Comparing Categories	--	--	--	--	25	--	--	--	--	49	--	--	--	--	15

Table 5.—Continued

Layers	<i>Hard Ware</i>										Total	Percent	
	<i>Red Surface</i>					<i>Brown Surface</i>							
	<i>Body</i>	<i>Rim</i>	<i>Base</i>	<i>Total</i>	<i>%</i>	<i>Body</i>	<i>Rim</i>	<i>Base</i>	<i>Total</i>	<i>%</i>			
Surface	0	0	0	0	--	0	0	0	0	--	2	1	--
II(1)	0	0	0	0	--	0	0	0	0	--	13	8	--
III(1)	2	4	1	7	41	2	0	0	2	100	123	78	--
IV(1)	2	0	0	2	12	0	0	0	0	--	4	3	--
V(1)	7	1	0	8	47	0	0	0	0	--	16	10	--
VI(1)	0	0	0	0	--	0	0	0	0	--	0	--	--
VII(1)	0	0	0	0	--	0	0	0	0	--	0	--	--
VIII(1)	0	0	0	0	--	0	0	0	0	--	0	--	--
Total	11	5	1	17	--	2	0	0	2	--	158	--	--
%	65	29	6	--	--	100	--	--	--	--	--	--	16
% Comparing Categories	--	--	--	--	11	--	--	--	--	1	--	101	--
Phase E													
I(1)[2]	0	0	0	0	--	0	0	0	0	--	2	40	--
II(1)[2]	0	0	0	0	--	0	0	0	0	--	3	60	--
Total	0	0	0	0	--	0	0	0	0	--	5	--	--
%	--	--	--	--	--	--	0	0	--	--	--	--	0.5
% Comparing Categories	--	--	--	--	--	--	--	--	--	--	--	100	--
Phase D													
III(1)[2]	4	1	1	6	9	0	0	0	0	--	46	7	--
III(1)[3]	0	0	0	0	--	0	0	0	0	--	33	5	--
III(1)[4]	0	0	0	0	--	0	0	0	0	--	30	4	--
III(1)[5]	0	0	0	0	--	1	0	0	1	7	77	11	--
III(2)[1]	4	2	0	6	9	7	1	0	8	53	162	23	--
III(2)[4]	0	0	0	0	--	2	0	0	2	13	28	4	--
III(2)[5]	24	10	0	34	52	2	2	0	4	27	239	34	--
III(3)[1]	11	8	1	20	30	0	0	0	0	--	78	11	--
Total	43	21	2	66	--	12	3	0	15	--	693	--	--
%	65	32	3	--	--	80	20	--	--	--	--	--	71
% Comparing Categories	--	--	--	--	10	--	--	--	--	2	--	101	--
Phase C													
IV(1)[3]	0	0	0	0	--	0	0	0	0	--	0	--	--
IV(2)[2]	0	0	0	0	--	0	0	0	0	--	0	--	--
IV(2)[3]	0	0	0	0	--	0	0	0	0	--	4	3	--
IV(2)[4]	0	0	0	0	--	0	0	0	0	--	1	0.8	--
V(1)[2]	0	0	0	0	--	1	0	0	1	50	3	3	--
V(1)[3]	2	3	1	6	55	0	0	0	0	0	85	73	--
V(1)[4]	2	2	1	5	45	0	0	1	1	50	24	21	--
Total	4	5	2	11	--	1	0	1	2	--	117	--	--
% in Category	36	45	18	--	--	50	--	50	--	--	--	--	12
% Comparing Categories	--	--	--	--	9	--	--	--	--	2	--	100	--

Table 5.—Stratigraphic Distribution of Neolithic Sherds by Ware and Surface Color

Layers	Normal Ware														
	Plain					Red Surface					Brown Surface				
	Body	Rim	Base	Total	%	Body	Rim	Base	Total	%	Body	Rim	Base	Total	%
Phase B															
V(2)[3]	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--
VI(1)[2]	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--
VII(1)[2]	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--
VIII(2)[2]	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--
Total	0	0	0	0	--	0	0	0	0	--	0	0	0	0	--
%	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
% Comparing Categories	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Grand Total	152	43	9	204	--	341	120	12	473	--	131	51	1	183	--
% in Category	75	21	4	--	--	72	25	3	--	--	72	28	0.5	--	--
% Comparing Categories	--	--	--	--	21	--	--	--	--	49	--	--	--	--	19

## JAR FORMS

Most of the normal ware jar rims are from large vessels and all but one are extremely simple. The tops of the vessels seem to have been drawn up, thinned and bent out slightly with one sharp-angle bend. Most of the necks are high, with the exception of 22:34, and the openings proportionately wide, again with only one exception, 22:36. If a development in the form of jar rims exists from step V through II, it is not evident in the small sample we have. The rim 22:33 is unusually sophisticated compared with the other forms. It has an interior ledge which was apparently intended to hold a lid.

## JAR DECORATION

The decoration of jars is simple, as shown on plate 24:4, 9, 11–14, 16–22. Most common is a series of curving bands 24:11–13, 16 and 20, which on 24:12 are pendent from a horizontal band around the neck. Plate 24:4 shows a horizontal band just over 4 cm below the neck with a near-vertical band coming down to it. The surface finish on 24:9 is badly worn so that it is hard to tell what areas may originally have been intended to show in reserve. This rim is washed as is apparently the lower portion of the body. A 3 cm zone separates the two areas and may have been filled with a horizontal zigzag or with partly filled reserved triangles as on 27:40 and 30:6. The reserved areas are not uniform and seem to be hatched.

## NORMAL WARE BOWL AND POT FORMS

This category contains both small and deep bowls, and the latter shade into a form which is close to a hole-mouth jar. Because of our restricted sample, it is impossible to make further subdivisions based on proportions of vessel height to diameter or on other features. Most of the closed, incurved forms are not deep enough to be easily classed as jars. We have not tried to make distinctions here and leave this as matter for future work, when a

## POTTERY

Table 5.—Continued

Layers	Hard Ware										Total	Percent	
	Red Surface					Brown Surface							
	Body	Rim	Base	Total	%	Body	Rim	Base	Total	%			
Phase B													
V(2)[3]	0	0	0	0	--	0	0	0	0	--	0	--	--
VI(1)[2]	0	0	0	0	--	0	0	0	0	--	0	--	--
VII(1)[2]	1	0	0	1	100	0	0	0	0	--	1	100	--
VIII(2)[2]	0	0	0	0	--	0	0	0	0	--	0	--	--
Total	1	0	0	1	--	0	0	0	0	--	1	--	--
% in Category	100	--	--	100	--	--	--	--	--	--	--	--	0.1
% Comparing Categories	--	--	--	--	100	--	--	--	--	--	--	100	--
Grand Total	59	31	5	95	--	15	3	1	19	--	974	--	--
% in Category	62	33	5	--	--	79	16	5	--	--	--	--	99.6
% Comparing Categories	--	--	--	--	10	--	--	--	--	2	--	101	--

larger amount of material should be available. The profiles on plates 23, 25, 28, and 29 illustrate the range and size of forms, from the relatively few low open forms (including a fragment of a very low, tray-like vessel) to the hole-mouth jar-like forms mentioned above. Plate 25:19 represents the lowest open form, a heavy tray-like vessel. Such forms were far more common among the white ware vessels (15:2, 7, 10, 12 and 13 above). As is also the case with the deeper vessels, the sides can show a smooth curve (23:19; 25:1, 2, 23, 29 and 36) but obtuse angles are far more common (23:5, 29, 30, 31; 25:17, 20 and 27). Uniform tapering or uniform thickness of the vessel walls is seldom found, illustrating an efficient but simple method of construction. Only a small percentage of the bowl profiles demonstrate a second change in direction, a slight out turn near the rim (23:7, 34, 35 and 28:4).

A majority of the bowl rims have a near vertical stance. The same is also true for the greater percentage of the deeper bowls. In some cases the deeper bowl rims are close to vertical (25:3, 4, 6, 24, 32, 37) but usually they are tilted slightly inward (23:1, 18, 20; 25:7, 25, 34) or outward (23:2, 3, 33; 25:31 and 33). A smaller percentage show a moderate (23:12, 16, 17 and 25:10, 18, 22, 34, 9) or rarely steeper (25:28 and 28:13) inward tilt. Only a general trend can be noticed statistically between levels. Table 4 indicates that in-turned rims are far more numerous in the lower layers while the opposite is true in the higher layers. The few sherds showing the sharpest incline are from the latest Neolithic layers. Also, the rims from the lowest layers are with rare exceptions rounded at the ends. This is still true on most rims in the upper layers but flat-ended rims, which are absent early, are now common (23:20, 33; 25:33; 28:14). The evidence is not overwhelming but seems to demonstrate a greater confidence in the production of pottery vessels. The thickening at the point where the profile changes direction is a good feature to use for comparison with other sites but is rather rare (23:17 and 25:7, 18, 30). The sharp carination on 23:17, similarly, is very diagnostic but is found most often in lower bowl forms (25:8, 10, 36).

Little can be said about an evolution of base shapes since few bases were found in the lower layers. A variety of bases is present. The ring base 23:23 is an unusual occurrence at such an early date. The bases with a thickness equal to the vessel walls (23:6; 28:2, 8), those which thin down toward the center (23:32; 25:5, 14) and those which are thicker than the vessel walls (23:20; 25:11, 12, 29; 28:1, 2), all have their counterparts in white ware vessel bases. Particularly interesting are additional similarities with the white ware vessels: a lack of sharp edges at transition between wall and base and the slight concavity on the underside of some of the bases. Rounded bases are rare and most bases show some flattening. The sharpest angles exist on the two that resemble disk bases, 23:25, 26. One of these, 23:26 (=27:10), was formed on a coiled mat. The impression is clear, again illustrating a feature which is more frequent on plaster vessels (pp. 20–21 above). All of these overlapping features on pottery and white ware vessels indicate an initial similarity in vessel construction, namely building up the vessels in sections from a stationary base.

Only a few nearly complete forms of normal ware vessels were found, but they are enough to give a basic idea of the simple vessel forms. The bases have been positioned in the line-drawing plates so that bases and rim profiles of similar size are placed in relative position to give an idea of the complete vessel shape and thus give us a somewhat more complete picture of the ceramic repertoire.

Several sherds with rim sections were also found with simple ledge handles. It is interesting to see this feature, which is common later at the end of the Chalcolithic and during the Early Bronze Age, appearing as a simple utilitarian feature at such an early date. Similar handle positions just below the rim of a deep vessel like 23:20 are indicated in 28:14 and 15, the former with flat-ended rim and the latter with a rounded rim. Plate 28:17 is from a similar vessel. The handle on 28:16 is on a lower, open form but at about the same distance from the rim. A similar bowl is illustrated on 28:18 but the handle has been broken off. An unusual knob handle was found but there is no evidence from the other sherds to indicate the position in which it would have been attached.

#### NORMAL WARE BOWL AND POT DECORATION

Surface finishes and color variations have been discussed above. Decoration on bowl forms is primarily the hatching of light reserved triangular areas on vessels covered with a darker slip. In most cases the triangles are pendent from the rim with the apex pointing down. Plates 24:46, 48 and 26:20, 39 clearly show the most frequent arrangement, and 26:5, 26, 32 and 38 are similar but less complete. Plate 26:16 may also have been decorated in similar fashion, though there are indications that it may have been more elaborate. There is no indication how much of the vessel was left in reserve or, possibly, whether a zigzag line was used to block out triangles which were further decorated. Two triangular areas are clear. One is hatched while the filling of the other is not clear. Though a small fragment, 26:35, presents another variation, a zigzag red line at the rim frames a reserved area which forms two pendent triangles.

All of the decoration mentioned so far was found on the vessel exteriors and primarily at the rim. One low open bowl, 24:33, was totally different, however, with decoration on the inside. There is a border at the rim of the same red-orange wash used on the remainder of the bowl with a series of broad crossed lines (possibly a total of seven if the spacing is somewhat uniform) over a cream slip.

## HARD WARE SHAPES

On the whole this group of vessels represents finer, smaller and more elaborate pieces than that of normal ware. One quite large vessel was found but it is exceptional (29:5). Most of the shapes are similar to those discussed for the normal ware, namely, the open bowls with near vertical rim stance, with only rare lower forms (28:21, 23, and 29:2), and the deeper bowls with near vertical rims. A distinct group of the closed, deeper bowls illustrate an outward turn at the rim which is not found in the normal ware vessels (28:22, 38 and 29:3, 4, 5, 11).

Plate 29:5 represents one of the three most elaborate vessels in profile and decoration. It is a fairly complete profile which like 23:17 illustrates the rare but very diagnostic sharp body carination. An even sharper carination, but on a very small vessel with a higher, narrow out-turned neck, is found in 28:33. Only few examples of bases can be illustrated; 28:24 represents the common flat base while 28:37 has a slightly pushed up bottom on a nearly flat base.

## HARD WARE DECORATION

A greater percentage of hard ware sherds are decorated than of the normal ware sherds. Because finer clays, slips and better firing were employed, the decoration stands out more clearly on these sherds than it does on normal ware sherds (except those cases where the sherd has been worn to an extent that the highly burnished surface has become damaged and flaking has started on the surface). A greater variety of decoration is also found on these vessels. Plates 27:40 and 30:6, 2 illustrate the common row of reserved hatched triangles, but here they stand on a base line with the apex at or near the rim. On the first sherd, the triangle actually touches the top of the rim, but on the third it is separated from the top by a narrow painted band. Such a band at the rim occurs on all of the decorated sherds of similar profile (27:24, 42; 30:7 and 13). Plate 27:24 has two rows (minimum) of curving bands in dark red-brown slip on a light orange surface which has its only possible parallel in the badly worn sherd 24:9. The color of 30:13 is slightly lighter than the previously mentioned sherd and the wash has an orange cast. The chevron design has a parallel in the fragment of a large vessel 24:14. Plate 30:8 is the only vessel with decoration both inside and outside, and 30:1 and 10 seem to be fragments of similar vessels. On the interior of 30:8 there is a sun-burst pattern below the carination. Six lines are clear but the pattern does not cover the entire base, since a portion of the area is filled solid. Plate 30:1 is a fragment which shows a similar pattern on the interior of a vessel (its surface is very poorly preserved and not illustrated). On the exterior, the decoration is again below the carination. A circular area near the base was apparently left in reserve and between this and the carination is one (probably of a series of) hatched triangle(s) with apex pointing down. Plate 30:2 is a related example of exterior decoration, apparently from a hatched triangle. The surface of this sherd is better preserved than most; its colors and burnishing are quite crisp and bright.

Plate 30:10 is a body sherd of a bowl, possibly related in shape to 30:8, and is decorated on the interior. Unfortunately the pattern is indiscernable. The reserved portion with decoration is confined to the area below the carination and the wash has a curious mottled effect in two colors, medium brown and dark red-orange. A line of the darker color, at the carination, divides the reserved area from the red-orange wash that seems to cover the remainder of the vessel.

The last of the decorated sherds is 27:42. The exterior surface is decorated with a combination of paint and applied clay knobs. Remains of four rows of conical knobs are preserved with a spacing of just under 2 cm between knobs. The space between the first and second rows is somewhat less (1.5 cm). As on some of the other sherds, the interior and exterior colors vary somewhat. On the interior the medium brown paint below the rim is over a tan surface while on the exterior a bright red-orange slip is over a light orange surface. The painted band at the rim is clear on the photograph as is the paint on some of the conical knobs. Actually, all of the knobs are painted, but this and the decoration between them is not clear on the photographs. The surface is not well preserved so the painted decoration is not entirely comprehensible. The left hand section indicates hatching over a reserved area but the outlines of that area are not clear. The decorated portion seems to be confined to the area between the two upper rows of knobs.

One unusual pottery object was found in a pre-pottery layer, VI (1) [2]. Plate 30:14 is biconical with a finger depression pressed deep from one side. It is made of dark brown ware and is only lightly fired.

#### POST-NEOLITHIC POTTERY

The ceramic evidence for dating the post-Neolithic layers at el Kowm is very inconclusive. Despite the fact that considerable effort was expended in collecting as much material as possible from the highest layers (see p. 9 above), not enough material was found upon which to base a firm conclusion. Only 18% of these sherds were found at any depth below the surface, but even here the areas seemed disturbed by late graves near, but primarily outside, the trench. Eighty-nine percent of the sherds were body sherds, only thirteen providing rim profiles and two, base profiles. This compares to the 73.5% body sherds for the Neolithic, where rim sherds represented 23% and base sherds 3.5%, a ratio which provides a sufficiently high percentage of shapes upon which to base conclusions.

A basic breakdown of the distribution of post-Neolithic sherds is presented in table 4. In some cases the chronological attributions of the body sherds are clear, while in others the judgment had to be somewhat subjective. The sherds from layers II (1) [2] and I (1) [2] are too mixed to provide useful information and only three of these were rim sherds. It is impossible at this point to correlate the various historical phases evident from the surface pottery with the pottery found in the layers encountered in steps II and I.

Since further clarification of the upper layers must be left until additional excavation is undertaken, we will have to content ourselves with only a few comments, primarily concerning the sherds which can be attributed with relative confidence.

Several clear and probable Early Bronze Age sherds are illustrated on 29:12, 13, 15 and 30:17, 18. The last two sherds are fairly fine and of orange-tan color. The portion below the ribbing on 30:17 is medium grey as a result of smoking in a fire. Both sherds were decorated with very fine comb-incised lines. The best parallels for such sherds at present come from Early Bronze I contexts at Tell Hadidi on the Euphrates River. The first three sherds illustrated are best dated to the Early Bronze IV period (Dornemann 1979, figs. 17 & 18). Plate 29:13 is tan to light orange with a dark grey core and medium to heavy straw inclusion. The ware is not very different from that which is common in the Neolithic layers but no similar profile was found on another Neolithic sherd. A similar profile could be found in contexts from the end of the Neolithic through the Early Bronze Age but it is tentatively assigned here to an EB IV date.

Plate 29:14 is a ribbed jar rim of pink ware with fairly heavy black and white grit inclusion. Although similar profiles can be found in MB, Iron II and later contexts, it probably belongs to the Roman period. Other sherds which may be attributed to the Roman period are 29:20–24, though again, parallels can be found in other periods.

Distinctive incised decoration typical of MB II is illustrated on 29:16, 18 and 30:21, 23 (Dornemann 1979, figs. 22 & 23). The profiles of 29:18, 19 and 30:21 are distinctive of that period. Similarly distinctive of the Middle Bronze II are a grey ware bowl base, 29:17, and a horizontal lattice-band painted bowl in grey paint on a powdery white slip, 30:16. It has a pink ware with grey core and a medium amount of white grit inclusion.

No exact parallels can be listed for 30:15 and the design would be possible in several periods from the Chalcolithic through the Iron Age. It most likely belongs in a Bronze Age context because of the composition of the ware, which is medium pinkish-brown with a grey core and medium to heavy straw inclusion. The paint is black.

Since the parallels which can be drawn for many of these sherds are not entirely satisfactory, additional excavation and a stratified sequence documenting the ware and shape peculiarities of this region are essential.



## 5

STONE VESSELS, MISCELLANEOUS STONE OBJECTS AND  
BONE TOOL FRAGMENTS

Most of the fragments of stone bowls were found on or just below the surface though several well stratified examples were found. The earliest example, 29:26, was found in one of the lowest pre-pottery layers, layer IX (2) [4]. It has a simple curved rim and is made of tan veined marble. The base fragment, 29:27 from IV (1) [2], is from a bowl with simple flattened base. The stone is a yellow marble veined with red. The other rim fragment is from one of the highest pottery Neolithic layers (29:28 from III (1) [4]). It is of alabaster and has a slight beaded rim. With so few stratified pieces it is hard to say whether there is a change in the type of stone used from veined marbles to alabaster. The unstratified pieces consist of two body fragments of alabaster and two rim fragments. A simple rim fragment, like the earliest example 29:26, is also of marble but here it is red with yellow veins (29:31). Bowl fragment 29:33 provides the most complete profile. Its rim is simple, and it tapers to a narrow disk-base. The surface of the alabaster is not polished and the tool marks are quite evident, particularly on the interior. The alabaster fragments 29:29 and 30 were found in the disturbed layer just beneath the mound's surface in steps VI and V.

A stone weight of white limestone, 29:35, was found in IV (1) [3] and similar objects found at others sites have been given a variety of designations and interpreted in several different ways. The stratigraphic context on the stairway, where the steps continued on into the mound, suggests that it may have been used as a counter weight for a door closing one of the openings in the walls (Kirkbride 1966b, fig. 9:5, 6). Possible use as an agricultural implement does not seem very likely. There is no indication of polishing or wear and the stone is not strong enough that it would survive intact if subjected to much battering. An extremely interesting surface find is a basalt fragment of a pear-shaped mace-head (29:34). There is, of course, no indication of the date of this piece and it is impossible to speculate whether the absence of basalt among the stone used in the Neolithic objects indicates a later date for the piece.

Two unique pieces from the sounding were a small polished, veined grey marble axe head (29:32) from Step VIII (1) [2] and a dark red marble bead fragment from Step III (1) [2].

A small collection of typical bone tools was found in the sounding from loci IX (1) [2] through III (1) [1] (30:35–39). Two complete awls were found and fragments of three others. A spatula fragment represented the only other bone tool type.



## 6

## FLINT TOOLS

A total of 11,276 flint pieces are tabulated from layers stratified beneath the uppermost surface disturbance layer in the sounding at el Kowm. An even greater number of flint pieces were found in the upper surface layer, but a statistical breakdown is not considered worthwhile or informative. Soil from all layers was screened through 5 mm<sup>2</sup> mesh. Though the samples in some loci are small, the breakdown presented here provides a good cross section of what is available from the site and indicates the major features and shifts in the development of the tool kit. Further excavation is, of course, required for additional refinements, but the documentation is presented in considerable detail to provide as much reliable information as possible now.

Table 6 presents the numerical breakdown of flint tools, fragments and chips, by type and layer. The illustrations (plates 31–46) are intended to show the basic variations of the specific flint types and the stratigraphical distribution of these variations. In order of frequency, table 7 shows that there are shifts back and forth through the stratigraphic sequence as to whether blades or flake types are more common. As far as total numbers for the entire sequence, flake tools are most common, around 49%, blades a very close second with 45% and cores just less than 5%. Scrapers, burins, miscellaneous pieces, tanged pieces and perforators are included in the above compilation, but as categories are represented by 3, 2, 0.3, 0.2, and less than 0.1 percent respectively of the total number of flints.

Up to this point the layers of the sounding have not been grouped into a broader series of phases, though these have been indicated in the tables. The major changes have been from pre-ceramic layers at the bottom of the tell to early white ware vessels and early ceramic materials beginning in step VIII. There is also a dramatic shift in the white ware vessel typology between steps IV and III and the occurrence of only the “burnt plaster” pieces below step V (1). The phases designated in the tables and used from this point on in this discussion are based on these basic changes as well as the shifts in the flint tool inventory. A fuller exposition of these phases is presented in the summarizing conclusions, page 51 and following, where developments in the different artifact categories are examined side by side within the phases and then placed in their broader cultural and geographical contexts.

The significant development in the el Kowm flint industry would seem to be an essential shift from the predominance of blade tools in the earliest aceramic layers to the gradual predominance of flake tools in the Phase D pottery Neolithic layers. The amount of flint in the lowest layers is quite small in contrast to the large quantities present in the lower layers of Phase B, and the actual average for Phase A does not show the drastic variance of 52% blade tools to 44% flake tools which is the case in the eight lowest layers. In Phase B, where the average narrows to 48% to 47%, flake tools are predominant, but in Phase

## TELL EL KOWM

Table 6.—Stratigraphic Distribution of Flint Tools

<i>Layers</i>	<i>Flakes</i>	<i>Blades</i>	<i>Blade Points</i>	<i>Tanged Pieces</i>	<i>Burins</i>	<i>Cores</i>	<i>Scrapers</i>	<i>Misc.</i>	<i>Total</i>	<i>%</i>	<i>% by Phase</i>
<b>Phase E</b>											
I(1)[2]	1	1	--	1	--	--	--	--	3	18	--
II(1)[2]	--	--	--	--	1	1	2	--	4	41	--
II(1)[3]	--	5	--	--	--	--	2	--	7	41	--
<b>Total</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>14</b>	<b>--</b>	<b>0.1</b>
<b>%</b>	<b>30</b>	<b>35</b>	<b>--</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>24</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>
<b>Phase D</b>											
III(1)[2]	152	97	30	--	7	14(3)	15	--	315	23	--
III(1)[3]	24	15	--	--	3	7(4)	3	1	53	4	--
III(1)[4]	69	19	--	1	3	7(5)	4	2	105	8	--
III(2)[1]	275	64	7	1	2	40(29)	16	--	405	30	--
III(2)[4]	39	12	7	--	4	5	6	1	74	6	--
III(2)[5]	227	42	1	--	5	63(20)	21	--	359	26	--
III(3)[1]	7	13	1	--	4	5	9	--	39	3	--
<b>Total</b>	<b>793</b>	<b>262</b>	<b>46</b>	<b>2</b>	<b>28</b>	<b>141(61)</b>	<b>74</b>	<b>4</b>	<b>1350</b>	<b>--</b>	<b>12</b>
<b>%</b>	<b>59</b>	<b>19</b>	<b>3</b>	<b>0.1</b>	<b>2</b>	<b>11</b>	<b>6</b>	<b>3</b>	<b>--</b>	<b>--</b>	<b>--</b>
<b>Phase C</b>											
IV(1)[3]	14	3	--	1	--	7	--	1	26	3	--
IV(2)[3]	7	4	--	--	--	--	--	--	11	1	--
IV(2)[4]	2	3	--	--	--	--	--	--	5	0.6	--
V(1)[2]	85	117	18	2	26	18	37	9	312	37	--
V(1)[3]	--	4	--	1	--	1	3	--	9	1	--
V(1)[4]	161	134	48	--	10	11	16	--	380	45	--
V(2)[2]	27	49	1	1	5	3	12	--	98	12	--
<b>Total</b>	<b>296</b>	<b>314</b>	<b>67</b>	<b>5</b>	<b>41</b>	<b>40</b>	<b>68</b>	<b>10</b>	<b>841</b>	<b>--</b>	<b>7</b>
<b>%</b>	<b>35</b>	<b>38</b>	<b>8</b>	<b>0.6</b>	<b>5</b>	<b>5</b>	<b>8</b>	<b>1</b>	<b>--</b>	<b>--</b>	<b>--</b>
<b>Phase B</b>											
V(2)[3]	44	49	7	--	4	6	22	--	132	2	--
VI(1)[2]	79	72	--	--	11	20	14	2	198	3	--
VI(2)[2]	61	51	5	--	2	9(5)	12	3	143	2	--
VII(1)[2]	20	93	6	1	2	6	11	2	141	2	--
VIII(1)[2]	665	533	93	1	35	89	75	5	1496	21	--
VIII(1)[3]	679	469	211	3	37	69	33	3	1504	21	--
VIII(1)[4]	1109	904	262	5	34	71	59	3	2448	35	--
VIII(2)[1]	274	215	35	2	8	23	6	--	563	8	--
VIII(2)[2]	175	182	34	--	3	25	2	--	420	6	--
<b>Total</b>	<b>3106</b>	<b>2568</b>	<b>653</b>	<b>12</b>	<b>136</b>	<b>318(5)</b>	<b>234</b>	<b>18</b>	<b>7045</b>	<b>--</b>	<b>62</b>
<b>%</b>	<b>44</b>	<b>37</b>	<b>9</b>	<b>0.2</b>	<b>2</b>	<b>4.5</b>	<b>3</b>	<b>0.3</b>	<b>--</b>	<b>--</b>	<b>--</b>

## FLINT TOOLS

Table 6.—Continued

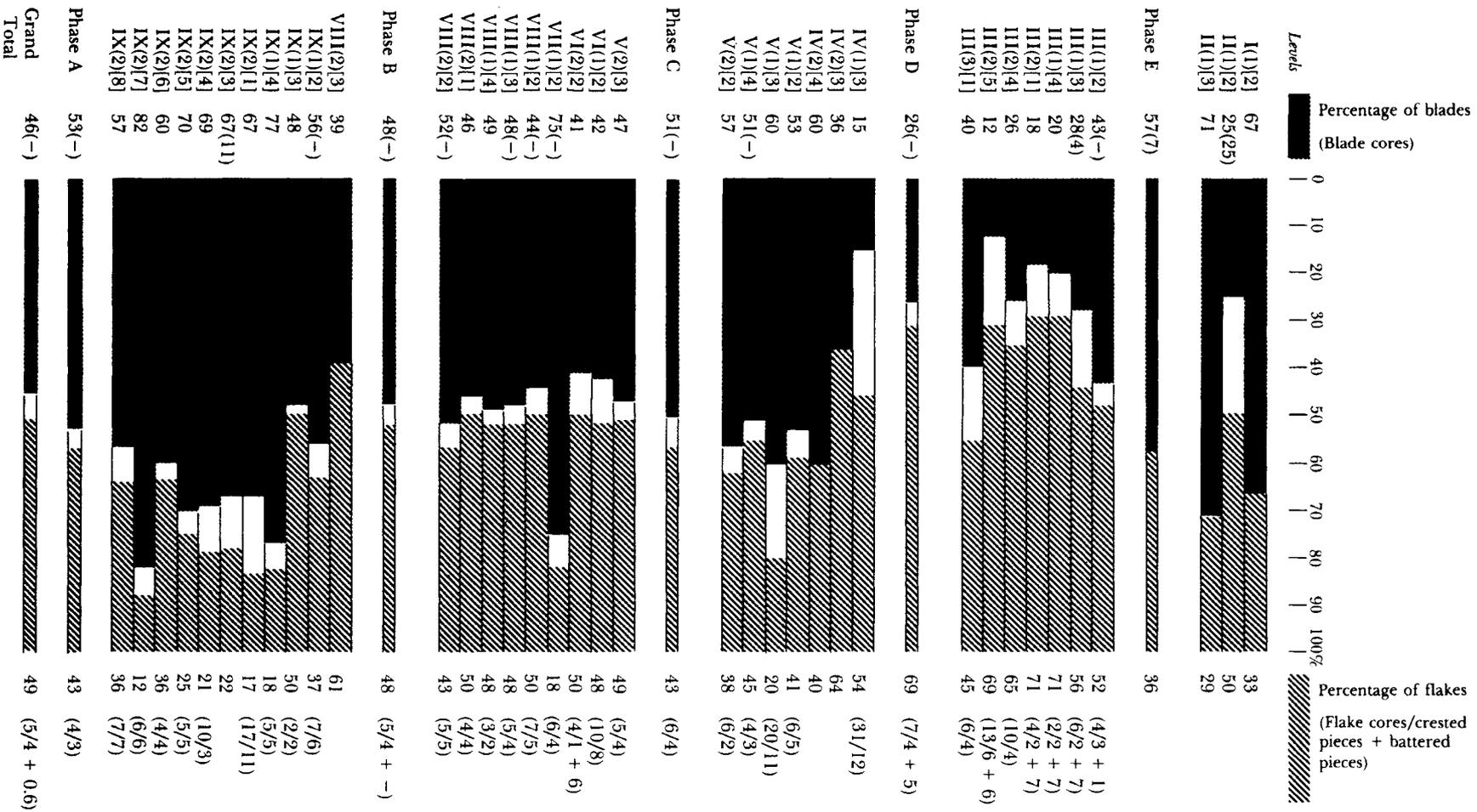
<i>Layers</i>	<i>Flakes</i>	<i>Blades</i>	<i>Blade Points</i>	<i>Tanged Pieces</i>	<i>Burins</i>	<i>Cores</i>	<i>Scrapers</i>	<i>Misc.</i>	<i>Total</i>	<i>%</i>	<i>% by Phase</i>
Phase A											
VIII(2)[3]	141	74	20	--	5	2	9	--	251	13	--
IX(1)[2]	204	297	43	3	17	43	40	3	650	32	--
IX(1)[3]	392	265	120	1	15	14	5	2	814	40	--
IX(1)[4]	19	70	10	--	3	6	4	--	112	6	--
IX(2)[1]	2	8	1	--	2	2	2	1	18	1	--
IX(2)[3]	1	4	1	--	--	1	2	--	9	0.5	--
IX(2)[4]	5	17	--	--	3	3	--	1	29	1.4	--
IX(2)[5]	12	33	4	--	--	3	4	--	56	3	--
IX(2)[6]	6	12	1	--	1	1	4	--	25	1	--
IX(2)[7]	3	20	2	--	4	2	2	--	33	1.6	--
IX(2)[8]	8	13	1	1	1	2	2	1	29	1.4	--
Totals	793	813	203	5	51	79	74	8	2026	--	--
%	39	40	10	0.2	3	4	4	0.4	--	--	18
Grand Totals	4989	3963	969	25	257	579	454	40	11,276	--	--
%	44	35	9	--	2	5	4	--	--	--	--

C the shift is back to blade tool predominance with just less than 51% blades to 43% flakes. A change once again back to flake tool predominance begins in IV (2) and continues into Phase D. Unfortunately, the flint tools from Phase E are too poorly represented to be of statistical value.

The flints from layers VIII (1) [2] through VIII (2) [1] and III (2) [5] provide peculiar lots which obscure some of the statistical changes. These layers contain large lots which include a very large number of unused flint flakes, resulting in depressed percentages in most categories. The fact that it does not influence the basic trends noted for the flake to tool ratios, as indicated in table 7, demonstrates that this is a clear component of the inventory and not accidental or intrusive. The flints from III (2) [5] may have come from the vicinity of a flint workshop area. The high percentage of unused flint, the oddly shaped pieces which were extremely difficult to classify into types or not at all analogous to the earlier flint materials, the many coarse or poor examples of specific types and a much higher than usual percentage of cortex on the flint pieces, all suggest this as a possible explanation. No specific peculiarities are noted in the flint from VIII (1) [2] through VIII (2) [1] other than the high number of unused flakes.

No noticeable pattern is obvious for the distribution of small blade tools or for the use of cherty flint rather than the fine dark brown to black flint which is common throughout. Of the total blade tool pieces only 0.3% are of obsidian, 4.4% of cherty flint and 4.7% are small pieces which were less than 4 cm in length, indicating that these categories are of minor importance in the tool kit. Since the flint is good there is no special need for obsidian though its use predominantly for small narrow blades indicates a specialized use (35:18, 19). Twelve pieces out of a total of 11,276 is scarcely a significant number and indicates little more than the presence of the material on the site. Cherty flint never seems to have

Table 7.—Stratigraphical Distribution of Blade and Flake Tools by Percentage



been sought out as a preferred material for tools and may have been a by-product of the flaking process. Only in Phases D and E is a noticeable amount of cortex left on a substantial number of pieces. There seemed for the most part to be conscious effort to produce flint pieces which were of a consistent dark color. No specific microlithic tools exist but a small number of tools are found in a range smaller than 4 cm in length.

The flint is predominantly dark in color. Some is clearly black, some grades from black to dark brown, some is dark brown and some with gradation of darker and lighter browns. A medium color is less common. This range of flint seems to be available as nodular flint in the surrounding area. The rich, dark flint of the earliest levels is impressive in its quality while the later flint is on the whole not of the same quality. Only rare examples of different kinds of flint are found on the site. Most of these again were found in Phases D and E. These flints are usually light grey-brown in color (35:15; 38:3, 7; 39:6 and 43:9, 15) and a few have a bluish hue (35:3). A few pieces of the flint seem to have been weathered white (32:8, 33:2 and 34:21) but were found beneath ground surface. Some of the very black flint was of a different type and crumbled, where the surface had been broken away, to reveal a granular consistency at the interior of the tool (31:8). The condition of the flint is probably the result of its having been burnt.

#### BLADES

Since there is a greater variety in the blade tools we will discuss these first. A representative selection of complete blades, as well as dorsal, medial and ventral segments are illustrated on plates 31–37. No compilation is made of the size of blades other than to note the numbers of smaller blades 4 cm or smaller in length. Long blades are most common in the lowest layers and are best illustrated by 31:7, 10; 32:1–3, 7 and 33:1, 21 with 33:1 representing the maximum length at 16 cm. Two blade types which are included in the tabulation under the headings fish-tail blades, 36, and blade points, 37, seem to have been formed as a by-product of the technique employed to produce the desired blades or to thin down the thickness of the blades. Both of these blade types were commonly utilized as tools, a fact clearly demonstrated by indications of use.

Table 8 shows the distribution of the major profile types but does not provide a specific tabulation of the less frequent forms like the leaf-shaped blades (31:9, 13; 33:16 and 35:10), crescent-shaped blades (34:9, 12, 13 and 35:7), the thick blades (31:14, 33:25 and 34:7), and a variety of intentionally pointed blades. The best examples of the last are illustrated on 32:17; 33:1, 3 and 35:8, 9. Examples of the few which were purposefully retouched at the point are illustrated on 31:7 and 35:8, and these blades may have been used as perforators. Other good examples of pointed blades are illustrated on 32:11,12; 33:4, 11, 18; 34:1, 10, 14 and 35:1; while the occasional blades with points on both ends are illustrated on 33:23, 24 and 34:15. Only the odd shaped, rougher, often wider blades like those illustrated on 35:1, 4, 5 and 6 are concentrated stratigraphically in the latest phases.

