

# EXCAVATIONS IN THE FRANCHTHI CAVE, 1969-1971. PART II.<sup>1</sup>

(PLATES 45-53)

THE following represents the concluding installment of the progress report summarizing the results of the third and fourth seasons of excavation conducted by Indiana University and the University of Pennsylvania at Franchthi Cave in the Greek Argolid. As these lines were being written, preparations were well under way for a fifth major campaign to be carried out in the summer of 1973.

The reader's attention should be drawn to the fact that this report again includes contributions by colleagues engaged in our project. Rosemary Payne (R. P.) of the British Institute of Archaeology at Ankara contributed the following note on the bone implements, and Dr. J. L. Angel (J. L. A.) of the Smithsonian Institution, Washington, D. C., is responsible for the section dealing with the human skeletal remains. Dr. F. R. Matson of the Pennsylvania State University had intended to contribute an interpretation of analyses of selected potsherds from Franchthi, but interruptions in conducting the analyses have prevented his contribution from being included here; it may appear in a later issue of this journal.

## BONE TOOLS

A good sample of bone tools has now been recovered from Franchthi Cave. Most are made on long bones, with a few on scapulae. Antler tools are surprisingly scarce (only six); there are a few boar's tusk ornaments. Of the 329 tools found so far, over two-thirds (239) are points, of which almost half fall into five distinct types (Pls. 45-48). Type 1 (Pl. 45, a) is a stout point, made on the distal end of a sheep or goat metapodial, with the articulation, basically complete but modified by grinding, as its handle. Type 2 (Pl. 45, b) is made on the same bone, but it has been split lengthwise from the space between the two barrels of the articulation. Type 3 (Pl. 46, a) is similar to Type 2, but the posterior and anterior sides of the barrel have been ground flat. Type 4 (Pl. 46, b) is a small, fine point made on the distal end of a hare or canid metapodial. Type 5 (Pl. 47, a) is a longer, stronger point on the distal end of a hare tibia. Of the other tools, 46 are spatulae, scoops or

<sup>1</sup> This article is meant to complete that which appeared in *Hesperia*, XLII, 1973, pp. 45-88. In accordance with the procedure adopted therein (p. 45, note 1), "Part I" will hereafter be referred to as *Franchthi*, II. 1, in which the following corrections should be made: Figure 1, p. 46, scale to read "1: 275,000"; Plate 16, scale to read "2: 1"; p. 87, Table 8, for "P-1829" read "P-1827."

gouges, 25 are just worked scraps, and the remaining 19 include five fishhooks, three pendants, a mattock and a bead. It must be remembered that many more worked pieces, particularly the tips of tools and the smaller types, can be expected to be found among the bone samples and the water-sieving residues.

Only 23 tools come from Mesolithic or earlier contexts. The Palaeolithic has produced one tool only, the tip of a stout flat point made from a deer-size long bone. Twenty-two tools come from Mesolithic levels (Pl. 48, a), but seven of them are merely worked scraps. There are thirteen points, mainly crude and of no consistent shape, one well-made scoop, and the tip of a spatula.

Little Aceramic Neolithic or pure Early Neolithic material has been excavated; these levels have produced nine bone tools. From the Aceramic Neolithic comes one well-made point, worked from the split distal end of a deer metapodial (similar to the Type 2 points so common in the Neolithic) together with two cruder points and a rough spatula. In the Early Neolithic there is one very well made tibia gouge, with a sharp bevelled tip. The butt end of what was probably a similar tool also comes from the Early Neolithic, and one complete and one broken example from E.N./M.N. units. Otherwise the Early Neolithic has produced one curious notched object and two simple points.

The Middle Neolithic, which has given about 16% of the pottery, has produced 30% of the bone tools found in pottery levels—a total of 90 tools. This group is particularly characterized by points of Types 1, 2 and 5, of which it has 21, 13 and 10 respectively. Types 3 and 4 are absent. Of the rest 24 are other sorts of points, 13 are scoops, gouges or spatulae, and there is one small, well-finished fishhook (Pl. 47, b, top right).

The Late Neolithic also has a good sample (56 tools). It is characterized by two new types of point, Types 3 and 4, of which there are seven and eight respectively. Type 2 is still common, but Types 1 and 5 have almost disappeared. There are also 19 other points, four spatulae, one scoop and two boar's tusk pendants. Also noteworthy is the only heavy antler tool yet found: a mattock or pick with a horizontal shaft hole (Pl. 47, c).

R. P.

## GROUND AND POLISHED STONE

Nearly 500 objects of stone bearing evidence of grinding, polishing or some form of utilization have now been inventoried.<sup>2</sup> Needless to say, the vast majority belong to the Neolithic period, yet enough has been found in earlier contexts to suggest that experiments in the shaping of stone by grinding had begun well before the Neolithic at our site.

<sup>2</sup> This number obviously excludes all flaked stone tools as well as many grinding stones, querns and the like from disturbed or contaminated contexts.

Very few clearly identifiable implements have been found in Palaeolithic levels. Three or four pebbles, fist-size or smaller, show considerable evidence of abrasion on at least one face, suggesting that they had been used as rubbing stones. At least one other pebble was almost certainly used as a hammerstone, perhaps for the (indirect?) percussion-flaking of flint tools. Apart from these specimens, however, few other tools can be identified with any certainty from the Pleistocene.<sup>3</sup>

The situation is slightly improved for the Mesolithic. Our inventory includes several specimens with clear evidence of utilization, largely as rubbing stones, though at least one of these also seems to have served as a hammerstone. Two other roughly circular pebbles (max. dimension of each, *ca.* 0.03 m.), each with two flattened faces, are of special interest. Both faces of each pebble have been nicely smoothed (perhaps at least partially as a result of use) though they also show signs of light pitting and abrasion scars. In these scars are clear traces of red pigment (ocher?), indicating that they had been used to prepare this coloring matter. Red ocher is of course known to have been used for ritual purposes in the Mesolithic elsewhere, but this is the first reasonable indication of its use at Franchthi. Several other pieces exhibit well-smoothed or polished surfaces. One of the most interesting of these is a "shaft-straightener" (Pl. 48, a, right) from an upper Mesolithic context in G-1 (Unit 34). It is a fragmentary piece of dark talc of oblong shape (maximum preserved length, 0.07 m.), markedly smoothed through use on all sides, with two highly polished channels (each *ca.* 0.01 m. wide) on different sides. Implements of this type, which may have been used to finish shafts of bone or wood, are known from a number of sites of this general time-period in the eastern Mediterranean.<sup>4</sup> Finally, reference should be made to two small polished pendants with suspension holes formed by drilling from both faces. (The specimen illustrated in Plate 48, a, top is the same as that in *Franchthi*, I, *Hesperia*, XXXVIII, 1969, pl. 98, d, bottom middle.<sup>5</sup>) It is interesting that in the excavated unit (H-1: A 132) which produced one of these pendants we found still another pebble which had been drilled from one side and then abandoned. Clearly there is as yet very little in the realm of small finds from the Mesolithic levels at Franchthi to help us create a picture of life among the cave's inhabitants other than in its purely utilitarian or economic aspects.

With the introduction of agriculture in the Neolithic the use of ground and

<sup>3</sup> There is a great need in Aegean archaeology for careful (preferably microscopic) analyses of all possible ground stone implements from reliable archaeological contexts. Much can be learned from such studies, and it is hoped that our material can be examined in this way preparatory to the final publication.

<sup>4</sup> Cf. E. Y. Bostanci, "Researches on the Mediterranean Coast of Anatolia," *Anatolia*, IV, 1959, p. 148 (Beldibi and elsewhere), and J. Mellaart, *Earliest Civilizations of the Near East*, New York, 1965, figs. 3 (Shanidar) and 4 (Karim Shahr).

<sup>5</sup> It might be noted here that the captions of pls. 98, d and 99, a in *Franchthi*, I, should be interchanged.

polished stone implements increased dramatically.<sup>6</sup> Millstones of various forms for the preparation of cereals are common and polished celts for the felling of trees (and the loosening of soil?) are found throughout the Neolithic sequence. Vessels of stone also make their appearance rather early in the Neolithic but are rarely found thereafter. Of the eleven inventoried fragments (none appear to be from the same vessel), seven are from E.N. or E.N./M.N. contexts, two from early M.N., one from M.N. and one from a disturbed (probably later) context. A selection of profiles is reproduced in Figure 1.

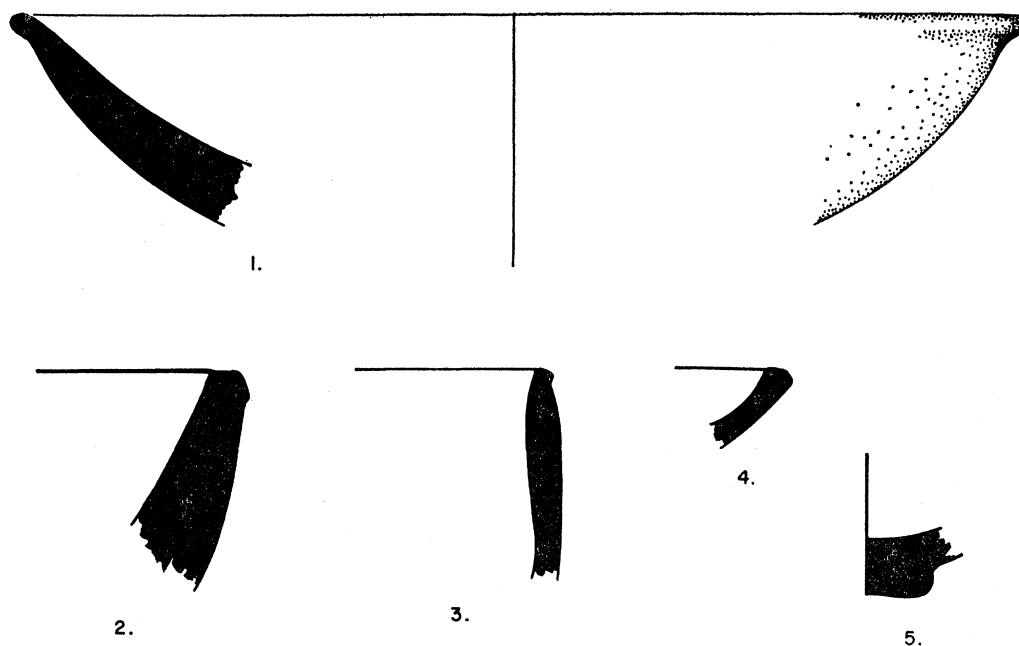


FIG. 1. Profiles of Neolithic Stone Vessels (Scale, 2:3).

Objects of personal adornment and/or possible ritual significance are common throughout the Neolithic. The last two seasons of fieldwork have added considerably to the number of beads and pendants found during the 1967 and 1968 seasons.<sup>7</sup> Although no new anthropomorphic figurines have come to light,<sup>8</sup> several new objects of an amuletic character have been inventoried. Perhaps most interesting of these is an essentially complete "anthropomorphic amulet" of dolomite (Pl. 48, b-c),

<sup>6</sup> As the survey of the environmental remains in *Franchthi*, II. 1 has shown, there is as yet no solid evidence to support the idea of a gradual *local* experimentation with or development of plant and animal husbandry. Indeed, if anything, present evidence strongly suggests a rather sudden introduction of domesticated plants and animals from elsewhere.

<sup>7</sup> Cf. *Franchthi*, I, pl. 98, d.

<sup>8</sup> *Franchthi*, I, pl. 99, a, above.

clearly related to the type already known from three examples noted in the first preliminary report.<sup>9</sup> Although differing from the latter in certain details, the new piece resembles them in general appearance, in size (*ca.* 0.02 m. high), in its flat engraved obverse (Pl. 48, b) and in its reverse (Pl. 48, c) with perforated suspension ledge. Its archaeological context, however, is slightly less secure than that of the other examples, all of which can be assigned in general terms to the Middle Neolithic.<sup>10</sup> Thus we now have a group of at least four such objects from Franchthi, yet one is very hard pressed to find good parallels for the group elsewhere on the Greek mainland. Indeed the most suitable parallels seem to come from southeastern Europe, where the type is known variously as "Toad/Frog Ladies" or "Birth-giving Goddesses."<sup>11</sup> Although it has yet to be established that all of the Franchthi examples are partial representations of the female form (at least one may be a "male"), it is difficult not to imagine these objects as having some fertility significance. At the same time, it is quite possible that the engraved examples also served as "seals," i.e. perhaps the southern Greek equivalents of the northern Greek "pintaderas."<sup>12</sup>

### WORKED SHELL

Although there is considerable evidence of shell collecting (of both marine and terrestrial molluscs) during the Palaeolithic and the Mesolithic at Franchthi, evidence of worked shell is rare in those levels. Shackleton has already noted the possibility of pierced *Neritea* shells having been used as beads in the Mesolithic,<sup>13</sup> and the presence of *Dentalium* fragments in Mesolithic contexts may represent the remnants of necklaces of the type frequently found at prehistoric sites in the eastern Mediterranean.

<sup>9</sup> *Franchthi*, I, p. 371 and pl. 99, a, below.

<sup>10</sup> The excavated unit (H-1 : 66) from which this new example came also produced a somewhat similar piece: a small, flat, two-legged specimen of talc with a suspension hole just below the finished waist. It differs from the rest of the group in material and in the absence of engraved decoration and suspension ledge.

<sup>11</sup> Cf. Marija Gimbutas, "Excavation at Anza, Macedonia," *Archaeology*, XXV, 1972, pp. 120-121 (Anza II, Bulgaria). I should like to thank Dr. Gimbutas for the information she has so kindly given me about a number of unpublished examples from the Balkans, among which is an interesting but rather later piece from Sitagroi III in Greek Thrace. Although other examples suit our date better, one of the best parallels for the general form and size of the Franchthi group is from an uncertain context at the site of Akca Ac (Razgrad) in Bulgaria. See J. H. Gaul, *The Neolithic Period in Bulgaria*, American School of Prehistoric Research, Bulletin No. 16, 1948, pl. LIX, no. 6.

<sup>12</sup> Insofar as I know, no sites in southern Greece have produced examples of pintaderas of the type known from several sites of the earlier Neolithic in northern Greece, the Balkans and Anatolia.

<sup>13</sup> *Franchthi*, I, p. 379. Dr. Shackleton has not been able to examine our molluscan material since 1969, but he is expected to join our staff in 1973 when he will also be collecting samples for paleoenvironmental and paleoclimatic analyses.

Yet it is not until the Neolithic period that the working of shell becomes a common practice. The techniques of this craft—grinding, polishing, drilling and engraving—seem to be essentially the same as those of contemporaneous stone working. Well over 100 examples of worked shell have now been inventoried, the vast majority of which seem to have served as items of personal adornment. Beads are most common, but pendants and bracelets are also found.<sup>14</sup> The following is a partial list of worked shell according to species, indicating the variety of raw materials and the objects associated with them. The numbers in parentheses represent the number of worked objects per species and should be regarded as minimum quantities.

*Spondylus gaederopus* (20). The inventory includes fragmentary bracelets (Pl. 48, d, lower right), pendants (Pl. 48, d, upper left),<sup>15</sup> a miniature celt or chisel (Pl. 48, d, lower row, second from right), “spoons” (Pl. 48, d, upper right), disks (Pl. 48, d, lower left), and a rod (Pl. 48, d, lower row, second from left). Several nicely polished examples (including one or two amorphous pieces) may have served as burnishing tools.

*Mytilus galloprovincialis* (5). All are mussel “spoons” (Pl. 48, d, second row, right) of the type recognized by Shackleton at Saliagos.<sup>16</sup> All were found in F/A (No.) Balk: Units 119N (3), 111N (1) and 88N (1), hence M.N./L.N. and L.N. according to the ceramic sequence. According to the radiocarbon chronology, these findspots correspond quite well with the Saliagos contexts.

*Monodonta* (4). All examples were ground to form rings or pendants (Pl. 48, d, second row, second from left).

*Ostrea*, Oyster (4). All are fairly delicate pieces and pierced for suspension. Two fragments have carefully notched edges.

*Luria lurida*, Cowrie (2). Both are carefully ground at or near one end to produce suspension holes (Pl. 48, d, second row, left).

*Columbella* (1). This piece is ground on one side to produce a suspension hole.

## NEOLITHIC POTTERY

Pottery appears suddenly at Franchthi. From the very outset of the Neolithic it makes up the largest single class of finds and therefore serves as the basis for the relative chronology of the site throughout this period. Although considerable evi-

<sup>14</sup> Water-sieving has turned up hundreds of beads from Neolithic levels, many of them so small that accurate identification of their material is impossible without microscopic or chemical analyses. It is reasonably certain, however, that these beads were made of stone, bone and clay as well as shell.

<sup>15</sup> Cf. similar examples in stone, e.g. *Franchthi*, I, pl. 98, d, lower left.

<sup>16</sup> J. D. Evans and C. Renfrew, *Excavations at Saliagos*, The British School of Archaeology at Athens, 1968, pp. 68 and 126.

dence to support a more subtle phasing is gradually accumulating, we shall continue to be guided by the most widely accepted scheme for southern Greece, that proposed by S. S. Weinberg.<sup>17</sup> When our pottery has been fully studied in terms of its stratigraphic distribution and in conjunction with other classes of artifacts and the environmental evidence, it may well be necessary to modify the existing impression of Neolithic development in the eastern Peloponnese.<sup>18</sup>

### EARLY NEOLITHIC

As reported in 1969, the earliest pottery continues to be the least abundant of the Neolithic wares from Franchthi. Pure E.N. pottery in fact comprises somewhat less than five per cent of the total ceramic assemblage. Although found in all areas where excavation has proceeded to sufficient depths, it is at present most abundantly represented in deposits lying directly upon Mesolithic levels.<sup>19</sup> Therefore there is as yet little to indicate that the beginnings of the ceramic industry represented here should be found locally. Indeed the impression given by these remains is that the craft of pottery-making was introduced at a relatively well-developed level of technical competence, and its origins are probably to be sought elsewhere. It should be noted, however, that additional excavation across the Neolithic-Mesolithic interface in F/A Balk in 1973 may alter this picture.

It is perhaps of interest that a handful of unbaked sherds was found in an E.N. context in H-1, Quadrant A (Pl. 49, a) in 1969. These sherds have a slightly gritty fabric of a uniformly orange-buff color and were found in a moist and extremely delicate condition.<sup>20</sup> Most were simply body sherds, but at least one piece (Pl. 49, a, right) seems to have been a roughly finished rim fragment belonging to a fairly straight-sided deep bowl. It seems most likely that these sherds were merely unfired

<sup>17</sup> Cf. *Franchthi*, I, p. 361.

<sup>18</sup> Recent studies such as Colin Renfrew's *The Emergence of Civilisation*, London, 1972, and D. H. French's privately circulated monograph, *Prehistoric Pottery Groups from Central Greece*, Athens, 1972, have justifiably urged serious reconsideration of the suitability of traditional chronological schemes in the prehistoric Aegean. French rightly recognizes the importance of reconstructing the sequence of a given geographical area on the basis of *all* of the preserved remains (organic and inorganic); he reminds us that present reconstructions are almost exclusively based upon ceramic sequences, themselves rarely adequate. Nevertheless, in view of our still incomplete understanding of the material from our excavations, we have chosen to express our results largely in accordance with the more traditional approach. If major changes appear to be in order after a systematic review of all the remains, they will be duly incorporated in the final publication of our site.

<sup>19</sup> This is largely due to the fact that our excavations have exposed only one area in the cave (now called "F/A Balk") where a horizon seemingly transitional between Mesolithic and ceramic Neolithic (i.e. "Aceramic Neolithic") has been isolated. No investigation of this horizon has been made since the 1968 season. Cf. *Franchthi*, I, p. 376.

<sup>20</sup> It was necessary to consolidate them in a mild solution of Atlacol before they could be examined.

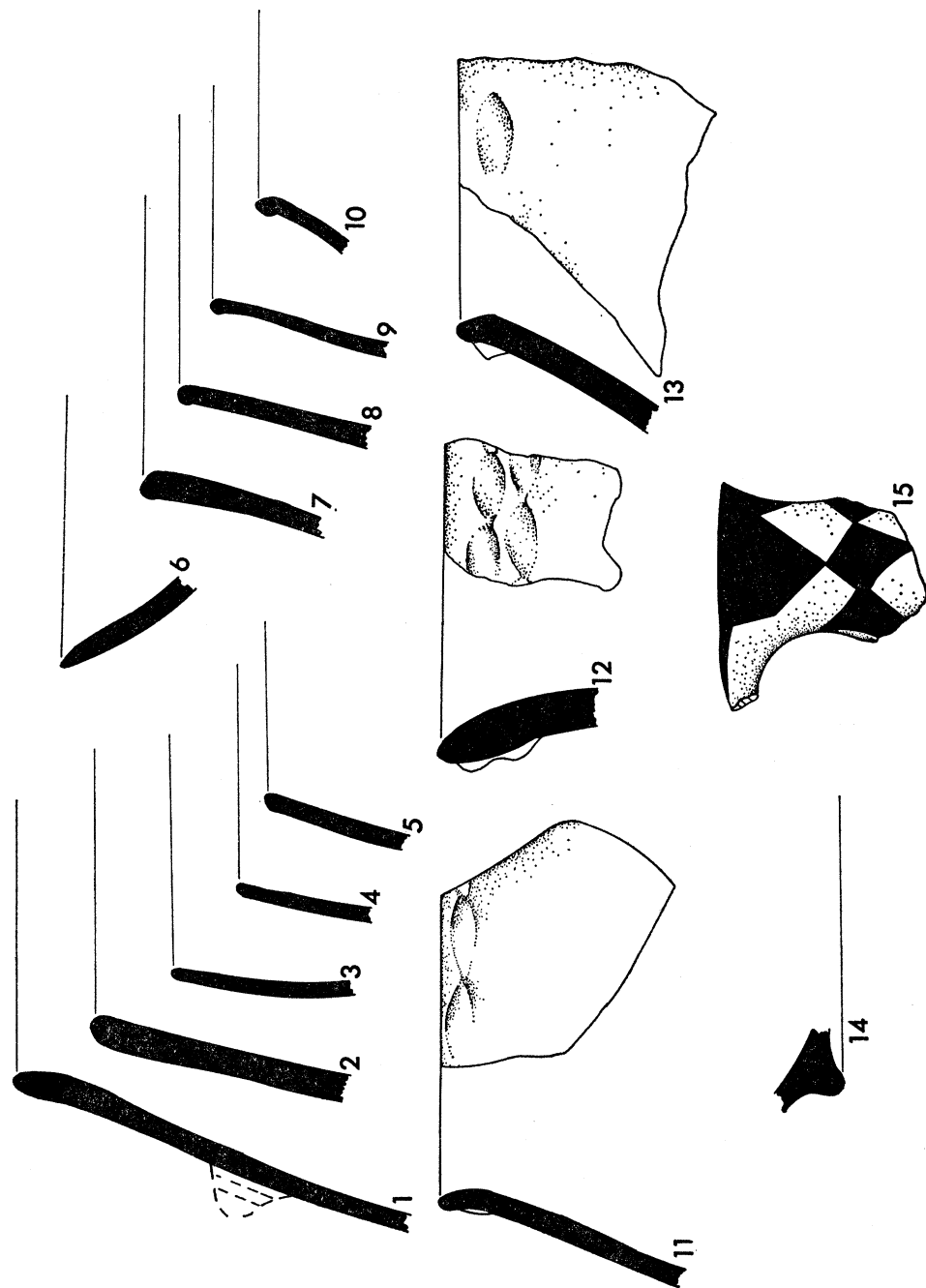


FIG. 2. Profiles of E.N. Pottery, Paralia (Scale, 1:2).



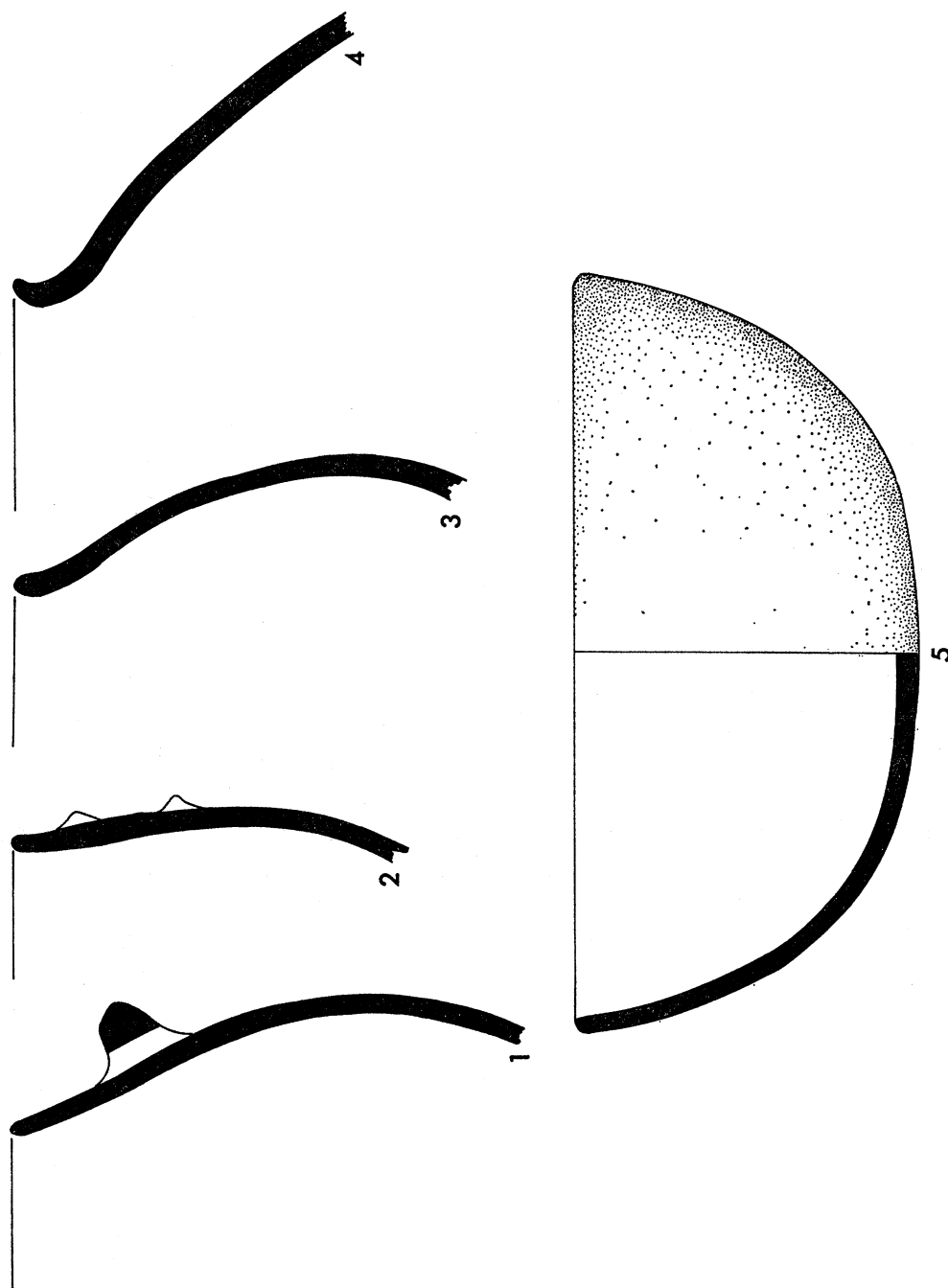


FIG. 3. Profiles of E.N. Pottery, Pit H (Scale, 1:2).

rejects from the potter's shop rather than representative of an early attempt to produce pottery without adequate knowledge of proper firing techniques.