A number of significant features in the character of the blades in the el Kowm tool kit are clear from table 8. The three columns on this table within each vertically represented category display, from left to right, chert, flint and obsidian. Blade points are numerically the most common form, when all layers are totaled, as a result of their frequency in Phases A and B, where they comprise the most common type. The percentage decreases in the higher layers but the form continues as a significant type. Similarly, miscellaneous or poorly defined blades, or blades which could not easily be classified in any other category, are a

Table 8.—Blade Morphology

Layers	Totals	Trapezoidal Section			Complex Section			Triangular Section			Fish-Tail Blades			Backed Blades			Obsidian Blades	Blade Points				Miscellaneous Blade Pieces		
		C	F	O	C	F	O	C	F	O	C	F	O	C	F	O		Screw	Curved	Straight	Oblique	C	F	O
<b>Phase E</b>																								
I(1)[2]	1	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--
II(1)[2]	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
II(1)[3]	5	--	2	--	--	2	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Totals	6	--	2	--	--	2	--	--	1	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--
%	100	--	33	--	--	33	--	--	17	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--
<b>Phase D</b>																								
III(1)[2]	127	4	22	--	1	17	--	5	34	--	--	7	--	1	5	--	--	--	15	12	3	--	1	--
III(1)[3]	15	--	3	--	--	3	--	2	3	--	--	--	--	--	1	--	--	--	--	--	--	--	3	--
III(1)[4]	19	--	8	--	--	--	--	2	7	--	--	--	--	--	--	--	--	--	--	--	--	--	2	--
III(2)[1]	71	2	16	--	--	2	--	4	24	--	--	1	--	1	2	--	--	--	4	3	--	--	12	--
III(2)[4]	19	--	3	--	--	1	--	--	4	--	--	--	--	--	1	--	--	--	3	2	2	1	2	--
III(2)[5]	43	--	4	--	1	4	--	--	14	2	--	4	2	--	4	--	--	--	--	--	1	--	7	--
III(3)[1]	14	--	4	--	--	6	--	--	3	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--
Totals	308	6	60	--	2	32	--	13	89	2	--	12	2	2	13	--	--	--	22	18	6	1	27	--
%	100	2	19	--	0.7	11	--	4	29	0.7	--	4	0.7	0.7	4	--	--	--	7	6	2	0.3	9	--
Total %	100		21			11			34			5		5					15				9	
<b>Phase C</b>																								
IV(1)[3]	3	--	--	--	--	1	--	--	1	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--
IV(2)[3]	4	--	1	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	2	--
IV(2)[4]	3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	--
V(1)[2]	135	--	38	--	3	27	--	5	28	--	--	1	--	--	3	--	--	--	6	12	--	--	12	--
V(1)[3]	4	--	1	--	--	--	--	--	2	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--
V(1)[4]	182	--	35	--	3	25	--	1	16	--	--	16	--	--	36	--	1	5	10	28	5	--	1	--
V(2)[2]	50	2	20	--	--	10	--	2	13	--	--	--	--	--	--	--	1	--	1	--	--	--	1	--
Totals	381	2	95	--	6	63	--	8	60	--	--	18	--	--	40	--	3	5	17	40	5	--	19	--
%	102	0.5	25	--	2	17	--	2	16	--	--	5	--	--	11	--	0.8	1	5	11	1	--	5	--
Total %	102		26			18			18			5		11			1		18				5	
<b>Phase B</b>																								
V(2)[3]	56	--	18	--	1	11	--	--	16	--	--	1	--	--	--	--	1	5	--	1	--	2	--	--
VI(1)[2]	72	--	13	--	1	14	--	1	17	--	--	3	--	1	5	--	--	--	--	--	--	--	17	--
VI(2)[2]	56	--	11	--	--	7	--	--	17	--	--	1	--	--	--	--	--	2	1	2	1	14	--	--
VII(1)[2]	99	1	24	--	--	17	--	1	25	--	--	9	--	--	4	--	--	1	--	5	3	9	--	--
VIII(1)[2]	626	17	134	5	6	53	--	8	47	9	--	30	13	2	8	--	2	28	11	52	5	190	6	--
VIII(1)[3]	680	2	86	--	3	98	--	5	44	--	--	79	--	--	13	--	1	83	33	95	7	117	14	--
VIII(1)[4]	1166	10	151	13	17	146	3	10	115	24	5	154	31	3	17	--	8	9	106	108	39	10	154	33
VIII(2)[1]	250	--	2	--	--	6	--	--	--	--	7	54	17	2	1	--	1	--	14	4	17	--	109	16
VIII(2)[2]	216	1	43	--	1	23	--	4	49	1	2	27	--	--	--	--	1	--	16	4	14	--	17	13
Totals	3221	31	482	18	29	375	3	29	330	34	14	356	61	8	48	--	11	12	255	161	225	26	629	82
%	100	1	15	0.6	1	12	--	1	10	1	0.4	11	2	0.2	2	--	0.3	0.4	8	5	7	0.8	20	3
Total %	100		17			13			12			14		2			--		20				22	
<b>Phase A</b>																								
VIII(2)[3]	94	1	21	--	2	14	--	2	16	--	--	--	--	3	--	--	1	5	--	14	--	15	--	--
IX(1)[2]	340	5	43	--	5	97	--	3	33	1	--	43	2	--	15	--	1	8	14	7	14	3	44	2
IX(1)[3]	385	2	39	8	4	45	1	--	25	7	2	77	--	--	--	--	25	38	24	33	--	55	--	--
IX(1)[4]	80	1	19	1	2	10	--	--	8	--	2	5	--	--	--	--	1	--	3	1	6	3	12	6
IX(2)[1]	9	--	1	--	--	2	--	--	3	--	--	--	--	--	--	--	--	--	--	--	1	--	2	--
IX(2)[3]	5	--	1	--	--	--	--	--	1	--	--	--	--	--	1	--	--	--	1	--	--	--	1	--
IX(2)[4]	17	1	8	--	1	1	--	--	--	--	3	1	--	1	--	--	--	--	--	--	--	--	--	--
IX(2)[5]	37	--	8	--	--	6	--	--	6	--	--	--	--	--	4	--	--	1	3	--	--	--	9	--
IX(2)[6]	13	--	2	--	--	3	--	--	2	--	--	--	--	2	--	--	--	1	--	--	--	--	3	--
IX(2)[7]	22	--	8	--	1	2	--	--	1	--	--	3	--	--	1	--	--	1	1	--	--	--	4	--
IX(2)[8]	14	--	5	--	--	3	--	--	2	--	1	1	--	--	1	--	--	--	1	--	--	--	--	--
Totals	1016	10	155	9	15	183	2	5	97	8	5	132	3	--	28	--	2	34	64	37	68	6	145	8
%	101	1	15	1	2	18	0.2	0.5	10	0.8	0.5	13	0.3	--	3	--	0.2	3	6	4	7	0.6	14	0.8
Total %	101		17			20			11			14		3			--		20				16	
<b>Grand Totals</b>																								
Totals	4932	49	797	27	52	655	5	55	577	44	19	519	66	10	129	--	16	51	358	256	304	33	820	90
%	100	1	16	0.6	1	13	0.1	1	12	1	0.4	11	1	0.2	3	--	0.4	1	7	5	6	1	17	2
Total %	100		18			14			14			12		3			--		20				20	

Note: C = chert; F = flint; O = obsidian.

significant portion of the Phases A and B tool kit. The decrease in the higher layers is more dramatic. In both categories though the trend is clear, the Phase B statistics are heavily affected by the character of the flint in layers VIII (2) [1] through VIII (1) [2], as noted above. The number of fish-tail blades drops significantly after Phase B. They are never as numerous as the blade points and never the most numerous category in any period. By Phase D there is a clear shift away from more complicated cross-sectional profiles, usually associated with longer, narrower blades. Phase E should not be considered as a representative sample because of the very small number of examples of all flint types. In defining the profile types, the blades illustrated on 31:7, 2, 3, 6, 13, 17, 18; 32:23 and 34:5, 11 illustrate pieces which are classed as having a trapezoidal profile; 31:8, 11 and 32:7, 11, 13, 18, 22 illustrate blades with a more complicated profile; and 31:4; 33:1, 2, 8, 13, 15, 25, 26 and 34:15, 19, 21, 22 illustrate blades with a simpler triangular profile.

Backed blades, like those illustrated on 31:8; 32:15 and 34:16, are clearly a very small portion of the blade total and blades backed on two sides, like 32:15, are quite unusual. Since this blade is quite worn, it is possible that it was originally intended to serve as a backed blade with deep denticulation on the second edge. Only two other possible denticulated blade segments were found, 32:14 and 34:3, and both similarly are worn and of uncertain attribution. Clearly, blade segments with deep denticulation are extremely scarce, and since they are all questionable, may not have formed a component of this tool kit. Obsidian is present in Phases A-C but is statistically negligible; it obviously plays no significant role in the tool kit.

The blade points are subdivided morphologically in table 8 to indicate a diversity: pointed ends on fairly straight blades like 37:27, 7, 11, 21-23 and 26; or on curved blades like 37:6, 12, 18, 19, 24, 25 and 38:4, 5 or at an oblique angle like 37:17 as well as blades with screwdriver ends like 37:16, 2 and 14. The screwdriver pieces are least common but there is no clear pattern to the distribution of the types stratigraphically, indicating that there was no intentional selection or purposeful manufacture involved in the production of these pieces. Similarly, few of the fish-tail blades seem to have been fashioned to this form intentionally. Only rare pieces like 36:1 may have been designed for use as a projectile point to be hafted at the bulbar end. The double fin is the normal form on the fish-tail blades and wider, more flake-like pieces are common only in the latest periods. Both blade points and fish-tail blades are relatively thin blades.

#### INDICATIONS OF TOOL USE

Tabulations were made of use patterns on blades and flakes but these have not been included here because such tabulations based on visual inspection without microscopic aids provide little useful information now that such analysis can be done in a systematic way. We defer to the work of our French colleagues for such analysis (Masson 1982, Anderson-Gerfaud 1982 and Roy 1982).

It is surprising that only one tool clearly shows traces of silica sheen to the unaided visual inspection. The one piece is the crested blade illustrated on 45:25, from layer III (1) [3], and is not a regular blade type but included among the core tools. Only a few other blades have possible traces of sheen but it is restricted to very small patches and does not seem to represent a consistent use pattern.

#### TANGED PROJECTILE POINTS

Blades were further modified for use as tanged points, perforators, burins, notches and scrapers. Table 6 indicates that the number of tanged points are statistically negligible. The

majority of the tanged points is long, often leaf-shaped pieces with a maximum length of 10.2 cm. In almost all cases the tang is oval in section and is formed by retouching from all sides (38:9, 6–8 and 10–13). This type continues without noticeable change through the history of the site. Plate 38:14 and 15 illustrate a different type of triangular arrow point. No. 14 is from a high layer in Phase D and no. 15 is a surface find. Both are shorter points in which the tang is formed by retouch from the two sides only, giving a rectangular section and a short triangular tang. It is curious that the number of tanged pieces is also small, suggesting that if these were the major types of projectile points used in hunting and if their occurrence is representative, hunting played a minimal role in the economy of the site.

#### BURINS

A variety of burin types is illustrated on plate 39 and the stratigraphic distribution of variants is presented in table 9. This small category represents 2% of the total number of tools, but seventeen burin types are present as well as a large number (35% of the total number of burins) of burinating pieces, burin spalls and dubious examples that have been included in category 14 in table 9. Plate 39 shows that some burins, like nos. 3 and 4, are well made functional tools while many of the others are clearly to be defined as burins but are less distinctive.

All of the major burin types listed in table 9 are illustrated on plate 39. Tools with multiple end use are indicated by fractional representation on the table. Since the variety present in the types of burins which were manufactured is so great, as illustrated by the distribution in table 9, and since the numbers involved in specific stratigraphical groupings are so small, they are of minimal statistical significance. In general, the gouge (types 1–7) and screwdriver (types 8–17) provide useful groupings which show a specific indication and development. For the whole tool kit there is a decided preference for screwdriver type burins (42%) in contrast to gouge type burins (23%). Only in Phase B do the numbers of tools of the two types come close to equal (though still 37% screwdriver to 27% gouge). The large number of examples in layers VIII (1) [4] through VIII (1) [2] show only a slight preference for the screwdriver burins and consequently distort the better than 2:1 preference evident in the other layers. This proportion continues the 2:1 preference illustrated in Phase A which is increased dramatically to 5:1 in Phase C but reduced again back to the original proportion in Phase D, to 2.5:1.

Burins were fashioned primarily on blades by almost a 2:1 preference over flakes. This follows closely the proportions noted for gouge to screwdriver burins. The changes are somewhat more drastic when one notes the slight Phase A preference for blades (55% to 45%) shifting to better than 2:1 in Phase B, then to almost 5:1 in Phase C but dropping to 1:1 in Phase D. Layers VIII (1) [4] through VIII (1) [2] again have a moderating effect, where a 9:1 ratio is present in the other layers of that period.

Only one of the tools with burins on two ends is illustrated and in this example, 39:3, both types are similar. Plate 39:12 is a multiple tool with a small burin having been fashioned on the opposite end of a blade scraper, possibly after the latter had been snapped.

#### FLAKES

The flakes shown on plates 43:5 through 44:18 represent a cross-section of the variety of flakes found at the site. The variety is so great that no classification system could be devised to provide a useful tabulation. Many circular or sub-circular flakes, like those on

Table 9.—Burin Types

Layers	Gauge						Screwdriver							Misc.	Totals	% by Phases		
	1	2	3	4	5	6	7	8	9	10	11	12	13				14	
Phase E																		
IK(1)2]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IK(1)2]	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
IK(1)3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
% by Category										100								0.4
Phase D																		
HI(1)2]	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	7
HI(1)3]	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3
HI(1)4]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
HI(2)1]	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
HI(2)4]	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4
HI(2)5]	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	5
HI(3)1]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	1	0	0	1	0	0	0	0	3	3	3	0	0	0	0	0	0	28
% by Category									6	3	3	3	0	0	0	0	0	11
Phase C																		
IV(1)3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IV(2)3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IV(2)4]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
V(1)2]	3	0	0	0	0	0	0	0	2	3	2	7	0	2	0	6	0	26
V(1)3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
V(1)4]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
V(2)2]	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	10
Total	3	0	0	0	0	0	0	0	2	6	2	9	0	2	0	6	0	41
% by Category									2	6	2	9	0	2	0	6	0	16
Phase B																		
V(2)3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
V(1)2]	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
V(2)2]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
VH(1)2]	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
VH(1)2]	4	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	35
VH(1)3]	4	5	1	2	0	0	0	0	1	2	0	0	1	0	0	9	0	37
VH(1)4]	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34
VH(2)1]	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
VH(2)2]	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	11	5	3	5.5	7	0	0	0	0	0	0	0	0	0	0	0	0	136
% by Category																		53
Phase A																		
VH(2)3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
IX(1)2]	2	1	1.5	0.5	2.5	1	0	0	0.5	1	2.5	0	0	0	0	0	0	17
IX(1)3]	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
IX(1)4]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
IX(2)1]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
IX(2)3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IX(2)4]	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	3
IX(2)5]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IX(2)6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IX(2)7]	0	0	0	0	0	0	0	0	0	3	1	1	0	0	0	0	0	4
IX(2)8]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	3	1	2.5	2	2.5	1	0	0	0.5	1	2.5	0	0	0	0	0	0	51
% by Category																		20
Grand Total	19	7	5.5	8.5	13.5	7	26	34	14.5	25.5	2	5.5	1	89	257			
% by Category	7	3	2	3	5	3	10	13	5	10	1	2	0.4	35	42			

43:13–15, 17–20 and 22, are found in all layers as well as similar, less defined pieces, like 43:12, 16, 23, 25, 26 and 44:2, 8, 9, 10, 17. There are a variety of pointed flake pieces, as illustrated on 43:6, 8, 9, 16, 21, 24 and 44:4–7, 11–13, 15, 16, 18, and many of these show signs of use. A small number of pointed flakes, like 43:9, 11, and 24, are the flake counterparts of the blade points.

Many of the flakes with good edge surfaces show signs of use, like 43:5–11, 14, 15, 17–20, 23–25 and 44:1–13, 15, 16, 18. Only a small number seem to have been made to a predetermined form. Plate 43:5 is the best example of a flake with leaf-shaped form. A majority of the utilized flakes were apparently available as the result of the production of other tools and were put to use because they had a convenient shape, edge or point. The flakes vary greatly in thickness as well as size and shape. Many larger, odd shaped pieces are most characteristic of the highest layers, particularly Phase C (44:3–17).

#### SCRAPERS

A variety of scrapers constitutes 4% of the total tool kit. Table 10 shows a further breakdown of types. The great majority are clearly flake tools with only a 14% variation (from 76 to 62%) in the percentage of flakes present within Phases A through D. The percentage of scrapers on blades and cores changes through the history of the site and the development moves in opposite directions. The substantial number of scrapers on blades in Phase A, 37%, drops drastically in Phase B and then continues to diminish to 5% in Phase D. In contrast, while only one example of a scraper on a core is found in Phase A, the percentage increases significantly so that it is close to that of blades in Phase B; it surpasses the number of blades present in Phase C by 16% as opposed to 13% and in Phase D core scrapers are more numerous than blade scrapers by a 3.5:1 ratio.

The blade scrapers are usually on thick pieces of flint and the narrow blade scrapers often prove to be double ended when the complete tool is preserved (40:7, 8, 13 and 6, 9–11). The larger blade scrapers are usually single ended, 41:3, 7, 1, 2, 5, 13, 15–18, and steep scrapers are on truncated blades like 41:4, 6, 21 and 24. A selection of side scrapers on flakes is illustrated on 41:8, 10–12, 19, 22, 23, 25 and 42:7, 2, 3, 5. Three of these (41:12, 22 and 25) are almost square and were used on all four sides. Four of these scrapers are on thin flakes and were worked with fine pressure flaking (42:7, 2, 3 and 5). This technique is quite rare at el Kowm and confined almost exclusively to Phases B and C. Several heavy scrapers were formed on cores and are illustrated on 42:4 and 6.

End scrapers like those on plates 41:9, 14 and 42:1 are the least common type of scrapers found on flakes and become less common in the later layers, from 16% to 10% from Phases A through D. Side scrapers, on the other hand, become increasingly more common in the higher layers, from 18% to 44% in the same phases (again with layers VIII (1) [4] through VIII (1) [2] providing a variation which obscures this progression slightly). Circular scrapers remain fairly consistent in percentage throughout, varying between 28% and 22%, with a general decline in numbers from earlier to later layers.

The circular scrapers vary in size and thickness. The majority are quite flat and well shaped with careful flaking (42:9, 8, 10, 12, 14, 15 and 43:4). Some are quite small like 42:16 and 17. Heavier, thicker circular scrapers, or nearly circular scrapers, were intentionally produced (42:11, 13, 20 and 43:2, 3) and only on rare occasions are they reshaped cores like 42:18, 19. The circumferences of many of the heavier scrapers were worked to produce a series of notches, rather than continuous, even surfaces. This is best illustrated on plate 43:1.

The diversity evident in the scrapers indicates that they were intended for a variety of functions. There is a broad range in the sizes of both the end and circular scrapers. In both categories there are some very heavy tools as well as small, finer tools for much more delicate tasks. In addition, there are some very thin (not narrow, but flat) tools. These are primarily late, for the most part finished with the fine pressure flaking mentioned above (42:5 and 7), and may represent a new variety, though there are only a few examples.

#### NOTCHED PIECES

In general, notches were seldom produced intentionally, as on the circular scrapers, but are found on blades or flakes as the result of heavy use. Plate 40:3, 1 and 2 represent three rare notched tools. No. 1 is on an odd shaped flake, no. 3 on a snapped blade and no. 2 has two notches worked on a flake.

#### CORES

The final category of items in the el Kowm flint tool kit is cores. These constitute less than five percent of all flints, but this amount includes the category of crested blades which are a distinctive class. Some core pieces are quite rough or very irregular in shape like 44:19–21 and 45:1, 2, 4, and include a good example of a discoidal levallois type core, 44:19. Others are no more than heavily battered pebbles, often with a considerable portion of the cortex remaining (45:3). Table 10 provides a very basic breakdown of core types. Blade cores are extremely rare throughout, despite the thousands of blade tools found on the site. Plate 46:8 and 10 represent two of the nine blade cores. Plate 46:1, 2, 3, 5 and 7 are keel-shaped cores. Flake cores are represented by 46:4, 6 and 9. Similar to the stratigraphical occurrence of blades and flakes on the site, blade cores are most numerous in Phase A and are represented in the other phases while flake cores become more numerous in the later periods.

#### *Crested blades*

Seventy percent of the total number of pieces attributed to the core category are defined variously as crested blades, fabricators or trihedral bars. This category seems to be a diagnostic flint product at el Kowm. The piece seems to be formed as the product of a specific flaking technique and is then split off as a blade. A normal technique of flake production is illustrated by 44:20; 45:1–4 and 46:1, 7, where flakes are taken off in opposite directions to form a ridge along the length of the core. If this crested portion is struck off, the variety of crested blades and flakes illustrated on 45 result. We cannot consider the crested blades as purely waste by-product of the flaking technique since they conform, throughout the history of the site, to clear morphological types. The trihedral bars, best illustrated by 45:25 and 24, and by many segments, nos. 9–15, seem, in particular, to be intentional forms. In fact, the one blade with the silica sheen, mentioned above, is one such crested blade, no. 25. Unfortunately the sheen is not a common feature so cannot be used to define a possible function, i.e. sickle blades, for these pieces.

#### MISCELLANEOUS FLINTS

Plate 45:6 and 7 illustrate what we have designated as crested flakes in table 10. These are a variety of pointed flakes formed with the same flaking technique but, like the unusual crested blade form no. 8, they are relatively flat pieces with the crest on one side.

The pieces with pointed ends, like 45:5,6 and 16–19, or the rounded pieces like nos. 20–23, often taper in height and show signs of use, often considerable use, and many of

Table 10.—Burin, Scraper and Core Types

Layers	Burins			Scrapers						Cores						
	On Blades	On Flakes	Total	On Blades	On Cores	End	Side	Cir- cular	Total	Blades	Crested Blades	Crested Flakes	Flake	But- tered	Pebble	Total
<b>Phase E</b>																
I(1)[1]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
II(1)[2]	1	--	1	--	--	2	--	--	2	1	--	--	--	--	--	1
II(1)[3]	--	--	--	--	--	1	--	1	2	--	--	--	--	--	--	--
Total	1	--	1	--	--	3	--	1	4	1	--	--	--	--	--	1
%	100	--	--	--	--	75	--	25	--	100	--	--	--	--	--	--
<b>Phase D</b>																
III(1)[2]	7	--	7	3	2	1	8	1	15	1	9	--	1	3	--	14
III(1)[3]	--	3	3	--	2	--	--	1	3	2	1	--	--	--	4	7
III(1)[4]	1	2	3	--	--	--	2	2	4	--	2	--	--	5	--	7
III(2)[1]	2	--	2	1	4	3	6	2	16	--	7	--	4	6	23	40
III(2)[4]	--	4	4	--	2	1	--	2	5	--	3	--	2	--	--	5
III(2)[5]	2	3	5	--	3	2	8	8	20	--	23	--	20	--	20	63
III(3)[1]	2	2	4	--	1	--	8	--	9	--	4	--	1	--	--	5
Total	14	14	28	4	14	7	32	16	73	3	49	--	28	14	47	141
%	50	50	--	5	19	10	44	22	--	2	35	--	20	10	33	--
<b>Phase C</b>																
IV(1)[3]	--	--	--	--	--	--	--	--	--	--	3	1	3	--	--	7
IV(2)[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
IV(2)[4]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
V(1)[2]	19	7	26	4	1	6	11	15	37	--	14	--	4	--	--	18
V(1)[3]	--	--	--	1	1	--	--	1	3	--	1	--	--	--	--	1
V(1)[4]	10	--	10	3	6	--	5	2	16	0.5	10	--	0.5	--	--	11
V(2)[2]	5	--	5	1	3	--	8	--	12	--	2	--	1	--	--	3
Total	34	7	41	9	11	6	24	18	68	0.5	30	1	8.5	--	--	40
%	83	17	--	13	16	9	35	27	--	1	75	3	21	--	--	--
<b>Phase B</b>																
V(2)[3]	4	--	4	2	--	17	2	1	22	--	5	--	1	--	--	6
VI(1)[2]	10	1	11	--	--	--	8	6	14	--	15	3	2	--	--	20
VI(2)[2]	1	1	2	2	1	--	8	1	12	--	2	1	1	--	5	9
VII(1)[2]	2	--	2	5	3	--	--	3	11	--	6	--	--	--	--	6
VIII(1)[2]	23	12	35	7	10	3	28	27	75	1	70	--	18	--	--	89
VIII(1)[3]	25	12	37	6	4	4	8	11	33	1	65	--	3	--	--	69
VIII(1)[4]	17	17	34	10	3	6	29	11	59	1	57	8	6	--	--	72
VIII(2)[1]	7	1	8	1	2	1	1	1	6	--	22	--	1	--	--	23
VIII(2)[2]	3	--	3	--	--	--	2	--	2	--	21	--	3	--	--	24
Total	92	44	136	33	23	31	86	61	234	3	263	12	35	--	5	318
%	68	32	--	14	10	13	37	26	--	1	83	4	11	--	2	--
<b>Phase A</b>																
VIII(2)	3	2	5	--	--	3	3	3	9	1	--	--	1	--	--	2
IX(1)	7	10	17	13	1	7	7	12	40	1	36	--	6	--	--	43
IX(1)	6	9	15	4	--	--	--	1	5	--	13	--	1	--	--	14
IX(1)	3	--	3	3	--	--	--	1	4	--	6	--	--	--	--	6
IX(2)[1]	2	--	2	1	--	--	1	--	2	--	2	--	--	--	--	2
IX(2)[3]	--	--	--	1	--	--	--	1	2	0.5	--	--	0.5	--	--	1
IX(2)[4]	2	1	3	--	--	--	--	--	0.5	--	2	0.5	--	--	3	3
IX(2)[5]	--	--	--	2	--	--	1	1	4	0.5	2	--	0.5	--	--	3
IX(2)[6]	1	--	1	1	--	2	--	1	4	--	1	--	--	--	--	1
IX(2)[7]	4	--	4	1	--	--	--	1	2	--	2	--	--	--	--	2
IX(2)[8]	--	1	1	1	--	--	1	--	2	0.5	1	--	0.5	--	--	2
Total	28	23	51	27	1	12	13	21	74	4	63	2	10	--	--	79
%	55	45	--	37	1	16	18	28	--	5	80	3	13	--	--	--
<b>Grand Total</b>																
Total	169	88	257	73	49	59	155	117	453	10.5	405	15	81.5	14	53	579
%	66	34	--	16	11	13	34	26	--	2	70	3	14	3	9	--

the pieces have retouched edges. It is possible that some of these were used as chisels, nos. 5 and 6, and the remainder as picks. Though very few in number, these tools are found from the beginning to the end of the sequence.

The miscellaneous category tabulated in table 6 includes both odd shaped pieces which cannot be assigned to any specific type and forms which are distinct but which are so few in number that it is not reasonable to create additional categories. The notches shown on pl. 40 are tabulated here as are a number of heavy tools which are almost half of the miscellaneous total. Three of these are illustrated on 46:11–13. Six, like nos. 12 and 13, are modified flake cores with sharp edges that seem to have been used as choppers. Four, like no. 11, again modified flake cores or large flakes, have smoothed ends and seem to have been used as pounders or hammers. Eight others, which are either flake cores or modified large flakes, seem to have been designed for use as hand axes but all are rather rough and poorly defined tools.



## 7

## CONCLUDING REMARKS AND PLACEMENT OF EL KOWM IN ITS CONTEMPORARY NEOLITHIC SETTING

Though the material is very limited, the information, as detailed above, provides a good representative sample characteristic of the long sequence of building layers at the site. The quantity of white ware fragments, their variety and stratified context over a lengthy sequence is currently unmatched elsewhere. The interrelation of white ware and pottery vessel uses, and some insight into the origin and development in adaptation of both materials is evident.

The tables summarize the development by phases and within phases, and also highlight the unique features and major shifts in the pottery, white ware and lithic components of the sequence of el Kowm assemblages. Some specific shifts of forms and preferences as to ware, decorative style and shape can be demonstrated, but on the whole white ware and pottery vessels remained simple and apparently closely tied to their functional uses. Except in Phase B, with its enigmatic "burnt" plaster, the production procedures and techniques are all established, and specialized functions of vessels have been adapted to the most appropriate material. The stage has been reached which is beyond the initial trial and error attempts at discovering the combination of ingredients needed to manufacture white ware vessels or at finding the proper mix of clays and other ingredients needed to produce fine, hard pottery as well as simpler normal wares or at firing pottery at appropriate temperatures to produce serviceable pottery. Possibly Phase B, which is so scantily represented, will some day yield the evidence of early developments and discarded unsuccessful attempts. By Phase C, however, the technological stage indicated by the vessels and architecture, implies the remains of a well articulated, established cultural assemblage which reflects a fairly complex society that has reached a stable cultural plateau.

By far, the most numerous class of artifacts at el Kowm is the flint tool assemblage which represents the culmination of a long history of developments, traditions, experiences and skills that reach back many millennia. The sequence of flint tools is a sensitive indicator of development extending throughout the entire el Kowm Neolithic sequence. The numbers of bone tools and stone vessel fragments were quite small but illustrate simple tools and vessels which were products of technologies which also reached far back before the sequence of materials at el Kowm, contrasting sharply with the "modern" innovations of white ware and pottery vessels. Similarly, the wooden vessels which probably existed in limited quantity in this area (so well illustrated by the well preserved examples from Çatal Hüyük in Turkey, Mellaart 1967, 215–16), the woven reed and matting containers and surface covers (illustrated by the impressions left on vessels described above) and the hides, leather and fabric materials (Burnham 1965 and Helbaek 1963) which were worked by the bone implements and flint tools, represent materials and simple technologies which undoubtedly resulted from longstanding achievements of past generations.

The analyses of the botanical and zoological remains also demonstrate the cultural plateau which had been reached in the Neolithic phases represented at el Kowm. There are no surprises in what is present here. The samples clearly conform to what was found in the same cultural horizons at contemporary sites. Osteological remains of gazelle were most plentiful and equid (probably onager), large cattle, sheep and goat were found in limited quantity. Preliminary examination indicates that the bones of these potential domesticates do not show clear signs of animal husbandry. The evidence for plant cultivation is presented by van Zeist in the Appendix. Domestication of various plants and animals had occurred to some degree in different areas of the Near East for millennia before the occupation at el Kowm was established (Mellaart 1975, 63–67). The settlement at el Kowm, as was true also at contemporary sites, was heavily dependent on food production but some amount of hunting undoubtedly continued.

Since the samples are small, general conclusions are limited. However, as with the artifactual assemblage, there is a definite continuity from pre-pottery to white ware vessel and pottery layers. Cultivated plants occur already in preceramic layers and a much larger collection of samples will be needed before development and change can be noted in the way of statistical shifts in numbers of examples of a species present. Van Zeist indicates that the varieties of grains which are present argue for the advance to irrigation, which would be a major innovation even if accomplished by simple means. Major changes do not seem to have occurred after the founding of the settlement at el Kowm but the distinctive features of the settlement and its economy can apparently be traced to the earliest Neolithic occupation layers. A similar continuity was evident in the very small sample of animal bones which was found. Because of the small sample it was not possible to apply statistical criteria to distinguish safely domesticated from wild sheep and goat.

The physical character of the site may have changed drastically several times from Phases A through D. The developing village of Phase A may have taken on a different character, possibly regional in nature, in Phase B. Not until step VI were any sizeable architectural remains encountered. The hard white plaster on several large wall faces indicates that the tradition represented in step IV can be carried back and should be considered characteristic of both Phases B and C. The step VI architecture would seem to fall in the time range documented by the  $^{14}\text{C}$  samples from other sites and also within the range of the samples from the French work at El Kowm 2 Caracol.

The excavations at El Kowm 2 Caracol are considered late PPNB and yielded white ware but no pottery. No mention is made of anything corresponding to "burnt" plaster. Phase B described here represents a build up of considerable height and probably a lengthy period of occupation as well. El Kowm 2 Caracol fits into this phase, but exactly where the dividing line between Phase B and C fall are very much of a problem, as is the exact correspondence of the high tell with the remainder of the site. The El Kowm 2 Caracol exposure would indicate a preceramic, white ware phase with  $^{14}\text{C}$  dates in the first half of the 6th millennium. This coincides with our initial arrangement of phases but the newest  $^{14}\text{C}$  dates of ca. 6400–5900 B.C. for the occupation at Bouqras (Aurenche et al. 1981) seem to bring pottery production earlier than indicated here, namely into the end of the seventh millennium B.C. Further excavation at el Kowm will help to clarify this problem. The latest Bouqras report provides an additional caution in that it documents the presence of pottery scattered over the entire site but usually in very small amounts, except for the southwestern quarter (Akkermans et al. 1983, 352). It is not confined exclusively to the highest layer as

at first seemed the case. Only ample exposure in various areas of a tell can provide certainty of a pre-ceramic, white ware phase. It is not possible to emphasize the "burnt" plaster at this point until its occurrence is confirmed by being found elsewhere on the site in unquestionable context.

The presence of red paint on the hard architectural plaster from step VI is very limited evidence, but seems to provide a link with the decoration painted in spectacular fashion on similar hard white plaster at Çatal Hüyük (Mellaart 1967, 131-77) in Turkey, Abu Hureyra (Moore 1975, 60) and Bouqras (Akkermans and Roodenberg 1979, figure 8) on the Syrian Euphrates, at Umm Dabaghiyah (Kirkbride 1975, plates 6b-8) in northern Iraq and at 'Ain Ghazal in the Transjordan (Banning and Byrd 1984). Step VI architecture indicates that considerable sophistication had already developed at el Kowm and it would appear that the defense wall encountered in step V was contemporary with that exposed by the villagers in the northeastern area of the lower part of the tell. If that assumption is correct the size of the site increased dramatically during Phase B, as the fine white plaster present in the rooms encountered in the pit at the northeast edge of the site and architecture encountered at El Kowm 2 Caracol seem to indicate. Whether or not the extensive lower city existed already before Phase B or continued into Phase C is a matter for the French expedition to document. Not only did the defense needs of the community change drastically, but the high tell seems to have taken on a special character. As time went on, it increasingly dominated the remainder of the tell.

The architectural remains encountered in the trial trench were of course very limited by the narrow exposure. The best preserved architecture, that of step IV, represented the culmination of a long tradition characterized by basically rectilinear buildings which were finished on wall and floor surfaces with a rather thin, hard, fine white plaster. The buildings apparently were constructed with mud brick but the evidence is not conclusive. Brick superstructures on stone foundations are documented at El Kowm 2 Caracol.

With the destruction of Phase C, the character of the settlement changed drastically, though the artifactual remains demonstrate unquestionable continuity. The fragments of walls preserved in step III clearly represented a break with the earlier tradition, noticeable primarily in the absence of the fine white plaster surfaces. Little more can be said other than that walls were preserved but the short segments gave little indication of a plan or method of construction. The size and sophistication of the settlement clearly diminished and occupation was restricted apparently to the high tell. The El Kowm 2 Caracol excavations encountered numerous pits cut into the earlier preceramic occupation which contained pottery of this phase.

This brings one to the vexing problem of the establishment of an absolute date for the span of time covered by the Neolithic occupation at Tell el Kowm. De Contenson, Kirkbride, Mellaart, Moore, Perrot, Schaeffer, the Cauvins, Stordeur, Meréchal and others have discussed the complex relationships between the sites attributed to the Neolithic in Syria, Palestine, Anatolia and Iraq, and there is no reason to repeat what they have compiled as a sequence of synchronisms. The Tell el Kowm preliminary report (Dornemann 1969) provided information upon which comparisons could be made with a growing list of sites at which white ware had been found. The quantity and diversity of the white ware remains at el Kowm was not evident because of the limited description which could be given in that report and, consequently, there was insufficient evidence upon which to base an assessment of the length of the el Kowm sequence.

With the evidence presented here, the beginning and end of the sequence can be securely set on the basis of comparative material, but the layers containing the white ware present more of a problem despite the  $^{14}\text{C}$  dates which are available. Unfortunately the best  $^{14}\text{C}$  sample obtained from the earliest layers in step IX (2) [8] (Phase A) did not contain enough charcoal to produce a  $^{14}\text{C}$  date. Two other  $^{14}\text{C}$  samples which did produce dates are fairly close together near the end of the sequence and provide a good bracket for the end of Phase C and the beginning of Phase D.

The samples were run in 1973 at Groningen, Holland. The step IV sample came from room 1 of the building in level (2). It dated to  $7,400 \pm 45$  B.P. (calculated with the 5568 year half life for  $^{14}\text{C}$ ) or  $5450 \pm 45$  B.C. The sample from step III came from one of the lowest layers on Phase D, layer (2) [5]. This sample dated to  $7,290 \pm 45$  B.P. or  $5340 \pm 45$  B.C.

The roughly 110 years separating the two samples would allow roughly 60 years for the occupation of the building in IV (1) with its reuses and modifications, and roughly 50 years from the time of its destruction to the beginning of the occupation in Phase D. This would give us a fairly close date of  $5400 \pm 50$  B.C. for the end of Phase C, if we continue to use the 5568 year  $^{14}\text{C}$  half life as the basis of comparison. Our dates can then be arranged with the  $^{14}\text{C}$  dates from Neolithic sites which fall in the seventh–early fifth millennia B.C. and can be positioned where one would expect them, on the basis of typological comparisons between the sites. Table 11 summarizes the provisional dates assigned to el Kowm Phases A–E, as well as the steps and layers assigned to each phase.

It is beyond the scope of this monograph to discuss the problems of  $^{14}\text{C}$  dates based on the old and new half lives or on the MASCA corrected dates. However, if the latter MASCA corrected dates are applied to the materials by estimating a slight extension of that curve beyond its present limits, one would have to add between 700–800 years to the dates used here. It is possible that such corrected dates will prove to be the most accurate, but for comparative purposes the  $^{14}\text{C}$  dates calibrated with the old 5568 year half life (Braidwood 1970) are used here.

A rich variety of site and lithic designations have been used by various authors in their attempts at creating coherent sequences of cultures through the seventh to fifth millennia B.C. Subdivisions, into early, middle, late, or just early and late, or upper and lower, simple numerical period designations, or aceramic and pottery periods, are applied with more or less consistency by individual authors on the basis of their particular viewpoint. If one traces a particular time range over a wider geographical area, the variety of designations becomes even richer. It is difficult to find a consistent nomenclature by which to divide the millennia of Neolithic occupation.

It is difficult to impose a simple Early, Middle, Late Neolithic terminology on the materials, with the usual subdivisions, because of its mechanical, seemingly arbitrary and unimaginative nature; particularly when these periods are further subdivided in a tripartite scheme. The latter usually indicate definable units at the beginning and end of a period, separated by a less tangible middle period with varying degrees of continuity with what comes before or follows. The division of the Neolithic into preceramic and ceramic periods is basic but not necessarily helpful when further subdivisions are attempted. Mellaart's chart indicates a gap which currently separates the pre-pottery Neolithic A and B cultures in Palestine and Syria (this interval will be a candidate for a middle period when other sites have been found to fill the gap).

## CONCLUDING REMARKS

Table 11.—Chronology of Phases

<i>Phases</i>	<i>Steps/Levels/Loci</i>	<i>Estimated Dates BC*</i>	<i>Period Designations</i>
E	I(1)[2]–II(3)	5250–Modern	Post-Neolithic
D	III(1)–III(3)	5400–5250	Late Neolithic
	III(1)	5300–5250	
	III(2)	5350–5300	
	III(3)	5400–5360	
C	IV(1)–V(2)[2]	5675–5400	Middle Neolithic
	IV(1)	5475–5400	
	IV(2)	5550–5475	
	V(1)	5625–5550	
	V(2)[2]	5675–5625	
B	VI(2)[3]–VIII(2)[2]	6050–5675	Middle Neolithic
	VI(1)	5725–5675	
	VI(2)[1–2]	5775–5725	
	VI(2)[3]	5825–5775	
	VII(1)	5900–5825	
	VIII(1)	5975–5900	
	VIII(2)[2]	6050–5975	
A	VIII(2)[3]–IX(2)[8]	6400–6050	Early Neolithic
	VIII(2)[3]	6125–6050	
	IX(1)	6200–6125	
	IX(2)[1–2]	6250–6200	
	IX(2)[3–4]	6300–6250	
	IX(2)[5–6]	6350–6300	
	IX(2)[7–8]	6400–6350	

\*Dates are calculated in approximate years B.C. on the basis of the short, 5568 half-life for  $^{14}\text{C}$  and have not been recalibrated.

A ceramic Neolithic period is less easily subdivided because of the peculiarities at the earliest ceramic sites such as the sequence of Halaf phases on numerous sites and the early Ubaid periods. The situation is further complicated by a growing concern to define a “plaster vessel period” at the beginning of the ceramic period or beginning already at the end of the preceramic period. Moore has elaborated on an Early, Middle, Late Neolithic scheme in his discussion of the Neolithic in Palestine and broadened it recently into a four phase Neolithic scheme (Moore 1983). Schaeffer has structured a basic Early, Middle, Late Neolithic sequence for Syria on the basis of the stratigraphy at Ras Shamra. Moore discusses what he considers to be a poorly represented period between the defined Early Neolithic and Late Neolithic periods of Palestine (Moore 1973). This runs parallel to the early ceramic levels at Ramad, Labwe, Hama, Soukas, Ras Shamra, Abu Hureyra, Bouqras, el Kowm, Tell Halaf, Hacilar, Çatal Hüyük, Çan Hassan, Tellul eth Thalathat, Yarim Tepe, Umm Dabaghiyah, Nineveh, Hassuna, Matarrah, Jarmo and sites farther east. At Tell el Kowm

the two Phases B and C may indicate a point upon which future subdivisions may be arranged. At any rate, the finds from el Kowm suggest that the white ware phases, where they occur at the sites listed above, be placed within a Middle Neolithic period as well as the contemporary early pottery layers of the remaining sites. Tell el Kowm D should be attributed to an early period of the Late Neolithic.

The major periods we have outlined correspond to the developmental phases spelled out once more in the Braidwood tradition by Redman (Redman 1978). These categories are indicated in the section headings below. Certainly in Phase B, and possibly in Phase C as well, el Kowm must have been a large, well established farming village. Previously, in Phase A, el Kowm seems to have been progressing rapidly toward that stage as a small but significant early village.

#### PHASE A: EARLY NEOLITHIC (PERIOD OF EARLY VILLAGES)

Neither pottery nor plaster vessel fragments were found in Phase A and though a continuous sequence of floors was found, very little architecture was encountered. The flint inventory is the main diagnostic material of this preceramic phase. Unfortunately, the earliest stage is lacking since virgin soil was not reached. A 1979 sounding by Cauvin encountered Kebaran and Natufian remains but so far the evidence is limited so it is premature to discuss the possible continuous occupation up through Phase A (J. Cauvin, M. -C. Cauvin and D. Stordeur 1979).

The stone bowl fragments come primarily from Phase A and represent a continuation of an earlier tradition illustrated at Abu Hureyra (Moore 1975, fig. 8:6–18), Bouqras II (Akkermans et al. 1983, 351 and Plate 39), Ramad I (de Contenson 1971, 280), Labwe I, Ras Shamra VC, Jarmo (Braidwood and Howe 1960, pl. 21:12–16), and Tell es Sawwan I–III. There are few complete forms and a variety of stone was used. The major point is that small stone bowls were much more commonly in use in Phase A than later.

As in the later phases at el Kowm, the sampling of cultural materials is very limited due to the small exposure and the peculiarities of one specific location on a large site. Features found at other sites in the PPNB but not found in the el Kowm sounding are: burials, plastered skulls, figurines, and decorated objects, as well as grinding stones, a significant component of heavy tools, microlithic flint tools, leaf-shaped projectile points, and flint tools like notched projectile points and serrated blade segments which continue a Natufian tradition. Some features, like the last ones mentioned, are apparently components of the assemblages of neighboring cultural areas but not in the area which included the site of el Kowm. In Phase A the el Kowm flint assemblage showed a predominantly blade tool industry with 53% blade tools as opposed to 43% flake tools.

The discussion that follows concerns the character of the flint assemblage at el Kowm as it relates to other sites in the Middle and Late Neolithic and its continuity throughout. There is no major shift or substantial change but a continual development from the basic assemblage which apparently was established when the site was founded. The sites of Ramad, Labwe, Munhata, Jericho and Beidha, in the levels attributable to the end of the Early Neolithic, as well as other contemporary sites in close geographical proximity to them, had more in common among themselves than they had in common with el Kowm, particularly in the area of tool types which seemed to continue the Natufian traditions of their area. Particularly characteristic, and not found at el Kowm, is a microlithic component, particularly segmented blades for composite tools, bifaces and specific notched projectile points.

Similarly in the north, many of the specific tool types which continued into the Neolithic from the Natufian occupations, at sites like Mureybet, did not continue in the flint assemblages at Abu Hureyra and Bouqras farther south along the Euphrates.

The coastal area represented by Ras Shamra and the Amuq shared some features like serrated, segmented blades and leaf-shaped projectile points with the Palestinian–south Syrian area (van Liere and de Contenson 1963, figs. 8, 9 and 13; and de Contenson 1971, 280, 282, 283). Such tools were not present at el Kowm or were found as a few questionable examples. The simple tanged points, which are the only type of projectile point found at el Kowm, are found with slight variation in size and proportions at almost all contemporary sites. On the other hand the variety of scrapers and burins at el Kowm seem to be greater than elsewhere, probably indicating that the working of hides and wood was important at el Kowm throughout the Neolithic. The variety of blades can be paralleled quite successfully at other sites but the high percentage is a locally important feature, as is the range of possible usage which seems to exclude use as sickle blades. Other means of harvesting grains must have been employed; possibly the simple technique, still used today in many areas, of pulling up the plant by hand without the aid of any tool. Since domesticated varieties of wheat and barley were present, it is possible, as has been argued for other contemporary sites, that a simple form of irrigation had also been developed in this region to tap the sources of water which were so close to the surface in many places throughout the surrounding area (see van Zeist's comments on p. 67 in the Appendix).

The component of heavier tools present at other sites was poorly represented at el Kowm but almost all of the possible axes, picks, chisels and cleavers were found in Phase A. It would seem that the tools necessary for the rough work on heavy lumber were not as important here as elsewhere. Tools from the "butcher shop" rooms at Beidha show that similar tools were needed for purposes other than woodworking but also that specialized tools are primarily to be found in specific buildings or workshops (Kirkbride 1966b, 25) and that unless such rooms of buildings are encountered, few tools characteristic of such specialized industries can be expected elsewhere on a site.

#### PHASES B–C: MIDDLE NEOLITHIC (PHASE OF ESTABLISHED FARMING VILLAGES)

The break between Phases A and B was placed between VIII (2) [3] and VIII (2) [2] because white ware and pottery vessels were no longer found after VIII (2) [2], and this change was an obvious and basic difference in the sequence. Exactly how precise this break will prove to be is unanswerable at present. Clearly, Phase A must be placed in the final phase of the Pre-Pottery Neolithic B and be confined solely to that phase. Although the el Kowm sounding produced no evidence for earlier material, this has now been supplied by Cauvin's work (J. Cauvin 1980). The end of the phase is clearly a problem. Further investigation will have to be carried out to see how long the PPNB continues into the early layers of Phase B, possibly up to VII (1) [2] where the first pottery sherds were found. Since the number of sherds is so few, and may have been intrusive, it is very possible that all of Phase B should also be attributed to the end of the PPNB. Phase C is clearly a pottery Neolithic phase but Phase B, particularly step VI, may run parallel to the El Kowm 2 Caracol which is characterized as late PPNB with white ware and without pottery. The "burnt" plaster of Phase B may be accidental and must be substantiated by further excavation. It may simply represent white ware which has been "burnt" in destruction and thus bring this

phase into line with the findings from El Kowm 2 Caracol. In the discussion above there were features which indicated, however, that this solution might be too simple.

When this scanty information is placed into a broader context additional problems become evident. Red-burnished architectural plaster for floors and walls is a common feature at many PPNB sites; mention has been made of such plaster at Ramad in I, Labwe in I, Ras Shamra VC, Jericho in PPNB, Beidha in VI–IV, 'Ain Ghazal, Munhata 6–3, Bouqras in I, Abu Hureyra and at Hacilar in the aceramic (Mellaart 1975). At Beidha in particular there is a clear difference of a plaster with some lime of a sandy clay composition occurring in levels VI–IV but a very hard white lime plaster beginning in IV and continuing through I. Red-burnished plaster is found at Jericho, but purple-red, red ochre, brown, black and grey plaster surfaces are found in Beidha VI–IV on the sandy plaster (Kirkbride 1966b, 22–23). If the <sup>14</sup>C dates for Beidha IV–II did not range from about 7000–6600 B.C., Beidha IV would seem to be contemporary with layers VIII (2) [2] through VIII (1) [2] at el Kowm. It would appear that Beidha IV is contemporary instead, primarily, with the earlier layers in Phase A at el Kowm and other explanations must be sought for the architectural parallels in the way of local variations.

In light of the evidence from el Kowm, as well as the evidence from Abu Hureyra, Bouqras, and Tell Soukas, it would seem that pottery and white ware vessels were in use at the same time for a long period of time. This fascinating phase of the cultural history must have lasted for almost a millennium. El Kowm Phase B unfortunately provides limited evidence for the formative phase in both pottery and white ware production. The sounding at el Kowm provides no evidence which gives an indication of which of these materials has been put to practical use first (le Miere 1982).

The total number of white ware forms in el Kowm Phase C provides a greater variety than is yet published from any other site. The flat pieces and the low bowls-platters are only illustrated from el Kowm at this point (with the possible exception of surface finds from locality 64 of the Japanese survey near Palmyra [Hanihara and Azakawa 1979, 212]) and are confined to Phase C. Only the gypsum basket liners at Umm Dabaghiyah resemble some of the el Kowm low bowls with mat impressions. As is indicated on the map, plate 1, white ware fragments were also found at Tabbat el Hammam, Hama, Abu Hureyra, Bouqras, Baghouz, 'Ain Ghazal, Çayönü, and Çatal Hüyük.

The forms which did not continue beyond el Kowm Phase C were those forms which are well attested at Labwe I (Copeland and Wescombe 1966, fig. 32, pl. 7c), Ramad II (de Contenson 1971, 282) and level VB at Ras Shamra (de Contenson 1962, 506, fig. 30) alongside a variety of "pot" or heavier bowl forms, and were associated with <sup>14</sup>C dates which provide a range at the beginning of the sixth millennium B.C. Parallels to the rough, low bowl category are found at Labwe and it would seem that they are identical with forms designated as ring bases (inverting the profile) at Neba'a-Faour and Ramad II (Mellaart 1975, fig. 28).

The evidence demonstrates, as shown below, that el Kowm Phases B–C must fall between a date of ca. 5400 B.C. for the end of Phase C and a date around 6050 B.C. which would be parallel with the earliest dates associated with the pottery from Ras Shamra, Ramad and Labwe. The newest series of <sup>14</sup>C dates from Bouqras (Aurenche et al. 1981), which begins with 6400 B.C. in the pre-pottery layers, may indicate that the el Kowm date may in the future have to be pushed back somewhat. The continuity between the tool kits of Phases A and B, between the Early and Middle Neolithic, is pronounced. Given the strong con-

tinuity of the flint tradition at el Kowm between Phases A through D and the limited amount of published flint contemporary with Phases B and C, little more can be added to what has been said above in comparing the el Kowm flint with Ramad and sites farther west or the Euphrates sites and those farther north and northwest. Phases B–C contain the best architectural remains in the sounding at el Kowm. We have noted above the other sites where such thin, hard, white lime plaster wall and floor surfaces occurred. Continuity is obvious when the remains of step VI (2) are compared with those of step IV, though the latter dates later than most of the other contemporary remains. The step VI (2) remains, though early in this architectural tradition at el Kowm, are closer to the time when similar building methods were employed at Bouqras, Umm Dabaghiyah, 'Ain Ghazal and Çatal Hüyük and the red paint on the architectural plaster in el Kowm step VI (2) seems to relate to the distinctive painted decoration which is found at the three sites mentioned. Hard plaster was also found on buildings of levels III–I at Beidha.

PHASE D: BEGINNING OF THE LATE NEOLITHIC (BEGINNING OF THE PERIOD OF ADVANCED VILLAGE COMMUNITIES)

In Phase D the size and probably the significance of el Kowm declined but this short-lived village settlement clearly showed changes which kept pace with the developments defining advanced village communities in Syria and northern Mesopotamia.

The most dramatic differences between Phases C and D were in the percentages of white ware fragments. Less dramatic but still quite definite were the statistical shifts which were apparent in the inventory of flint tools. These changes clearly stay within a developing but continuing, long-standing local tradition. The greatest continuity is demonstrated in the pottery tradition but there are limitations in assessing this because of the very limited sample in Phases B and C.

The greatest continuity in the white ware category is demonstrated by the fragments of vessels designated as "pots." The specialized and distinctive forms most characteristic of the early phases were no longer produced, or very rarely produced. The forms which continued to be produced were very similar to pottery and for a time, apparently, white ware vied with pottery as an alternative material for specific functional applications. It is these "pot" forms which continued to be produced at places like Tell Soukas and level VA at Ras Shamra, with the modifications noted above.

Despite the <sup>14</sup>C determinations which help provide a date for the end of Phase C at el Kowm, it is difficult to use the evidence to gain an understanding of the length of time white ware vessels were used in Syria and Palestine and to determine the importance of such vessels at a specific site. Plaster vessels seem to have played a more important role in the occupation at el Kowm than at any other site yet excavated. In Phase D white ware continued to be manufactured, but when the numbers of white ware and pottery fragments were combined the former constituted only 10 percent of the total while in Phase C they constituted 72 percent of the total. The number of white ware fragments had dropped to less than one-quarter from Phase C to Phase D. In both phases white ware fragments with red wash on their surfaces constituted two percent of the entire sample, but this was 2 out of 10 in Phase D or twenty percent of the number of white ware fragments as opposed to 2 out of 72 or three percent in Phase C. The use of red wash on plaster is also noted at Byblos in the Early Neolithic layers, at Ramad in II and at Tell Soukas. Some pottery vessels are decorated with plaster coatings in levels N<sup>7</sup> and N<sup>3-1</sup> at Tell Soukas, at Ras Shamra in

level VB, in the basal level at Byblos, at Ramad in III, at Hama in level M<sup>4</sup> and at the Wadi Shu'aib in the Transjordan.<sup>3</sup> Some of the incised patterns on pottery at these sites were not intended as decoration but as "keying" for plaster coatings (Riis and Thrane 1974, plate 2E). Plaster on pottery occurs only twice at el Kowm and both times in Phase D. The 5410 ± 70 B.C. date for the layer 43 in the middle phase of the Early Neolithic at Byblos fits well with the <sup>14</sup>C dates for the beginning of el Kowm Phase D.

White ware vessel forms are present at Soukas in all 11 layers of Period N. Only the el Kowm category of "pots" seem to be present here and then only forms 1–5 (with very few falling in the categories 2–4). The flat pieces, "basins," low bowls-platters and rough bowls (which are represented only by isolated examples in el Kowm Phase D and are found primarily in el Kowm Phase C) do not seem to be present. By Soukas N<sup>3-1</sup> the number of white ware vessels has fallen off sharply but only in N<sup>1</sup> does it fall below the 1 to 10 ratio of white ware to pottery which is present in el Kowm C (Riis and Thrane 1974, fig. 222).

Other artifactual evidence from Soukas puts levels N<sup>3-1</sup> parallel to Ras Shamra IV which is dated by a sample with a <sup>14</sup>C date of 4184 ± 81 B.C. Such a late date demonstrates a long period of use for white ware vessels at Soukas and contrasts sharply with the <sup>14</sup>C dates from layers at other sites where white ware is present. These <sup>14</sup>C determinations come from Ras Shamra VB, Ramad II, Labwe I and Bouqras III and date: 5736 ± 112; 5970 ± 50 and 5950 ± 50; 6040 ± 140, 5910 ± 140 and 5900 ± 140; and 5990 ± 60 respectively. The <sup>14</sup>C dates then, taken together, indicate that plaster vessels were produced for a period of about 1900 years during the Neolithic.

The most significant shift in the el Kowm flint assemblage was the change to a predominantly flake tool industry in Phase D with 69 percent flake to 26 percent blade tools. In Phases B and C these percentages were roughly even. The greatest statistical shifts in the flint tool categories occurred between Phases C and D with the increases in the number of flakes from 39, 44 and 35 percent to 59 percent (Phases A, B and C to D respectively) and cores from 4, 4.5 and 5 percent to 11 percent; blade points decreased from 10, 9 and 8 percent to 3 percent and blades decreased from 40, 37 and 38 percent to 19 percent. The change in the percentages for cores is deceptive with the inclusion of crested blades in this category. The increase up to Phase D is steady, 4, 4.5, 5 to 6 percent, if the 5 percent represented by the crested blades is removed. The crested blades formed a new category of cores in Phase D which were not statistically relevant earlier.

The numbers of other tools are quite small so the shifts in the categories of burins and tanged projectile points do not seem significant. A statistical shift in number of scrapers occurs between Phases B and C with an increase from 4 and 3 percent to 8 and 6 percent (A and B to C and D). While the shift from Phase C to D is accentuated by the percentages noted for most of the different categories of flint tools, there is demonstrable continuity from the Middle Neolithic to the Late Neolithic at el Kowm. Though we have noted considerable change between Kowm C and D, the latter phase is still closer to C than to the material from Soukas N, Ras Shamra VA or Ramad III. In contrast, it is much closer to the earlier Ras Shamra VB materials than it is to the VA materials.

El Kowm Phase D clearly must be of short duration, no more than a century or the maximum of a century and one half. It does not seem to have overlapped Ras Shamra VA

<sup>3</sup> See Riis and Thrane 1974, 52 and 53, particularly footnote 239 which documents a reexamination of the materials from Hama M, indicating that the "white ware" found at Byblos was plaster-coated pottery. Additional analyses of Hama samples are found in Thuesen and Gwozdz 1982.

very long and most probably is not as late as the  $^{14}\text{C}$  date of  $5234 \pm 84$  B.C. from that layer. It would also seem that the overlap between el Kowm Phase D and Soukas N was quite short and the latter sequence continued for a long time after the end of el Kowm Phase D. Similar conclusions can be drawn when comparisons are made between the pottery and flint assemblages of el Kowm Phase D and those of the coastal sites mentioned; Byblos in the Early Neolithic, Soukas in Period N, Tabbat el Hammam's basal layer, Ras Shamra in VA and to a lesser degree at inland Ramad in level III. Unfortunately, the amount of flint published, aside from Byblos, is so limited that it is difficult at this point to see more than basic similarities and dissimilarities, and it is very difficult to trace these in any detail from phase to phase. The flint remains from Soukas (Riis and Thrane 1974) are quite limited and many of the characteristic pieces are fragments. The parallels which could be shown to exist as to scrapers, simple blades or burins, are not very safe because few pieces are involved at Soukas and these represent basic types with a long history at el Kowm. The most numerous of the tools at Soukas are the projectile points but only a few have simple tangs which in any way resemble those at el Kowm. Instead, most of the projectile points can be attributed to the Amuq types which Cauvin has described in great numbers from Byblos. Such points were not present at el Kowm. Also missing at el Kowm are the variety of axes and adzes, the basic woodworking tools which formed the major component of the Byblos Early Neolithic flint tool assemblages (Cauvin 1968). Sickle blades or blade segments with denticulated edges are common elsewhere but not at el Kowm.

The tool kit of Ras Shamra V is said to be similar from level to level and it is difficult to see if the tanged points published for VC indeed continue through VA (de Contenson 1962). Almost all the illustrated flints are points or blades. Only a few flakes, burins and scrapers are published so it is premature to rely heavily on this evidence. A considerable number of denticulated blade segments are present and most of the points are tanged in the manner common at el Kowm. Only an isolated example of Cauvin's "Amuq type 2" projectile point is published from Ras Shamra VB and it provides one of the few good points of contact with the tool kit discussed above as characteristic of Byblos Early Neolithic and Soukas N. The contact with Ramad of course is closer but again the illustrations are limited. The first two levels at Ramad seem to have greater contact with the Ras Shamra V materials in one component of the industry. The other component, which is related to the Natufian, is of equal importance in Ramad I but continues only minimally into Ramad II (de Contenson 1971). The tool kit of Ramad III is said to be a poor shadow of II. The best illustrations of Ramad flint come from the surface collection (van Liere and de Contenson 1963, pls. 7-12) and give an indication of what is present but do not allow for precision in making comparisons. Clearly parallels with el Kowm exist as far as tanged projectile points, a number of burin types, a good selection of end and disc scrapers, "fabricators," and crested blades worked into picks and chisels. Unlike el Kowm, denticulated blade segments are common and there seems to be a component of axes and chisels which show closer relationships with coastal Byblos than with el Kowm.

The same problems are evident in the pottery found in the levels with the white ware fragments and flint tools just cited. Again, the documentation is insufficient to draw more certain conclusions. The plain unburnished wares or unslipped, burnished wares have quite simple forms and are apparently similar over a broad area. The finer, highly burnished and decorated wares are for the most part quite distinct from what is present at el Kowm. The plain dark-faced burnished wares of the Amuq (Braidwood and Braidwood 1960, 49-

52; 73–77; pls. 11:10–15; 12; 13:1–8; 15:1–15; 16:1–11, etc.) and elsewhere have only one good parallel at el Kowm in Phase D (pl. 24:40) but it is on normal thickness ware while the vessels of dark-faced burnished ware at Soukas (Riis and Thrane 1974, pl. I), Ras Shamra (de Contenson 1962, figs. 27 and 28, and Kuschke 1962, pl. 10) and Ramad (de Contenson 1971, 284) are thinner walled and burnished to a greater luster (usually in a darker range of colors) than the el Kowm sherd. No incised or impressed decoration occurs at el Kowm but such decorated sherds form a major component in the pottery of Ras Shamra VA, are rare in Soukas N, and are very common in Ramad III. Such incised, impressed and pattern burnished decoration can be compared in a general way with materials in Palestine at Shaar Hagolan, Munhata 2B2 (Perrot 1968, fig. 845), Wadi Rabah, Jericho Pottery Neolithic B and related sites (Mellaart 1975, 238–43 and Moore 1975). The el Kowm pottery on the other hand is similar to Jericho Pottery Neolithic A and a few isolated sherds from other Palestinian sites. The primary orientation of the el Kowm pottery is rather to the north and northeast. Presently Bouqras and Umm Dabaghiyah provide the closest parallels but more will be said about this below.

The amount of pottery found in Phase D at el Kowm showed a marked increase, by almost six times, over what was present in Phase C. Only one rim and four body sherds were found in step IV, and only one body sherd was found in step VII. All of the Phase C sherds were confined to four of the simplest types, of the ten types which were distinguished. Three of these types, however, were represented only by a total of four sherds. The finer hard ware sherds were represented by a 1:8 ratio in comparison to the plain and normal slipped wares in Phase C, while in Phase D the ratio was just slightly lower at 1:7.6.

It is possible that there was some development in the decoration of pottery from Phase C to Phase D but the Phase D sample is so small that it is premature to draw conclusions. Only three decorated sherds (not of course counting plain washed or burnished sherds) were found in Phase C, two from a large jar and the other from a small hard ware bowl. The jar sherds have a band at the neck and bands curving down across the body of the vessel. A number of sherds with similar painted bands were found throughout Phase D. The decoration on the bowl sherd from step V (1) [3], which was done with broad painted strokes, is unique. It is difficult to reconstruct the complete pattern, however.

There is very little variety in the decoration of sherds from Phase D. Triangles in reserve, usually hatched, parallel bands and parallel zigzag lines are most common. There are a few unusual variations like 26:16, 35 and 42; the “sunburst” pattern on 30:1 and 8 and a speckled pattern on the inside of a bowl, 30:10; parallel bands on a large jar which are joined by a vertical band, 24:4; and the unusual knobbed decoration with painted bands at the neck and between the knobs (a similar knobbed sherd is illustrated as coming from Ia-c at Hassuna, Lloyd and Safar 1945, fig. 6:15).

A majority of the distinctive patterns from level III at Bouqras, or elements of those patterns, have parallels in el Kowm Phase D (Akkermans and Roodenberg 1979, fig. 11). The decoration on the pottery at both sites is clearly related to the decoration on vessels from Umm Dabaghiyah (Kirkbride 1972, pl. 10 and 1973a, pl. 3). The simple pottery forms at these three sites are also closely related. Though there are clearly differences between the sites, like molded decoration on some of the vessels at Umm Dabaghiyah (Kirkbride 1972, 6c and 11; Kirkbride 1973a, pl. 3), and the small amount of pottery with incised decoration which first begins in level 4 at that site, the three seem clearly to belong to a geographically defined cultural tradition. The Neolithic materials from Çatal Hüyük and Hacilar in Turkey share a number of significant features with el Kowm Phases C–D, Bouqras

III and Umm Dabaghiyah, but the total artifactual assemblage is distinctive of the central Anatolian area.

The limited excavations at el Kowm have not yet yielded some of the other characteristic materials but may be expected to do so when excavations are continued. At both Bouqras III and Umm Dabaghiyah, as at el Kowm Phase C–D, the architecture is rectilinear and fine plaster coatings are found on the walls. Unlike el Kowm, painted decoration has been found on plastered walls at the other sites. The most elaborate examples of painted decoration on fine, hard plastered walls are the murals from Çatal Hüyük. Only at Bouqras III are plaster vessels found, but plastered bins, built into the ground, and gypsum plaster jar lids, spindle-whorls, grinders and basket liners (gypsum plaster with woven matting basket impressions on the bottom) were found at Umm Dabaghiyah (Kirkbride 1972, 8). White ware vessel fragments were said to have been found at Çayönü and at Çatal Hüyük in level VIB (Mellaart 1975, 62–63). Seal impressions were found on white ware fragments at Bouqras (Akkermans and Roodenberg 1979, fig. 13:11, 12), as they have been now on quite a number of pieces at el Kowm (pl. 21:12 and Maréchal 1982, figs. 3 and 4). Fragments of seals used for making similar impressions were found at Bouqras, but the best examples are from Çatal Hüyük in levels VIB through II (Mellaart 1967, pl. 121). ‘Ain Ghazal, Bouqras, Ramad, Ras Shamra, Umm Dabaghiyah and other sites have also produced human and animal figurines in clay (Rollefson 1983, 1984, fig. 4 and 1985, 48–50; Akkermans and Roodenberg 1979, figs. 12, 13; de Contenson 1971, 281–83; Kirkbride 1972, pls. 7–9 and Schaeffer 1962, 154, fig. 1) and the remains of human burials (de Contenson 1971, 281, Kirkbride 1966b, 23–24 and Rollefson 1985, 54–56). None of these were found in the el Kowm sounding.

Only a small amount of flint has been published from Bouqras and Umm Dabaghiyah so it is difficult at present to gauge the extent of the similarities or differences between the sites. The short, tanged, leaf-shaped projectile points of Çatal Hüyük (Bailor 1962, figs. 2:2 [level VIII], 3:6 [level VI] and 7:6, 14 [level III]), though not found at el Kowm, are found at the other sites. The burins and scrapers at both Bouqras and Umm Dabaghiyah resemble el Kowm examples, and the latter are basic forms with wide ranging similarities that can be found as far away as Çatal Hüyük. The same is true of some of the larger and medium-sized simple blades with minimal shaping or retouch. There is limited contact between the flint industry at Umm Dabaghiyah and the Amuq and other Syrian coastal sites.

Umm Dabaghiyah must be set in the context of the other early pottery sites of the Mesopotamian area, specifically Jarmo, basal Matarra, Hassuna Ia-c and the early layers at Tell es Sawwan. It would be beyond the scope of this report to try to add to the discussions of Mellaart and others by going beyond the sites listed so far, other than to mention a few features at these sites which relate to the el Kowm finds. The simple parallel line decoration on the Jarmo (Braidwood and Howe 1960, pl. 15:11–17) and Hassuna (Lloyd and Safar 1945, fig. 8) vessels are in keeping with the simple decoration at el Kowm. Plaster basins which were built into the ground are found at Tell es Sawwan. The knobbed sherd from el Kowm Phase D, 27:42, has an exact parallel in Hassuna Ia-c as indicated on p. 62 above. A fragment of a “husking tray” was found at Ras Shamra in level VA (de Contenson 1962, 502, fig. 25), providing a link with level II at Hassuna where such vessel forms begin as a very distinctive feature. As mentioned above, Ras Shamra VA overlapped el Kowm Phase D somewhat but extended considerably later, and level II at Hassuna would seem to date just after the end of el Kowm Phase D.

Tell el Kowm in Phase D must, in light of the above discussion, be placed in a cultural

sphere which has its main points of contact south through the Transjordan (Wadi Shu'aib [de Contenson 1960] and very recently Amman [Rollefson 1982]) at least as far as the Jordan Valley at Jericho, but even stronger points of contact to the northwest, north and northeast. The area of north central Palestine, south central Syria and the Levantine coast represents another cultural area with evidence of contacts in many specific features, which is chronologically parallel. The el Kowm Phase D materials extend only briefly into this early Late Neolithic phase and show signs of increasing change. This change is by no means as great as that which is evident at the other sites we mentioned, which continue on and provide a better diagnostic cluster of features which can be considered most characteristic of this phase. That development then culminates at sites like the Amuq B sites, Ras Shamra VA and the Early Neolithic at Byblos after which the earlier flint traditions, among other diagnostic features, suddenly end and are replaced by a new complex of features on the Ras Shamra IV, Amuq C–D horizon.

In conclusion, there seems to be little reason to see any radical changes occurring through the long sequence of Neolithic occupations at el Kowm from the original subsistence patterns established in the seventh millennium B.C. Neither the artifactual record nor the osteological and botanical remains excavated so far provide evidence for such change. The components of this culture were already established when the settlement was founded and were not affected by the earlier Natufian tradition with strong roots in areas to the west.

Surveys and recent excavations in the vicinity of el Kowm have documented a heavy concentration of early sites which had developed in locations where strong natural springs existed (the most recent survey is presented in Besançon, et al. 1982 and J. Cauvin 1982b). These sites were exploited in antiquity, namely, for their convenient and abundant supply of underground water. Neolithic white ware fragments and pottery have been found at a number of tells in the vicinity and a strong component of Upper Paleolithic flint has been found at many sites. It is possible that the sheltered desert environment provided a semi-isolation from influences from the west. This seems to be a pattern which continues throughout the sequence of assemblages at el Kowm and the closest points of contact are with sites to the northeast. Clearly, much needs to be added to what has been presented here to provide greater insight into the many fascinating developments which occurred through the history of the settlement at Tell el Kowm.

## APPENDIX: PLANT REMAINS FROM NEOLITHIC EL KOWM, CENTRAL SYRIA

*Willem van Zeist*

### INTRODUCTION

During the 1967 trial excavation of el Kowm (Dornemann 1969 and this volume) a small number of soil samples were taken for botanical examination. From these samples, charred plant remains were recovered in the field by a simple manual water separation method. The numbers of seeds, fruits and other plant remains found in these samples are shown in table 12. As for the sample designations (step IX (2) [6], etc.) the reader is referred to Dornemann's report. The periodization and dating of the samples in table 12 are based on the dates for the samples from Phases C (step IV (2)) and D (step III (2)). They yielded dates of  $5450 \pm 45$  B.C. (GrN-6778) and  $5340 \pm 45$  B.C. (GrN-6777), respectively, using the 5568 year half-life. The samples cover two rather short periods with a considerable time gap in between: Phase A (about 6300–6100 B.C. for samples 1 and 2) and phases C–D (about 5550–5300 B.C. for samples 3–8).

It is self-evident that not too much importance should be attached to a few samples from a brief sounding. The results of the botanical examination are not particularly impressive and they do not give occasion to exhaustive discussions. A separate publication of the plant remains was considered to be justified for two reasons. Because of the scarcity of archaeobotanical data for interior Syria, even minor results are worthwhile. Moreover, the indications for crop plant growing in Neolithic el Kowm are of more than usual interest.

The samples examined for seeds and fruits were from the occupational fill. It is not likely that the vegetable remains in these samples originated from one specific type of domestic activity, but kitchen refuse, crop-processing residues and seeds, which as a result of other human activities, had arrived in the site may be found in one and the same sample. In this report some remarks will be made on the possible economic and ecological significance of the plant species established for el Kowm.

### PLANT CULTIVATION

The palaeobotanical evidence clearly points to plant cultivation by the inhabitants of the site. Of the cereals, two wheat and three barley species could be demonstrated for el Kowm. The wheat species are hulled emmer wheat (*Triticum dicoccum*) and a free-threshing species, indicated here as hard wheat/bread wheat (*Triticum durum/aestivum*). The charred plant remains do not allow us to distinguish between tetraploid hard wheat and hexaploid bread wheat. From an ecological point of view hard wheat is the more likely candidate. Until recently *Triticum durum*, which is well adapted to climatic conditions in the Mediterranean basin, was the most widely grown wheat in the Near East. Einkorn wheat, *Triticum monococcum*, is not represented among the el Kowm cereal remains.



The barley species include hulled two-row (*Hordeum distichum*) and six-row barley (*Hordeum vulgare*) and the free-threshing variety *Hordeum vulgare* var. *nudum* (naked barley). Grain as well as rachis internodes (the central axis of the ear consists of internodes) point to the presence of two-row and six-row barley at el Kowm, but because of poor preservation it could not always be determined which hulled barley species are represented in each sample. For that reason, both species are taken together in table 12. Naked barley can be distinguished from the hulled varieties by the shape of the grains.

Leguminous crop plants are more scarcely represented at el Kowm. A few lentil seeds were found in samples 3 and 5. The evidence for the cultivation of pea (*Pisum*) is questionable. A number of leguminous seeds have tentatively been attributed to *Pisum* on the basis of the size (2.4–2.8 mm). The seeds are admittedly rather small for pea and one should consider the possibility that large-seeded *Vicia* (vetch) is concerned here. Unfortunately, the hilum which is a distinguishing feature had not been preserved.

The role of crop plants in the diet of the inhabitants of the site cannot be ascertained from the charred plant remains. It is likely that plant cultivation was only of secondary importance. However, crop plant growing at el Kowm seems to imply one interesting conclusion, viz. that some kind of irrigation agriculture must have been practised. The present mean annual precipitation of ca. 130 mm is too low to rely on for dry-farming and there are no indications that 8000 to 9000 years ago rainfall was appreciably higher. It is true that nowadays some barley is grown under dry-farming conditions, in depressions where rainwater accumulates, but only in years with exceptionally high precipitation are satisfactory yields obtained. More often the crop is not harvested and the fields are left to the animals (Besançon et al. 1982). The spring at which el Kowm is situated could have provided water for irrigating the fields. At present only a little, badly smelling, sulphurous water trickles out of the soil, but in prehistoric times the spring may have been more powerful. Nevertheless, the acreage of the cultivable land may have been very limited.

Exploitation of surface water is also assumed for Bouqras, on the Euphrates, c. 140 km. to the east of el Kowm. Samples 1 and 2, from pre-pottery levels, should correspond with Bouqras; samples 3–8 are from levels which are definitely later than the habitation at Bouqras. The crop plant species established for both sites in inland Syria are largely identical.

As for the possible origin of the crop plant assortment at el Kowm, the following should be taken into consideration. For the early Neolithic sites of Çayönü and Jarmo, in eastern Turkey and northern Iraq, no free-threshing barley (*Hordeum vulgare* var. *nudum*) and wheat (*Triticum durum/aestivum*) are reported (cf. van Zeist 1976, table 1). On the other hand, these species are recorded for Neolithic habitation levels in the Damascus area dating from before the pre-pottery levels at el Kowm (van Zeist & Bakker-Heeres 1979). This could indicate that plant cultivation expanded from the Damascus basin over the arid interior of Syria.

#### WILD PLANT SPECIES

One may assume that fig (*Ficus*), the pips of which were found in considerable numbers in a few samples, was consumed by the inhabitants of the site. It is likely that wild fig occurred naturally in the oasis of el Kowm. No nutshell remains of pistachio were met with in the samples examined, suggesting that pistachio nuts were at most a rare commodity. *Pistacia atlantica* stands may have been too far away from the site. At present the nearest occurrence of this tree is on the Jebel el Haour, about 40 km to the southwest of el Kowm.

To which extent other wild plant species demonstrated for el Kowm served as food for its inhabitants must remain undecided. It is true that Helbaek (1969) has advocated the

opinion that the small seeds of various leguminous seeds played an important part in the diet of the early farmer-collectors at Ali Kosh. One should not exclude the possibility that at el Kowm the seeds of wild legumes and other wild plant species were collected for human consumption. On the other hand, the presence of these seeds in the occupational debris can also be explained in other ways. These seeds may have formed part of crop-cleaning residues, or they may have arrived in the settlement with the firewood, e.g. *Astragalus*.

The wild plant taxa listed in table 12 are usually found in steppe vegetations, but many of them occur also as weeds in the fields. In this connection it should be realized that most seeds have been identified to the genus level only, implying that with these seed types various species with diverse ecological requirements come into consideration. Even if a species name is given, it cannot always be ruled out that more species are included. However, one may safely assume that at the time steppe or desert-steppe vegetation constituted the natural plant cover in the el Kowm area. The seeds of *Aizoon hispanicum* point to saline or gypseous soils. It is not clear why *Aizoon* is represented only in both pre-pottery Neolithic samples. Somewhat puzzling are the considerable numbers of seeds of *Arnebia decumbens* and to a less degree of *Lithospermum arvense*, both of the boraginaceous family. It is unlikely that these species played such a predominant part in the ancient vegetation. These species must seriously be over-represented in the seed record. This may in part be due to the fact that apparently because of the silica skeleton the wall of the non-carbonized seeds was also preserved. As a matter of fact, on burning the achenes of many Boraginaceae do not turn black, but they acquire a whitish to yellow-grey color. For boraginaceous seeds in archaeological sites it is often difficult to determine whether or not they have been in contact with fire and whether they are of the same age as the deposit in which they were found or whether they may be due to a later intrusion. (The author has profited much from a discussion on this subject with Dr. Gordon C. Hillman, London.)

Although one may assume that *Artemisia herba-alba* was one of the dominant species in the steppe vegetation, *Artemisia* is not represented in the charred seed record of el Kowm and other archaeological sites in arid areas. It is most likely that in carbonization the tiny, fragile seeds of *Artemisia* turn to unrecognizable ash remains. Admittedly the absence of various other steppe plant genera in the el Kowm charred vegetable remains cannot be explained in this way.

## SERIAL LISTS

## POTTERY SHERDS

<i>No.</i>	<i>Locus</i>	<i>Drawing</i>	<i>Photograph</i>	<i>No.</i>	<i>Locus</i>	<i>Drawing</i>	<i>Photograph</i>
1	VI (1)[1]	29:23	--	40	III (2)[1]	25:30	26:25
2	I (1)[2]	--	--	41	III (2)[1]	25:21	26:12
3	I (1)[2]	29:14	30:19	42	III (2)[1]	25:25	26:19
4	I (1)[2]	29:13	30:20	43	III (2)[1]	25:20	26:11
5	III (1)[1]	--	--	44	III (2)[1]	28:16	27:3
6	III (1)	28:12	26:41	45	III (2)[1]	--	--
7	III (1)	28:11	26:40	46	III (2)[1]	25:27	26:21
8	III (1)	--	--	47	III (2)[1]	29:4	30:7
9	VI (1)[1]	29:22	--	48	III (2)[1]	25:34	26:24
10	III (1)	28:13	26:42	49	III (2)[1]	--	--
11	III (1)	--	--	50	III (2)[1]	--	--
12	III (1)[2]	28:10	26:39	51	III (2)[1]	29:5	30:8
13	I Surface	--	--	52	III (2)[1]	--	--
14	II (1)[2]	29:12	--	53	III (2)[1]	--	--
15	III (1)[1]	29:10	30:12	54	III (2)[1]	29:6	30:9
16	III (1)[1]	22:36	24:10	55	III (2)[1]	25:23	26:17
17	III (1)[2]	28:9	26:38	56	III (2)[1]	22:32	24:7
18	III (1)[2]	22:34	24:9	57	III (2)[1]	29:2	30:5
19	III (1)[4]	28:3	27:20	58	III (1)[4]	--	--
20	III (1)[3]	28:5	26:34	59	III (1)[4]	--	--
21	III (2)[1]	--	--	60	III (1)[4]	--	--
22	III (1)[3]	29:9	--	61	III (1)[4]	25:37	26:32
23	III (1)[3]	28:4	26:33	62	III (1)[4]	29:8	30:11
24	III (1)[3]	28:7	26:36	63	III (1)[4]	38:17	27:4
25	III (1)[3]	28:6	26:35	64	III (1)[5]	28:2	27:19
26	III (1)[3]	--	--	65	III (1)[5]	28:1	27:18
27	III (1)[3]	28:8	--	66	III (1)[5]	25:36	26:31
28	III (1)[3]	--	--	67	III (3)[1]	23:20	24:43
29	III (2)[1]	--	--	68	III (1)[5]	25:35	26:30
30	III (2)[1]	--	--	69	III (1)[5]	29:7	--
31	III (2)[1]	--	--	70	III (1)[5]	--	24:18
32	III (2)[1]	25:19	26:15	71	III (1)[5]	25:33	26:28
33	III (2)[1]	22:33	24:8	72	III (1)[5]	25:32	26:27
34	III (1)[2]	22:34	24:9	73	III (1)[5]	25:31	26:26
35	III (2)[1]	--	--	74	III (1)[5]	25:22	26:29
36	III (2)[1]	25:24	26:18	75	III (1)[5]	--	--
37	III (2)[1]	25:26	26:16	76	III (2)[1]	25:29	26:20
38	III (2)[1]	--	--	77	III (2)[5]	28:15	27:2
39	III (2)[1]	29:3	30:6	78	III (2)[5]	28:38	27:42

No.	Locus	Drawing	Photograph	No.	Locus	Drawing	Photograph
79	III (2)[5]	28:33	27:41	127	III (1)[2]	--	26:37
80	III (2)[5]	23:35	24:47	128	III (2)[4]	25:13	26:8
81	III (2)[5]	25:10	26:5	129	III (2)[4]	--	--
82	III (2)[5]	23:28	24:41	130	III (2)[4]	25:18	26:14
83	III (2)[5]	28:32	27:40	131	III (2)[5]	28:34	27:37
84	III (2)[5]	28:37	27:39	132	III (3)[1]	28:25	27:29
85	III (2)[5]	25:8	26:4	133	III (3)[1]	23:15	24:34
86	III (2)[5]	--	--	134	III (3)[1]	23:19	24:38
87	III (2)[5]	--	30:1	135	III (3)[1]	28:23	27:25
88	III (2)[5]	--	--	136	III (1)[1]	29:11	30:13
89	III (2)[5]	25:1	24:48	137	III (3)[1]	28:30	27:32
90	III (2)[5]	--	--	138	III (3)[1]	23:16	24:35
91	III (2)[5]	22:31	24:6	139	III (3)[1]	23:21	24:39
92	III (2)[5]	28:27	27:35	140	III (3)[1]	23:18	24:37
93	III (2)[5]	25:6	26:2	141	III (3)[1]	28:26	27:30
94	III (2)[5]	25:9	--	142	III (3)[1]	--	--
95	III (2)[5]	23:33	24:45	143	III (3)[1]	28:24	27:26
96	III (2)[5]	25:3	24:49	144	III (3)[1]	23:24	27:12
97	III (2)[5]	23:34	24:46	145	III (3)[1]	23:23	27:9
98	III (2)[5]	23:27	24:40	146	III (3)[1]	23:22	27:11
99	III (2)[5]	28:28	27:36	147	III (3)[1]	23:17	24:36
100	III (2)[5]	23:30	24:44	148	III (3)[1]	23:13	24:32
101	III (2)[5]	25:12	27:17	149	III (3)[1]	28:29	27:31
102	III (2)[5]	25:7	26:3	150	III (3)[1]	--	--
103	III (2)[5]	25:5	27:14	151	III (3)[1]	23:25	27:8
104	III (2)[5]	23:32	27:16	152	III (3)[1]	28:31	27:34
105	III (2)[5]	28:35	27:38	153	III (3)[1]	--	--
106	III (2)[5]	22:28	24:3	154	III (3)[1]	23:14	24:33
107	III (2)[5]	28:36	27:33	155	III (3)[1]	23:26	27:10
108	III (2)[5]	--	--	156	V (1)[3]	--	--
109	III (2)[5]	28:14	27:1	157	V (1)[3]	23:4	24:25
110	III (2)[5]	22:30	24:5	158	V (1)[3]	--	--
111	III (2)[5]	25:11	27:13	159	V (1)[3]	23:5	--
112	III (2)[5]	23:31	--	160	V (1)[3]	23:10	24:29
113	III (2)[5]	25:14	27:15	161	V (1)[3]	23:8	24:27
114	III (2)[5]	--	--	162	V (1)[3]	--	27:7
115	III (2)[5]	25:4	26:1	163	V (1)[3]	22:27	24:2
116	III (2)[5]	22:29	24:4	164	V (1)[3]	23:9	24:28
117	III (2)[5]	25:2	26:6	165	V (1)[3]	28:21	27:23
118	III (2)[5]	23:29	24:42	166	V (1)[3]	23:7	24:26
119	III (2)[4]	--	--	167	V (1)[3]	23:3	24:24
120	III (2)[4]	--	--	168	V (1)[3]	23:12	24:31
121	III (2)--	--	--	169	V (1)[3]	23:11	24:30
122	III (2)[4]	25:17	26:13	170	V (1)[4]	22:26	24:1
123	III (2)[4]	--	24:15	171	V (1)[4]	28:19	27:28
124	III (2)[4]	29:1	30:4	172	V (1)[4]	23:6	27:6
125	III (2)[4]	25:16	26:10	173	V (1)[4]	28:18	27:27
126	III (2)[4]	25:15	26:9	174	V (1)[4]	23:1	24:23