Two basic types have been recognized within the E.N. ceramic assemblage, a burnished monochrome ware and a red-patterned ware.<sup>21</sup> Both make use of essentially the same fabric, one which shows considerable variation in surface color, often on the same pot. The fabric is gritty, containing many small stone inclusions (there is no evidence of vegetal tempering), and is usually somewhat friable. The exterior surfaces are regularly burnished, sometimes in an uneven manner which results in a streaky appearance. The major difference between the two types is that one bears patterned decoration in a rather thick, reddish brown paint. The patterns are generally of a linear (rectilinear) character, but solid patterns are occasionally seen (Pl. 49, b and Fig. 2, No. 15). Burnishing is normally done after the painted decoration has been applied to the surface of the vessel.

A rather limited number of shapes has been recognized in these wares. The hole-mouthed jar and the deep hemispherical bowl are most frequently encountered (Figs. 2, Nos. 1-5, 7-10, and 3, Nos. 1, 2, and *Franchthi*, I, pl. 94, c), but open bowls (Figs. 2, No. 6, and 3, No. 5) and jars with "incipient" or low collars (Fig. 3, Nos. 3, 4, and Pl. 49, c) are also present. A jug (?) with an oval neck and attached handle is known only from the red-patterned ware (Fig. 2, No. 15).

Apart from painted decoration, surface treatment of the burnished monochrome ware also includes relief decoration. An especially common manifestation of this is the deployment of almond-shaped knobs, individually or in series, below the rims of bowls and jars (Fig. 2, Nos. 11-13). On one example, a deep hemispherical bowl, at least three rows of knobs are preserved (Pl. 49, d).<sup>22</sup> Several sherds from a large vessel of uncertain shape indicate that horizontal lug handles were also arranged in multiple rows on occasion (at least two rows in this instance). Finally, mention must also be made of a sherd found in 1969 in a deposit containing M.N. as well as E.N. pottery. It is a small body sherd with the clear remains of a human face preserved on it (Pl. 50, a-b). Although fragmentary, part of the nose, the left eye (and brow) and part of the right eye have survived. The exterior surface of the sherd seems to have borne a fugitive white slip on which very slight traces of a red paint were also observed. The position of this fragment on a vessel cannot be determined with absolute certainty, but a noticeable thinning of the sherd-wall in the region of the "forehead" suggests that the face was situated rather near the rim, now broken away. Although found in a transitional context, the fabric of this piece clearly indicates that it belongs to the E.N. rather than to the M.N. horizon. As such, it is of considerable interest since our excavations have produced no examples of figurines

<sup>21</sup> Cf. *Franchthi*, I, p. 362.

<sup>22</sup> These knobs were undoubtedly meant to be decorative, but it is possible that others, especially when found individually rather than in groups, served as potters' marks. See below.

definitely assignable to this horizon, and E.N. "face-pots" seem to be rare in Greece at this time.<sup>23</sup>

Little can as yet be said for certain about the stratigraphic distribution of the burnished monochrome and red-patterned wares. The former is clearly dominant throughout the E.N. sequence as we have it, comprising 70% or more of the total bulk of sherds (whether computed by weight or by sherd-count); the latter rarely exceeds five per cent. It is very difficult at present to ascertain the chronological relationship between the two wares since—in the area where they are most abundantly preserved<sup>24</sup>—both seem to be present in the lowest pottery-bearing levels and continue to be present until gradually replaced by characteristic M.N. wares. On the other hand, excavation in the small sounding in Paralia Q5N (*Franchthi*, II. 1, pp. 56-57) produced very little red-patterned ware and then only in the upper portions of the pure E.N. deposit. Therefore, it is possible that the red-patterned ware is a later variation of the burnished monochrome ware and the E.N. context in which they appear together from the beginning does not represent the entire E.N. sequence at the site.<sup>25</sup> It is hoped that further excavation in F/A Balk and Paralia in 1973 will help to resolve the problem of the relationship between these wares.

Before turning to M.N. pottery, reference should be made to two wares associated with transitional E.N./M.N. contexts in the 1969 report. One of these is a fine black burnished ware which is easily distinguishable from the above-mentioned burnished monochrome ware mainly by its excellent surface treatment.<sup>26</sup> Unlike the latter, this ware usually has a rather thick slip which is regularly burnished to a uniformly lustrous finish; its surface color is normally a deep black, occasionally approaching a purplish brown. Excavations in the balk at the northern end of Pit H in 1969 and 1971 brought to light numerous examples of this fine black burnished ware in conjunction with the burnished monochrome ware and the red-patterned ware in contexts which precede the first appearance of what we recognize as M.N. wares. Yet it should be noted that it seems to have continued to be produced after the earliest M.N. pottery appeared. Therefore this seems to be a truly transitional ware whose roots are in the Early Neolithic, where it may be a finer development of the E.N. monochrome burnished ware.

The other type of pottery associated with these transitional contexts is a "spongy"

<sup>23</sup> For what appear to be related but slightly different examples from Nea Nikomedeia, see R. J. and J. M. Rodden, "A European Link with Catal Huyuk: Uncovering a 7th Millennium Settlement in Macedonia. Part I—Site and Pottery," *Illustrated London News*, April 11, 1964, figs. 7-8.

<sup>24</sup> The balk at the north end of Pit H (*Franchthi*, II. 1, p. 52).

<sup>25</sup> As indicated elsewhere (e.g. *Franchthi*, II. 1, pp. 52, 54), there is other evidence to indicate a hiatus at the beginning of the Neolithic in H/H-1. Further support of this is perhaps offered by the radiocarbon date of  $5328 \pm 86$  B.C. from one of the units (37 Y) containing both burnished monochrome and red-patterned wares in the balk in Pit H. (Cf. chronological chart, Table 8, *Franchthi*, II. 1.)

<sup>26</sup> *Franchthi*, I, p. 362 (note 20), and pl. 95, a, upper right.

monochrome ware of a normally gray to light brown fabric.<sup>27</sup> This ware is frequently identified by its fabric which lacks evidence of fine burnishing and, especially, has heavily pitted surfaces.<sup>28</sup> Since we found this ware quite commonly during the first two seasons (when we cleaned all pottery in a mild solution of water and hydrochloric acid) and rarely if ever in the past two seasons (when our sherds were washed exclusively in water), we have been forced to conclude that the "sponginess" of this ware is merely the result of acidic action on the basically unburnished surfaces of the sherds. This "plain monochrome ware," whose affinities are with the Early Neolithic in terms of both shapes and fabric, also continued to be produced after the first appearance of M.N. wares.

### MIDDLE NEOLITHIC

There is as yet little to indicate a significant break in ceramic development at Franchthi from Early Neolithic to Middle Neolithic. The major innovation in the latter horizon is the appearance of a finer fabric than that which characterized E.N. pottery. This fabric is easily distinguishable from that which prevailed earlier by being harder (less crumbly), less gritty, and lighter and more uniform in color. An additional characteristic of early M.N. pottery is the application of a reddish slip or wash (its color shows some variation) either to the entire exterior surface of the pot or in combination with simple linear patterns. Our impression at the end of the second season of excavation that the fabric and surface treatment of this ware link it more closely with Neolithic Urfirnis than with any E.N. ware still basically holds.<sup>29</sup> There is in fact little to add to the general observations made at the end of the 1968 campaign until a more systematic study of our M.N. pottery has been carried out.<sup>30</sup>

The second major phase of the M.N. ceramic sequence at Franchthi is characterized by the flowering of the handsome ware commonly known as Neolithic Urfirnis. As a development of the monochrome and patterned varieties of the early M.N. ware discussed above, it differs from that ware in the following ways: (1) the paint is usually finer and of a more consistently lustrous character, (2) the surface of the vase is more carefully prepared (the "paring" of the previous phase has now largely disappeared), and (3) there is a greater variety in the shapes employed. Indeed as

<sup>27</sup> *Franchthi*, I, pp. 362-363.

<sup>28</sup> S. S. Weinberg, "The Stone Age in the Aegean," *Cam. Anc. Hist.*, I<sup>2</sup>, p. 27: "This fabric apparently resulted from using crushed limestone for grit, which burned out on the surface and left it pocked or spongy."

<sup>29</sup> Cf. *Franchthi*, I, pp. 363-364. There may in fact be some justification for calling this early M.N. slip "Proto-Urfirnis," a term recently used to describe a group of surface finds with possible E.N. or M.N. affinities from Arcadia (R. Howell, "A Survey of Eastern Arcadia in Prehistory," *B.S.A.*, LXV, 1970, pp. 104-105). It seems unlikely, however, that the latter as described is fully comparable with the fabric and surface treatment of the Franchthi ware referred to here.

<sup>30</sup> It should be noted that Karen D. Vitelli of the University of Maryland, Baltimore County, is presently engaged in a detailed study of M.N. patterned pottery from Franchthi as part of her Ph. D. dissertation at the University of Pennsylvania.

our study of the material progresses, an increasing number of new shapes (or variations of old ones) is recognizable.<sup>31</sup> One of the most interesting of these is an askos-like shape, no examples of which have yet been fully restored, but an estimate of its general appearance may be gained from Miss Vitelli's composite reconstruction

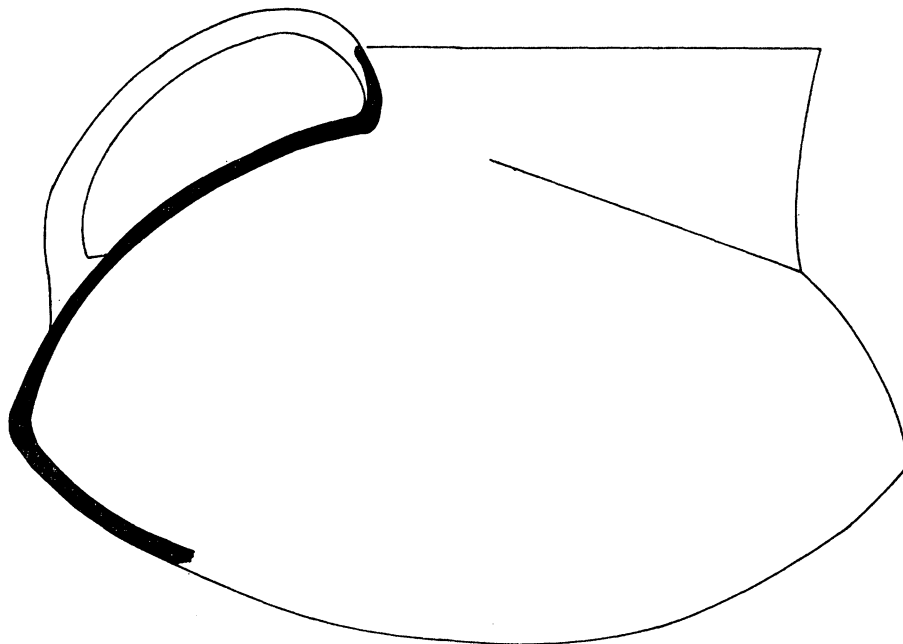


FIG. 4. Composite Reconstruction of M.N. "Askos" (Scale, 2:3).

in Figure 4. This shape, whose antecedents may lie in the Early Neolithic, is found in association with both the monochrome and patterned varieties of Neolithic Urfinis.

Attention should perhaps also be drawn to what may prove to be a major contribution to our understanding of the Neolithic potter's craft. In her study of the M.N. pottery from Franchthi and nearby Lerna, Miss Vitelli has observed that many of the not uncommon relief elements found on these vases—pellets, knobs and ribbing of various forms—were sometimes situated in such obscure places on the vessel that they could not have served primarily as decoration. Therefore she has arrived at the provisional conclusion that these elements were potters' marks, i.e. perhaps "trade-marks" of the specialist potter. If further study of the material supports this conclusion, this would anticipate by some two thousand years a practice well known throughout the Aegean Basin in the Bronze Age.<sup>32</sup>

<sup>31</sup> Unfortunately progress in the study, mending and restoration of our pottery has been severely impeded by limited work space in the storerooms of the Archaeological Museum in Nauplion.

<sup>32</sup> For a brief note summarizing a paper delivered at the General Meeting of the Archaeological Institute of America in 1970, see K. D. Vitelli, "Neolithic Potters' Marks," *A.J.A.*, LXXV, 1971, p. 216. Miss Vitelli is now preparing for publication a fuller treatment of this subject.