## POTTERY AND WHITE WARE

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No.	Locus	Drawing	Photograph	No.	Locus	Drawing	Photograph
175	V (1)[4]	23:2	--	197	III (1)[5]	--	24:19
176	V (1)[3]	28:22	27:24	198	III (1)[5]	--	24:20
177	V (1)[4]	28:20	27:22	199	III (1)[1]	--	24:21
178	III (1)[2]	--	--	200	III (1)[1]	--	24:22
179	Surface	29:24	--	201	III (2)[5]	--	26:7
180	Surface	29:17	--	202	III (2)[1]	--	26:23
181	Surface	--	--	203	III (3)[1]	--	27:5
182	Surface	29:20	--	204	V (1)[1]	--	27:21
183	Surface	--	--	205	III (2)[5]	--	30:2
184	Surface	29:15	--	206	III (2)[5]	--	30:3
185	Surface	29:16	--	207	III (2)[1]	--	30:10
186	Surface	22:37	--	208	II (1)[2]	--	30:15
187	Surface	29:19	--	209	I (1)[2]	--	30:16
188	Surface	29:18	30:24	210	I (1)[2]	--	30:17
189	Surface	22:35	--	211	I (1)[2]	--	30:18
190	Surface	29:21	--	212	I (1)[1]	--	30:21
191	V (1)[3]	--	24:11	213	Surface	--	30:22
192	V (1)[3]and	--	--	214	Surface	--	30:23
	IV (2)[3]	--	24:12	215	III (2)[1]	25:28	26:22
193	III (3)[1]	--	24:13		K'67-24		
194	III (2)[5]	--	24:14	216	VI (1)[2]	29:25	30:14
195	III (2)[1]	--	24:16		K'67-15		
196	III (2)[1]	--	24:17				

## WHITE WARE FRAGMENTS

No.	Locus	Drawing	Photograph	No.	Locus	Drawing	Photograph
1	III (1)[1]	25:1	--	20	III (1)[5]	9:3	10:3
2	III (1)[1]	22:19	21:8	21	III (1)[3]	12:24	10:10
3	III (1)[1]	13:19	--	22	III (3)[1]	12:9	10:8
4	III (1)[1]	13:25	16:7	23	III (2)[5]	12:18	--
5	III (1)[1]	22:16	21:4	24	III (2)[5]	12:17	10:9
6	III (1)[2]	12:27	14:24	25	III (2)[5]	12:19	--
7	III (1)[2]	12:28	--	26	III (1)[2]	22:23	21:19
8	III (1)[2]	22:1	20:33	27	III (1)[2]	--	20:30
9	III (1)[2]	--	21:17	28	III (1)[2]	9:4	--
10	III (1)[2]	--	20:32	29	III (1)[2]	15:27	18:10
11	III (2)[1]	12:23	14:26	30	III (1)[2]	22:2	20:38
12	III (2)[1]	17:48	20:29	31	III (1)[2]	--	20:37
13	III (2)[1]	17:49	--	32	III (1)[2]	--	20:34
14	III (2)[1]	12:21	14:5	33	III (1)[2]	--	20:36
15	III (2)[1]	17:15	--	34	III (1)[2]	15:9	16:15
16	III (3)[1]	9:1	10:1	35	III (1)[2]	--	16:17
17	III (2)[1]	22:22	21:18	36	III (1)[2]	15:12	16:16
18	III (2)[1]	12:22	14:4	37	IV (1)[1]	22:15	21:2
19	III (2)[1]	--	--	38	IV (1)[1]	22:13	--

## WHITE WARE FRAGMENTS (Continued)

<i>No.</i>	<i>Locus</i>	<i>Drawing</i>	<i>Photograph</i>	<i>No.</i>	<i>Locus</i>	<i>Drawing</i>	<i>Photograph</i>
39	IV (1)[1]	22:11	--	83	IV (1)[3]	17:3	18:24
40	IV (1)[1]	22:12	21:3	84	IV (1)[3]	--	--
41	IV (1)[1]	22:17	--	85	IV (1)[3]	15:36	--
42	IV (1)[1]	--	16:24	86	IV (1)[3]	17:40	20:24
43	IV (1)[1]	15:16	16:5	87	IV (1)[3]	17:43	20:27
44	IV (1)[1]	13:21	16:4	88	IV (1)[3]	15:37	--
45	IV (1)[1]	13:22	14:13	89	IV (1)[3]	17:5	--
46	IV (1)[1]	13:18	--	90	IV (1)[3]	17:4	--
47	IV (1)[1]	13:20	14:12	91	IV (1)[3]	17:1	18:23
48	IV (1)[1]	--	16:6	92	IV (1)[3]	17:2	--
49	IV (1)[1]	15:18	16:23	93	IV (2)[1]	--	18:22
50	IV (1)[1]	--	--	94	IV (2)[1]	15:34	18:20
51	III (1)[1]	--	--	95	IV (2)[1]	--	19:9
52	IV (1)[1]	22:14	21:24	96	IV (1)[1]	17:24	--
+ 82				97	IV (1)[1]	--	--
53	IV (1)[1]	17:25	--	98	IV (2)[1]	15:35	18:21
54	IV (1)[1]	17:21	19:3	99	IV (2)[1]	--	--
55			--	100	IV (2)[1]	--	20:21
56	IV (1)[1]	17:16	19:5	101	IV (2)[1]	--	20:23
57	IV (1)[1]	17:23	19:6	102	IV (2)[1]	--	20:22
58	IV (1)[1]	--	19:12	103	IV (1)[2]	17:42	20:28
59	IV (1)[1]	--	19:22	104	III (3)[1]	17:46	--
60	IV (1)[1]	17:22	19:4	105	IV (2)[1]	11:14	10:25
61	III (3)[1]	12:8	14:3	106	IV (2)[1]	17:39	--
62	III (3)[1]	17:28	19:20	107	IV (2)[1]	11:16	10:6
63	III (3)[1]	12:10	14:23	108	IV (2)[1]	11:17	10:5
64	III (3)[1]	12:6	14:25	109	IV (2)[1]	11:13	10:24
65	III (3)[1]	9:2	10:2	110	IV (2)[1]	11:15	--
66	IV (1)[3]	11:22	--	111	IV (2)[1]	11:9	--
67	III (1)[3]	12:26	14:27	112	IV (2)[1]	15:21	18:1
68	III (1)[3]	12:25	14:28	113	IV (2)[1]	--	--
69	III (1)[3]	17:50	20:31	114	V (1)[1]	--	--
70	IV (1)[3]	17:27	19:19	115	V (1)[1]	15:15	16:20
71	IV (1)[3]	12:15	14:22	116	V (1)[1]	--	--
72	IV (1)[3]	11:20	--	117	V (1)[1]	15:13	16:18
73	IV (1)[3]	11:18	14:2	118	V (1)[1]	13:15	--
74	IV (1)[3]	11:21	--	119	V (1)[1]	13:12	--
75	IV (1)[3]	12:12	--	120	V (1)[1]	15:10	16:19
76	IV (1)[3]	12:13	--	121	V (1)[1]	15:14	16:21
77	IV (1)[3]	15:5	16:10	122	V (1)[1]	13:17	16:2
78	III (1)[3]	15:8	16:12	123	V (1)[1]	--	19:1
79	III (1)[3]	15:7	16:13	124	V (1)[1]	17:20	--
80	IV (1)[3]	15:23	18:7	125	V (1)[1]	13:9	14:8
81	IV (1)[3]	15:25	18:8	126	V (1)[1]	17:17	19:2
82	IV (1)[3]	22:14	21:24	127	V (1)[1]	17:19	--
+ 52				128	V (1)[1]	17:18	--

## WHITE WARE

<i>No.</i>	<i>Locus</i>	<i>Drawing</i>	<i>Photograph</i>	<i>No.</i>	<i>Locus</i>	<i>Drawing</i>	<i>Photograph</i>
129	III (2)[4]	12:20	--	177	IV (3)[1]	17:11	--
130	V (1)[1]	13:6	14:10	178	IV (3)[1]	17:7	--
131	IV (3)[1]	--	--	179	IV (1)[3]	15:38	--
132	V (1)[1]	22:10	--	180	--	--	--
133	V (1)[1]	15:28	18:9	181	IV (3)[1]	--	19:7
134	V (1)[1]	13:1	--	182	IV (3)[1]	--	20:13
135	V (1)[1]	13:16	16:1	183	IV (3)[1]	17:6	--
136	V (1)[1]	22:9	--	184	IV (3)[1]	15:20	16:27
137	V (1)[1]	13:10	--	185	IV (3)[1]	--	19:15
138	V (1)[1]	17:30	19:21	186	IV (3)[1]	17:9	--
139	V (1)[1]	13:7	--	187	IV (3)[1]	17:8	--
140	V (1)[1]	22:7	20:43	188	IV (3)[1]	17:13	18:17
141	V (1)[1]	22:4	20:41	189	IV (3)[1]	--	20:17
142	V (1)[1]	22:8	--	190	--	--	--
143	V (1)[1]	13:14	--	191	IV (3)[1]	17:45	20:19
144	V (1)[1]	13:3	14:9	192	IV (3)[1]	--	20:14
145	V (1)[1]	--	--	193	V (1)[1]	--	--
146	V (1)[1]	13:8	14:6	194	V (1)[4]	9:10	14:14
147	V (1)[1]	13:13	--	195	V (1)[2]	15:19	16:26
148	V (1)[1]	13:2	--	196	V (1)[4]	9:11	14:15
149	V (1)[1]	13:4	14:7	197	V (1)[4]	17:31	20:7
150	V (1)[1]	13:5	16:3	198	V (1)[4]	9:9	10:12
151	IV (3)[1]	17:14	18:18	199	V (1)[4]	15:29	18:12
152	IV (3)[1]	--	--	200	V (1)[4]	9:7	--
153	IV (3)[1]	12:2	10:4	201	V (1)[2]	11:2	--
154	IV (3)[1]	15:26	18:6	202	V (1)[2]	11:1	10:17
155	IV (1)[3]	17:41	--	203	V (1)[3]	--	--
156	IV (3)[1]	--	--	204	V (1)[3]	9:13	10:14
157	IV (1)[3]	--	20:26	205	V (1)[2]	15:31	18:13
158	IV (3)[1]	12:7	14:19	206	V (1)[2]	15:33	18:15
159	IV (3)[1]	12:1	10:22	207	V (1)[3]	15:2	16:8
160	IV (3)[1]	--	--	208	V (1)[3]	9:16	10:13
161	IV (3)[1]	17:12	--	209	V (1)[3]	9:12	14:18
162	IV (3)[1]	--	20:16	210	V (1)[3]	9:14	--
163	IV (3)[1]	11:23	--	211	V (1)[2]	9:20	10:19
164	III (3)[1]	--	--	212	V (1)[2]	15:32	18:14
165	IV (3)[1]	12:5	--	213	V (1)[2]	15:30	18:16
166	V (1)[2]	9:23	14:16	214	V (1)[2]	9:15	--
167	IV (3)[1]	17:47	--	215	V (1)[3]	17:32	20:8
168	IV (3)[1]	12:11	14:20	216	V (1)[2]	9:21	10:15
169	IV (3)[1]	--	--	217	V (1)[2]	17:34	--
170	IV (3)[1]	12:4	10:21	218	V (1)[2]	17:36	--
171	IV (3)[1]	17:10	18:19	219	V (1)[2]	11:3	10:18
172	IV (3)[1]	12:3	10:23	220	V (1)[2]	9:19	--
173	IV (3)[1]	--	20:12	221	V (1)[3]	22:25	21:20
174	IV (3)[1]	17:44	--	222	V (1)[2]	9:18	14:17
175	IV (3)[1]	17:29	19:16	223	V (1)[2]	--	--
176	V (3)[1]	15:22	18:4	224	V (1)[2]	15:24	18:5

## TELL EL KOWM

No.	Locus	Drawing	Photograph	No.	Locus	Drawing	Photograph
225	V (1)[2]	9:24	--	273	IV (2 [3]	15:3	--
226	V (1)[2]	17:35	20:10	274	III (1)	--	16:25
227	V (1)[2]	--	20:9	275	III (1)[5]	--	18:2
228	V (1)[2]	9:22	10:16	276	V (1)[2]	--	19:8
229	V (1)[2]	9:17	--	277	IV (3)[1]	--	19:10
230	V (1)[2]	17:33	--	278	IV (1)[1]	--	19:13
231	V (1)[2]	--	--	279	IV (3)[1]	--	19:17
232	IV (2)[3]	22:21	21:23	280	IV (2)[1]	--	19:18
233	IV (2)[3]	11:10	16:9	281	VIII (2)[2]	--	20:1
234	IV (2)[3]	11:5	14:21	282	VII (1)[2]	--	20:2
235	IV (2)[3]	17:37	--	283	VII (1)[2]	--	20:3
236	IV (2)[3]	--	--	284	VI (1)[2]	--	20:4
237	IV (2)[3]	11:6	--	285	VI (1)[2]	--	20:5
238	IV (2)[3]	11:11	--	286	IV (3)[1]	--	20:11
239	IV (2)[3]	15:17	16:28	287	IV (3)[1]	--	20:18
240	IV (2)[3]	11:8	--	288	IV (3)[1]	--	--
241	IV (2)[3]	11:12	--	289	IV (1)[4]	--	20:25
242	IV (2)[3]	--	--	290	III (1)[2]	--	20:35
243	IV (2)[3]	11:7	--	291	V (1)[1]	--	--
244	IV (2)[3]	11:4	--	292	V (1)[1]	--	20:44
245	IV (2)[3]	17:38	20:20	293	IV (3)[1]	--	20:15
246	V (1)[4]	9:8	--	294	III (1)	--	--
247	V (1)[1]	22:6	20:42	295	III (1)[1]	--	21:5
248	VI (1)[2]	12:16	--	296	III (1)[1]	--	21:6
249	IV (3)[1]	--	19:11	297	V (1)[1]	22:5	21:9
250	IV (1)[1]	--	21:25	298	III (1)[1]	--	21:10
251	IV (1)[1]	--	21:26	299	Surface	--	21:12
252	IV (1)[1]	13:24	14:11	300	Surface	--	21:13
253	V (1)[1]	13:23	--	301	III (1)[2]	--	21:15
254	VI (1)[2]	--	20:6	302	Surface	--	21:16
255	VI (1)[2]	--	--	303	V (1)[1]	--	21:21
256	IV (1)[2]	--	--	304	V (1)[1]	--	21:22
257	IV (1)[2]	12:14	10:7	305	V (1)[1]	--	22:3
258	V (1)[2]	17:26	19:14	306	V (1)[1]	--	20:39
259	VI (1)[2]	9:6	10:11	307	IV (1)[3]	15:4	16:14
260	VI (1)[2]	9:5	10:20		K'67-20		
261	VI (1)[1]	13:11	--	308	III (3)[1]	15:6	16:11
262	VIII (2)[2]	--	18:11		K'67-23		
263	III (1)	22:24	18:3	309	IV (1)[1]	15:11	16:22
264	Surface	--	--		K'67-10		
265	Surface	--	--	310	III (1)[2]	--	20:40
266	Surface	22:20	21:14		K'67-16		
267	Surface	--	--	311	IV (1)[1]	--	21:1
268	Surface	--	--		K'67-14		
269	Surface	--	--	312	III (1)	--	21:11
270	Surface	22:18	21:7		K'67-12		
271	IV (1)[3]	--	--	313	III (2)[5]	--	21:27
272	IV (1)[2]	11:19	14:1		K'67-7		

## STONE AND BONE IMPLEMENTS

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## STONE VESSELS AND IMPLEMENTS

<i>No.</i>	<i>Locus</i>	<i>Field Number</i>	<i>Drawing</i>	<i>Photograph</i>	<i>Object</i>
1	IX K'67-1	(2)[4]12	29:26	30:25	Bowl rim; Tan, veined marble
2	IV K'67-5	(1)[2]16	29:27	30:26	Bowl rim; Yellow marble, veined with red
3	III K'67-21	(1)[4]21	29:28	30:27	Bowl rim; Alabaster
4	VI K'67-9	(1)[1] 9	29:29	30:28	Bowl fragment; Alabaster
5	V K'67-17	(1)[1] 4	29:30	30:29	Bowl fragment; Alabaster
6	Surface top trench K'67-11	$\frac{1}{3}$ of 2	29:31		Bowl rim; Red marble, veined with yellow
7	III K'67-4	(1)[2]14	29:32	30:34	Bead; Dark red marble
8	Surface 1971		29:33	30:30	Bowl section; Alabaster
9	Surface 1971		29:34	30:31	Mace head fragment; Basalt
10	IV K'67-19	(1)[3]18	29:35	30:33	Counterweight; Limestone
11	VIII K'67-8	(1)[2] 8	--	30:32	Small axe head; Grey veined marble

## BONE IMPLEMENTS

<i>No.</i>	<i>Locus</i>	<i>Field Number</i>	<i>Photograph</i>	<i>Object</i>	
1	IX	(2)[4]17	K'67-6	30:35	Awl fragment
2	IX	(1)[2]15	K'67-2	30:36	Spatula fragment
3	IX	(1)[2]22	K'67-22	--	Awl fragment
4	VIII	(2)[2]11	K'67-18	30:37	Awl
5	IV	(1)[3]13	K'67-3	30:38	Awl
6	III	(1)[1]3	K'67-13	30:39	Awl fragment



## LITERATURE CITED AND ADDITIONAL BIBLIOGRAPHY

- Abu Al-Soof, B.  
1968 Tell es-Sawwan: Excavations of the fourth season (spring, 1967). *Sumer* 24:3–16.
- Abu Hamdan, M.  
1982 Finds lengthen known Amman history. *Jordan Times*, January 25.
- Al-A'dami, K. A.  
1968 Excavations at Tell es-Sawwan. *Sumer* 24:54–95.
- Akkermans, P. A.  
1981–82 Tall Buqras. *Archiv für Orientforschung* 28:212–14.
- Akkermans, P. A., Fokkens, H. and Waterbolk, H. T.  
1981 Stratigraphy, architecture and lay-out of Bouqras. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, 485–501. Éditions du Centre national de la recherche scientifique, Paris.
- Akkermans, P. A. and Roodenberg, J. J.  
1979 Bouqras, een neolithisch dorp in Syrie. *Spiegel Historiae* 14: 157–64.
- Akkermans, P. A., Roodenberg, J. J., van Loon, M. N., and Waterbolk, H. T.  
1978–79 Tall Buqras. *Archiv für Orientforschung* 26:152–56.
- Akkermans, P. A., Boerma, J. A., Clason, A. T., Hill, S. G., Lohof, E., Meikeljohn, C., le Miere, M., Molgat, G. M. F., Roodenberg, J. J., Waterbolk-van Rooyen, W., and van Zeist, W.  
1983 Bouqras revisited: Preliminary report on a project in eastern Syria. *Proceedings of the Prehistoric Society* 49:335–72.
- Anderson-Gerfaud, P.  
1982 Comment préciser l'utilisation agricole des outils préhistoriques? *Cahiers de l'Euphrate* 3:149–64.
- Aurenche, O.  
1981a *La maison orientale: L'architecture du Proche-Orient ancien des origines au milieu du quatrième millénaire*. Geuthner, Paris.  
1981b Repartition chronologique et spatiale de quelques traits architecturaux du Proche-Orient ancien. In *Préhistoire du Levant* edited by J. Cauvin and P. Sanlaville, 503–12. Éditions du Centre national de la recherche scientifique, Paris.
- Aurenche, O. and Cauvin, M.-C.  
1982 Qdeir 1, campagne 1980: une installation néolithique du VII<sup>e</sup> millénaire. *Cahiers de l'Euphrate* 3:51–78.

- Aurenche, O., Cauvin, J., Cauvin, M.-C., Copeland, L., Hours, F., and Sanlaville, P.  
 1981 Chronologie et organisation de l'espace dans le Proche-Orient de 12.000 à 5.600 av.J.C. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, 571–601. Éditions du Centre national de la recherche scientifique, Paris.
- Bailor, P. A.  
 1962 The chipped stone industry of Çatal Hüyük. *Anatolian Studies* 12:67–110.
- Balfet, H., Lafuma, H., Longuet, P., and Terrier, P.  
 1969 Une invention néolithique sans lendemain, vaisselles pré-céramic et sols enduits dans quelques sites du Proche-Orient. *Bulletin de la Société Préhistorique Française* 66:158–92.
- Banning, E. B. and Byrd, Brian F.  
 1984 The architecture of PPNB 'Ain Ghazal, Jordan. *Bulletin of the American Schools of Oriental Research* 255:15–20.
- Bar Yosef, O.  
 1981 The "Pre-Pottery Neolithic" period in the southern Levant. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, 551–70. Éditions du la Centre national de la recherche scientifique, Paris.
- Besançon, J., Copeland, L., Hours, F., Muhesen, S., and Sanlaville, P.  
 1980 Geomorphologie et préhistoire de la vallée moyenne de l'Euphrate syrien. *Comptes-rendus de l'Académie des Sciences de Paris* 290:167–70.  
 1982 Prospection géographique et préhistorique dans le bassin d'El Kowm (Syrie). Rapport préliminaire. *Cahiers de l'Euphrate* 3:9–26.
- Besançon, J., de Contenson, H., Copeland, L., Hours, F., Muhesen, S., and Sanlaville, P.  
 1980 Étude géographique et prospection archéologique des plateaux de la région de Menbij (Syrie du Nord). *Travaux de la R. C. P.* no. 438. Maison de l'Orient, Lyon.
- Besançon, P., and Hours, F.  
 1968 Quelques sites préhistoriques nouveaux dans la Beqaa. *Mélanges de l'Université Saint-Joseph* 44:75–84.
- Braidwood, L. S. and Braidwood, R. J.  
 1969 Current thoughts on the beginnings of food-production in southwestern Asia. *Mélanges de l'Université Saint-Joseph* 45:149–55.
- Braidwood, R. J., Çambel, H., Lawrence, B., Redman, C. L., and Stewart, R. B.  
 1974 Beginnings of village farming communities in southeastern Turkey—1972. *Proceedings of the National Academy of Sciences U.S.A.* 71:568–72.
- Braidwood, R. J.  
 1940 Report on two sondages on the coast of Syria south of Tartous. *Syria* 21:183–226.  
 1952 Matarah. *Journal of Near Eastern Studies* 11:1–111.  
 1970 Prehistory into history in the Near East. In *Radiocarbon variations and absolute chronology*, edited by I. V. Olsson. Wiley, New York.  
 1975 *Prehistoric men*, 8th ed. Scott, Foresman, Glenview, Illinois.

- Braidwood, R. J. and Braidwood, L. S.  
 1960 *Excavations in the plain of Antioch*. Oriental Institute Publications, no. 61. University of Chicago Press, Chicago.
- Braidwood, L. S., Braidwood, R. J., Howe, B., Reed, C. A., and Watson, P. J., eds.  
 1983 *Prehistoric archeology along the Zagros flanks*. Oriental Institute Publications, no. 105. University of Chicago Press, Chicago.
- Braidwood, R. J. and Howe, B.  
 1960 *Prehistoric investigations in Iraqi Kurdistan*. Studies in Ancient Oriental Civilizations, no. 31. University of Chicago Press, Chicago.
- Browning, I.  
 1979 *Palmyra*. Noyes, London.
- Burnham, H.  
 1965 Catal Hüyük, the textiles and twine fabrics. *Anatolian Studies* 15:169–74.
- Buccellati, G. and Buccellati, M. K.  
 1967 Archaeological survey of the Palmyrene and the Jebel Bishri. *Archaeology* 20:305–6.
- Cauvin, J.  
 1963 Le néolithique de Moukhtara (Liban-Sud). *L'Anthropologie* 66:5.  
 1968 Les outillages néolithiques de Byblos et du Littoral libanaise. In *Fouilles de Byblos*, vol. 4, edited by M. Dunand. J. A. Maisonneuve, Paris.  
 1972a Nouvelles fouilles à Tell Mureybet (Syrie): 1971–1972. Rapport préliminaire. *Annales Archéologique Arabes Syriennes* 22:105–15.  
 1972b Sondage à Tell Assouad (Djezireh, Syrie). *Annales Archéologiques Arabes Syriennes* 22:85–103.  
 1973 Découverte sur l'Euphrate d'un village natoufien du IX<sup>e</sup> millénaire av. J.-C. à Mureybet (Syrie). *Centre du Recherche Academie Scientifique du Paris* 276 (Serie D):1985–87.  
 1974 Les debuts de la céramique sur le Moyen-Euphrate: nouveaux documents. *Paléorient* 2:199–205.  
 1978 *Les premiers villages de Syrie-Palestine du IX<sup>e</sup> au VII<sup>e</sup> millénaire avant J.C.* Maison de l'Orient, Lyon–deBoccard, Paris.  
 1979 Les fouilles de Mureybet (1971–1974) et leur signification pour les origines de la sédentarisation au Proche-Orient. *Annual of the American Schools of Oriental Research* 44:19–48.  
 1981a L'occupation Néolithique de la region d'el Kowm: resultats 1978–1979. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, 471–84. Éditions du la Centre national de la recherche scientifique, Paris.  
 1981b Le Néolithique du Levant. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, 603–5. Éditions du la Centre national de la recherche scientifique, Paris.  
 1982a Le mission archéologique permanente à El Kowm (Syrie). *Cahiers de l'Euphrate* 3:7–8.  
 1982b Nouvelles stations néolithiques dans la cuvette d'El Kowm. *Cahiers de l'Euphrate* 3:79–92.

- 1982c L'oasis d'El Kowm au néolithique. Bilan après trois campagnes: méthodes, problèmes et premiers résultats. *Cahiers de l'Euphrate* 3:93–98.
- Cauvin, J. and Aurenche, O.  
 1980 Cafer Höyük (Malatya), 1979. *Anatolian Studies* 30:207–9.  
 1982 Le néolithique de Cafer Höyük (Malatya, Turquie). Fouilles 1979–1980. *Cahiers de l'Euphrate* 3:123–38.
- Cauvin, J., Cauvin, M.-C. and Stordeur, D.  
 1979 Recherches préhistoriques à El Kowm (Syrie). Première campagne 1978. *Cahiers de l'Euphrate* 2:80–117.
- Cauvin, M.-C.  
 1972 Note préliminaire sur l'outillage lithique de Tell Assouad, Djezireh. *Annales Archéologiques Arabes Syriennes* 22:90–94.  
 1973 Problèmes d'emmanchement des faucilles du Proche-Orient. *Paléorient* 1:103–6.  
 1974a Outillage lithique et chronologie à Tell Aswad (Damascus-Syrie). *Paléorient* 2:429–36.  
 1974b L'outillage lithique de la phase IV de Mureybet. *Annales Archéologiques Arabes Syriennes* 24:59–63.  
 1979 Tell Aswad: étude comparative d'après l'outillage lithique. *Paléorient* 5:157–60.
- Cauvin, M.-C., Coqueugniot, E. and Nierlé, M.-C.  
 1982 Rapport préliminaire sur la campagne 1980 d'El Kowm 1. *Cahiers de l'Euphrate* 3:27–32.
- Cauvin, M.-C. and Stordeur, D.  
 1978 Les outillages lithiques et osseux de Mureybet, Syrie (Fouilles van Loon, 1965). *Cahiers de l'Euphrate* 1.
- Çambel, H.  
 1981 Chronologie et organisation de l'espace à Çayönü. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, 531–50. Éditions du Centre national de la recherche scientifique, Paris.
- Çambel, H. and Braidwood, R. J.  
 1970 An early farming village in Turkey. *Scientific American* 222:50–56.
- Clason, A. T.  
 1977 Bouqras, Gomolava en Molenaarsgraaf, drie stadia in de ontwikkeling van de veeteelt. *Museologia* 7:54–64.  
 1979–80 The animal remains from Tell es-Sinn compared with those from Bouqras. *Anatolica* 35:48.
- Clason, A. T. and Buitenhuis, H.  
 1978 Archaeozoologisch onderzoek in het Midden Oosten. *Spiegel Historiae* 13:677–87.

de Contenson, H.

- 1960 Three soundings in the Jordan Valley. *Annual of the Department of Antiquities of Jordan* 4 and 5:17–98.
- 1962 Pursuits des recherches dans le sondage à l'ouest du Temple de Baal (1955–1960). In *Ugaritica*, vol. 4, edited by C. F. A. Schaeffer. Geuthner, Paris.
- 1963 New correlations between Ras Shamra and al-Amuq. *Bulletin of the American Schools of Oriental Research* 172:35–40.
- 1964 A further note on the chronology of basal Ras Shamra. *Bulletin of the American Schools of Oriental Research* 175:47–48.
- 1966a Notes on the chronology of Near Eastern Neolithic. *Bulletin of the American Schools of Oriental Research* 184:2–5.
- 1966b Ramad. *Syria* 43:153–54.
- 1966c Les trois premières campagnes de fouilles à Tell Ramad. *Académie des Inscriptions et Belles-Lettres, C.R.* 1966:531–36.
- 1966d Découvertes récentes dans la domaine de néolithique en Syrie. *L'Anthropologie* 70:388–91.
- 1972 Tell Aswad, fouilles de 1971. *Annales Archéologiques Arabes Syriennes* 22:75–80.
- 1967 Troisième campagne à Tell Ramad: Rapport préliminaire. *Annales Archéologiques Arabes Syriennes* 17:17–24.
- 1969 Contribution à l'étude du néolithique en Syrie. *Mélanges de l'Université Saint-Joseph* 45:63–77.
- 1970 Sondage ouverte sur l'acropole de Ras Shamra. *Syria* 47:1–23.
- 1971 Tell Ramad, a village of Syria of the 7th and 6th millennia B.C. *Archaeology* 24:278–83.
- 1976 Précisions sur la stratigraphie de Tell Aswad (Syrie). *Bulletin de la société préhistorique française* 73:198–99.
- 1977 Le Néolithique de Ras Shamra V d'après le campagnes 1972–1976 dans le sondage SH. *Syria* 54:1–23.
- 1981 Le Néolithique de Damascene. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, 467–70. Éditions du la Centre national de la recherche scientifique, Paris.

de Contenson, H. and van Liere, W. J.

- 1964a Holocene environment and early settlement in the Levant. *Annales Archéologiques Arabes Syriennes* 14:125–28.
- 1964b Sondages à Tell Ramad en 1963: Rapport préliminaire. *Annales Archéologiques Arabes Syriennes* 14:109–24.
- 1966a Premier sondage a Bouqras. *Annales Archéologiques Arabes Syriennes* 16:181–92.
- 1966b Premiers pas vers une chronologie absolue à Tell Ramad. *Annales Archéologiques Arabes Syriennes* 16:175–76.
- 1966c Seconde campagne à Tell Ramad, 1966: Rapport préliminaire. *Annales Archéologique Arabes Syriennes* 16:167–74.

- Copeland, L.  
 1969 Neolithic village sites in the southern Beqaa, Lebanon. *Mélanges de l'Université Saint-Joseph* 45:83–114.  
 1979 Observations on the prehistory of the Balikh Valley, Syria, during the 7th to the 4th millennia B.C. *Paléorient* 5:251–75.
- Copeland, L. and Wescombe, P. J.  
 1965 Inventory of stone age sites in Lebanon. Part I: West central Lebanon. *Mélanges de l'Université Saint-Joseph* 41:61–175.  
 1966 Inventory of stone age sites in Lebanon. Part II: North, south and east central Lebanon. *Mélanges de l'Université Saint-Joseph* 42:1–174.
- Dornemann, R. H.  
 1969 An early village (El Kowm). *Archaeology* 22:68–70.  
 1979 Tell Hadidi: A millennium of Bronze Age city occupation. *Annual of the American Schools of Oriental Research* 44:113–51.
- Ducos, P.  
 1968 *L'origine des animaux domestiques en Palestine*. Publications de l'institute de préhistoire de l'Université de Bordeaux, Memoire no. 6. Imprimeries Delmas, Bordeaux.  
 1972 The Oriental Institute excavations at Mureybit, Syria. Preliminary report on the 1965 campaign. Part V: Les restes de bovines. *Journal of Near Eastern Studies* 31:295–301.  
 1976 Communautés villageoises et origine de la domestication en Syrie-Palestine. *2ème colloque du IXème Congrès international des Sciences Pré- et Protohistoriques, Nice 1976*, 145–52.  
 1978 Les changements de l'économie alimentaire d'une communauté villageoise préhistorique du Néolithique précéramique, Tell Mureybet (VIIIème et VIIème millénaire) Syrie. *Bulletin de la Société Préhistorique Française, C.R.S.M.* 147:35.
- Ducos, P. and Helmer, D.  
 1981 Le point actuel sur l'apparition de la domestication dans le Levant. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, 523–28. Éditions du Centre national de la recherche scientifique, Paris.
- Dunand, M.  
 1961 Rapport préliminaire sur les fouilles de Byblos, 1957–59. *Bulletin du Musée de Beyrouth* 16:69–83.
- El-Wailly, F. and Abu al-Soof, B.  
 1965 The excavations at Tell es-Sawwan: First preliminary report (1964). *Sumer* 21:17–32.
- Fleisch, H., Remiro, J. and Sanlaville, P.  
 1969 Gisements préhistoriques découverts dans la région de Batroun (Liban). *Mélanges de la l'Université Saint-Joseph* 45:3–27.
- French, D. H.  
 1966 Excavations at Çan Hasan: Fifth preliminary report. *Anatolian Studies* 16:113–24.

- Fugmann, E.  
1958 *Hama, fouilles et recherches de la Fondation Carlsberg 1931–1938: L'architecture des periods pré-Hellenistiques*, vol. 2, no. 1. National Museum, Copenhagen.
- Garrod, D. A. E.  
1957 The Natufian culture. The life and economy of a Mesolithic people in the Near East. *Proceedings of the British Academy* 43:211–27.
- Garrod, D. A. E. and Bate, D. M. A.  
1937 *The Stone Age of Mount Carmel: Excavations at the Wady el-Mughara*, Vol. 1. Clarendon Press, Oxford.
- Hanihara, K. and Azakawa, T., eds.  
1979 *Paleolithic site of the Douara cave and paleogeography of Palmyra basin in Syria: Part II: Prehistoric occurrences and chronology in Palmyra basin*. The University Museum, The University of Tokyo, Bulletin no. 16. University of Tokyo Press. Tokyo.
- Helbaek, H.  
1960 The paleoethnobotany of the Near East and Europe. In *Prehistoric investigations in Iraqi Kurdistan*, edited by R. J. Braidwood and B. Howe. Studies in Ancient Oriental Civilizations, No. 31. University of Chicago Press, Chicago.  
1963 Textiles from Çatal Hüyük. *Archaeology* 16:39–46.  
1964a Early Hassunan vegetable food at es-Sawwan near Samarra. *Sumer* 20:45–48.  
1964b First impressions of the Çatal Hüyük plant husbandry. *Anatolian Studies* 14:121–24.  
1965 Primitive man in Egypt, western Asia, and Europe. *The Cambridge ancient history*, vol. 1, edited by I. E. S. Edwards, G. J. Gadd, and N. G. L. Hammond. Cambridge University Press, Cambridge.  
1966 Pre-pottery neolithic farming at Beidha. *Palestine Exploration Quarterly* 98(1):61–66.  
1969 Plant collecting, dry-farming, and irrigation agriculture in prehistoric Del Luran. In *Prehistory and human ecology of the Del Luran Plain: An early village sequence from Khuzistan, Iran*, edited by F. Hole, K. V. Flannery and J. A. Neely. Memoirs of the Museum of Anthropology, University of Michigan, no. 1. University of Michigan Press, Ann Arbor.  
1970 The plant husbandry of Haçilar. In *Excavations at Haçilar*, vol. 1, edited by J. Mellaart. Edinburgh University Press, Edinburgh.  
1972a Traces of plants in the early ceramic site of Umm Dabaghiyah. *Iraq* 24:17–19.  
1972b Samarran irrigation agriculture at Choga Mami in Iraq. *Iraq* 24:35–48.
- Hillman, G.  
1975 Appendix A. The plant remains from Tell Abu Hureyra: A preliminary report. *Proceedings of the Prehistoric Society* 41:70–73.
- Hole, F.  
1959 A reanalysis of basal Tabbat al-Hammam, Syria. *Syria* 36(3–4):149–83.

- Hole, F. and Flannery, K. V.  
 1967 The prehistory of southwestern Iran: A preliminary report. *Proceedings of the Prehistoric Society for 1967* (London) 33:147–70.
- Hole, F., Flannery, K. V. and Neely, J. A.  
 1969 *Prehistory and human ecology of the Del Luran Plain: An early village sequence from Khuzistan, Iran*. Memoirs of the Museum of Anthropology, University of Michigan, no. 1. University of Michigan Press, Ann Arbor.
- Hooijer, D. A.  
 1966 Preliminary notes on the animal remains found at Bouqras and Ramad in 1965. *Annales Archéologiques Arabes Syriennes* 16:193–95.
- Hours, F.  
 1966 Les débuts du néolithique dans le Proche-Orient. *Travaux et jours* 20:3–23.  
 1969 Saayideh en le néolithique pré-potterie au Liban. *Mélanges de l'Université Saint-Joseph* 45:29–41.
- Hours, F., Copeland, L. and Aurenche, O.  
 1973 Les industries paléolithiques du Proche-Orient, essai de corrélation. *L'Anthropologie* 77:229–80.
- Ippoltoni, F.  
 1970–71 The pottery of Tell es-Sawwan, first season. *Mesopotamia* 5–6:105–79.
- Kenyon, K. M.  
 1957 *Digging up Jericho*. Praeger, New York.  
 1967a Jericho. *Archaeology* 20:268–75.  
 1969–70 The origins of the Neolithic. *The Advancement of Science* 26:1–17.
- Kenyon, K. M. and Kirkbride, D.  
 1960 Excavations at Jericho. *Palestine Exploration Quarterly* 92:1–32.
- Kirkbride, D.  
 1960 A brief report on the prepottery flint cultures of Jericho. *Palestine Exploration Quarterly* 92:114–19.  
 1966a Beidha: 1965 campaign. *Archaeology* 19:268–72.  
 1966b Five seasons at the pre-pottery neolithic village of Beidha in Jordan. *Palestine Exploration Quarterly* 98:8–72.  
 1967 Beidha 1965: An interim report. *Palestine Exploration Quarterly* 99:5–13.  
 1968 Beidha: Early neolithic village life south of the Dead Sea. *Antiquity* 42:263–74.  
 1969 Early Byblos and the Beqa'a. *Mélanges de l'Université Saint-Joseph* 45:45–59.  
 1972 Umm Dabaghiyah 1971: A preliminary report. An early ceramic site in marginal north central Jazira, Iraq. *Iraq* 34:3–15.  
 1973a Umm Dabaghiyah 1972: A preliminary report. *Iraq* 35:1–7.  
 1973b Umm Dabaghiyah 1973: A third preliminary report. *Iraq* 35:205–9.  
 1974 Umm Dabaghiyah: A trading outpost? *Iraq* 36:85–92.  
 1975 Umm Dabaghiyah 1974: A fourth preliminary report. *Iraq* 37:3–10.

- Kuschke, A.  
1962 Bericht über eine sondage im palastgarten von Ugarit-Ras Shamra. In *Ugaritica*, vol. 4, edited by C. F. A. Schaeffer. Geuthner, Paris.
- Lamberg-Karlovsky, C. C., ed.  
1972 *Old World archaeology: Foundations of civilization*. Readings from *Scientific American*. W. H. Freeman and Company, San Francisco.
- Legge, A. J.  
1975 Appendix B. The fauna of Tell Abu Hureyra: Preliminary analysis. *Proceedings of the Prehistoric Society* 41:74–77.
- Lloyd, S. and Safar, F.  
1945 Tell Hassuna. *Journal of Near Eastern Studies* 4:255–89.
- Mac Daniels, J., Warren, S. S. and Moore, A. M. T.  
1980 New investigations of obsidian from some neolithic sites in the Near East. *16th International Symposium on Archaeometry and Archaeological Prospection, Edinburgh, 1976*. National Museum of Antiquities of Scotland, Edinburgh.
- Maréchal, C.  
1982 Vaisselles blanches du Proche-Orient. El Kowm (Syrie) et l'usage du plâtre au néolithique. *Cahiers de l'Euphrate* 3:217–51.
- Masson, A.  
1982 Les pièces lustrées des sources d'El Kowm (Syrie). *Cahiers de l'Euphrate* 3:141–48.
- Merpert, N. Y. and Munchajev, R. M.  
1969 Yarim Tepe. *Sumer* 25:125–31.  
1971 Excavations at Yarim Tepe 1970. Second preliminary report. *Sumer* 27:9–21.  
1973 Excavations at Yarim Tepe 1972. Fourth preliminary report. *Sumer* 29:3–16.
- Mellaart, J.  
1956 The neolithic site of Ghрубba. *Annual of the Department of Antiquities of Jordan* 3:20–33.  
1961a Early cultures of the south Anatolian plateau. *Anatolian Studies* 11:159–84.  
1961b Excavations at Hacilar. *Anatolian Studies* 11:70–75.  
1961c Roots in the soil. In *Dawn of civilization*, edited by Stuart Piggot. Thames and Hudson, London.  
1962 Preliminary report on the archaeological survey in the Yarmuk and Jordan Valley. *Annual of the Department of Antiquities of Jordan* 6–7:126–57.  
1965a Çatal Hüyük west. *Anatolian Studies* 15:135–56.  
1965b *Earliest civilizations of the Near East*. McGraw Hill, New York.  
1966 *The Chalcolithic and Early Bronze Ages in the Near East and Anatolia*. Khayats, Beirut.  
1967 *Çatal Hüyük: a neolithic town in Anatolia*. McGraw-Hill, New York.  
1970 *Excavations at Hacilar*, vols. 1 and 2. Edinburgh University Press, Edinburgh.  
1971b The archaeological research in the Sinjar valley. *Sumer* 27:23–32.  
1973 Early agricultural settlements in the Sinjar plain. *Iraq* 35:93–113; 202–3.  
1975 *The Neolithic of the Near East*. Scribner's, New York.

- du Mesnil du Buisson, H.  
1948 *Baghouz, l'ancien Chorsote*. Documenta et Monumenta ad Orientis Antiqui, no. 3. Brill, Leiden.
- le Miere, M.  
1982 La céramique préhistorique de Tell Assouad. Djezireh, Syrie. *Cahiers de l'Euphrate* 2:4–78.
- Moore, A. M. T.  
1973 The late Neolithic in Palestine. *Levant* 5:36–68.  
1975 The excavation of Tell Abu Hureyra in Syria: A preliminary report. *Proceedings of the Prehistoric Society* 41:50–77.  
1979 A pre-neolithic farmers' village on the Euphrates. *Scientific American* 241:62–70.  
1981 North Syria in Neolithic 2. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, 445–56. Éditions du Centre national de la recherche scientifique, Paris.  
1982 A four-stage sequence for the Levantine Neolithic, ca. 8500–3750 B.C. *Bulletin of the American Schools of Oriental Research* 246:1–34.
- Mortensen, P.  
1970 A preliminary study of the chipped stone industry from Beidha. *Acta Archaeologica* 41:1–54.
- Nierlé, M.-C.  
1982 Mureybet et Cheikh Hassan (Syrie): outillage de mouture et de broyage (9<sup>e</sup> and 8<sup>e</sup> millénaires). *Cahiers de l'Euphrate* 3:177–216.
- Oates, J.  
1973 The background and development of early farming communities in Mesopotamia and the Zagros. *Proceedings of the Prehistoric Society* 39:147–81.
- Perkins, A. L.  
1949 *The comparative archeology of early Mesopotamia*. Studies in Ancient Oriental Civilization, no. 25. University of Chicago Press, Chicago.
- Perkins, D. Jr.  
1966 The fauna from Madamagh and Beidha: A preliminary report. *Palestine Exploration Quarterly* 98:66–67.  
1969 Fauna of Çatal Hüyük: Evidence for early cattle domestication in Anatolia. *Science* 164:177–79.  
1973 The beginnings of animal domestication in the Near East. *American Journal of Archaeology* 77:279–82.
- Perkins, D. Jr. and Daly, P.  
1968 A hunters' village in neolithic Turkey. *Scientific American* 219:97–106.
- Perrot, J.  
1962 Palestine—Syria—Cilicia. In *Courses toward urban life*, edited by R. J. Braidwood and G. Willey. Aldine, Chicago.

- 1964 Les deux premières campagnes de fouilles à Munhata (1962–1963): Premiers résultats. *Syria* 41:323–45.
- 1966a Le gisement natoufien de Mallaha (Eynan), Israël. *L'Anthropologie* 7:437–84.
- 1966b La troisième campagne de fouilles à Munhata (1964). *Syria* 43:49–63.
- 1967 Munhata: Un village préhistorique. *Bible et terre sainte* 93:4–16.
- 1968 La préhistoire palestinienne. In *Supplément au dictionnaire de la Bible*, no. 8, pp. 286–446. Letouzey & Ane, Paris.
- 1969 Le 'Néolithique' du Liban et les récentes découvertes dans la haute et moyenne vallée du Jourdain. *Mélanges de l'Université Saint-Joseph* 45:135–45.
- Redman, C. L.  
1978 *The rise of civilization*. W. H. Freeman, San Francisco.
- Reed, C. A.  
1959 Animal domestication in the prehistoric Near East. *Science* 130:1629–39.  
1969 The pattern of animal domestication in the prehistoric Near East. In *The domestication and exploitation of plants and animals*, edited by P. J. Ucko and G. W. Dimbleby, pp. 361–80. Aldine, Chicago.
- Reed, C. A., ed.  
1977 *Origins of agriculture*. Mouton, The Hague.
- Renfrew, C., Dickson, J. and McCann, J.  
1966 Obsidian and early cultural contacts in the Near East. *Proceedings of the Prehistoric Society* 32:30–72.  
1968 Further analysis of Near Eastern obsidians. *Proceedings of the Prehistoric Society* 34:319–31.
- Riis, P. J. and Thrane, H.  
1974 *Sûkās: The Neolithic periods*, vol. 3. Publications of the Carlsberg Expedition to Phoenicia, no. 3. Copenhagen.
- Rollefson, Gary O.  
1983 8,000-year-old human statues discovered at 'Ain Ghazal (Jordan). *American Schools of Oriental Research Newsletter* 35:1–3.  
1984 'Ain Ghazal: An early neolithic community in highland Jordan, near Amman. *Bulletin of the American Schools of Oriental Research* 255:3–14.  
1985 The 1983 season at the early neolithic site of 'Ain Ghazal. *National Geographic Research* 1:44–62.
- Roy, S.  
1982 Méthodologie pour l'étude de traces d'utilisation sur les lames et éclats bruts: recherche expérimentale d'après un niveau épinatoufien de Mureybet (Syrie). *Cahiers de l'Euphrate* 3:165–76.
- Schaeffer, C. F. A.  
1962 Les fondements préhistorique d'Ugarit. In *Ugaritica*, vol. 4, pp. 151–250, edited by C. F. A. Schaeffer. Geuthner, Paris.
- Singh, Purushottam  
1974 *Neolithic cultures of western Asia*. Seminar Press, New York.

Stekelis, Moshe

1972 *The Yarmukian culture*. Magnes Press, Jerusalem.

Stordeur, D., Maréchal, C. and Molist, M.

1982 El Kowm 2—Caracol; campagnes 1978, 1979 et 1980. Stratigraphie et architectures. *Cahiers de l'Euphrate* 3:33–50.

Thuesen, I. and Gwozdz, R.

1982 Lime plaster in neolithic Hama, Syria. A preliminary report. *Paléorient* 8:99–103.

Ucko, P. J. and Dimbleby, G. W., eds.

1969 *The domestication and exploitation of plants and animals*. Aldine, Chicago.

van Liere, W. J. and de Contenson, H.

1963 A note on five early neolithic sites in inland Syria. *Annales Archéologiques Arabes Syriennes* 13:175–205.

van Loon, M.

1966 First results of the 1965 excavations at Tell Mureybat near Meskene. *Annales Archéologiques Arabes Syriennes* 16:211–17.

van Loon, M., Skinner, J. H. and van Zeist, W.

1968 The Oriental Institute excavations at Mureybit, Syria: Preliminary report on the 1965 campaign. Part 1: Architecture and general finds. *Journal of Near Eastern Studies* 27:265–90.

1970 The Oriental Institute excavations at Mureybit, Syria: Preliminary report of the 1965 campaign. Part 3. The paleobotany. *Journal of Near Eastern Studies* 29:167–76.

van Zeist, W.

1968 Wild einkorn and barley from Tell Mureybit in northern Syria. *Acta Bot Noerl* 17:44–53.

1969 Reflections on prehistoric environments in the Near East. In *The domestication and exploitation of plants and animals*, edited by P. J. Ucko and G. W. Dimbleby. Aldine, Chicago.

1972 Palaeobotanical results of the 1970 season at Çayönü, Turkey. *Helinium* 12:1–19.

1976 On macroscopic traces of food plants in southwestern Asia. *Philosophical Transactions of the Royal Society of London* 275:27–41.

1979–80a Examen des graines de Tell es-Sinn. *Anatolica* 7:55–59.

1979–80b Plant remains from Girikihaciyan, Turkey. *Anatolica* 7:75–89.

van Zeist, W. and Bottema, S.

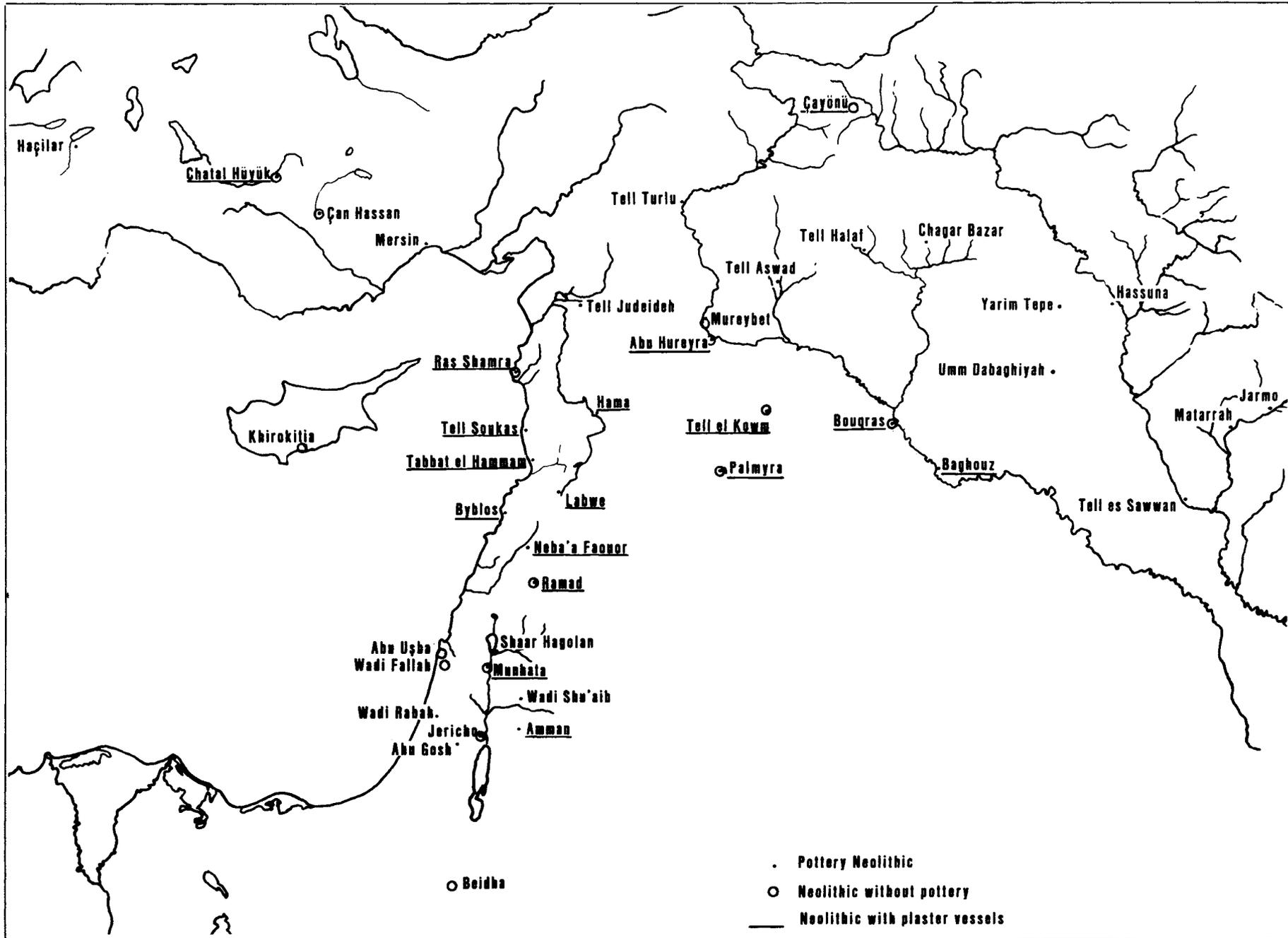
1966 Palaeobotanical investigations at Ramad. *Annales Archéologiques Arabes Syriennes* 16:179–80.

van Zeist, W. and Bakker-Heeres, J. A. H.

1979 Some economic and ecological aspects of the plant husbandry of Tell Aswad. *Paléorient* 5:161–69.

- van Zeist, W. and Wright, H. E. Jr.  
1963 Preliminary pollen studies at Lake Zeribar, Zagros Mountains, southwestern Iran. *Science* 140:65–69.
- de Vaux, R.  
1966 Palestine during the Neolithic and Chalcolithic periods. *The Cambridge ancient history*, vol. 1, edited by I. E. S. Edwards, C. J. Gadd, and N. G. L. Hammond. Cambridge University Press, Cambridge.
- Warren, S. E.  
1981 The distribution of obsidian in the Near East and its interpretation in terms of linear exchange mechanisms. In *Préhistoire du Levant*, edited by J. Cauvin and P. Sanlaville, 529–30. Éditions du Centre national de la recherche scientifique, Paris.
- Watson, P. J.  
1965 The chronology of north Syria and north Mesopotamia from 10,000 B.C. to 2000 B.C. In *Chronologies in old world archaeology*, edited by R. Ehrich. University of Chicago Press, Chicago.
- Zohary, M.  
1973 *Geobotanical foundations of the Middle East*. 2 vols. Stuttgart-Amsterdam.





(1) Map of Neolithic sites in Syria, Palestine, Turkey and Iraq.

PLATE I



2

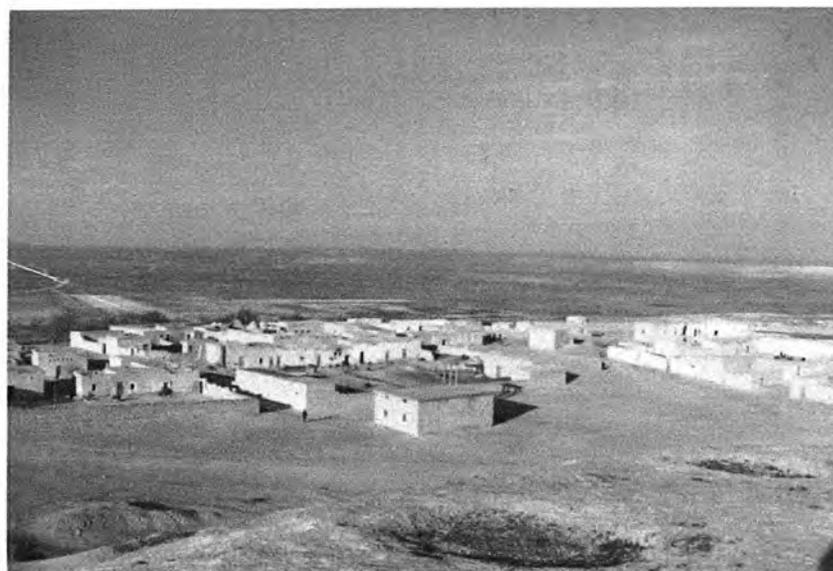


3

(2) View of Tell El Kowm from the south; (3) View of Test Trench on high tell from the south.



1



2

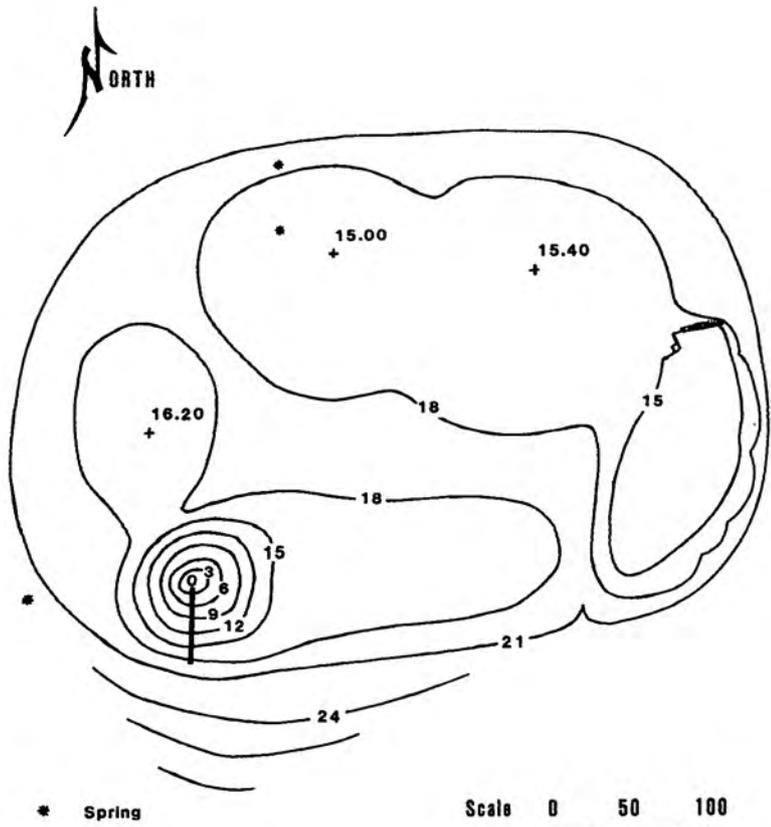


3



4

(1) View to the north from top of high tell; (2) View to northeast from top of high tell; (3) Brick wall revealed in pits on edge of east side of low tell; (4) Walls of Neolithic house revealed in pit on east side of low tell.



2



3

(1) Sketch plan of Tell El Kowm; (2) View to the south over edge of modern cemetery, from top of high tell; (3) View to the southwest with modern well installation and irrigation canal in foreground, from top of high tell.



1

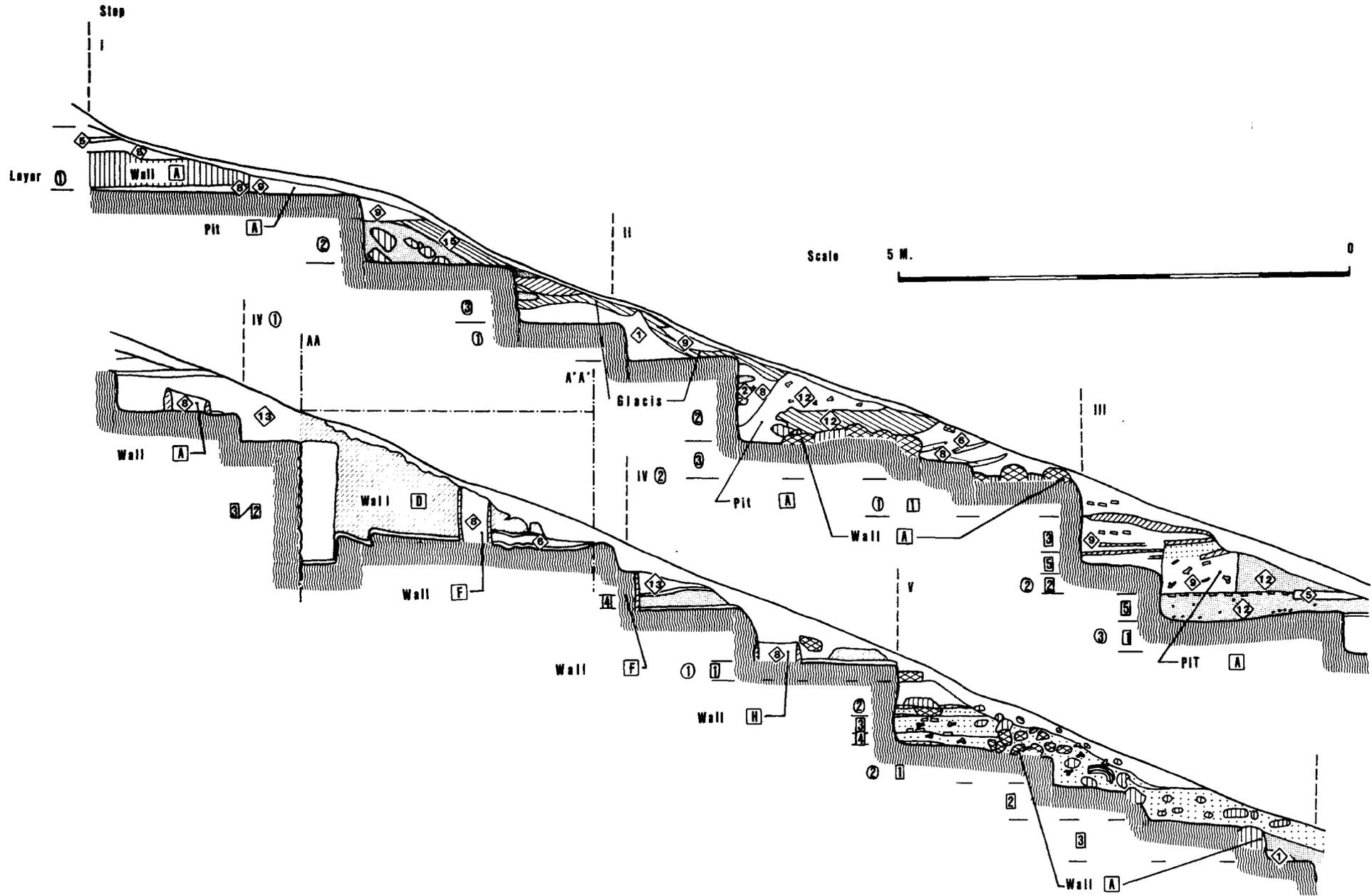


2



3

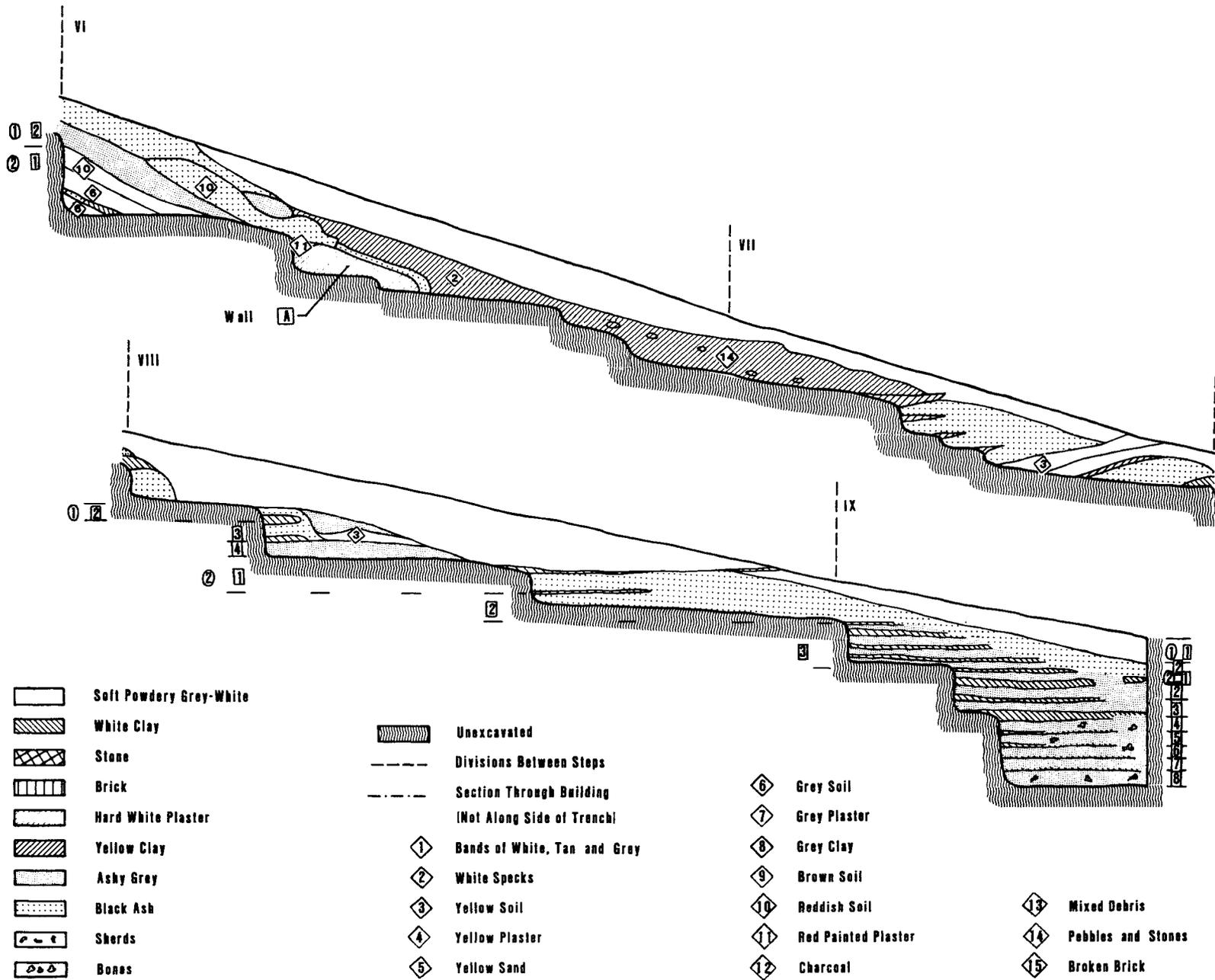
(1) View of Tell El Kowm from the north; (2) View of north side of high tell; (3) General view of step trench from the south.



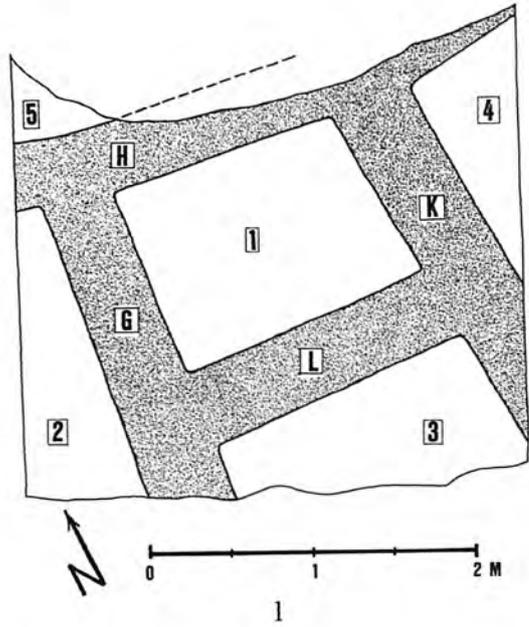
Scale

10 M.

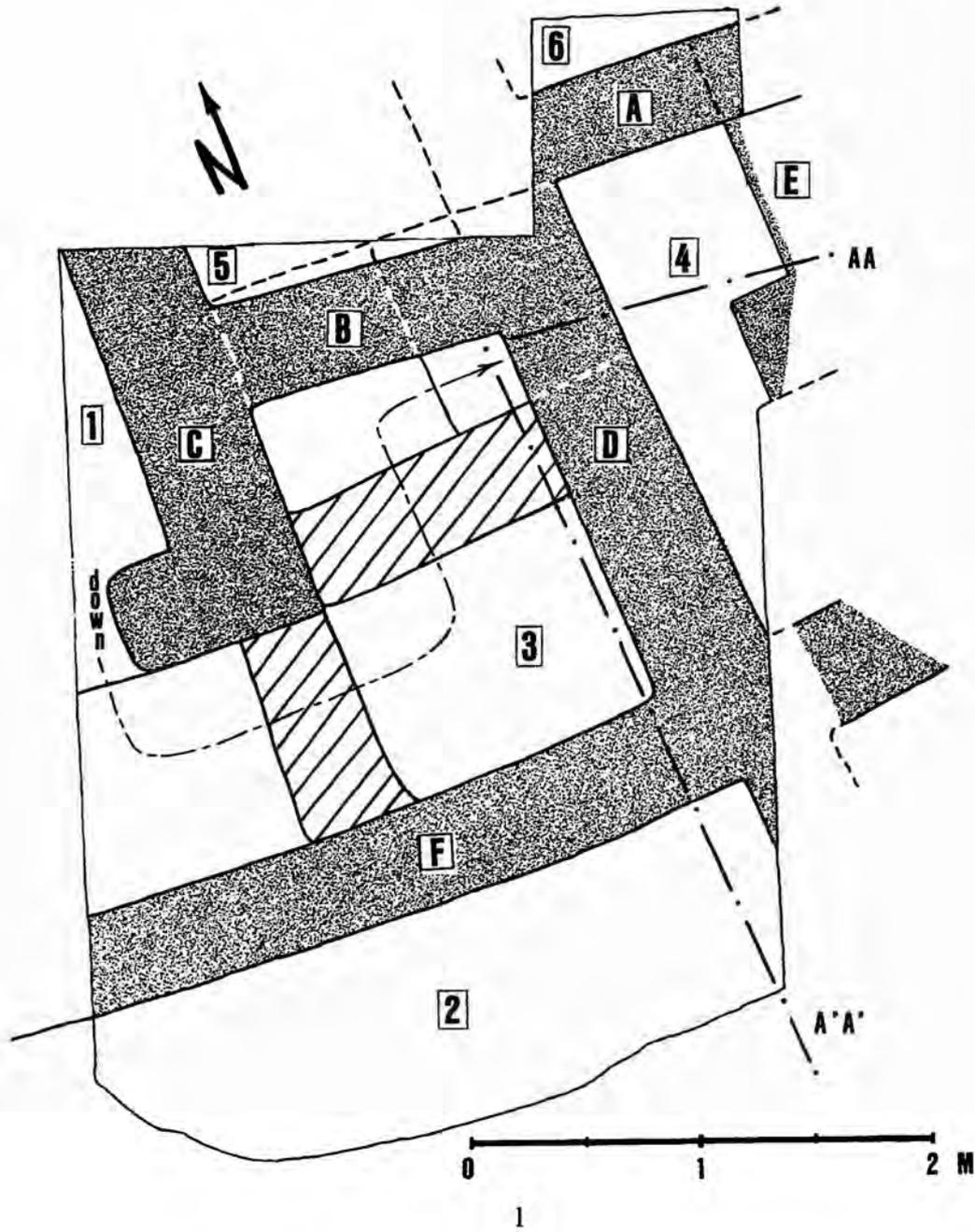
5 M.



Test trench section



(1) Plan of building in Step IV(2); (2) Building in Step IV(2) from east side of trench; (3) Floor at south edge of IV(2) building and east section of top of Step V; (4) View of Step IV(1) building over top of IV(2) from the northeast.



2



3

(1) Plan of building in Step IV(1); (2) Building in Step IV(1) from north during clearance of room (3); (3) View of building in Step IV(1) from southeast during clearance of room (3).



1



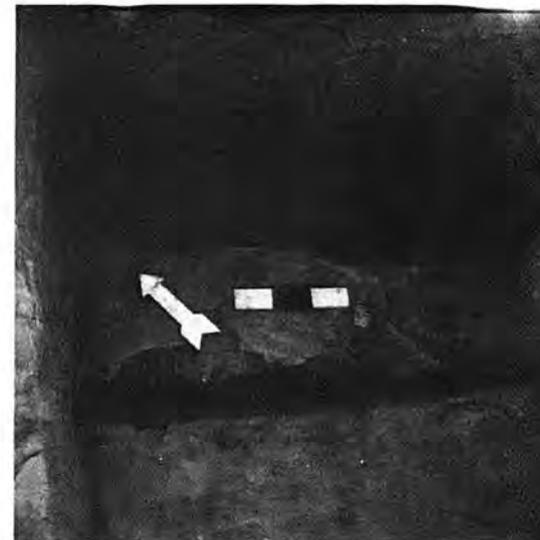
2



3

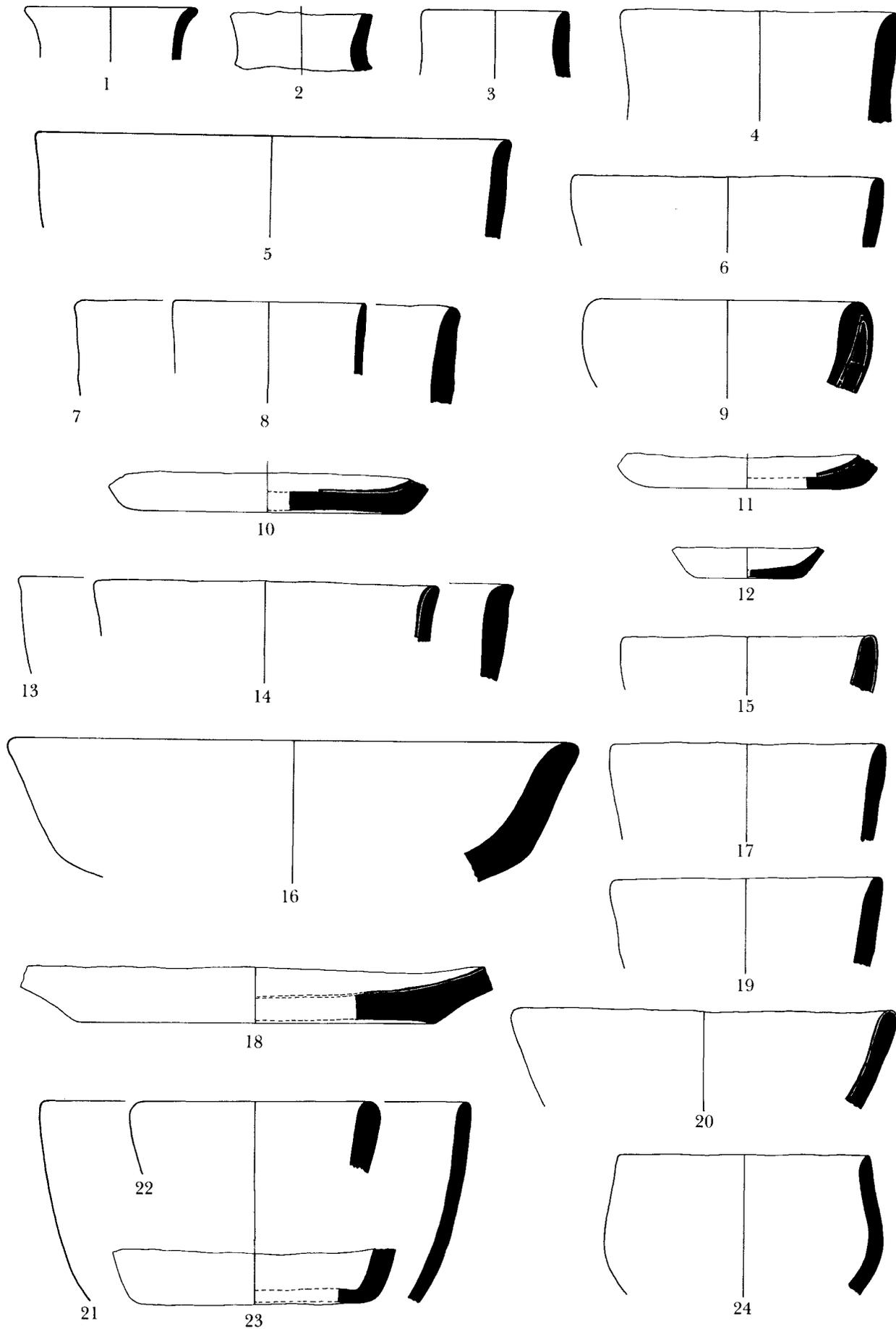


4



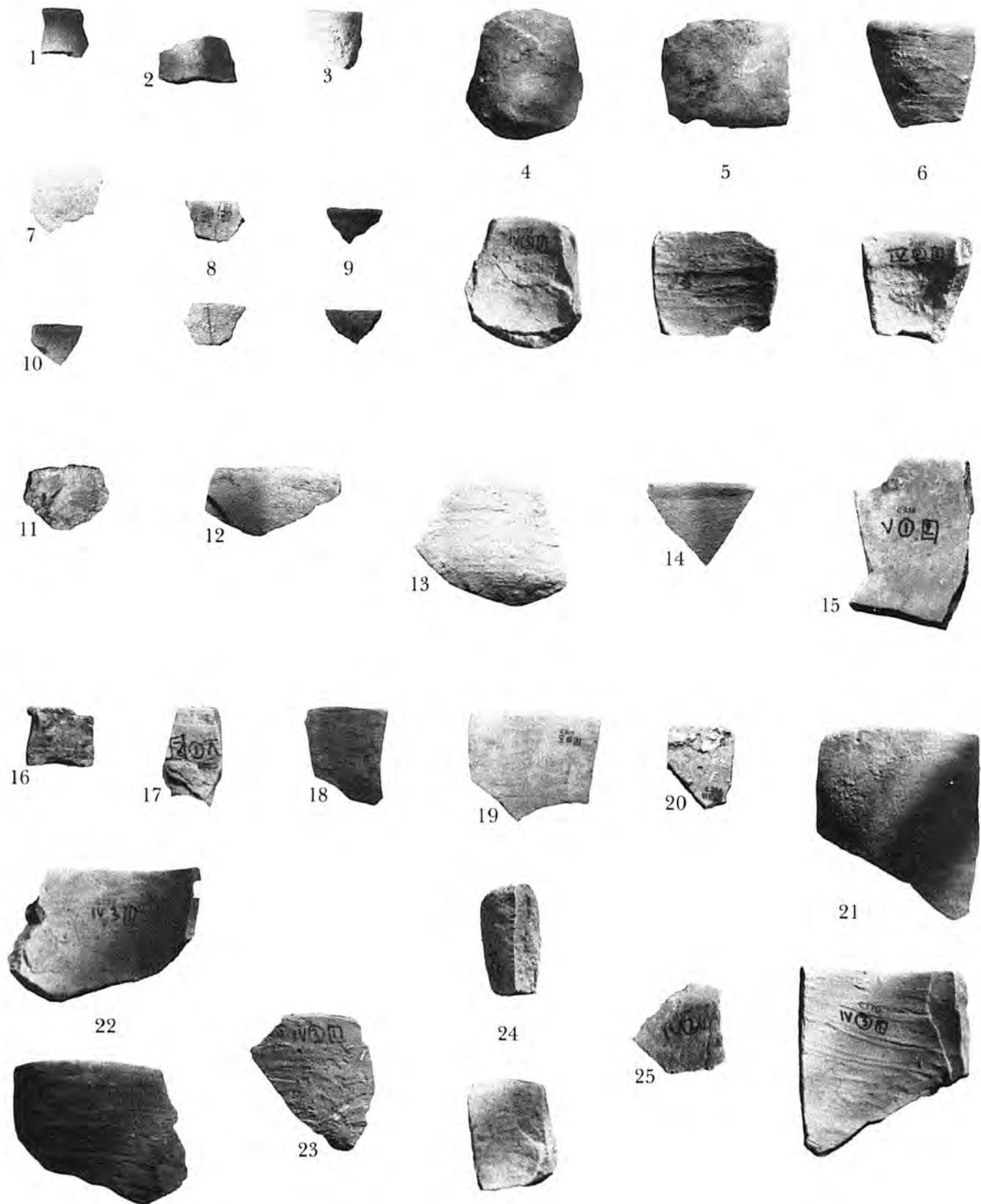
5

(1) View of stairs in Step IV(1) from north; (2) View of stairs from northwest; (3) View of stairs from west; (4) View of stairs from east; (5) View of stairs from south.