Whereas the proportion of monochrome Urfirnis remains relatively constant throughout the Middle Neolithic (*ca.* 50%–*ca.* 65% of the total ceramic assemblage from F/A Balk, whether computed by weight or number of sherds), patterned Urfirnis increases from a small percentage at the outset to a maximum of *ca.* 20%. After reaching its crest, the latter gradually declines in frequency in later Middle Neolithic until it virtually disappears by the end of the period. While this is taking place a technique which we have called “burnished Urfirnis” comes to be very common.<sup>33</sup> Burnished Urfirnis, which had only been found in small quantities in earlier phases, reaches its peak at this time (20–25% by weight or number of sherds) and therefore becomes characteristic of the final phase of the Middle Neolithic. The shapes preferred are essentially similar to those of the previous phase. Thus three major ceramic phases may be provisionally isolated within the M.N. sequence at Franchthi; it is quite possible that one or more of these phases can be further subdivided after additional study of all the remains.

#### LATE NEOLITHIC

As indicated in Part I of this report, one of the major objectives of the last two seasons of fieldwork has been to isolate and elucidate the excellent stratigraphic sequence first encountered in Pits A and F/F-1 and most clearly defined in F/A Balk.<sup>34</sup> This has now been accomplished for the later Neolithic; the finds from F/A Balk will in fact serve as the basis for our final interpretation of the L.N. sequence at the site. The following observations, however, must be regarded as quite provisional since not only is the L.N. pottery yet to be studied in detail but much of the residue from the water-sieving operation remains to be sorted and the finds incorporated with those collected in the course of excavation. Nevertheless preliminary examination of the pottery has suggested at least a general developmental sequence.<sup>35</sup>

The transition (ceramically) from Middle Neolithic to Late Neolithic seems to be gradual and without conspicuous break. Pottery decorated with patterns in a dull (matt) paint—often regarded as signaling the onset of Late Neolithic—first appears in very small quantities at the point when burnished Urfirnis begins to decline in frequency. At the same time a handsome black burnished ware, which had first appeared when burnished Urfirnis was at its peak, itself reaches its peak. Thus the relative sequence, burnished Urfirnis-black burnished-matt painted, can be established with reasonable certainty, and the black burnished ware may be said to bridge the gap between Middle Neolithic and Late Neolithic.<sup>36</sup> According to the radiocarbon

<sup>33</sup> *Franchthi*, I, p. 367.

<sup>34</sup> *Franchthi*, II. 1, p. 50.

<sup>35</sup> Steven Diamant of the University of Pennsylvania has contributed in considerable measure to the initial sorting and study of the L.N. pottery in the course of preparing his doctoral dissertation on the later Neolithic in southern Greece.

<sup>36</sup> Indeed in much the same way as the earlier fine black burnished ware seems to have spanned

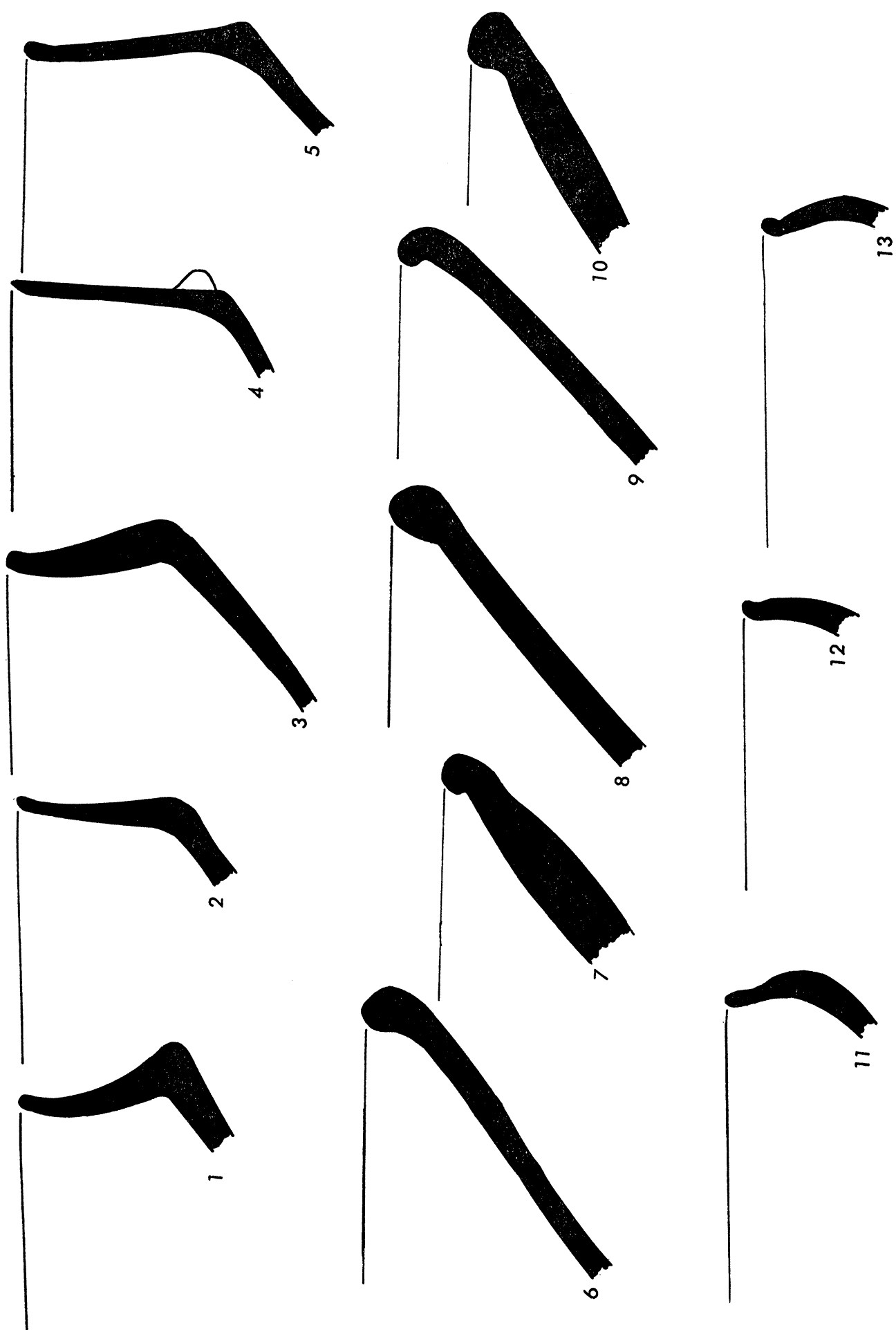


FIG. 5. Profiles of Black Burnished Ware (Scale, 1:1).

chronology, this transitional phase when black burnished ware was at its peak may be dated to the first half of the fifth millennium B.C.<sup>37</sup>

This later black burnished ware was briefly described in our first preliminary report.<sup>38</sup> As indicated there, the burnished monochrome surface of the vessel was sometimes complemented by patterned decoration in a dull white paint. The patterns

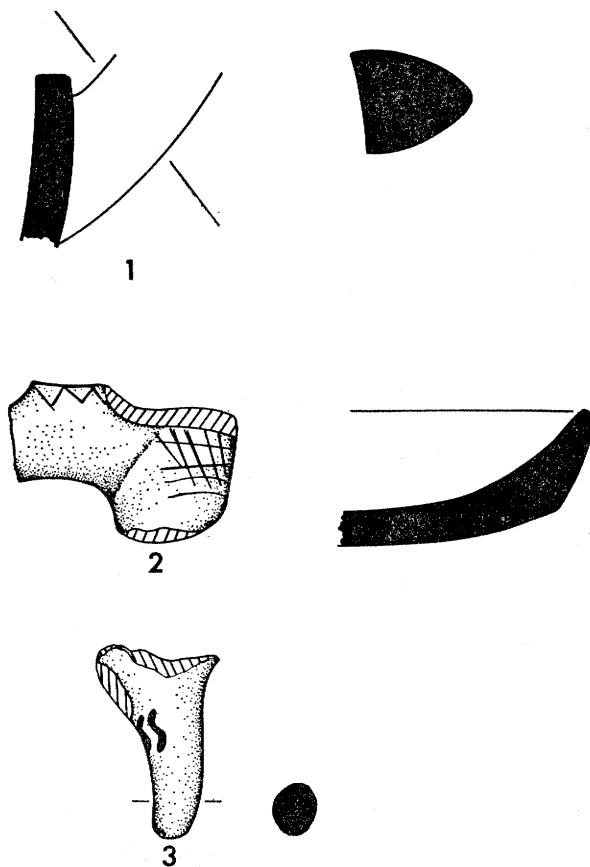


FIG. 6. Profiles of L.N. "Ritual" Vessels (Scale, 1:2).

are quite simple and generally of a linear character, parallel or intersecting bands of paint being most common (Pl. 50, c). Other forms of decoration are rather more rare: incised or punctate patterns filled with a chalky white substance (Pl. 50, d) or

the transition from Early Neolithic to Middle Neolithic (see above). It is important to note, however, that there is nothing as yet to indicate a relationship between the earlier and later black burnished wares.

<sup>37</sup> The dates, P-1662 (F/A Balk, Unit 114 N:  $4741 \pm 81$  B.C.) and I-6128 (F/A Balk, Unit 120N:  $4905 \pm 190$  B.C.), are perhaps slightly high. See below and *Franchthi*, II. 1, pp. 85-88 and Table 8.

<sup>38</sup> *Franchthi*, I, pp. 368-369.



reserved bands filled with a burnished pattern in crosshatching (Pl. 50, e).<sup>38a</sup> Shapes associated with this ware include carinated bowls (Fig. 5, Nos. 1-5), cups or bowls with incurved and offset rims (Fig. 5, Nos. 11-13), broad open bowls with thickened or inverted rims (Fig. 5, Nos. 6-10) and necked jars.<sup>39</sup> Both flat and pedestal bases are known, but handles (usually lugs) are not common.

As an addendum to this black burnished ware, reference should perhaps be made to a small group of fragments clearly belonging to four-legged vessels of the type first recognized by Weinberg at Elateia and Corinth.<sup>40</sup> None of these pieces can be joined to produce even a partially restorable shape, but they do include a number of readily diagnostic fragments: two stumpy legs (e.g. Fig. 6, No. 2), a more graceful leg (Fig. 6, No. 3), and a rim with attached handle which is triangular in section (Fig. 6, No. 1).<sup>41</sup> The fabric and decoration (white paint, a crusty pinkish paint and white-filled incisions) fully correspond to Weinberg's description of those vessels. Although it is difficult to establish the exact relationship between these fragments and the black burnished ware, the stratigraphic distribution of our examples suggests that they belong to the very end of the black burnished phase and to a time when matt-painted ware was reaching its peak.

If the "black burnished phase" represents the transition from Middle Neolithic to Late Neolithic as our evidence suggests, the next major ceramic stage is that of matt-painted ware. This ware reaches its peak in contexts dated by the radiocarbon method to the last half of the fifth millennium.<sup>42</sup> As indicated above, matt-painted pottery first began to appear in very small quantities (less than 5% of the total ceramic assemblage) when black burnished ware was at its peak (ca. 20%), but as the latter declined the former increased in frequency until it reached its peak (50% or more, including unpainted pieces of the same fabric). By this time black burnished ware had virtually disappeared.<sup>43</sup>

<sup>38a</sup> The latter has actually been fired to a uniform gray color (rather than black) on its exterior surface.

<sup>39</sup> Perhaps the grandest example of the latter is that illustrated in *Franchthi*, I, p. 369, fig. 8.

<sup>40</sup> S. S. Weinberg, "Excavations at Prehistoric Elateia, 1959," *Hesperia*, XXXI, 1962, pp. 190-195. Another fragment has recently been reported from the Alepotrypa Cave in Mani: H. Hauptmann, *Arch. Anz.*, Heft 3, 1971, p. 352. It is interesting that the distribution of these vessels, whose closest parallels outside Greece are usually thought to be in western Yugoslavia, is thus far confined to central and southern Greece.

<sup>41</sup> Cf. Weinberg, *op. cit.*, p. 194 (fig. 13, no. 1). A complete basket handle of a more brownish fabric was found in a contaminated surface context at Franchthi; it may be a later variation of the same shape.

<sup>42</sup> *Franchthi*, II, 1, pp. 85-88, fig. 4 and Table 8. To these dates (including the preliminary TL determination) may now be added two more dates received after Part I went to press, P-1920 and P-1921 (see below). The latter stands out as being inordinately high.

<sup>43</sup> It may also be noted that, although patterned Urfirnis essentially died out with the burnished Urfirnis phase of later Middle Neolithic, monochrome Urfirnis continued to be found in substantial quantities through the black burnished (ca. 40%) and matt-painted (ca. 20%) crests. Thereafter it too dies out. Cf. *Franchthi*, I, p. 370.