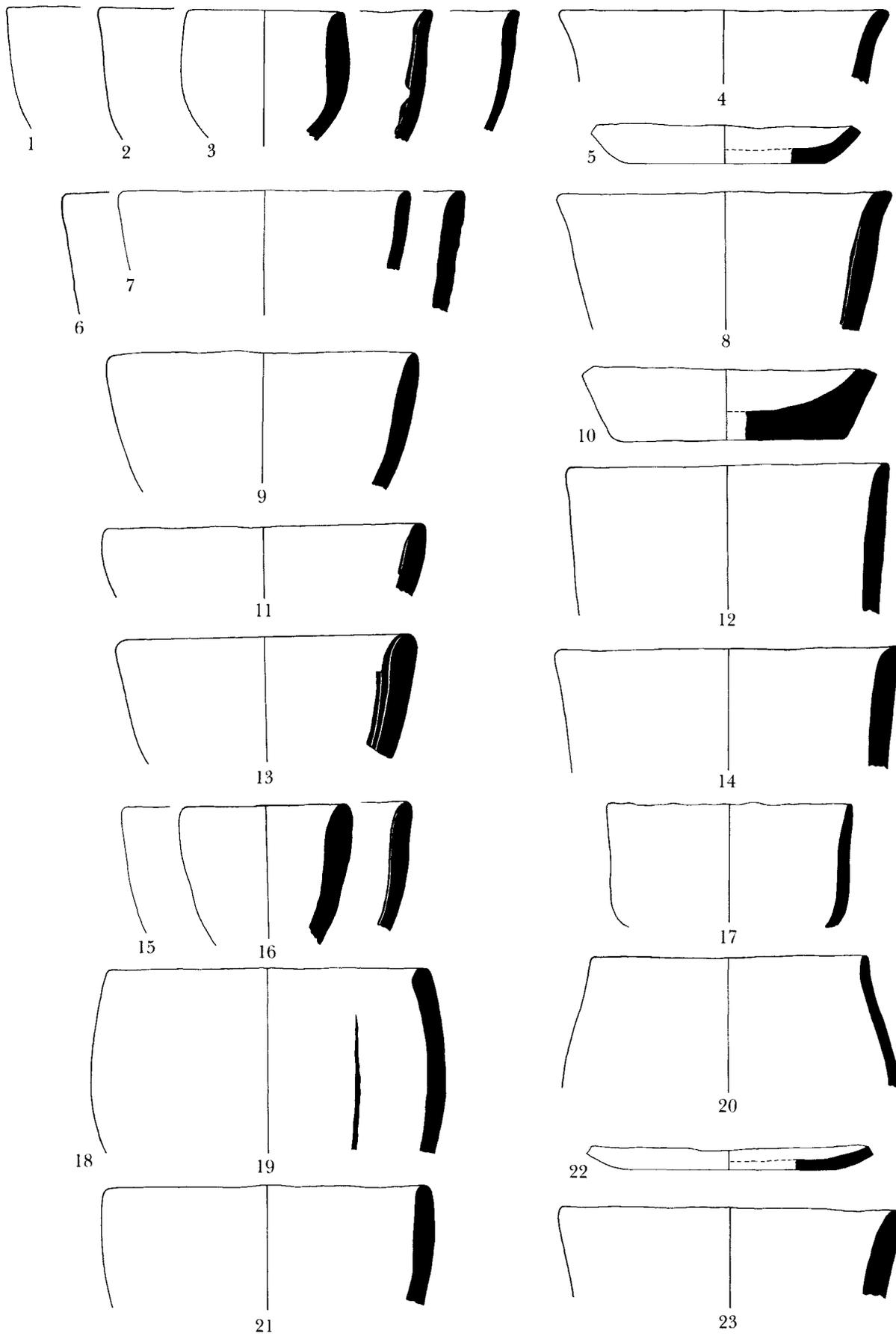


White ware jar profiles from Step III: (1) 16, (2) 65, (3) 20, (4) 28; Pot and bowl profiles from Steps VI(1) to V(1): (5) 260 (6) 259, (7) 200, (8) 246 (9) 198, (10) 194, (11) 196, (12) 209, (13) 204, (14) 210, (15) 214, (16) 208, (17) 229, (18) 222, (19) 220, (20) 211, (21) 216, (22) 228, (23) 166, (24) 225. Scale 1:5

## PLATE 10

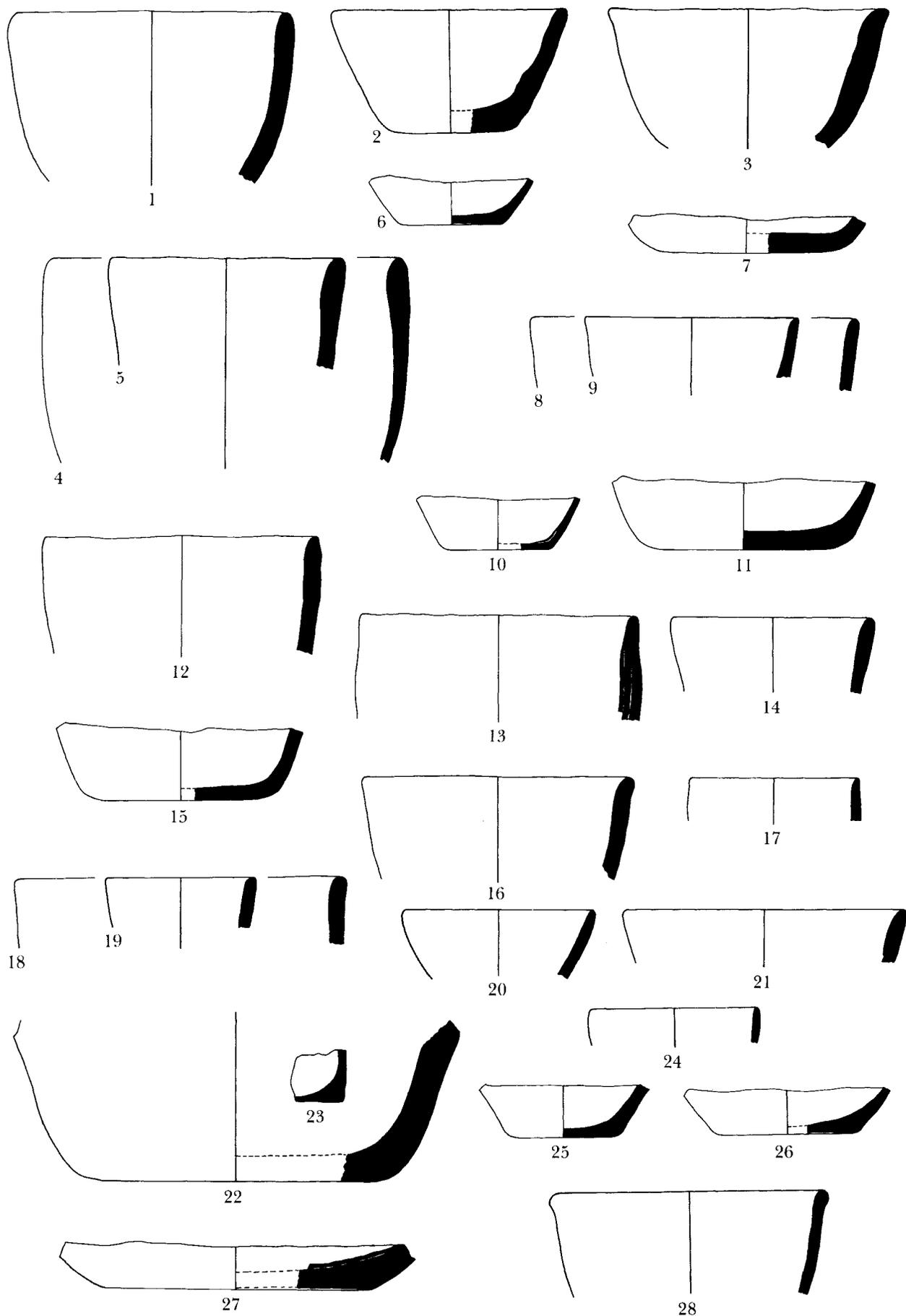


White ware jar and pot fragments: (1) 16, (2) 65, (3) 20, (4) 153, (5) 108, (6) 107, (7) 257, (8) 22, (9) 24, (10) 21, (11) 259, (12) 198, (13) 208, (14) 204, (15) 216, (16) 228, (17) 202, (18) 219, (19) 211, (20) 260, (21) 170, (22) 159, (23) 172, (24) 109, (25) 105. Scale 1:5

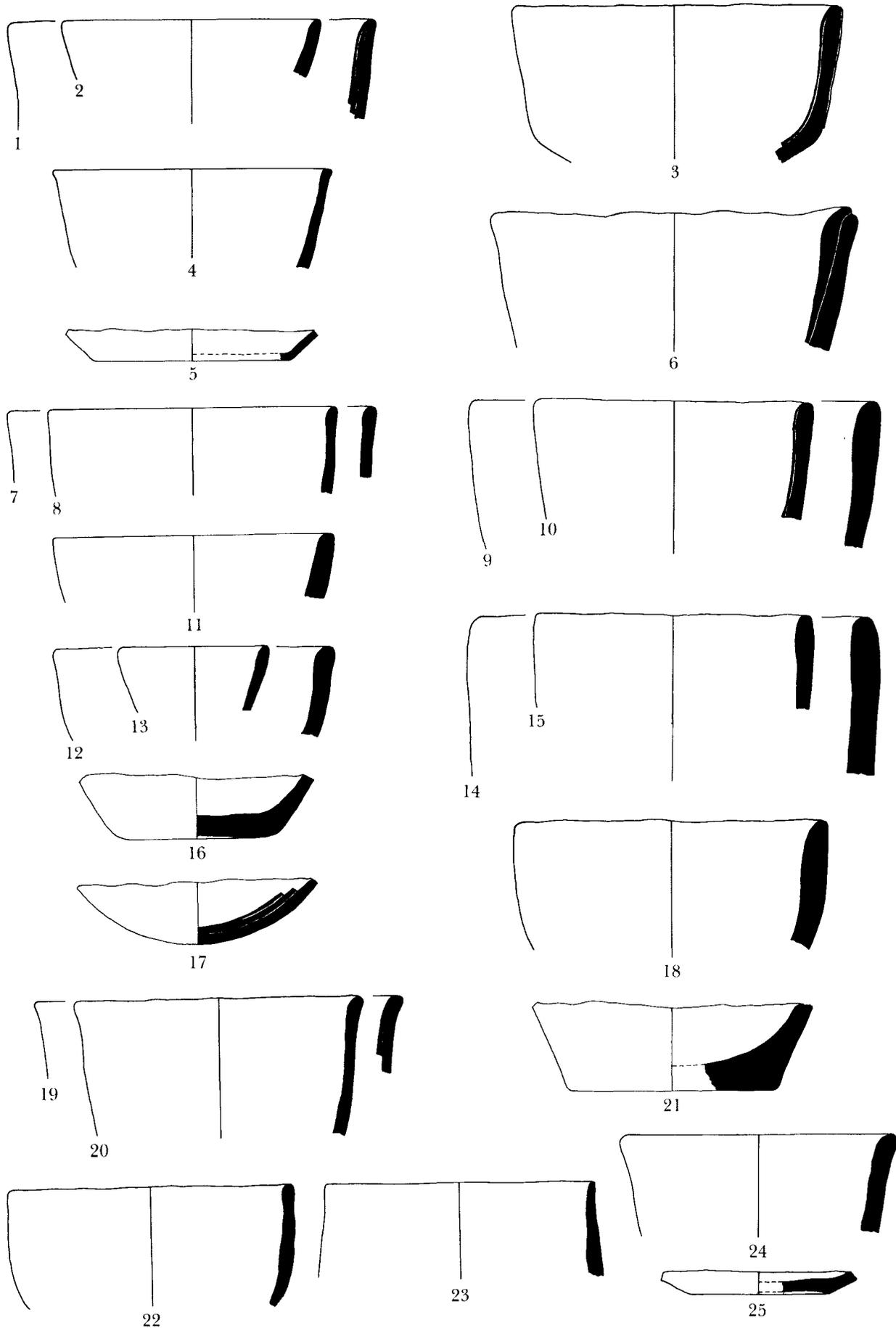


White ware pot profiles from Steps V(1) to IV(3): (1) 202, (2) 201, (3) 219, (4) 244, (5) 234, (6) 237, (7) 243, (8) 240, (9) 111, (10) 223, (11) 238, (12) 241, (13) 109, (14) 105, (15) 110, (16) 107, (17) 108, (18) 73, (19) 272, (20) 72, (21) 74, (22) 66, (23) 163. Scale 1:5

## PLATE 12

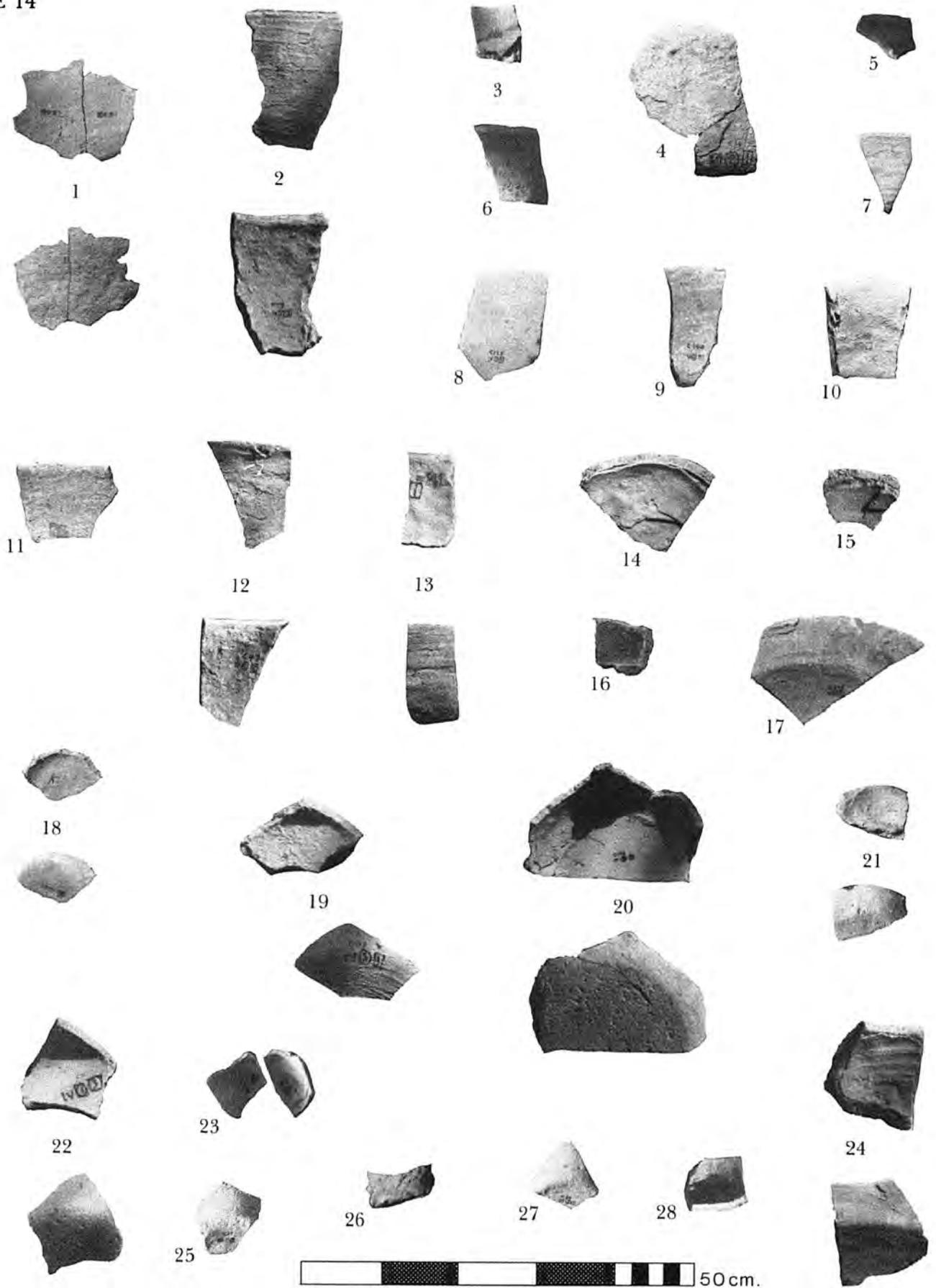


White ware pot profiles from Steps IV(3) to III(1)[2]: (1) 159, (2) 153, (3) 172, (4) 170, (5) 165, (6) 64, (7) 158, (8) 61, (9) 22, (10) 63, (11) 168, (12) 75, (13) 76, (14) 257, (15) 71, (16) 248, (17) 24, (18) 23, (19) 25, (20) 129, (21) 14, (22) 18, (23) 11, (24) 21, (25) 68, (26) 67, (27) 6, (28) 7. Scale 1:5

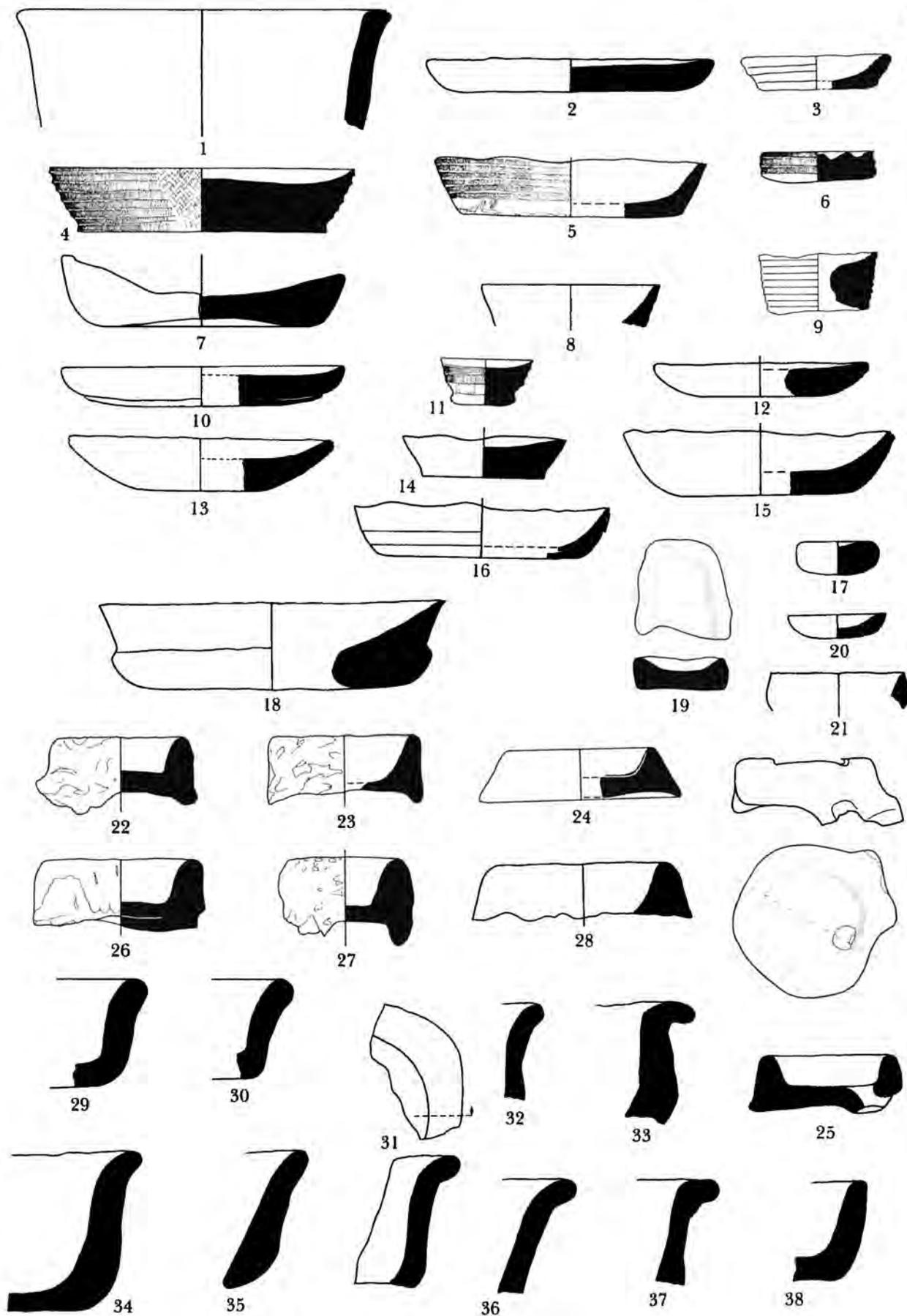


White ware pot profiles from Steps V(1)[1] to III(1)[1]: (1) 134, (2) 148, (3) 144, (4) 149, (5) 150, (6) 130, (7) 139, (8) 146, (9) 125, (10) 137, (11) 261, (12) 119, (13) 147, (14) 143, (15) 118, (16) 135, (17) 122, (18) 46, (19) 3, (20) 47, (21) 44, (22) 45, (23) 253, (24) 252, (25) 4. Scale 1:5

## PLATE 14

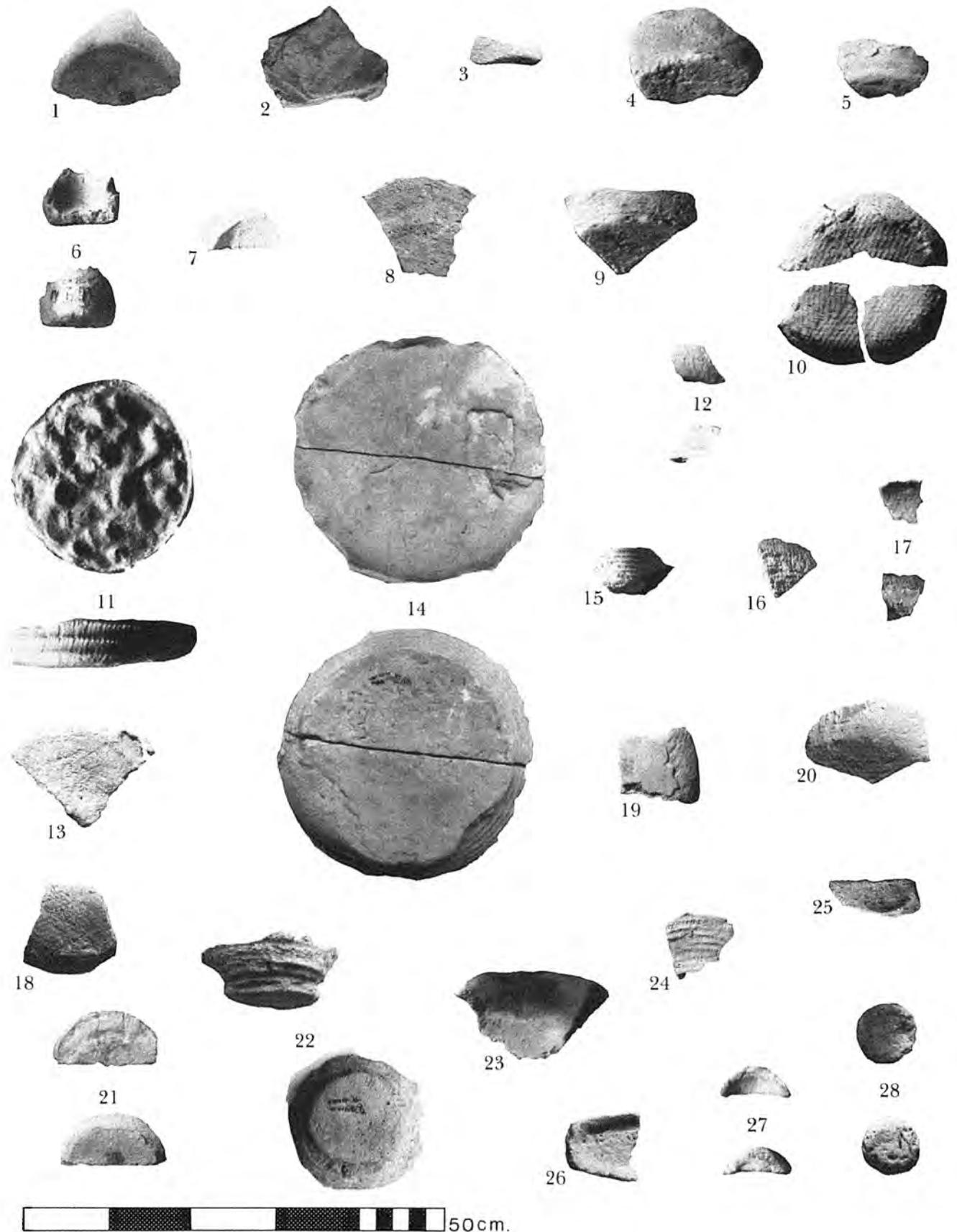


White ware rims, bases and fragments: (1) 272, (2) 73, (3) 61, (4) 18, (5) 14, (6) 146, (7) 149, (8) 125, (9) 144, (10) 130, (11) 252, (12) 47, (13) 45, (14) 194, (15) 196, (16) 166, (17) 222, (18) 209, (19) 158, (20) 168, (21) 234, (22) 71, (23) 63, (24) 6, (25) 64, (26) 11, (27) 67, (28) 68.

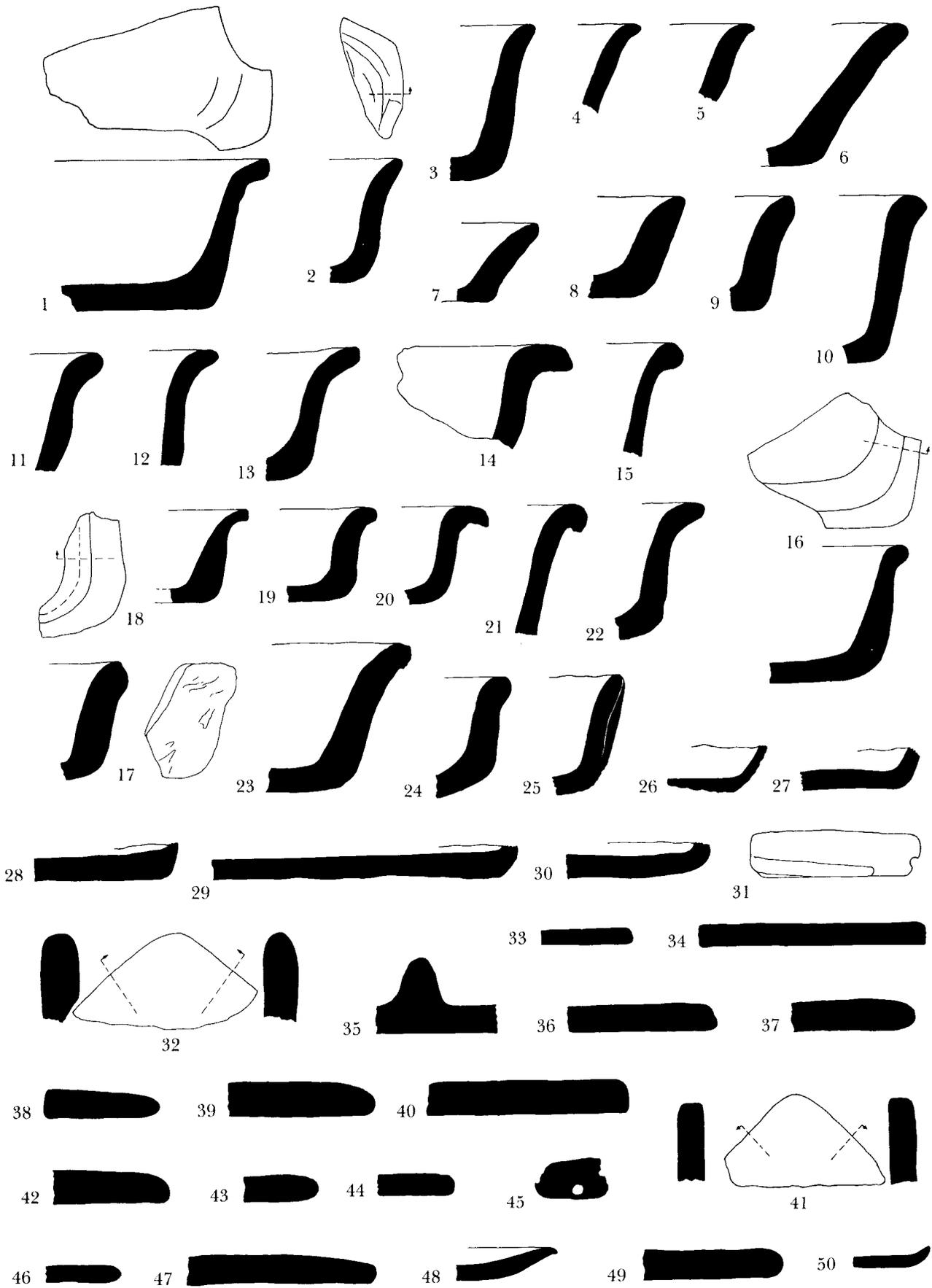


White ware jar rim, platter-low bowl, "basin" and miscellaneous vessel profiles: (1) 1, (2) 207, (3) 273, (4) 307, (5) 77, (6) 308, (7) 79, (8) 78, (9) 34, (10) 120, (11) 309, (12) 36, (13) 117, (14) 121, (15) 115, (16) 43, (17) 239, (18) 49, (19) 195, (20) 184, (21) 112, (22) 176, (23) 80, (24) 224, (25) 81, (26) 154, (27) 29, (28) 133, (29) 199, (30) 213, (31) 205, (32) 212, (33) 206, (34) 94, (35) 98, (36) 85, (37) 88, (38) 179. Scale 1:5

## PLATE 16

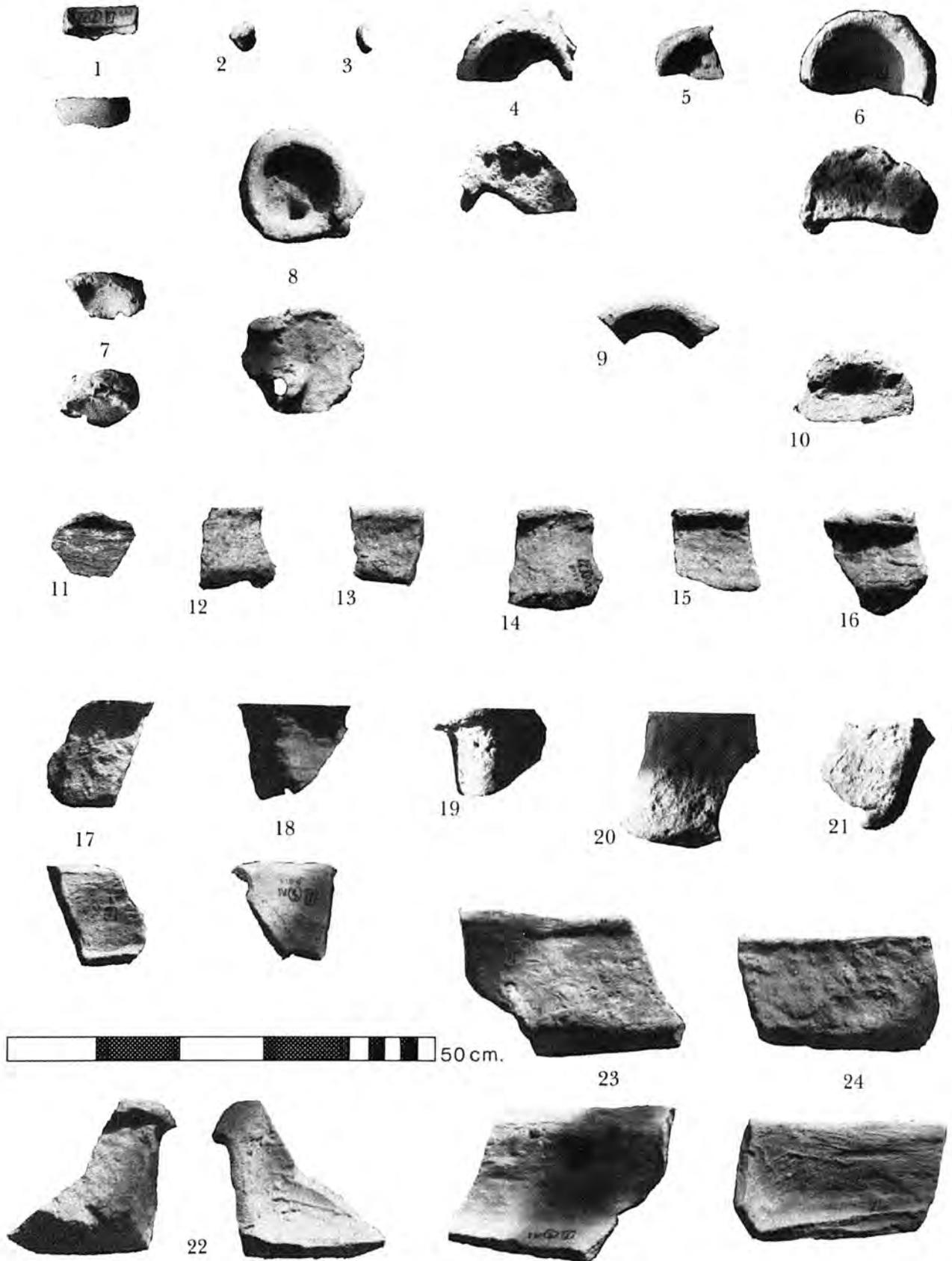


White ware bases, platters-low bowls and miscellaneous vessel fragments: (1) 135, (2) 122, (3) 150, (4) 44, (5) 43, (6) 48, (7) 4, (8) 207, (9) 233, (10) 77, (11) 308, (12) 78, (13) 79, (14) 307, (15) 34, (16) 36, (17) 35, (18) 117, (19) 120, (20) 115, (21) 121, (22) 309, (23) 49, (24) 42, (25) 274, (26) 195, (27) 184, (28) 239.

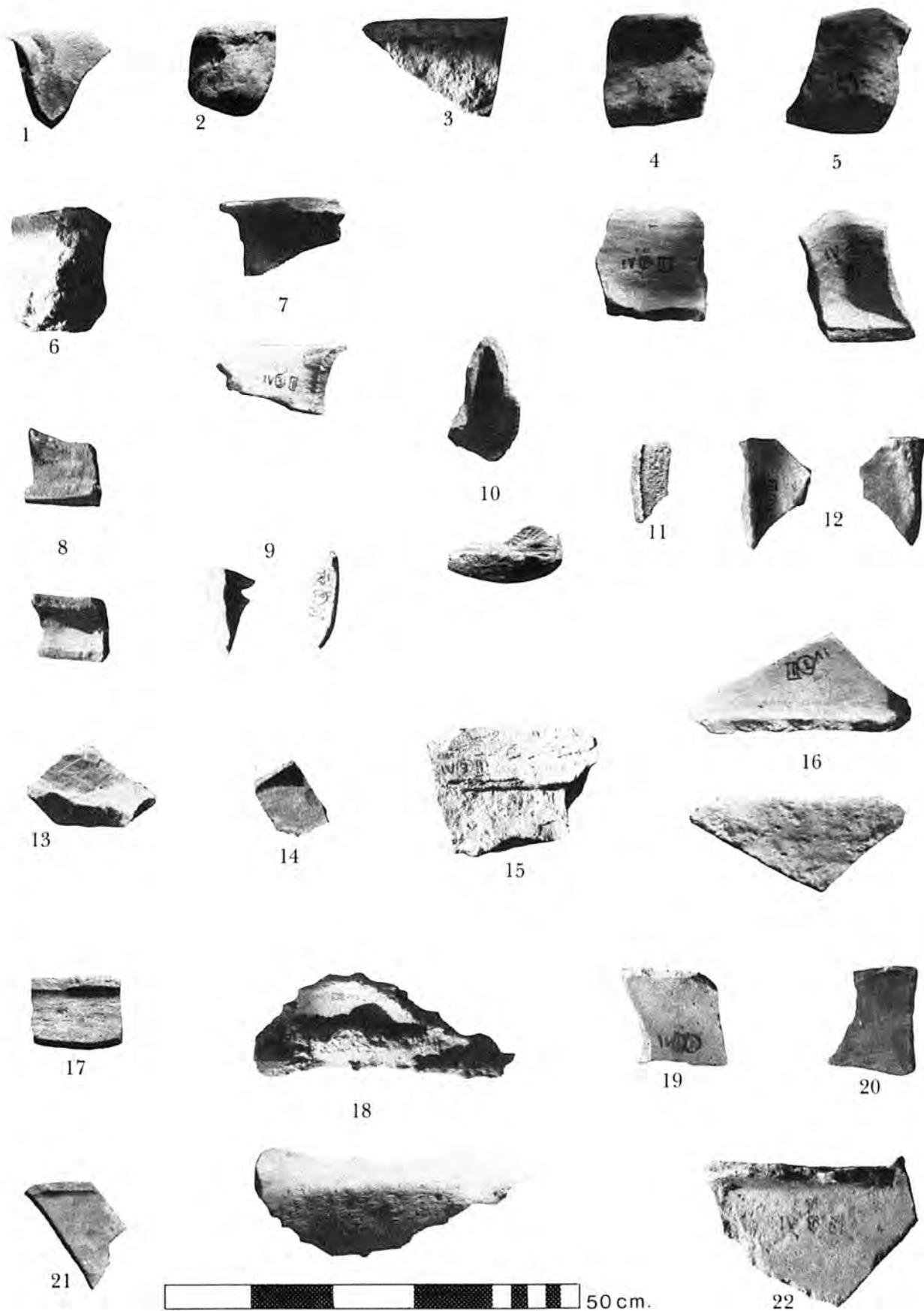


White ware "basin" and flat piece profiles: (1) 91, (2) 92, (3) 83, (4) 90, (5) 89, (6) 183, (7) 178, (8) 187, (9) 186, (10) 171, (11) 177, (12) 161, (13) 188, (14) 151, (15) 15, (16) 56, (17) 126, (18) 128, (19) 127, (20) 124, (21) 54, (22) 60, (23) 57, (24) 96, (25) 53, (26) 258, (27) 70, (28) 62, (29) 175, (30) 138, (31) 197, (32) 215, (33) 230, (34) 217, (35) 226, (36) 218, (37) 235, (38) 245, (39) 106, (40) 86, (41) 155, (42) 103, (43) 87, (44) 174, (45) 191, (46) 104, (47) 167, (48) 12, (49) 13, (50) 69. Scale 1:5

## PLATE 18



White ware "basin" fragments: (1) 112, (2) 275, (3) 263, (4) 176, (5) 224, (6) 154, (7) 80, (8) 81, (9) 133, (10) 29, (11) 262, (12) 199, (13) 205, (14) 212, (15) 206, (16) 213, (17) 188, (18) 151, (19) 171, (20) 94, (21) 98, (22) 93, (23) 91, (24) 83.

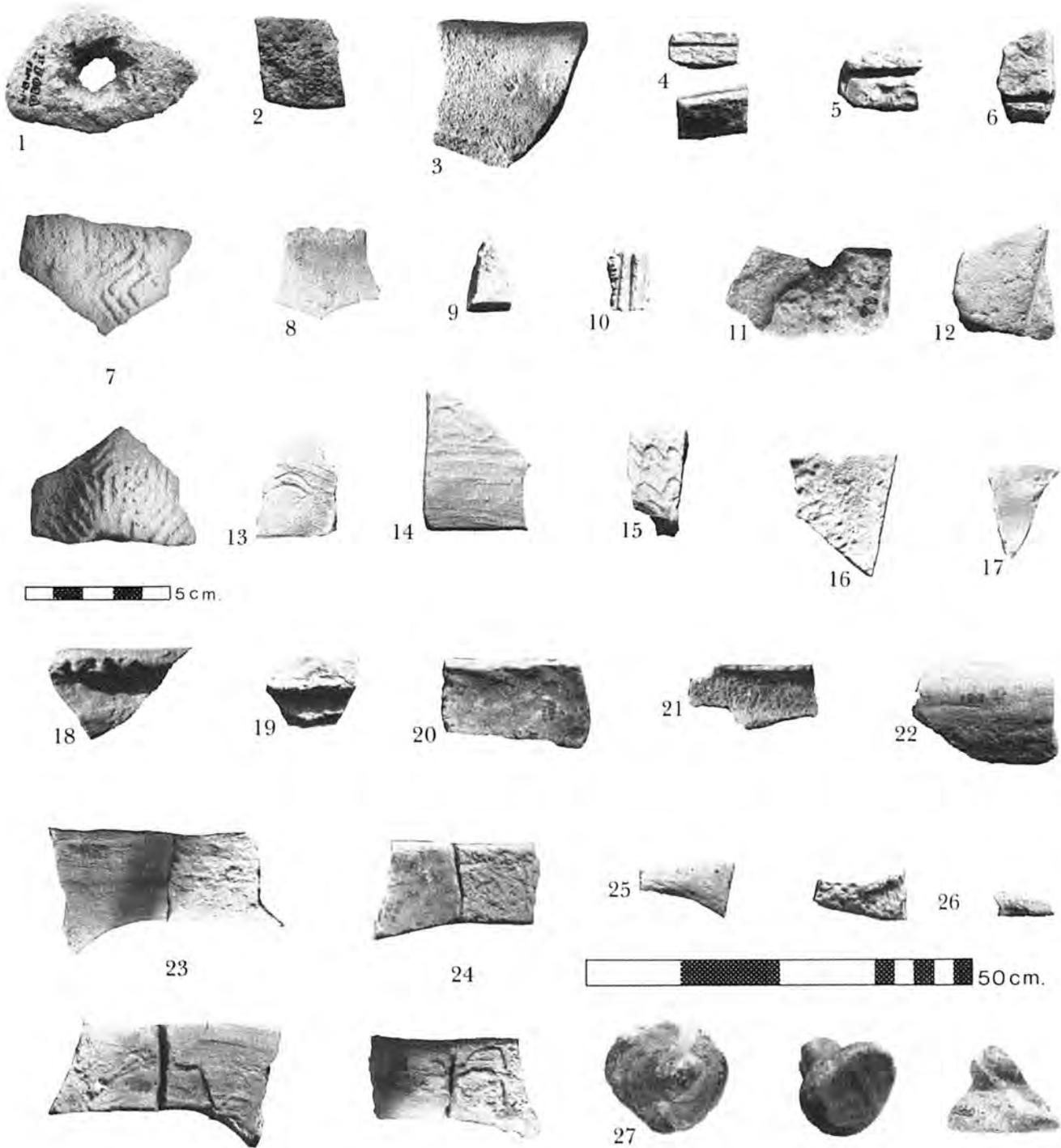


White ware "basin" rim, spout and base fragments: (1) 123, (2) 126, (3) 54, (4) 60, (5) 56, (6) 57, (7) 181, (8) 276, (9) 95, (10) 277, (11) 249, (12) 58, (13) 278, (14) 258, (15) 185, (16) 175, (17) 279, (18) 280, (19) 70, (20) 62, (21) 138, (22) 59.

## PLATE 20

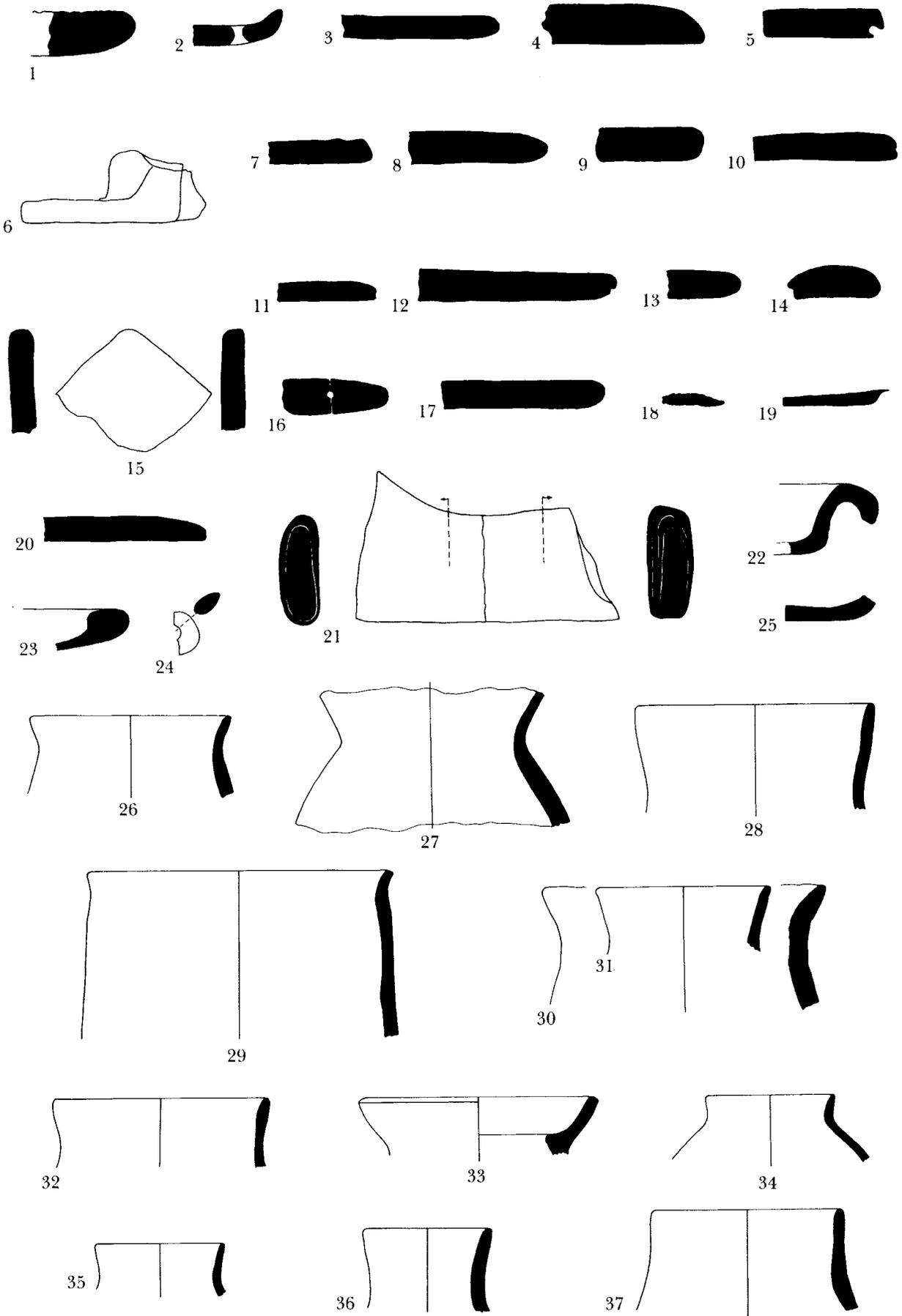


White ware flat pieces: (1) 281, (2) 282, (3) 283, (4) 284, (5) 285, (6) 254, (7) 197, (8) 215, (9) 227, (10) 226, (11) 286, (12) 173, (13) 182, (14) 192, (15) 293, (16) 162, (17) 189, (18) 287, (19) 191, (20) 245, (21) 100, (22) 102, (23) 101, (24) 86, (25) 289, (26) 157, (27) 87, (28) 103, (29) 12, (30) 27, (31) 69, (32) 10, (33) 8, (34) 32, (35) 290, (36) 33, (37) 31, (38) 30, (39) 306, (40) 310, (41) 141, (42) 247, (43) 140, (44) 292.

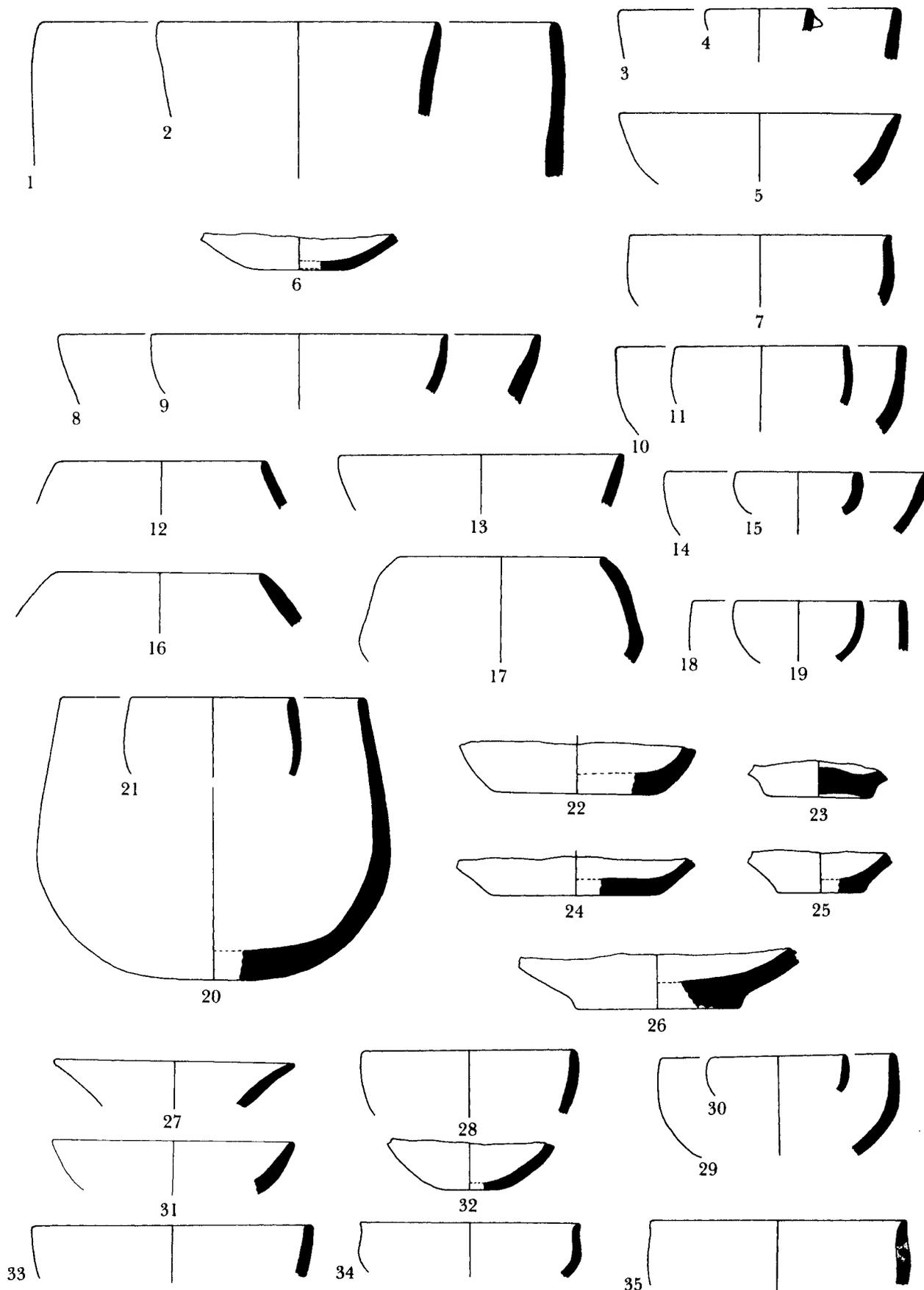


White ware miscellaneous pieces, sealed fragment and seal: (1) 311, (2) 37, (3) 40, (4) 5, (5) 295, (6) 296, (7) 270, (8) 2, (9) 297, (10) 298, (11) 312, (12) 299, (13) 300, (14) 266, (15) 301, (16) 302, (17) 9, (18) 17, (19) 26, (20) 221, (21) 303, (22) 304, (23) 232, (24) 52, (25) 250, (26) 251, (27) 313.

PLATE 22



White ware profiles of flat and miscellaneous pieces: (1) 8, (2) 30, (3) 305 (4) 141, (5) 297, (6) 247, (7) 140, (8) 142, (9) 136, (10) 132, (11) 39, (12) 40, (13) 38, (14) 52, (15) 37, (16) 5, (17) 41, (18) 270, (19) 2, (20) 266, (21) 232, (22) 17, (23) 26, (24) 263, (25) 221; Pottery jar profiles: (26) 170, (27) 163, (28) 106, (29) 116, (30) 110, (31) 91, (32) 56, (33) 33, (34) 18, (35) 189, (36) 16, (37) 186. Scale 1:5

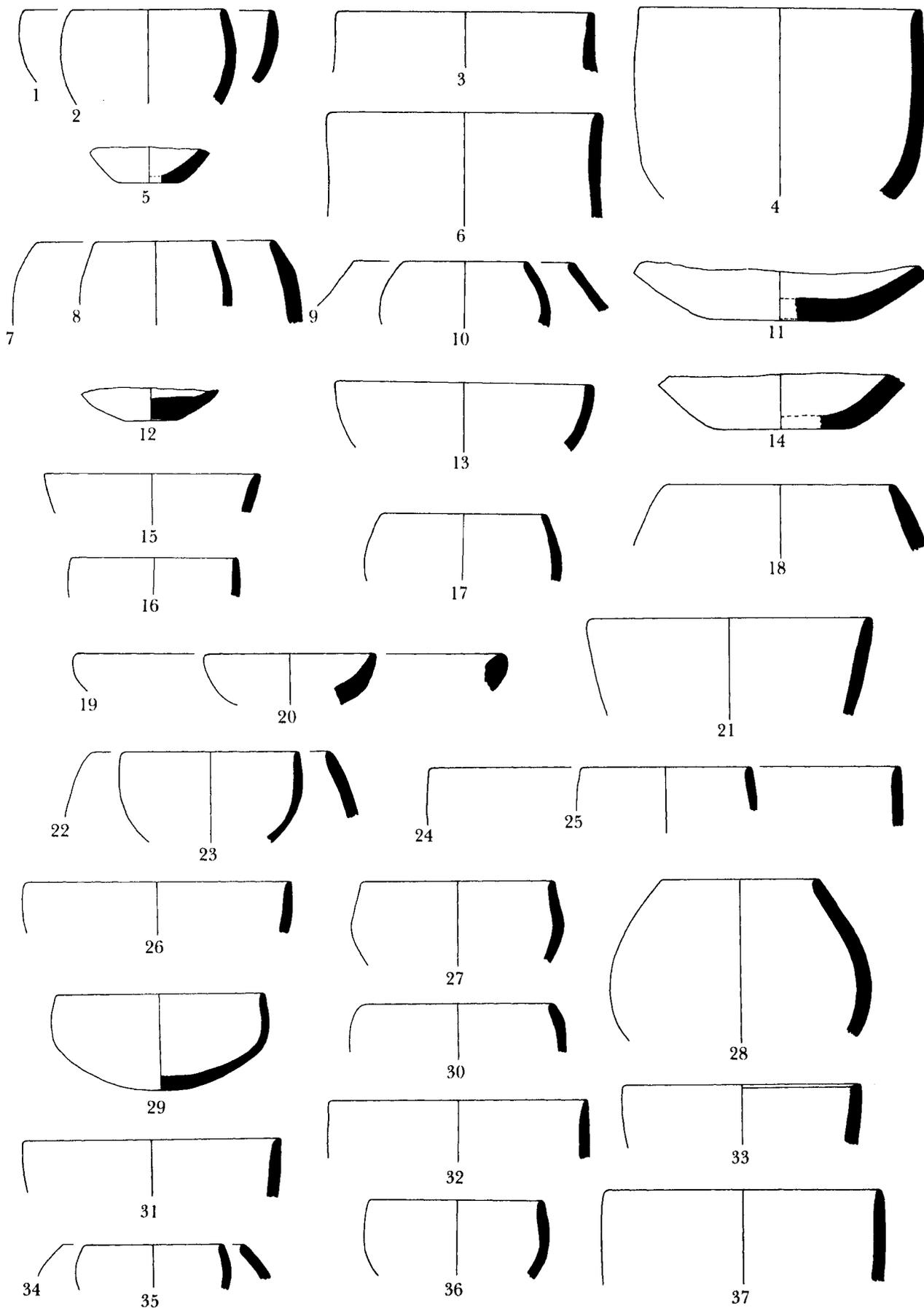


Normal ware pottery bowl and pot profiles from Steps V(1)[4] to III(2)[5]: (1) 174, (2) 175, (3) 167, (4) 157, (5) 159, (6) 172, (7) 166, (8) 161, (9) 164, (10) 160, (11) 169, (12) 168, (13) 148, (14) 154, (15) 133, (16) 138, (17) 147, (18) 140, (19) 134, (20) 67, (21) 139, (22) 146, (23) 145, (24) 144, (25) 151, (26) 155, (27) 98, (28) 82, (29) 118, (30) 100, (31) 112, (32) 104, (33) 95, (34) 97, (35) 80.  
Scale 1:5

## PLATE 24



Normal ware pottery jars, bowls and pots: (1) 170, (2) 163, (3) 106, (4) 116, (5) 110, (6) 91, (7) 56, (8) 33, (9) 18, (10) 16, (11) 191, (12) 192, (13) 193, (14) 194, (15) 123, (16) 195, (17) 196, (18) 70, (19) 197, (20) 198, (21) 199, (22) 200, (23) 174, (24) 167, (25) 157, (26) 166, (27) 161, (28) 164, (29) 160, (30) 169, (31) 168, (32) 148, (33) 154, (34) 133, (35) 138, (36) 147, (37) 140, (38) 134, (39) 139, (40) 98, (41) 82, (42) 118, (43) 67, (44) 100, (45) 95, (46) 97, (47) 80, (48) 89, (49) 96. Scale 1:5

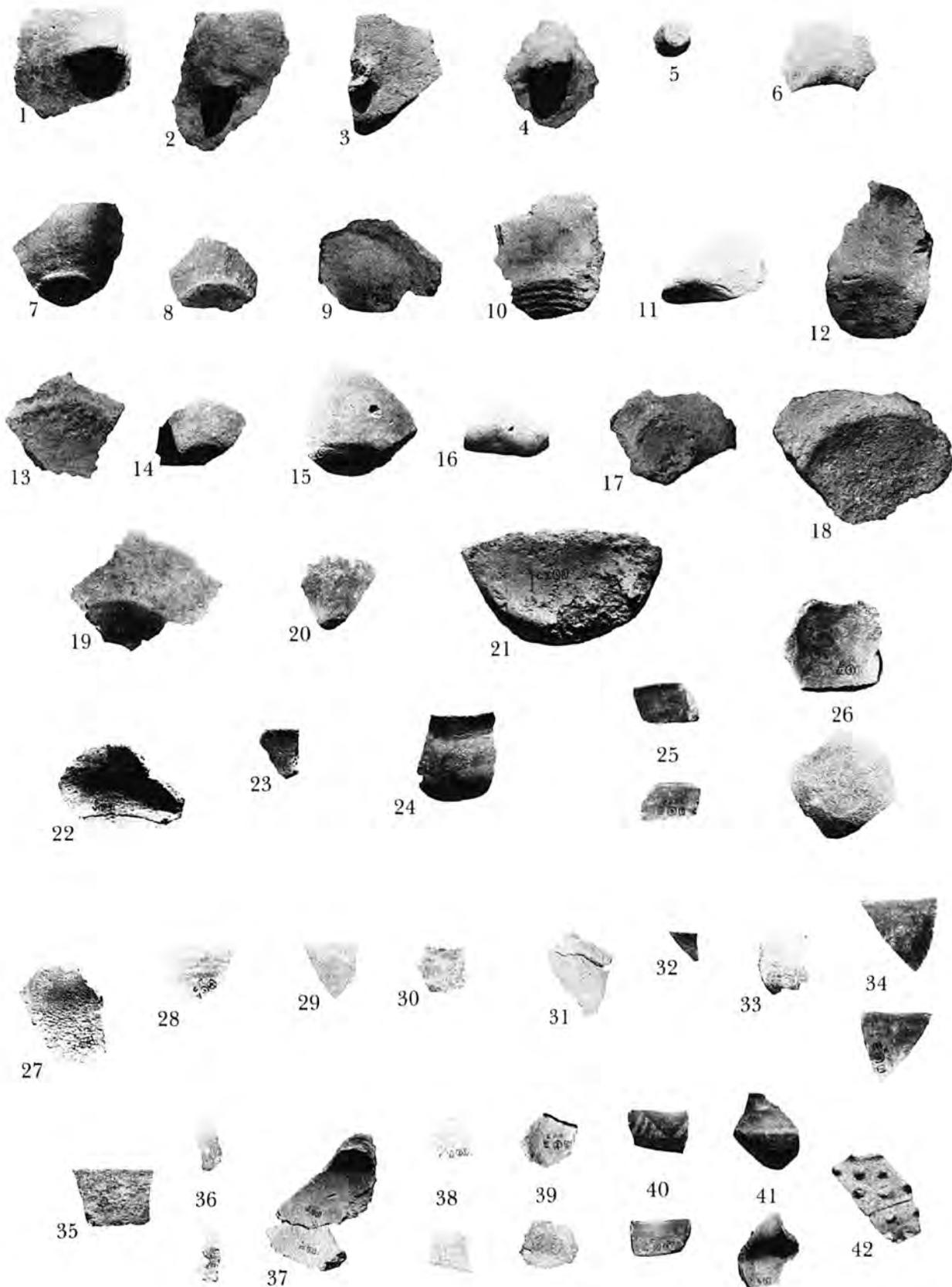


Normal ware pottery bowl and pot profiles from Step III: (1) 89, (2) 117, (3) 96, (4) 115, (5) 103, (6) 93, (7) 102, (8) 85, (9) 94, (10) 81, (11) 111, (12) 101, (13) 128, (14) 113, (15) 126, (16) 125, (17) 122, (18) 130, (19) 32, (20) 43, (21) 41, (22) 74, (23) 55, (24) 36, (25) 42, (26) 37, (27) 46, (28) 215, (29) 76, (30) 40, (31) 73, (32) 72, (33) 71, (34) 48, (35) 68, (36) 66, (37) 61. Scale 1:5

## PLATE 26

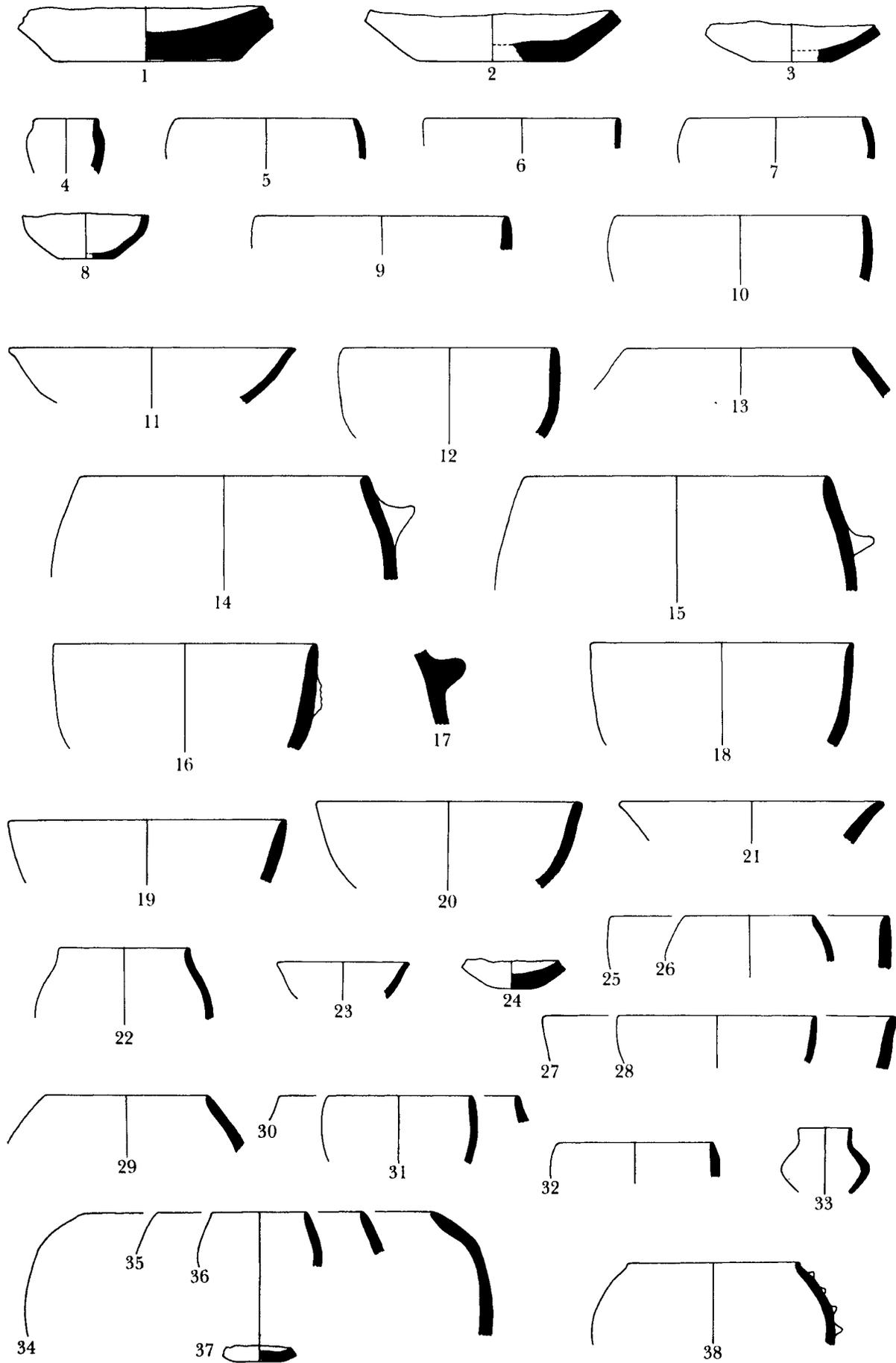


Normal ware pottery bowls and pots: (1) 115, (2) 93, (3) 102, (4) 85, (5) 81, (6) 117, (7) 201, (8) 128, (9) 126, (10) 125, (11) 43, (12) 41, (13) 122, (14) 130, (15) 32, (16) 37, (17) 55, (18) 36, (19) 42, (20) 76, (21) 46, (22) 215, (23) 202, (24) 48, (25) 40, (26) 73, (27) 72, (28) 71, (29) 74, (30) 68, (31) 66, (32) 61, (33) 23, (34) 20, (35) 25, (36) 24, (37) 127, (38) 17, (39) 12, (40) 7, (41) 6, (42) 10.  
Scale 1:5

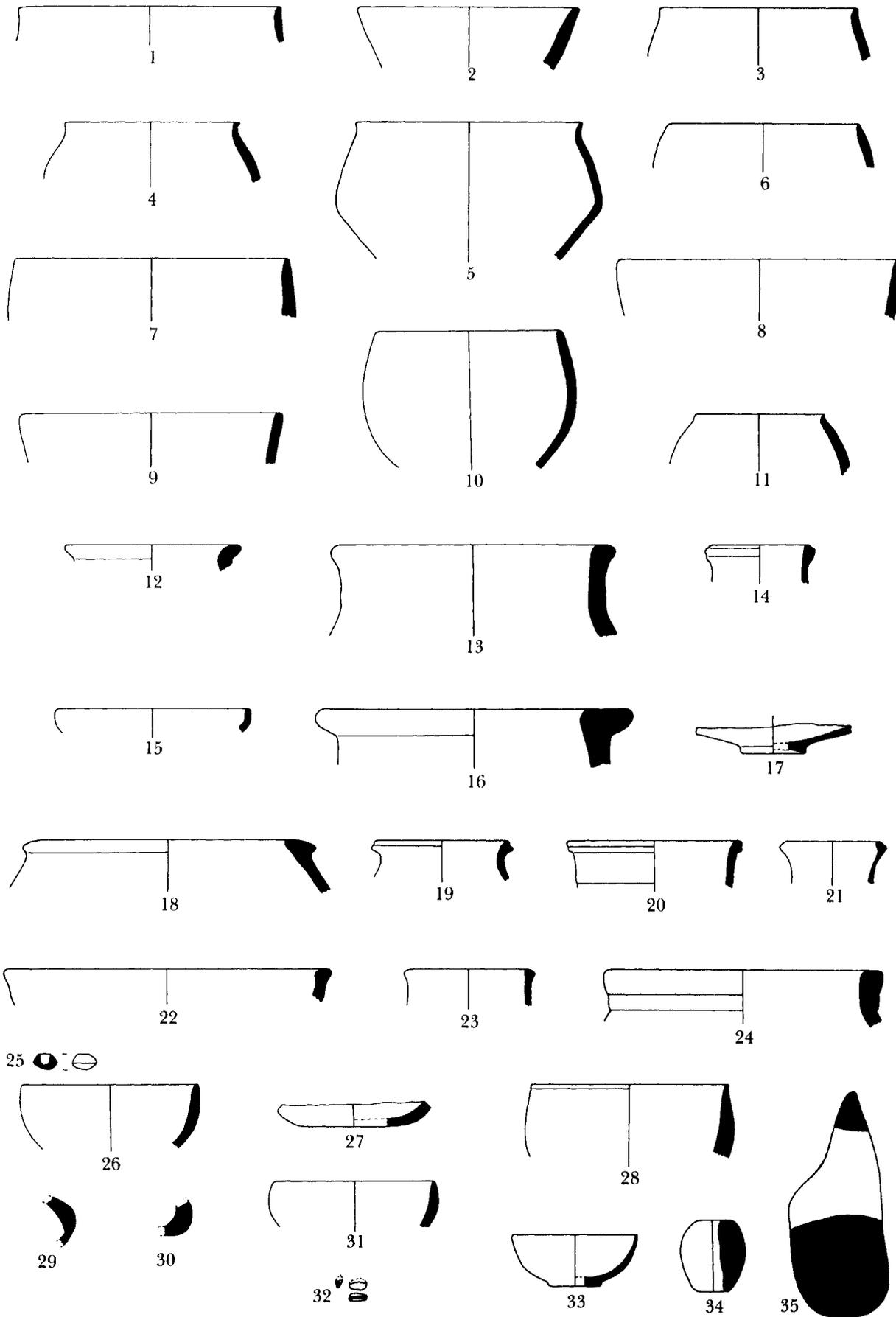


Normal ware pottery sherds with handles, knob and base sherds: (1) 109, (2) 77, (3) 44, (4) 63, (5) 203, (6) 172, (7) 162, (8) 151, (9) 145, (10) 155, (11) 146, (12) 144, (13) 111, (14) 103, (15) 113, (16) 104, (17) 101, (18) 65, (19) 64, (20) 19, (21) 204, Hard ware bowl and jar sherds: (22) 177, (23) 165, (24) 176, (25) 135, (26) 143, (27) 173, (28) 171, (29) 132, (30) 141, (31) 149, (32) 137, (33) 107, (34) 152, (35) 92, (36) 99, (37) 131, (38) 105, (39) 84, (40) 83, (41) 79, (42) 78. Scale 1:5

## PLATE 28

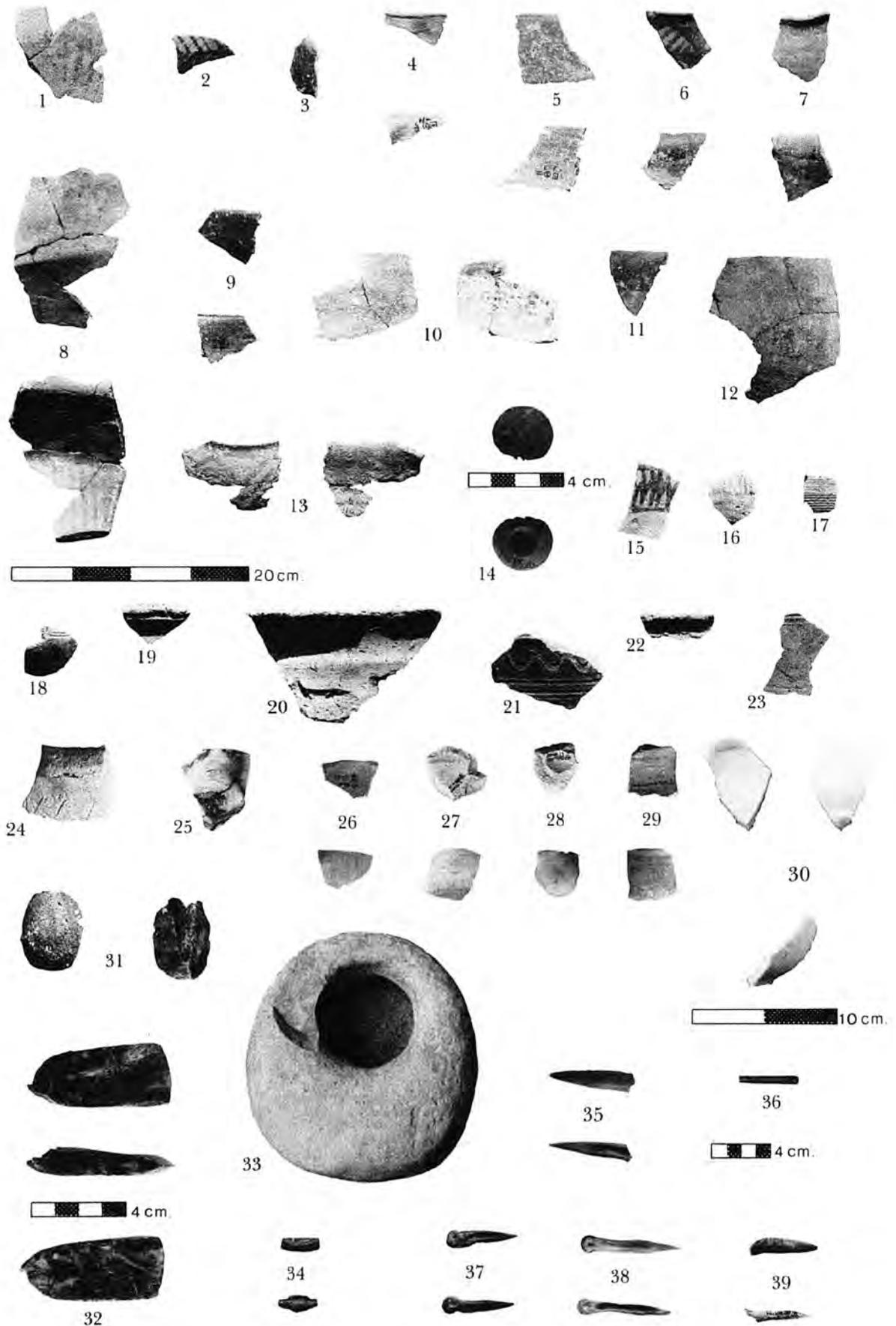


Normal ware pottery base and sherd, pot and bowl rim profiles: (1) 65, (2) 64, (3) 19, (4) 23, (5) 20, (6) 25, (7) 24, (8) 27, (9) 17, (10) 12, (11) 7, (12) 6, (13) 10, (14) 109, (15) 77, (16) 44, (17) 63; Hard ware pottery bowl and pot profiles: (18) 173, (19) 171, (20) 177, (21) 165, (22) 176, (23) 135, (24) 143, (25) 132, (26) 141, (27) 92, (28) 99, (29) 149, (30) 137, (31) 152, (32) 83, (33) 79, (34) 131, (35) 105, (36) 107, (37) 84, (38) 78. Scale 1:5

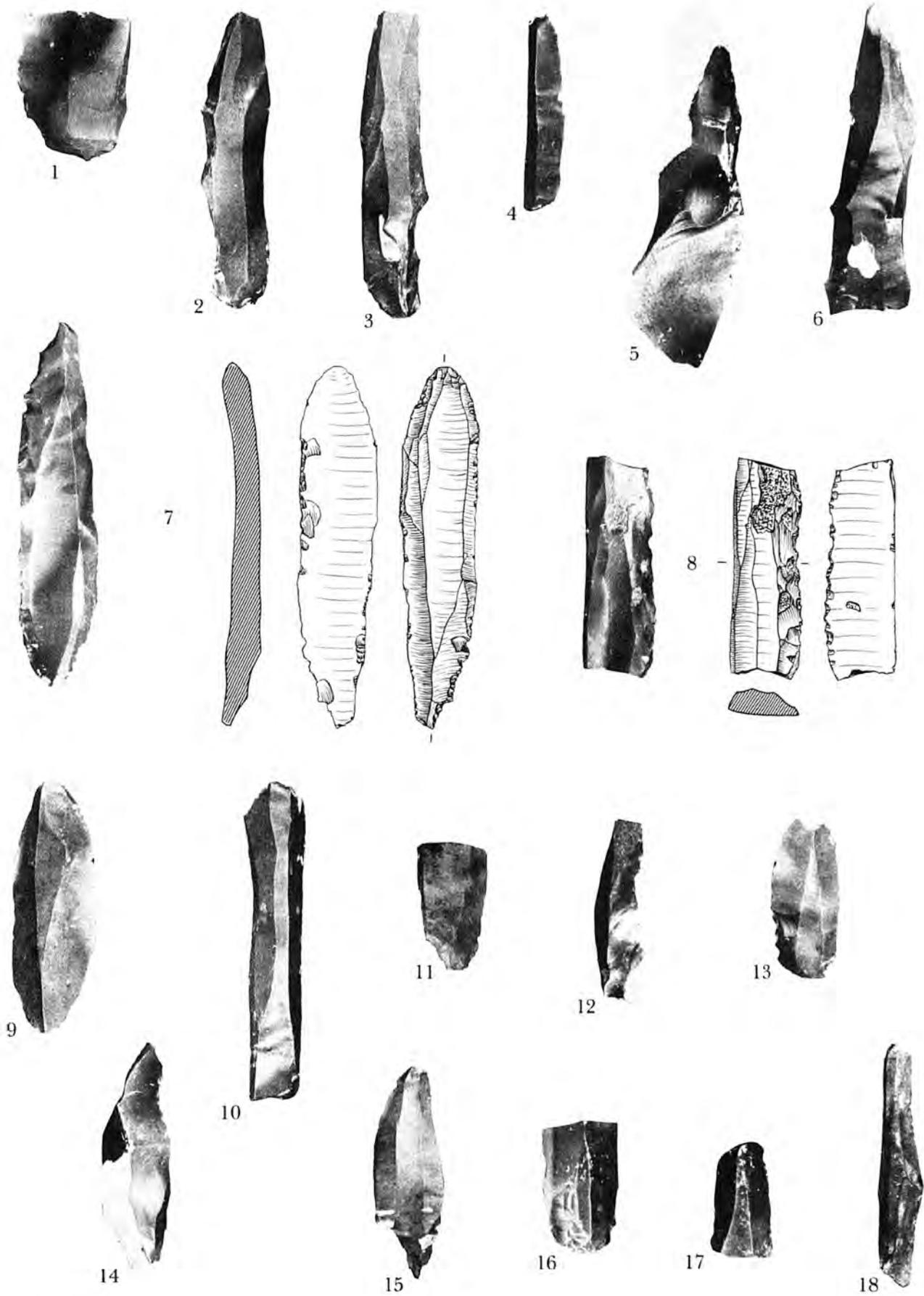


Hard ware pottery pot and bowl profiles: (1) 124, (2) 57, (3) 39, (4) 47, (5) 51, (6) 54, (7) 69, (8) 62, (9) 22, (10) 15, (11) 136; Late pottery profiles: (12) 14, (13) 4, (14) 3, (15) 184, (16) 185, (17) 180, (18) 188, (19) 187, (20) 182, (21) 190, (22) 9, (23) 1, (24) 179; Hard ware pottery knob: (25) 216; Stone—Bowl fragment profile: (26) 1, (27) 2, (28) 3, (29) 4, (30) 5, (31) 6; Bead: (32) 7; Bowl profile: (33) 8, Macehead fragment: (34) 9, Weight: (35) 10. Scale 1:5

## PLATE 30

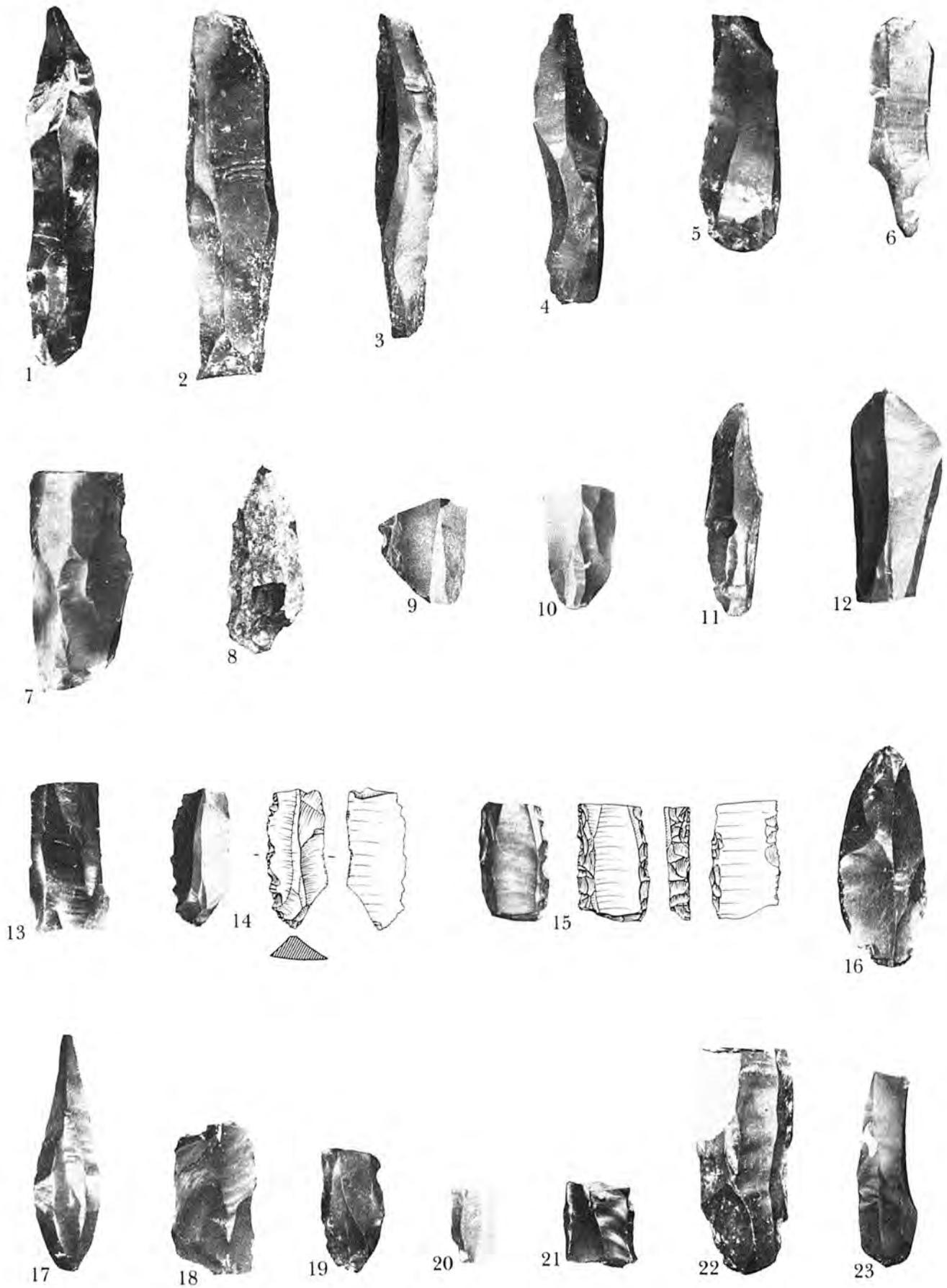


Hard ware jar and pot rims and body sherds: (1) 87, (2) 205, (3) 206, (4) 124, (5) 57, (6) 39, (7) 47, (8) 51, (9) 54, (10) 207, (11) 62, (12) 15, (13) 136; Post-Neolithic pottery sherds: (14) 216, (15) 208, (16) 209, (17) 210, (18) 211, (19) 3, (20) 4, (21) 212, (22) 213, (23) 214, (24) 188; Stone bowl fragments: (25) 1, (26) 2, (27) 3, (28) 4, (29) 5, (30) 8; Stone—Macehead fragment: (31) 9; Polished axe head: (32) 11; Weight: (33) 10; Bead fragment: (34) 7; Bone tools and fragments: (35) 1, (36) 2, (37) 4, (38) 5, (39) 6.