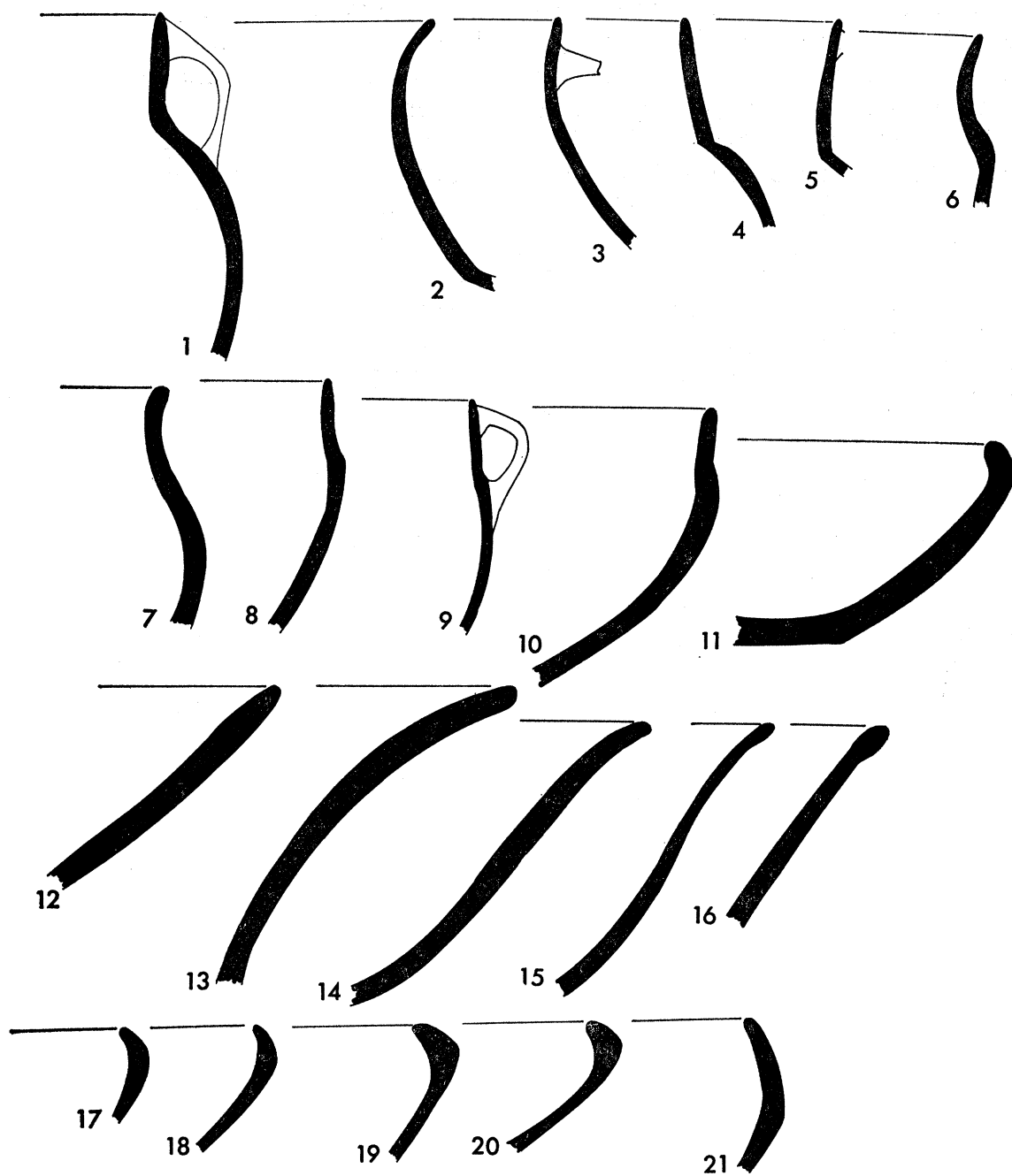


FIG. 7. Profiles of L.N. Matt-painted Pottery (Scale, 1:2).

Little can as yet be added to the brief description of the pottery with matt-painted decoration given in the first preliminary report.<sup>44</sup> As suggested there, at least two different varieties have been isolated. The first—a finer, thinner ware—is among the earliest matt-painted pottery found at the site and turns up only in small quantities. Its fabric is usually well purified and evenly fired, normally a greenish buff in color. The exterior surfaces (sometimes also the interiors, on open shapes) are always nicely finished, and the decoration (usually rectilinear) is applied in a dull paint which varies in color from dark brown to black. No shapes have yet been restored, and the only one about which we can be reasonably certain is a small-necked jar (Pl. 51, a, middle row, left). In view of the fragmentary state of the remains and the comparative infrequency with which they are found, it is likely that this ware was imported. On the other hand, the second class referred to above is very common and almost certainly the product of a local workshop. The fabric is usually rather coarse, characteristically gritty and unevenly fired; its color tends to vary from buff to brown (often gray at the core), while the paint ranges from a dull orange to black in color. The basically simple linear decoration (variations of the zigzag or wavy line are especially common) can be somewhat limited in terms of its distribution over the shape (usually lip, rim, neck or shoulder), thus often leaving large parts of the vessel undecorated (e.g. Pl. 51, a, lower row, second from left). Nevertheless the coarse, gritty fabric is so distinctive that it is usually not difficult to recognize sherds belonging to this ware whether they are painted or not. A selection of shapes associated with this ware is illustrated in Figure 7.<sup>45</sup> Pottery bearing decoration intentionally done in polychrome is extremely rare in the later Neolithic at Franchthi.

The last major stage of the ceramic sequence at Franchthi is characterized by the dominance of a coarse, largely undecorated ware. Until the remains have been studied in detail, however, there is little that can be added to our observations published at the end of the second season of excavation.<sup>46</sup> Few shapes have as yet been restored, but a selection of profiles belonging to coarse-ware vessels is reproduced in Figure 8. Flattened bases are common, and now—for the first time at our site—there is evidence of vegetal (Fig. 8, No. 14) and mat (Fig. 8, No. 15 = Pl. 51, c) impressions on them. The latter (FP 151) is a particularly well-preserved specimen, thus providing useful information about the techniques of mat making employed at this time.<sup>47</sup> Whether mats were used to build the vase or simply to assist in the drying of

<sup>44</sup> *Franchthi*, I, pp. 367-368.

<sup>45</sup> Cf. also *Franchthi*, I, p. 368 (fig. 7).

<sup>46</sup> *Franchthi*, I, pp. 369-370.

<sup>47</sup> Although found in a disturbed context, it belongs most likely to the horizon under consideration. Jill Carrington Smith of the British School of Archaeology in Athens has examined this piece and has kindly submitted her observations in writing (excerpts of which are quoted here). The mat "was made by the split twine method, which was perhaps the most popular of all matting techniques in prehistoric Greece. . . ." In this technique, according to Miss Carrington Smith,

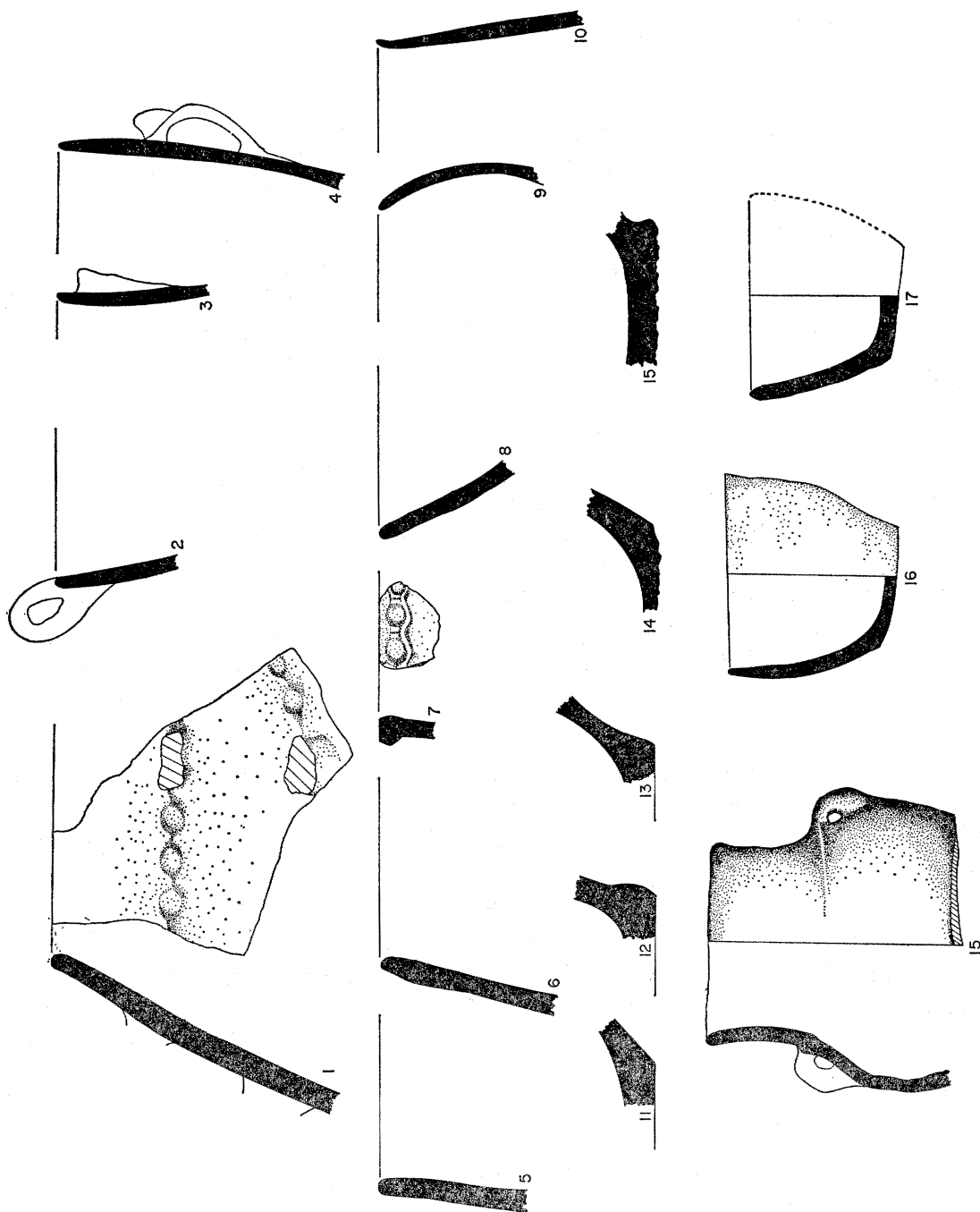


FIG. 8. Profiles of L.N. Coarse Ware (Scale, 1:3).

the vessel once it was made—or perhaps they were used in both stages of the production process—is not certain. In addition to the popularity of flattened bases, we have observed a greater variety in the forms of handles employed. Some of these are illustrated in Figure 8 (Nos. 2-4, 15), yet it will be noted that handleless cups are also present (Nos. 16 and 17).

Coarse-ware vessels generally receive little in the way of special surface treatment. Plastic decoration, usually relief bands with thumb impressions (Fig. 8, Nos. 1 and 7), is perhaps most frequently encountered. A particularly unusual specimen (Pl. 51, b) is a body sherd with a series of clay strips applied in no apparent order, though too little is preserved to indicate whether or not some kind of pattern was intended. Incision is occasionally used, and a very few examples bear traces of a rather crude linear decoration in a dull white paint (Pl. 51, d).

Among those units in which coarse ware was the predominant ceramic component, other wares were also present, but almost always in relatively small quantities.<sup>48</sup> Perhaps the most distinctive of these is a fairly coarse, unevenly fired fabric which bears the remains of a generally fugitive white or orange to pink “slip” (“crusted ware”).<sup>49</sup> Various forms or combinations of surface treatment are found in this ware: (1) not infrequently the entire surface of the vessel is covered with a thin application of the pinkish slip (Fig. 9, No. 5), (2) at other times a thicker coating

“the warps must be arranged in groups of at least two strands each. The first two weft strands pass before and behind the first bundle of warps, cross, pass before and behind the next bundle, exactly as with the simple twine technique. In the next weft row, however, the warp bundles are split, half of one warp bundle being caught with half of the next warp bundle. This produces a series of triangular openings, and the repetition of these two rows gives a pleasing overall honeycomb effect. When the wefts are reasonably close together, as in the present case, a resemblance to twill is also produced. The warps of the FP 151 impression seem to have been arranged in groups of four thin stalks of grass or reeds, which are split two and two to form new groups of four. The weft consists of triple strands of some reasonably pliable material, again probably thin grass or reed.”

<sup>48</sup> Matt-painted ware seems to have ceased to be produced by this time, but the assemblage includes a dark-faced slipped and burnished ware, a very small amount of pattern-burnished ware (apparently of the type known from Aegina and Kea) and a red-on-white painted ware. The latter, which appears in our sequence essentially for the first time now, is particularly puzzling in view of its similarity to the well-known pottery of Sesklo. It seems unlikely that all of the more than 100 sherds found at Franchthi in the context under consideration can be regarded as “kick-ups” from earlier contexts (where pottery of this type is virtually absent). It is interesting that a similar situation seems to exist in Athens at this time. S. A. Immerwahr, *The Athenian Agora*, XIII, *The Neolithic and Bronze Ages*, Princeton, 1971, pp. 10-11.