Flint blades from Step IX (2): (1) IX(2)[8], (2-6) IX(2)[7], (7-8) IX(2)[5], (9) IX(2)[4], (10) IX(2)[3], (11) IX(2)[4], (12-16) IX(2)[3], (17-18) IX(2)[1]. Scale 1:2

PLATE 32



Flint blades from Steps IX(2) to VIII(1): (1) IX(2)[1], (2-6) IX(1)[4], (7-15) IX(1)[2], (16-19) VIII(2)[2], (20-23) VIII(1)[4]. Scale 1:2

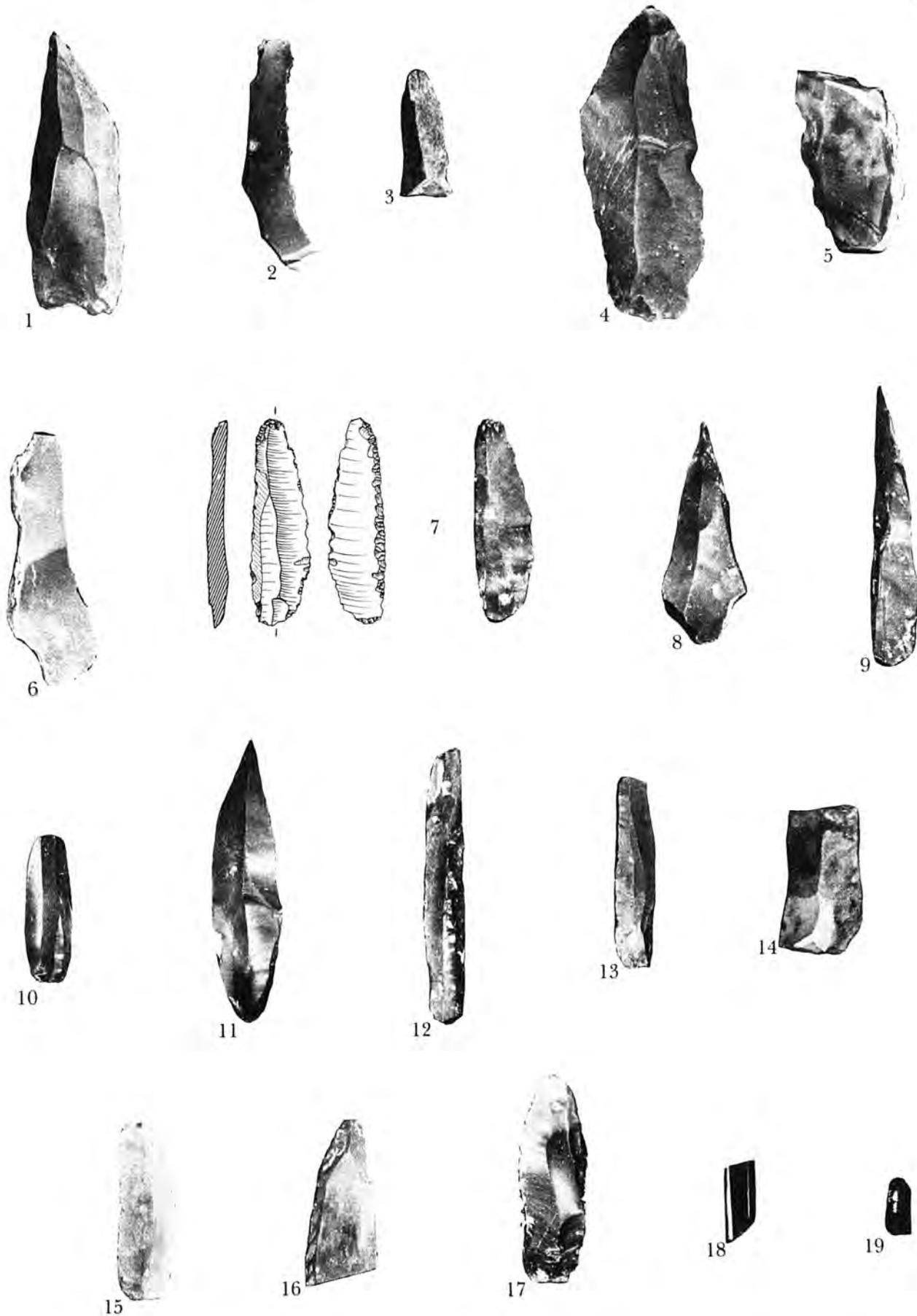


Flint blades from Steps VIII(1) to VI(2): (1-8) VIII(1)[4], (9-13) VIII(1)[2], (14-23) VII(1)[2], (24-26) VI(2)[2]. Scale 1:2

PLATE 34



Flint blades from Steps VI(1) to III(2): (1-3) VI(1)[3], (4-6) V(2)[3], (7-10) V(2)[2], (11-14) V(1)[2], (15) IV(1)[2], (16-22) III(2)[5]. Scale 1:2

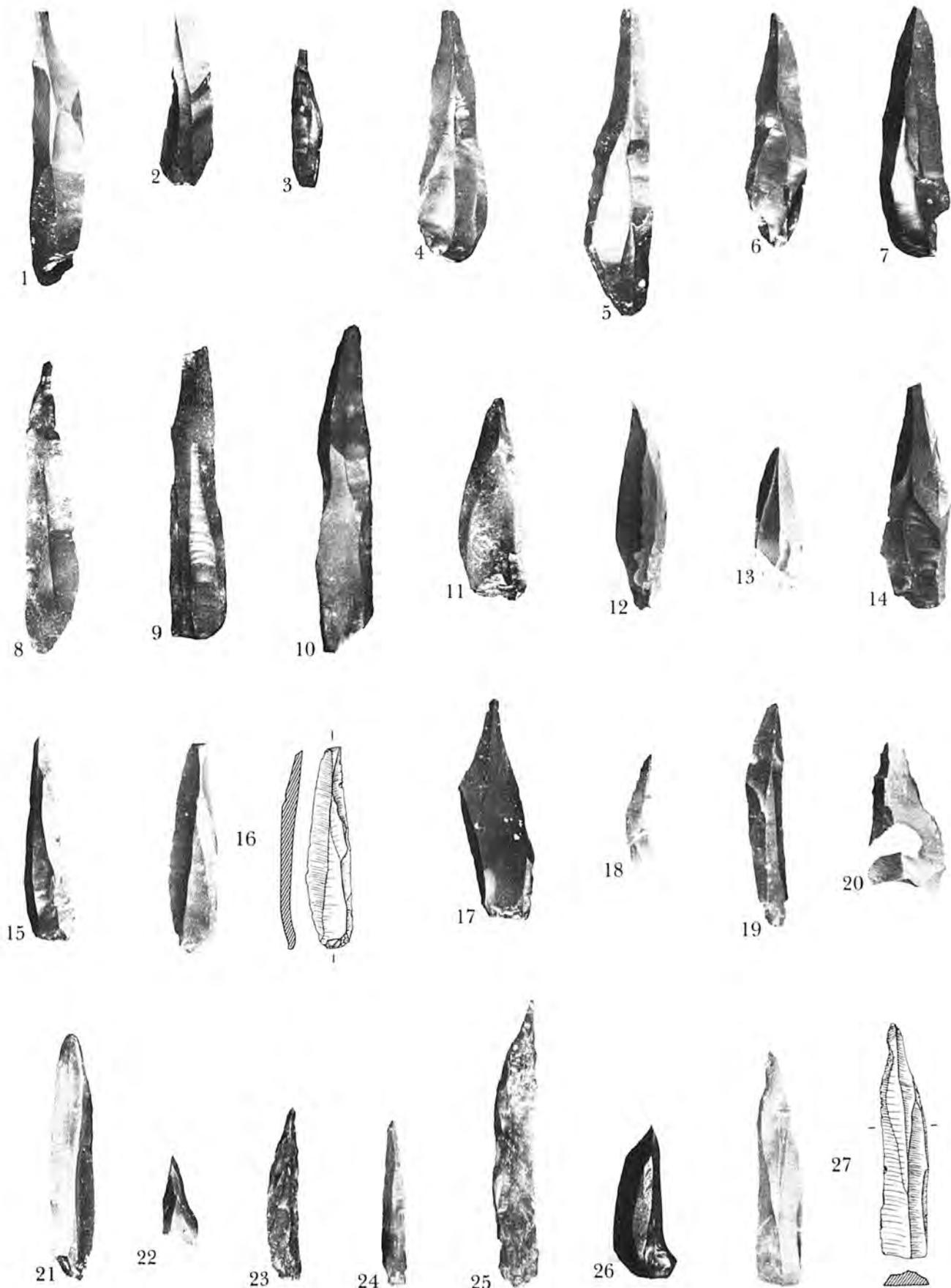


Flint blades from Steps III(2), III(1), II(1) and surface: (1-3) III(2)[5], (4-6) III(2)[1], (7) III(1)[4], (8-9) III(1)[3], (10) surface, (11-13) III(1)[3], (14-15) III(1)[2], (16-17) II(1)[3], (18-19) surface. Scale 1:2

## PLATE 36

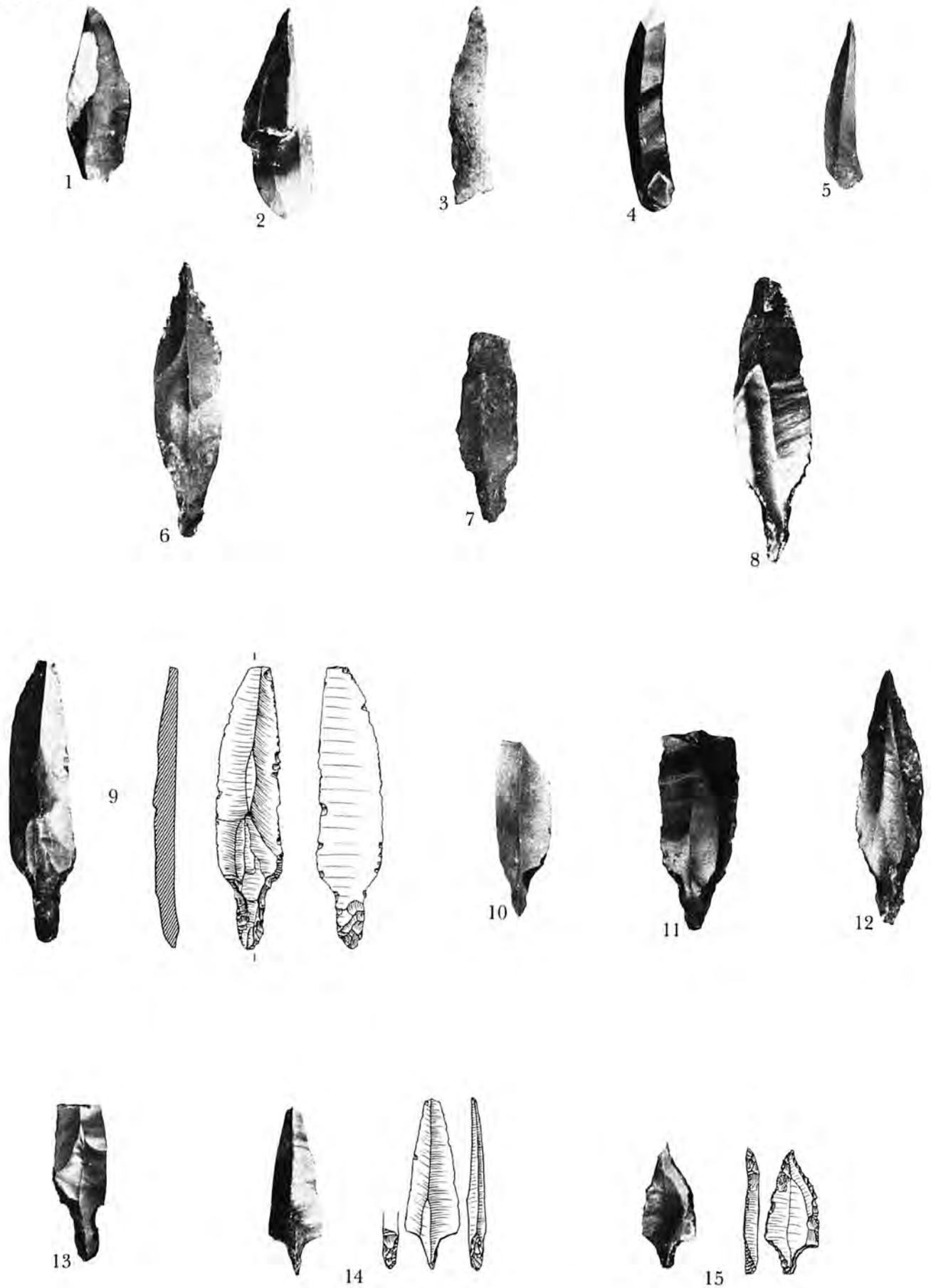


Fish-tail blades: (1) IX(2)[8], (2-4) IX(2)[7], (5) IX(2)[5], (6) IX(2)[4], (7-8) IX(2)[1], (9-14) VIII(1)[4], (15-18) VIII(1)[2], (19-23) VII(1)[2], (24-25) VI(1)[2], (26) V(1)[2], (27) III(1)[3]. Scale 1:2

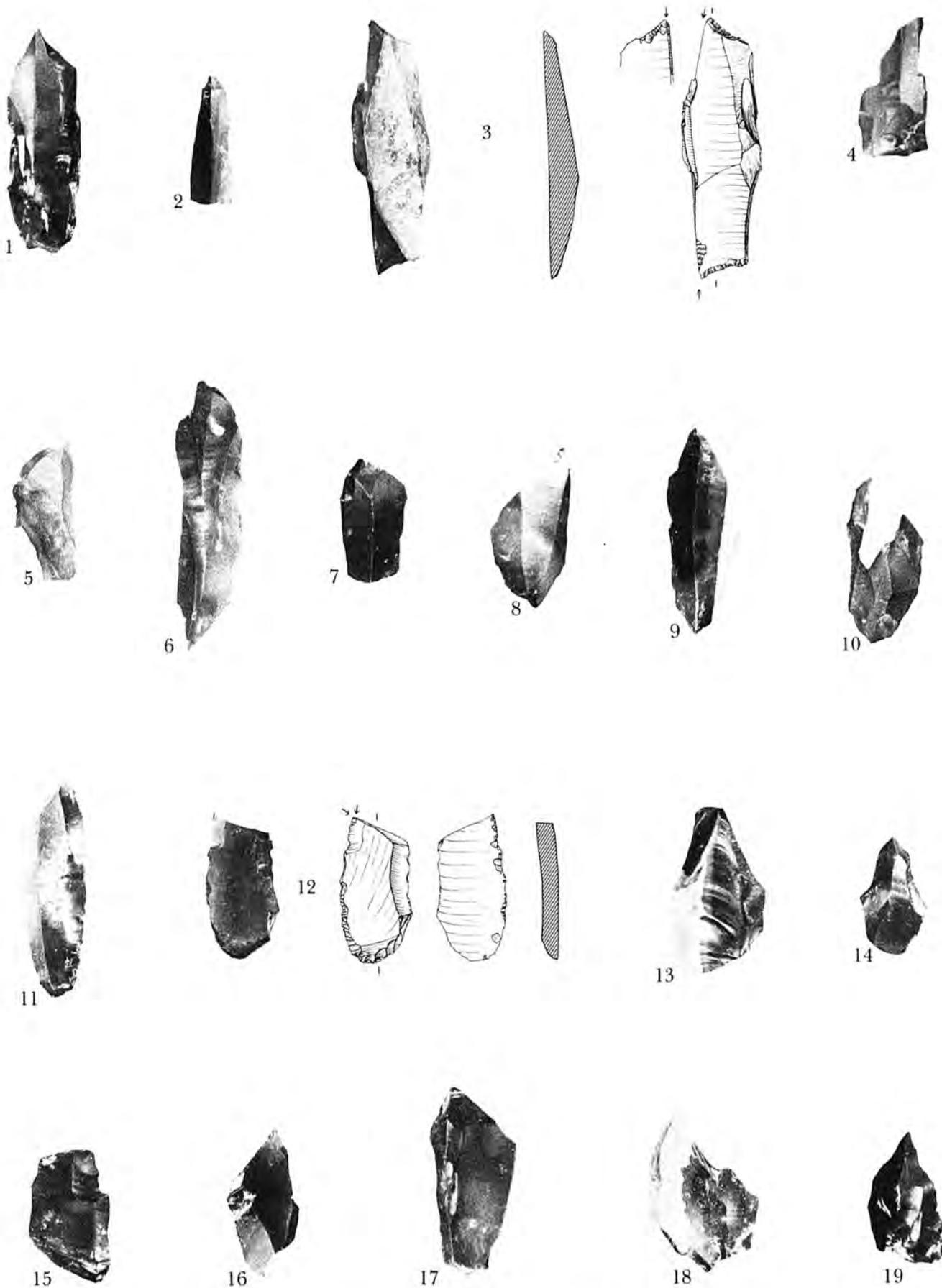


Blade points: (1-3) IX(2)[7], (4-6) IX(2)[4], (7) IX(2)[3], (8-11) IX(2)[1], (12-17) IX(1)[2], (18) VIII(2)[2], (19-21) VIII(1)[4], (22-25) VII(1)[2], (26) VI(1)[2], (27) V(2)[3]. Scale 1:2

PLATE 38

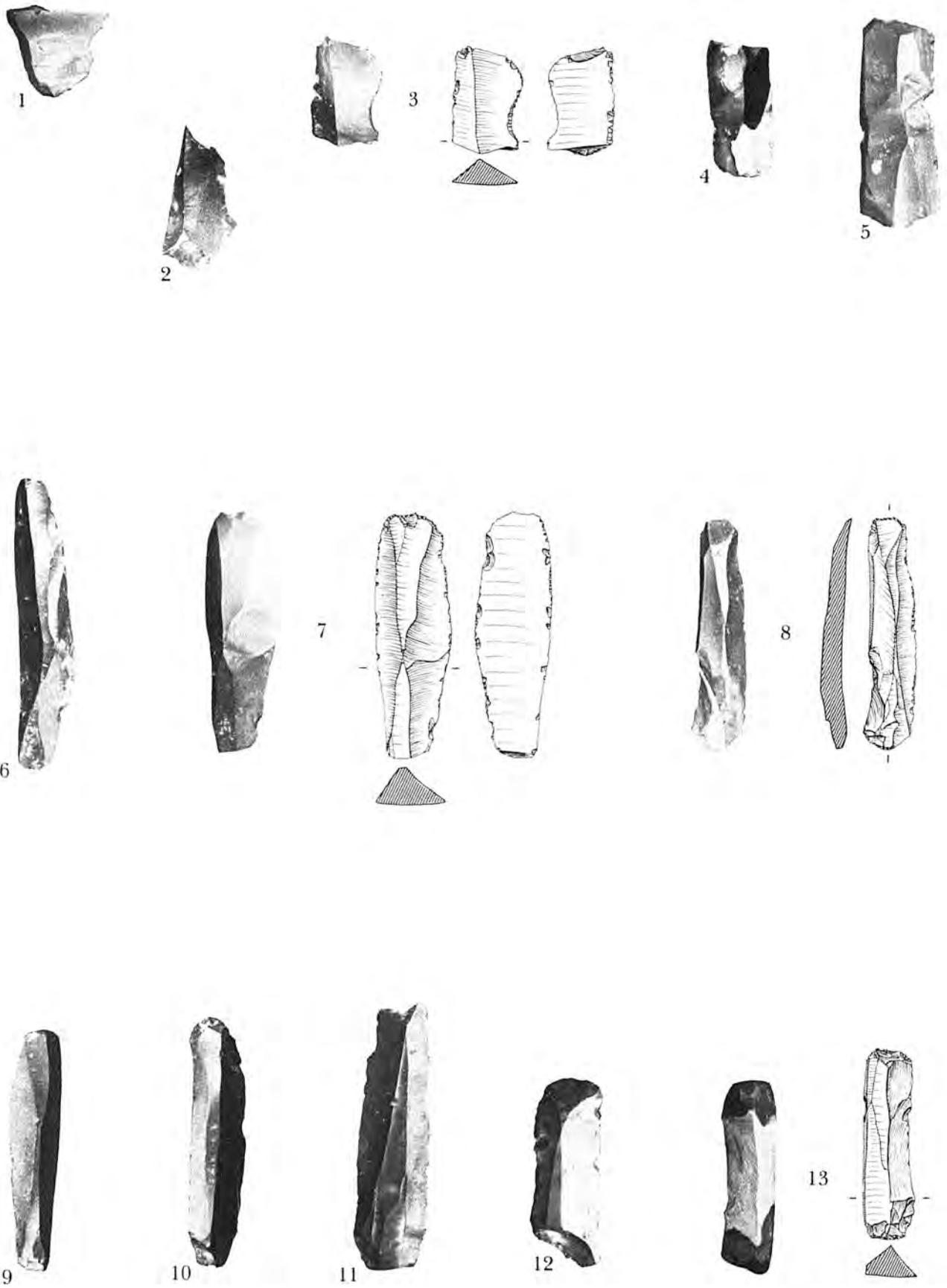


Blade points: (1-2) III(2)[5], (3-4) III(2)[1], (5) III(1)[3]; Projectile points: (6) IX(2)[8], (7) IX(2)[4], (8-9) VII(1)[2], (10) V(2)[2], (11) IV(1)[3], (12) III(2)[1], (13-14) III(1)[4], (15) surface. Scale 1:2



Burins: (1) IX(1)[4], (2-4) IX(1)[2], (5) VIII(1)[4], (6) VIII(1)[2], (7-8) VII(1)[2], (9-11) VI(1)[2], (12) V(2)[3], (13) V(2)[2], (14) V(1)[2], (15-18) III(2)[5], (19) III(2)[1]. Scale 1:2

PLATE 40

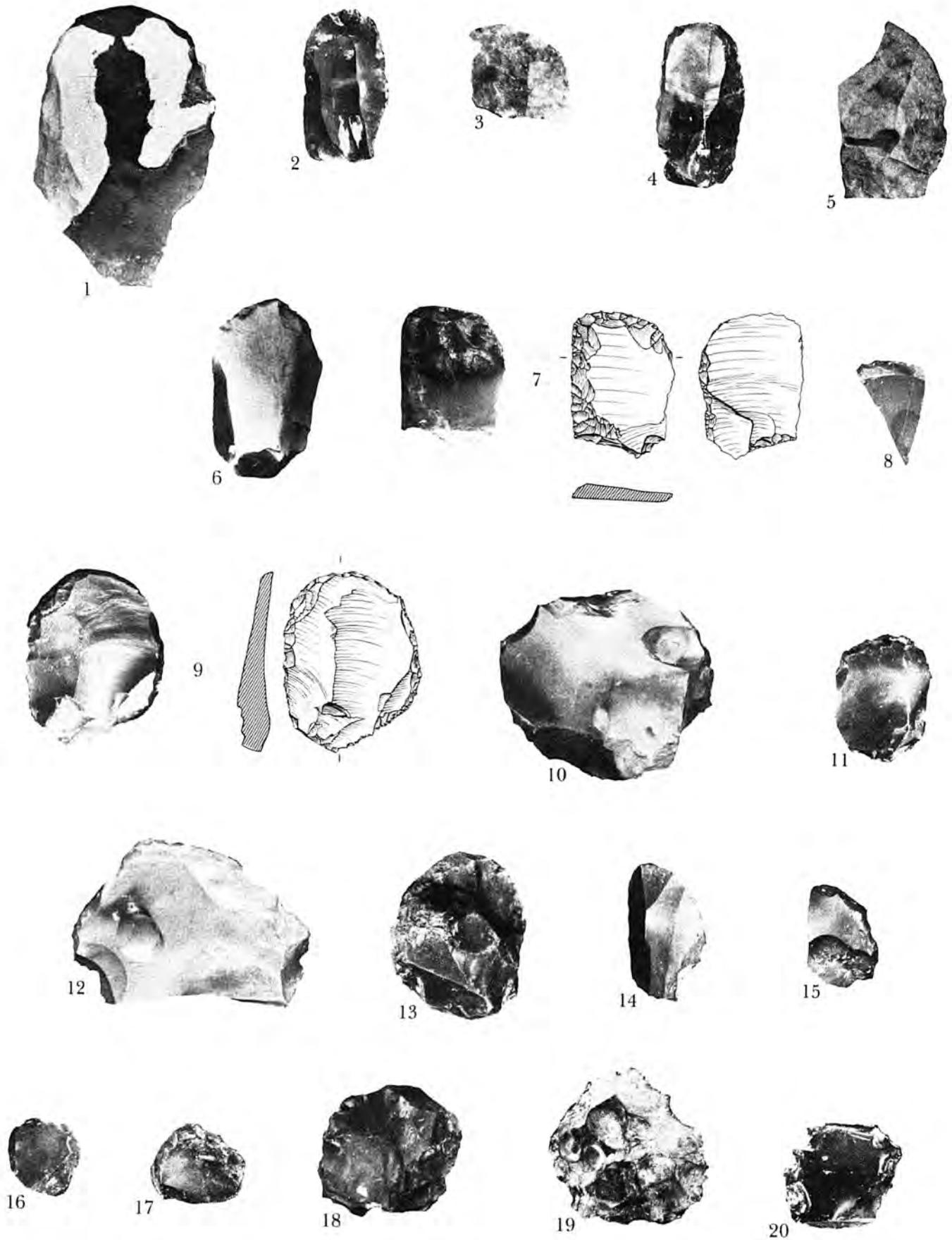


Notched blades and flakes: (1) IX(1)[2], (2) VII(1)[2], (3) V(2)[3]; Scrapers and blades: (4) IX(2)[1], (5-11) IX(1)[2], (12) VI(2)[2], (13) III(1)[2]. Scale 1:2

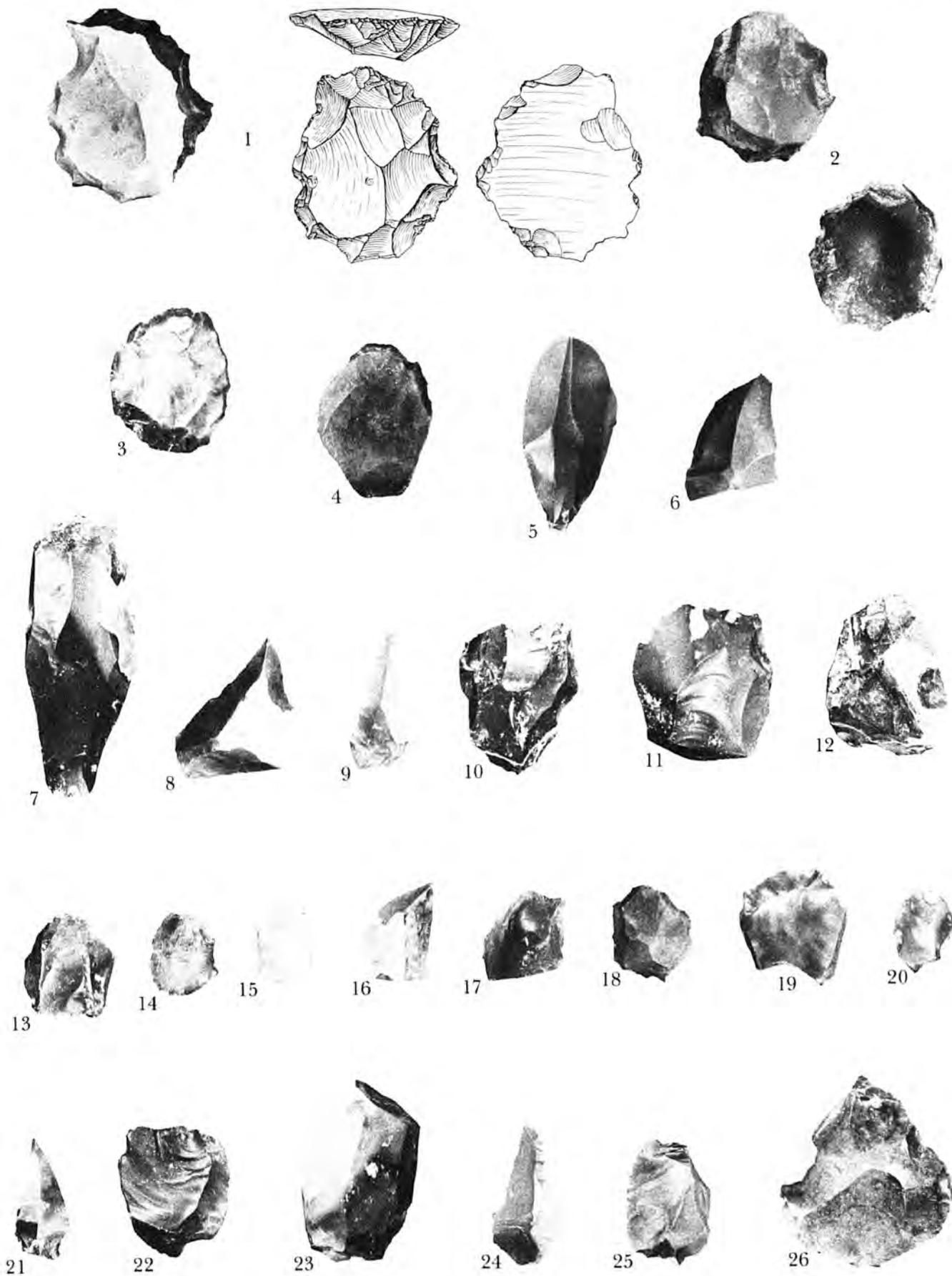


Scrapers from Step IX(2) through V(1): (1) IX(2)[8], (2-5) IX(2)[5], (5) IX(2)[3], (6) IX(2)1, (7-9) IX(1)[2], (10) VIII(2)[2], (11-14) VIII(1)[4], (15) VIII(1)2, (16-19) VII(1)[2], (20-23) V(2)[3], (24) V(2)[2], (25) V(1)[2]. Scale 1:2

## PLATE 42



Scrapers from Step III: (1-2) III(2)[5], (3) III(2)[1], (4) III(1)[3], (5-7) III(1)[2]; Circular scrapers from Steps IX(2) to III(2): (8) IX(2)[5], (9-12) IX(1)[2], (13-15) VIII(1)[4], (16-17) VII(1)[2], (18) VI(2)[2], (19) VI(1)[2], (20) III(2)[5]. Scale 1:2

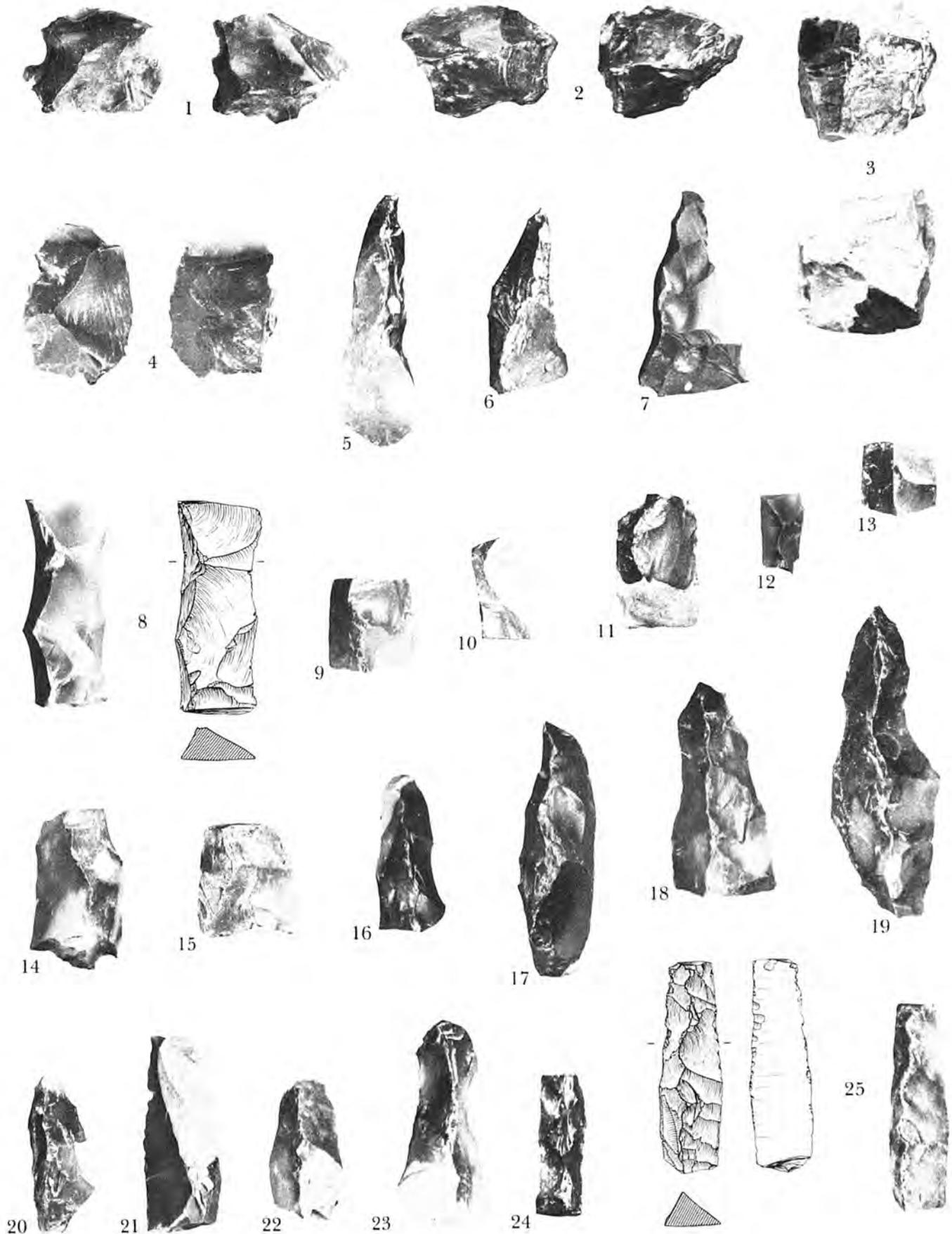


Circular scrapers from Step III: (1-2) III(2)[5], (3) III(2)[1], (4) III(1)[2]; Flakes from Steps IX(2) to V(1): (5-6) IX(1)[2], (7) VIII(2)[2], (8-14) VIII(1)[4], (15) VIII(1)[2], (16-20) VII(1)[2], (21) VI(1)[2], (22) V(2)[3], (23) V(2)[2], (24-26) V(1)[2]. Scale 1:2

PLATE 44

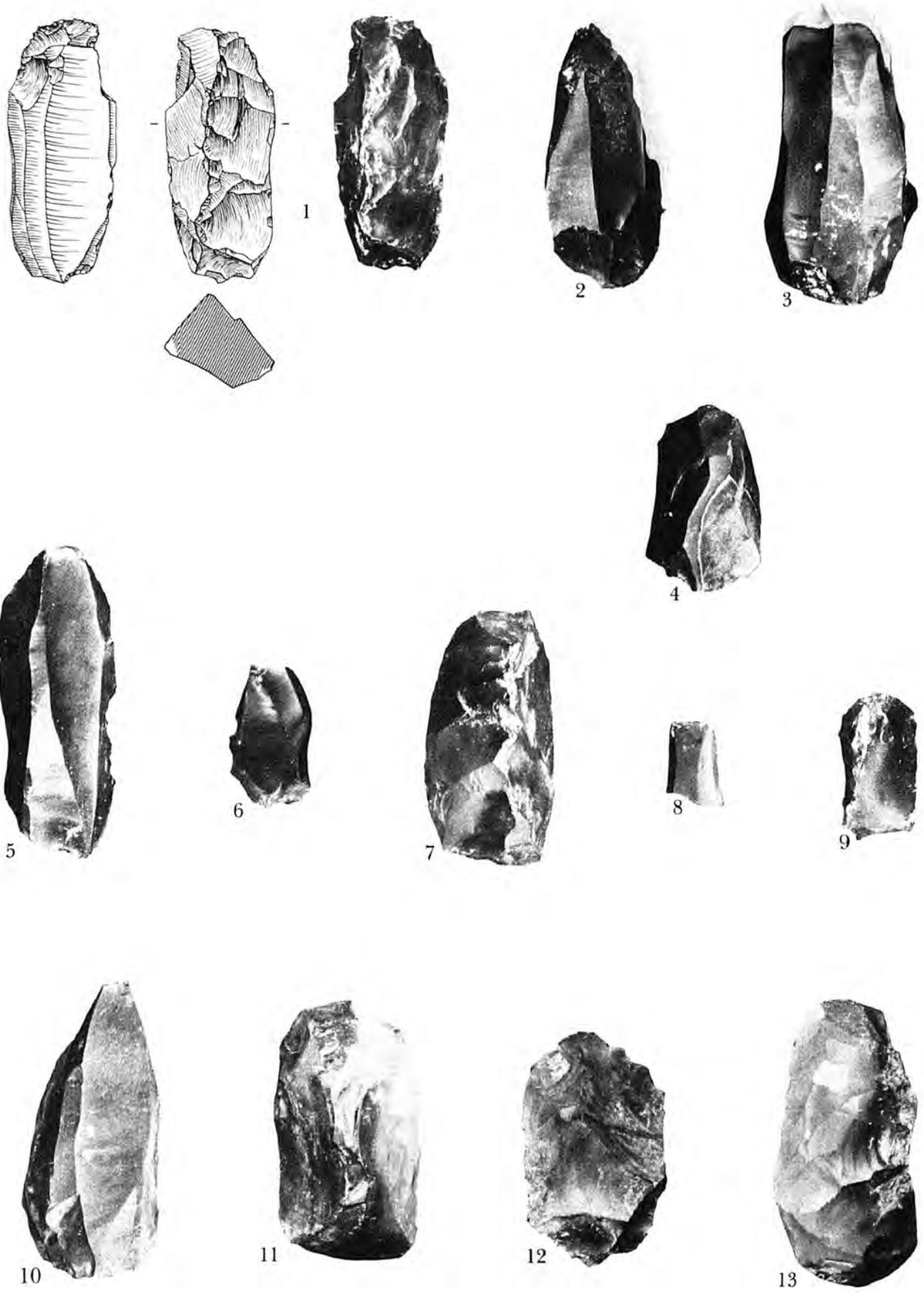


Flakes from Steps IV(1) to II(2): (1) IV(1)[3], (2) IV(1)[2], (3-10) III(2)[5], (11-13) III(2)[1], (14-16) III(1)[4], (17) III(1)[3], (18) II(2); Rough cores from Step III: (19-21) III(2)[5]. Scale 1:2



Cores from Step III: (1-4) III(2)[5]; Crested blades and fragments: (5) IX(2)[7], (6-9) IX(1)[2], (10-11) VIII(2)[2], (12-13) VIII(1)[4], (14-15) VII(1)[2], (16) V(2)[3], (17) IV(1)[3], (18-19) IV(1)[2], (20-21) III(2)[5], (22-23) III(2)[1], (24-25) III(1)[3]. Scale 1:2

PLATE 46



Cores: (1) IX(2)[8], (2) IX(2)[5], (3) IX(2)[4], (4) IX(2)[3], (5-8) IX(1)[2], (9) VIII(2)[2], (10) VIII(1)[4];  
Cores reused as tools: (11) VIII(1)[2], (12-13) VII(1)[2]. Scale 1:2