<sup>49</sup> The delicate character of the surface finish required that the sherds not be washed in water; therefore special care was taken to collect them during the course of excavation and to see that they were isolated from pottery which would be exposed to the routine procedure of cleaning. Although specimens of the “slip” have yet to be subjected to chemical analysis, the texture of the two basic colors seems to be quite different. The white has a sugary, more crystalline character, while the pinkish slip tends to be more dull and powdery. Both (but especially the white) disappear quite readily in water.

of the white slip covers the surface (Pl. 52, a, upper left), and (3) on still other occasions both slips are used in combination to produce a patterned effect (Pl. 52, a, lower left). Furthermore it is not uncommon to find dark-faced slipped and bur-

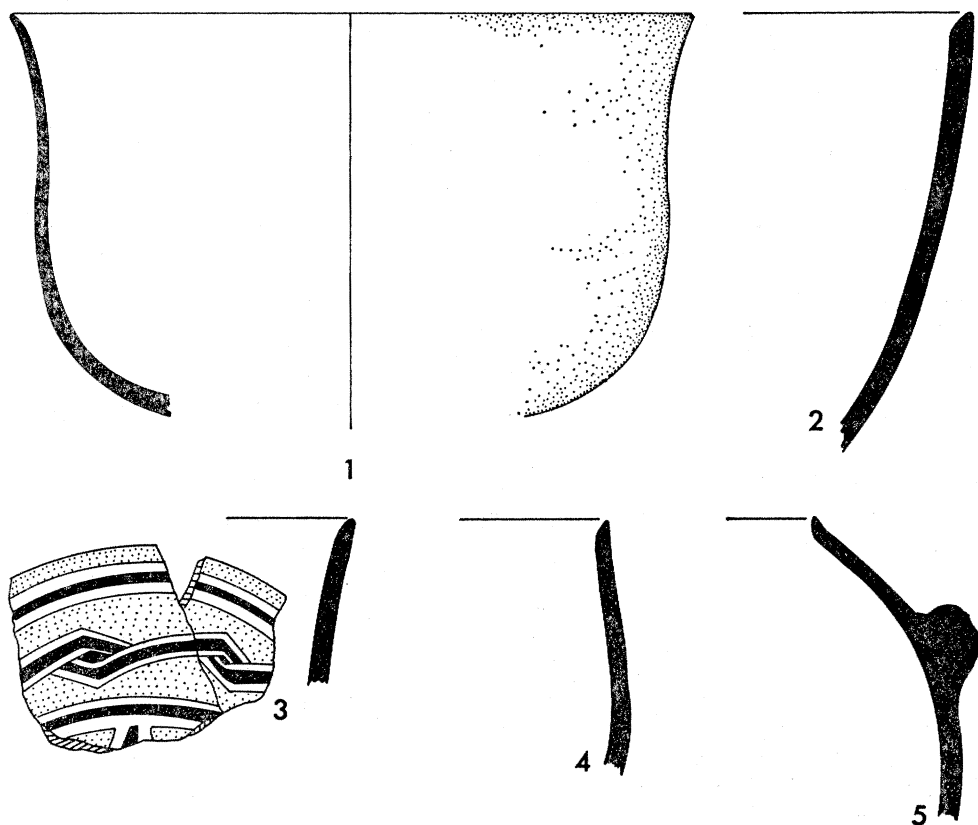


FIG. 9. Profiles of L.N. Crusted Ware (Scale, 1:2).

nished sherds with reserved areas (often located just below the rim) filled with crusted decoration (Pl. 52, a, right = Fig. 9, No. 2). The best preserved example of this technique is a pair of joining rim-sherds (FP 152) bearing a white meandroid pattern in a pinkish ground framed by horizontal white lines (Pl. 52, a, lower center = Fig. 9, No. 3). No complete shapes have yet been restored, but a selection of profiles of both open and closed forms is illustrated in Figure 9. Although crusted ware makes up less than five per cent of the total ceramic assemblage with which it is associated at our site, it is sufficiently distinctive to be considered a potential marker of the final phase of the Neolithic as soon as more is known about its geographical distribution.<sup>50</sup>

<sup>50</sup> The writer has observed examples of this ware in unpublished collections from a number of sites in southern Greece and the islands. The precise relationship between this ware and a superficially similar ware (TIγ) from Thessaly remains to be established.

The overall impression given by these remains is that they correspond favorably with a phase which has only recently come to be recognized in southern Greece. This phase, sometimes termed "Final Neolithic," seems to be generally characterized (ceramically) by an abundance of coarse pottery and a comparative lack of fine painted wares.<sup>51</sup> At Franchthi, Final Neolithic seems to be confined to the last half of the fourth millennium (in radiocarbon years), a date which accords reasonably well with what little chronological information we have from other sites of a comparable cultural level.<sup>52</sup>

### CLAY

The last two seasons of excavation have produced 15 additional examples of human or animal figurines, giving now a total of 25, all of which are in a fragmentary state of preservation. Most of these (15) have been found in uncertain contexts, while the remainder (10) belong to the later Neolithic (M.N. or L.N.); none can as yet be assigned with certainty to Early Neolithic. More than half of the total (14) are representations of the human form (all of those which can be sexed with some confidence [9] are females), at least two are zoomorphic and the rest are too fragmentary to allow reliable identification.

The finest and best preserved figurine yet recovered in our excavations (FC 118) was found in the 1971 season. It is a headless, seated female from a L.N. context in F/A (So.) Balk (Pl. 52, b, c). Apart from the missing head, this piece was found in an excellent state of preservation. Its maximum preserved height is 0.095 m. and the full length of the extended legs is 0.099 m. The brown to buff fabric is entirely typical of contemporaneous matt-painted pottery, and the decoration (presumably representing a gown) is done in matt black paint. Anatomical detail is executed in a rather cursory fashion: the feet are not clearly articulated, the hands (equally unarticulated) completely cover the breasts, and the navel is represented in relief. A profile view (Pl. 52, c) clearly illustrates the flat, plank-like torso. Rather than to consider this figure truly steatopygous, it seems more reasonable to regard the somewhat more voluminous buttocks as the result of her seated posture.

It is an interesting fact that our excavations have brought to light a number of figurines without heads as well as a number of heads separated from their bodies, but none of the preserved heads and bodies can be joined to one another. One wonders if this kind of fragmentation of anthropomorphic figurines was intentional and perhaps part of a religious ritual. In any case, it is difficult to determine what the missing head of FC 118 might have looked like. A good possibility might be a head

<sup>51</sup> Cf. Colin Renfrew, *The Emergence of Civilisation*, London, 1972, pp. 68-80.

<sup>52</sup> *Franchthi*, II. 1, fig. 4 and Table 8. The single date from Kephala, Kea ( $2876 \pm 56$  B.C.) may be slightly low, yet it is possible that the occupation of that site partially overlaps with the Early Bronze Age. It is equally possible, since there is as yet no certain evidence of Early Bronze Age occupation at Franchthi, that the Final Neolithic is not fully represented at our site.

found in a L.N. context in F/A (No.) Balk in 1969 (Pl. 52, d-e). Although of a slightly darker fabric, it too is decorated with matt black paint. The facial features lack naturalistic detail: the nose is only roughly pinched out and the eyes are represented by two approximately horizontal incisions. Two additional diagonal incisions below the eyes defy naturalistic interpretation.

The M.N. and L.N. clay figurines from our site are almost invariably adorned with painted decoration. Indeed it is not until the last phase of the Neolithic (Final Neolithic) that we encounter cruder unpainted examples<sup>53</sup> (Pl. 53). The figurine illustrated here (FC 112) is also from F/A (So.) Balk and, like contemporaneous pottery, is made of a coarse, unevenly fired fabric; it is unslipped and unpainted. Although the head is again missing, the body is fully intact (maximum preserved height, 0.073 m.) and reflects a schematism not so obvious in earlier figurines. It may well be that this example in clay belongs to the beginning of a tradition that culminated in the well-known marble "fiddle idols" of the Early Bronze Age in the Cyclades.<sup>54</sup>

The largest class of objects of baked clay is that consisting of spindle whorls, of which a total of 83 has now been catalogued.<sup>55</sup> Less than half (36) can be assigned to reasonably secure stratigraphic contexts, but the vast majority of these (33) are of L.N. date.

The earliest example is a fragmentary disk-whorl made by shaping a potsherd into a rough circle with a hole drilled from both sides in the center. This comes from a transitional E.N./M.N. unit and is not unlike others known from E.N. contexts elsewhere in Greece. The earliest examples of whorls which actually seem to have been created for that purpose are two specimens from M.N. contexts. One is a small, flattish whorl (thus far unique at the site) and the other is of the low, conical type which becomes quite common later.

The L.N. whorls may be divided broadly into two basic types: conical (or conoid) and biconical, the latter being slightly more common than the former. Most are reasonably well formed from a rather coarse, unevenly fired clay, but some are slipped and/or burnished in addition. None have incised decoration. The stratigraphical distribution of these whorls within the Late Neolithic is of interest since all but one belong to the latter half of the period (largely Final Neolithic). Although there is some evidence to indicate a similarly sudden increase in the use of the spindle

<sup>53</sup> Cf. also *Franchthi*, I, pl. 99, b, upper left.

<sup>54</sup> A situation which may be paralleled by the possible relationship between the Final Neolithic clay heads from Kea and the Athenian Agora and the later folded-arm figurines from the Cyclades.

<sup>55</sup> These whorls, as well as other evidence related to spinning and weaving, are being studied by Jill Carrington Smith of the British School of Archaeology in Athens, and many of the observations made here are taken from a detailed preliminary report submitted by her in November, 1972. Miss Carrington Smith completed most of her work while supported by a Greek State Scholarship Foundation grant.



whorl elsewhere in Greece at about the same time, it is perhaps safest at present to regard this as an unrelated local phenomenon at Franchthi. Further excavation at our site or elsewhere may help to explain the situation.

Finally, reference should be made to a group (5) of what were called "spherical weights" in the first preliminary report.<sup>56</sup> All were found during the first two seasons of excavation and all reflect a remarkable similarity in size, weight, shape and fabric. One of the best preserved examples (FC 10), from a M.N. context in Pit G is a rough sphere (ca. 0.05 m. in diameter) made of a gritty fabric whose surface color varies from gray to orange-buff as a result of uneven firing. It was pierced by a hole in which traces of string wear have been preserved. Its weight is 110 grams. Since these objects would be rather heavy as spindle whorls,<sup>57</sup> Miss Carrington Smith is inclined to regard them as loom weights. Although one was found in an uncertain context, the rest can provisionally be attributed to the Middle Neolithic. Thus it seems that at least by the M.N. period the inhabitants of Franchthi were practicing both spinning and weaving techniques. What raw materials were being worked, apart from wool, is as yet unknown.

### NEOLITHIC HUMAN REMAINS<sup>58</sup>

In contrast to the eight people (seven adults and one young child) from Mesolithic levels of G-1,<sup>59</sup> the approximately 30 people from largely Middle Neolithic levels of A, F, H and Paralía include about 18 under 15 years old. Of course these Mesolithic and Neolithic samples are small, they are not necessarily unitary breeding populations, all but four of the Neolithic people are represented by single sections of skull or skeleton, there is no evidence on disposal of dead infants in either group, and there is little certainty on other uniform burial customs; yet I wonder if the Neolithic child (and infant?) mortality rate was not higher than in Mesolithic times at Franchthi. Increase in child deaths could mean increase in fecundity with the same mortality rate as before or it could mean a decline in health, or both.

We lack any evidence for parity among the Franchthi Neolithic people but at

<sup>56</sup> *Franchthi*, I, p. 372.

<sup>57</sup> The average weight of the stratified whorls from Franchthi is just over 18 grams.

<sup>58</sup> The human skeletal material excavated between 1968 and 1972 by the joint expedition of Indiana University and the University of Pennsylvania under Professor Thomas Jacobsen was studied in early August of 1969 and mid-September of 1972. I studied the material from the Mesolithic layers in area G-1 in 1969 at the Byzantine Museum in Athens and at the Nauplion Museum, and the Neolithic material in 1972 at Nauplion in the museum storage building, except for the two child skeletons 11 *Fr* and 12 *Fr* done in 1969 at the Byzantine Museum. For the opportunity to work on these bones I am most grateful to Dr. Jacobsen and to the Ephor Mrs. Evangelia Protonotariou-Deilaki. I thank Mr. Yaşar Işcan for his care of the skeletal material found in 1971. For her careful and patient recording and other help I thank my wife Peggy Angel.

<sup>59</sup> J. L. Angel, "Human Skeletal Material from Franchthi Cave, Appendix II" in *Franchthi*, I, pp. 380-381.

Early Neolithic Çatal Hüyük and Nea Nikomedeia births per female average 4.9 (21)<sup>60</sup> and the available Mesolithic female from Franchthi, a girl only about 20 years old, shows minimal childbirth scars (1-2 births). Fecundity and health are both vitally linked to adult length of life.<sup>61</sup> At Franchthi the average adult (15 + years) age at death is 29 (4) for males and 28.1 (7) for females, possibly worse than the Early Neolithic values of 31 and 29.9<sup>62</sup> and probably not different from Mesolithic values (32 and 25 in general for males and females and 28.2 [3] and 28 [4] at Franchthi). There was no extra lifetime for rise in fecundity.

Decline in health is not clear, especially since the Mesolithic in general represents a low point. In the present sample anemia appearing as slight porotic hyperostosis (thickening of marrow-containing areas of bone plus some external porosity of skull especially) occurs in 31% (4 out of 13 of all ages). This incidence is not higher than Mesolithic or early Neolithic East Mediterranean sites but does suggest thalassemia linked with continuing falciparum malaria.<sup>63</sup> Growth-arrest lines of hypoplasia on the enamel of permanent teeth occur in two of four mouths, indicating some childhood stress of disease or of starvation or cold. Yet the estimated statures for the three available female skeletons seem surprisingly tall: 18 *Fr* is about 164 cm. (radius), 31 *Fr* is 161.5 cm. (humerus and radius) and 35 *Fr* is 154.5 cm. (radius). These may exaggerate, since the radius could be extra long as implied by a brachial index in the immature 31 *Fr* of over 80 as compared to the norm of about 74 in U. S. Whites. Early Neolithic female stature is 155.8 cm. (30)<sup>64</sup> in Greece and Anatolia whereas Mesolithic European female stature is only 152.5 cm. and two Mesolithic Franchthi females average only 137 cm.! Since the Franchthi Mesolithic people are of troll-like shortness it is possible that the Neolithic people go well beyond the expected 3 cm. stature increase. In sum they do not seem excessively sickly if one accepts probable chronic malaria as normal.

It would be nice to know if the Franchthi Neolithic people were mainly intruders,

<sup>60</sup> J. L. Angel, "Early Neolithic Skeletons from Çatal Hüyük: Demography and Pathology," *Anatolian Studies*, XXI, 1971, pp. 77-98.

<sup>61</sup> J. L. Angel, "The Bases of Paleodemography," *American Journal of Physical Anthropology*, XXX, 1969, pp. 427-437; J. L. Angel, *Lerna*, II, *The People*, American School of Classical Studies, Princeton, New Jersey, and Smithsonian Institution Press, Washington, 1971, pp. 69-84; Gy. Acsádi and J. Nemeskéri, *History of Human Life Span and Mortality*, translated by K. Balas, Akadémiai Kiadó, Budapest, 1970, pp. 138-262.

<sup>62</sup> Angel, *Amer. Journ. Phys. Anthropol.*, XXX, 1969, *loc. cit.*; Angel, *Anatolian Studies*, XXI, 1971, *loc. cit.*

<sup>63</sup> J. L. Angel, "Porotic Hyperostosis, Anemias, Malaras, and Marshes in the Prehistoric Eastern Mediterranean," *Science*, CLIII, pp. 760-763; J. L. Angel, "Ecological Aspects of Palaeodemography" in D. Brothwell, ed., *The Skeletal Biology of Earlier Human Populations*, Symposium for the Study of Human Biology, No. 8, Pergamon Press, Oxford, 1968, pp. 263-270; Angel, *Lerna*, pp. 77-95; L. J. Bruce-Chwatt, "Paleogenesis and Paleo-Epidemiology of Primate Malaria," *Bull. World Health Org.*, XXXII, 1965, pp. 363-387.

<sup>64</sup> Angel, *Anatolian Studies*, XXI, 1971, *loc. cit.*

as apparently at Nea Nikomedeia where there are negroid African as well as Levantine and Anatolian similarities plus local Mesolithic additions (massive Alpine and Basic White). But at Franchthi we have only four skulls and two of these are of children. The children *11 Fr* and *12 Fr* are apparently Basic White-Mediterranean and could derive from either an eastern (e.g. Natufian) or local Mesolithic origin; but child skulls are hard to compare with adult norms. The 33-year old female from Paralia, *18 Fr*, is more clearly a rugged Basic White, more linear but in general comparable with Mesolithic *1 Fr*, *2 Fr* and *3 Fr* in short face and low orbits with heavy browridges and some alveolar projection; this is also a somewhat warped and fragmentary skull without lower jaw. The 16- or 17-year old *31 Fr* has a large, high and brachycrane ovoid skull vault with full forehead above a fairly large and broad almost square face with large wide orbits; in this E2 (Mixed Alpine) complex she is like some at Çatal Hüyük and the smaller female (No. 3) at late Upper Paleolithic Hotu; and in alveolar prognathism, broadish nose, orbits, and wide jaw ramus she is like the Nea Nikomedeia people and *242 Ler* from Late Neolithic Lerna;<sup>65</sup> but she is not directly like the Franchthi Mesolithic people, although she has a literally superficial resemblance because she has the same red-brown and white bone color.

*31 Fr* has a number of individualisms, of which some are genetic and may characterize the group. She shows growth contradictions in that the epiphyses of the phalanges have just closed (normally just before 14), and closure of epiphyses of the metacarpals (normally at about 14) was just starting; yet her third molars are fully erupted with root tips almost complete and the coronal suture is beginning to close at stephanion. Epiphyses of wrist and shoulder of course are still open, as are those of the acromion and other scapular areas and medial clavicle, and the spheno-occipital synchondrosis; yet the cervical rim epiphyses are starting to close. Maturation of skull and neck suggests age 19-20 and that of the skeleton age 15 or at most 17. The lower two-thirds of the skeleton is missing. Perhaps the growth disturbances of her second and fifth to sixth years (indicated by clearcut enamel hypoplastic lines on incisors and canines) delayed postcranial maturation. The right clavicular facet on the sternum is 7 mm. lower than the left, and the striking dorsal bowing of the ulnae (12 mm.) may also reflect growth stress as may the marked overbite and "up-turned" chin area with arched lower incisor row. On the other hand the Carabelli (mesiolingual) accessory cusp on upper M1s of *31 Fr* occurs also on *41 Fr* and *42 Fr* (milk m2 only) but not on *18 Fr* (?), *41 Fr* or *42 Fr* (permanent M1); and *31 Fr*'s Dryopithecus (Y-5) pattern on lower M1s occurs on 4 or 5 others (*31 Fr*, *34 Fr*, *36 Fr*; *37 Fr* has + pattern). Permanent teeth in the alveoli or crypts of children are particularly clear for pattern comparisons since they are unworn. Thus there is a little suggestion of genetic links or continuity within Neolithic Franchthi.

<sup>65</sup> Angel, *Lerna*, II, pp. 40-41 and plate I.

TABLE 1. LIST OF NEOLITHIC SKELETAL REMAINS.

| <i>Fr</i> No. | Provenience | Description                    | Sex  | Age           | Type | Pathology                      | Details                |
|---------------|-------------|--------------------------------|------|---------------|------|--------------------------------|------------------------|
| 11            | A: 62       | skeleton & skull               | ♀ ?  | 6             | A3   | Porotic hyperostosis, sl.      |                        |
| 12            | F/F-1: 41D  | skeleton & skull               | ♂ ?  | 8             | A2   | Porotic hyperostosis           |                        |
| 18            | Q6 NE: 10   | skeleton & skull               | ♀    | 33            | A2   | Back injury                    | Humeri sinuous, robust |
| 18A           | Q6 NE: 10   | sacrum, knee                   | ♂    | 17            |      |                                |                        |
| 19            | Q5 N: 19    | frags., skel. and skull        | ♀ ?  | 28?           |      |                                |                        |
| 20            | H-2 B: 46   | 1 frag. frontal                | ?    | 6 <i>ca.</i>  |      |                                |                        |
| 21            | H-2 B: 46   | 2 frags. occipital             | ♀ ?  | young adult   |      |                                |                        |
| 22            | H-2 A: 60   | 1 central incisor              | ♀ ?? | 8             |      |                                | Slight shovel          |
| 27            | F/A: 81S    | 1 frag. occipital              | ?    | 11 <i>ca.</i> |      |                                |                        |
| 28            | F/A: 82S    | Frag. malar, occ. & temporal   | ♀    | 20            |      | Porotic hyperostosis, sl.      |                        |
| 29            | F/A: 115S   | 1 frag. occipital              | ♂ ?  | 29?           |      | Porotic hyperostosis, sl.      |                        |
| 29A           | F/A: 115S   | Frag. frontal, par., occipital | ?    | 3 <i>ca.</i>  |      |                                | ++ brain digitations   |
| 31            | H-2 A: 95   | Upper skeleton & skull         | ♀    | 17-           | E2   | Growth arrests of tooth enamel | Ulnae bowed            |
| 32            | F/A: 136N   | Frag. left hand                | ♀ ?  | 35?           |      |                                | Wiry build             |
| 33            | F/A: 137N   | Finger V                       | ♀ ?  | 29?           |      |                                |                        |
| 34            | F/F-1: 42B1 | Right jaw                      | ♂ ?  | 4 +           |      |                                | Dryopithecus, 6-cusp   |
| 35            | H-1: A91    | Frag. skeleton & teeth         | ♀    | 30??          |      |                                | Ulna sinuous           |
| 35A           | H-1: A91    | Frag. browridge                | ♂    | young adult   |      |                                |                        |
| 36            | H: 37H      | Frag. frontal                  | (♂)  | 6?            |      |                                |                        |

TABLE 1. LIST OF NEOLITHIC SKELETAL REMAINS—Continued.

| Fr No. | Provenience | Description               | Sex  | Age   | Type | Pathology | Details                         |
|--------|-------------|---------------------------|------|-------|------|-----------|---------------------------------|
| 37     | H: 37K      | Rt. jaw & left temporal   | ♀    | 5 —   |      |           | m2 Dryopithecus<br>M1 + pattern |
| 38     | H: 37A      | Rt. lower leg             | ?    | 3 +   |      |           |                                 |
| 39     | H: 37A      | Temporal & occipital      | ♀ ?? | 2     |      |           |                                 |
| 40     | H: 37M      | Metatarsals & ribs        | ?    | 3     |      |           |                                 |
| 41     | H: 37N      | Maxilla, temporal, femur  | (♂)  | 3 +   |      |           | m2 Carabelli<br>M1 no Carabelli |
| 42     | H: 37Ξ      | Maxilla                   | ♀ ?  | 3     |      |           | m2 Carabelli                    |
| 43     | H: 370      | Frag. frontal             | ?    | 3     |      |           | M1 no Carabelli                 |
| 44     | F/A: 45     | Metatarsal V              | (♂)  | 35??  |      |           |                                 |
| 45     | F/A: 65S    | milk central incisor (il) | ?    | 6 ca. |      |           |                                 |
| 46     | F/A: 125S   | 1 frag. parietal          | ?    | 8 ca. |      |           |                                 |

Except for signs of anemia there is not very much pathology, in contrast with the Mesolithic group, though the broken and very partial state of the remains hides pathology's true incidence. *18 Fr* shows a wedge-shaped third lumbar vertebral body (anterior height, 24 mm. and posterior height, 29 mm.) apparently from a mild compression fracture causing about 4 mm. of collapse; L4 shows a slight Schmorl herniation of the disc on its under surface and the facets at the lumbosacral joint show + degree of arthritic hypertrophy probably from the same stress. Her humerus is quite sinuous, flattened, and robust (middle diameters, 22.5 mm. and 15.5 mm., maximum and minimum) and forearm breadth is 47 mm. with marked bowing of radius. Her femur shows the expected extra flattening of upper shaft with platymeric index of 72.6 but is not extra muscular. Her hands are not small, although those of *31 Fr* are a little larger with length and breadth 172 mm. and 62 mm.

Teeth are undiseased in *31 Fr* but *18 Fr* shows five lesions in the 16 maxillary alveoli (there is no jaw): four molars lost, two with abscesses in one case reaching the maxillary sinus, and one carious molar of which only roots remain as diseased shells. Obviously we cannot be sure of the dental disease level. I might have expected the same excellent teeth as at Late Neolithic Kephala on Kea on the assumption that a diet including much fish raises the fluoride and lowers the selenium level.<sup>66</sup>

All together it seems more likely that the relatively high child mortality comes from general life stresses against a background of continuing malaria than from any other new disease complex.

J. L. A.

### ABSOLUTE CHRONOLOGY: AN ADDENDUM

The following is meant to supplement and partially supersede the section dealing with absolute chronology in *Franchthi*, II. 1. Shortly after that manuscript was submitted for publication, a series of additional dates was received from the Radiocarbon Laboratory at the University of Pennsylvania. This group now completes the processing of samples submitted through the 1971 excavation season and—excluding the final results for the preliminary determinations quoted in Part I of this report—brings the total of radiocarbon dates from Franchthi to thirty-seven.<sup>67</sup>

The new results are as follows:

<sup>66</sup> D. M. Hadjimarkos and C. W. Bonhorst, "Fluoride and Selenium Levels in Contemporary and Ancient Greek Teeth in Relation to Dental Caries," *Nature*, CXCI, 1962, pp. 177-178.

<sup>67</sup> I would like to thank again Dr. Ralph and her colleagues for the promptness and efficiency with which they have processed our samples.

|                              |                                     | 5568                    |
|------------------------------|-------------------------------------|-------------------------|
| <i>Lab No.</i> <sup>68</sup> | <i>Franchthi Context</i>            | <i>Half-Life (B.C.)</i> |
| P-1920                       | F/A Balk, 83 S<br>Late Neolithic    | 4222 $\pm$ 60           |
| P-1921                       | F/A Balk, 102 S<br>Late Neolithic   | 6457 $\pm$ 92           |
| P-1922 <sup>69</sup>         | F/A Balk, 129 N<br>Middle Neolithic | 4835 $\pm$ 87           |
| P-1922-A*                    | Same as above                       | 4780 $\pm$ 73           |
| P-1923 <sup>69</sup>         | H-1: A 181<br>Upper Palaeolithic    | 9287 $\pm$ 140          |

*Comment.* P-1920 (too small for NaOH pretreatment) corresponds reasonably well with the other L.N. dates though we might have expected it to have been slightly lower. P-1921 (too small for NaOH pretreatment) is obviously too high. It should have corresponded more closely with P-1661, but no explanation of the discrepancy is apparent at the moment. P-1922 (no NaOH pretreatment) is the same as the preliminary determination. P-1922-A is the other half of sample P-1922 and has been treated for humic acid contamination. Therefore it should be regarded as more accurate than P-1922. Unfortunately it offers little clarification for the somewhat puzzling uniformity of F/A dates from early through late M.N. P-1923 is simply confirmation of the preliminary determination.

Finally, a qualifying footnote should perhaps be added to the remarks made in Part I about the "risk of contamination" in charcoal samples collected by flotation or water-sieving (as compared with those collected in the course of excavation).<sup>70</sup> It should be emphasized here that those remarks were merely offered as a possible explanation of the discrepancy between the results of two of our samples, and, as indicated, the theory has not been systematically tested. Therefore we intend to submit a certain number of paired samples from our excavations in 1973 in order (hopefully) to contribute to the resolution of the question.

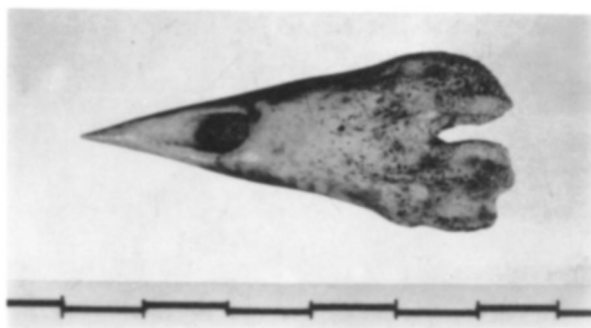
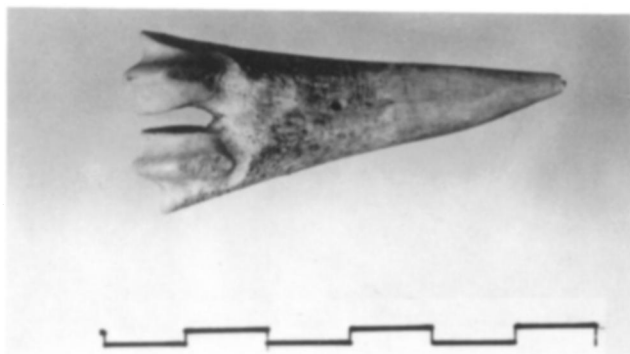
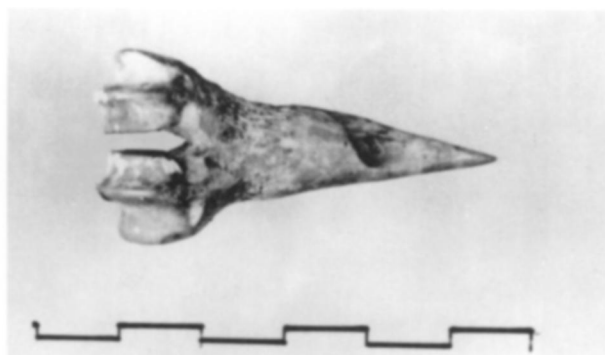
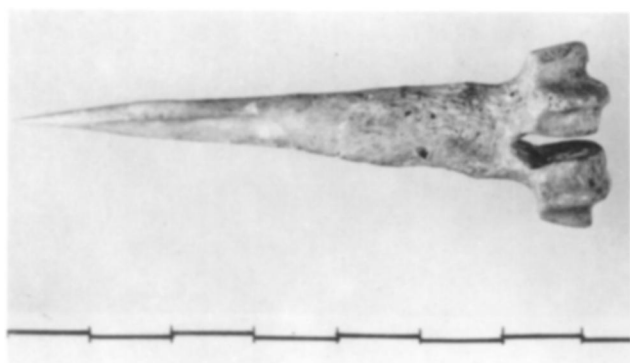
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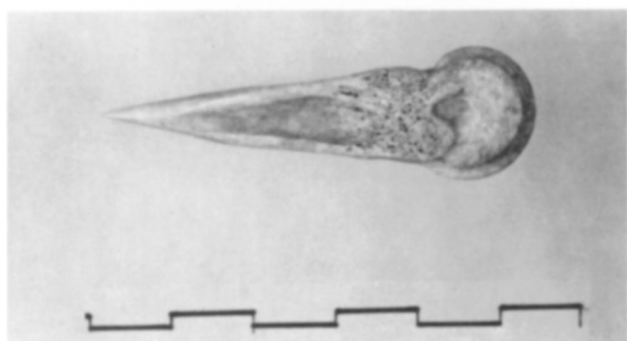
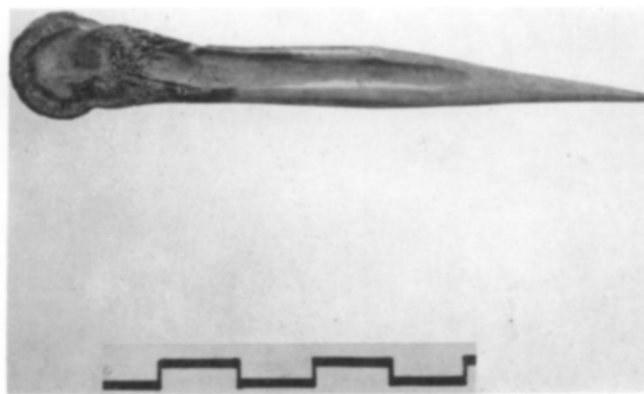
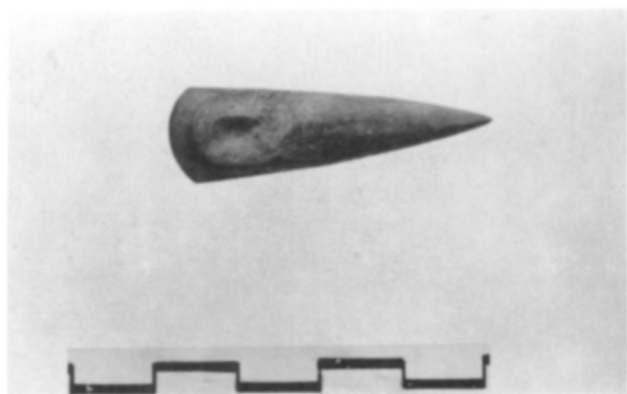
<sup>68</sup> The sample number with an asterisk indicates treatment for humic acid contamination.

<sup>69</sup> The results of these samples are now final. (Cf. *Franchthi*, II. 1, p. 86, note 70.) There are no changes from the preliminary results.

<sup>70</sup> *Franchthi*, II. 1, p. 86.

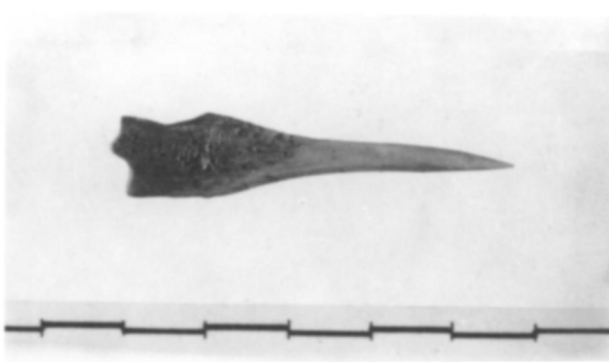
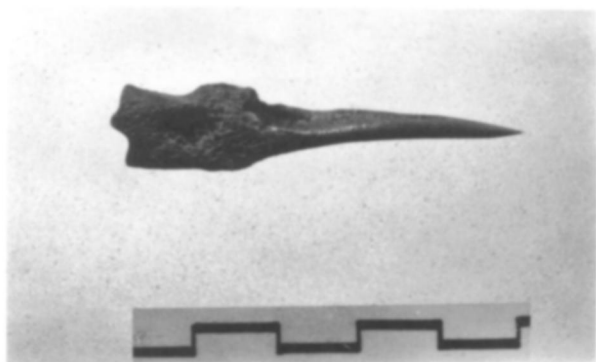
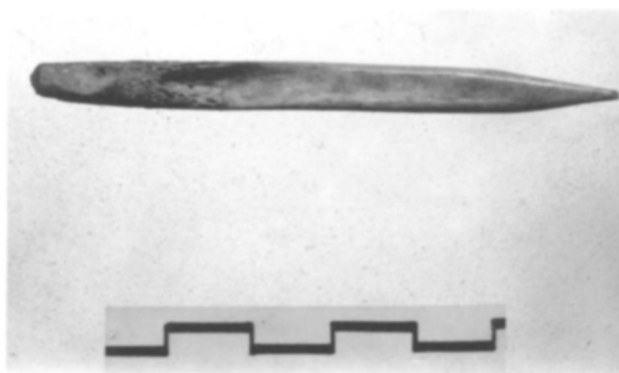
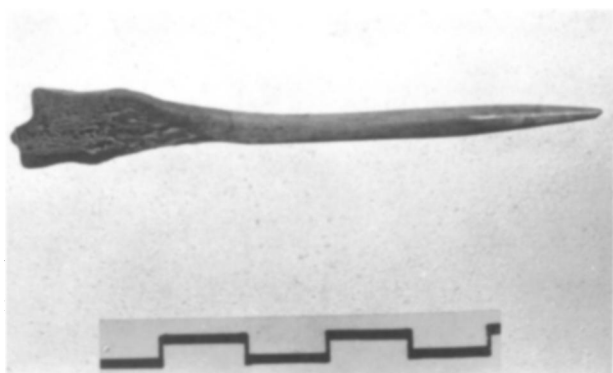


a. Bone Points of Type 1

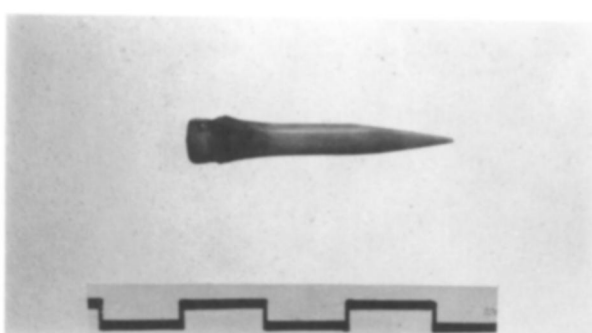
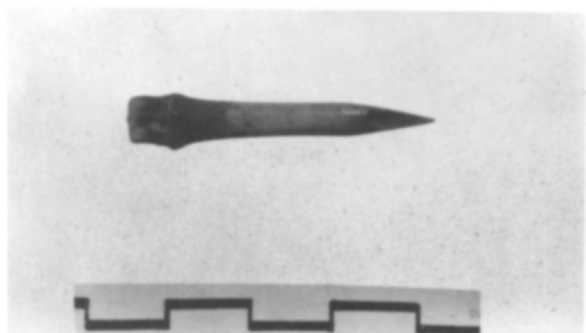
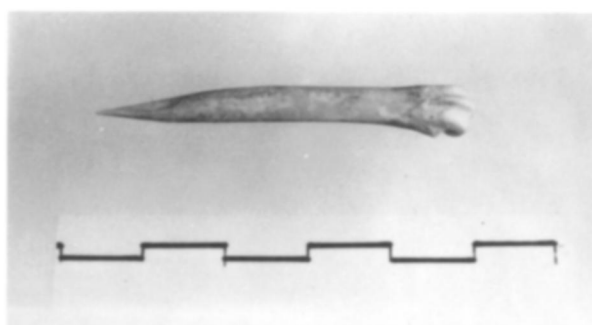
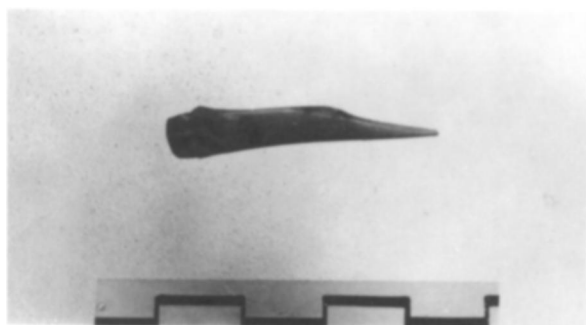


b. Bone Points of Type 2

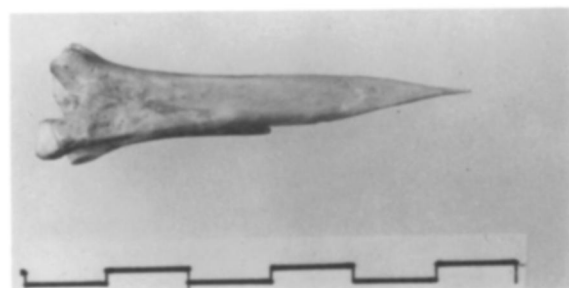
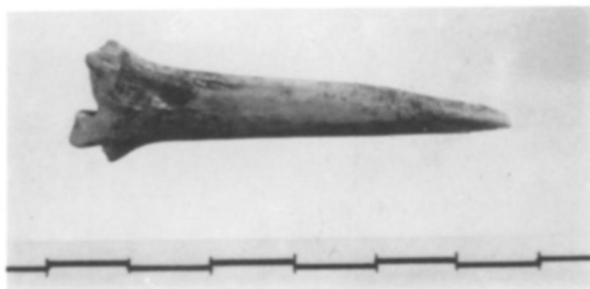
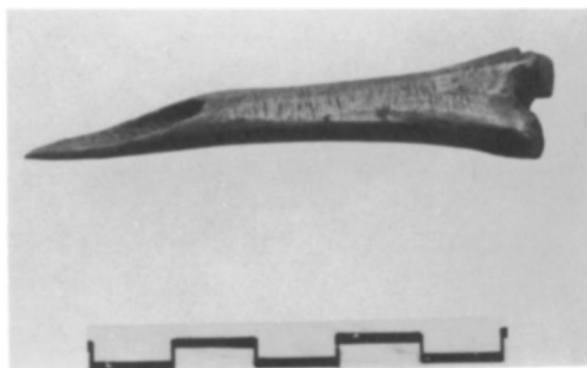
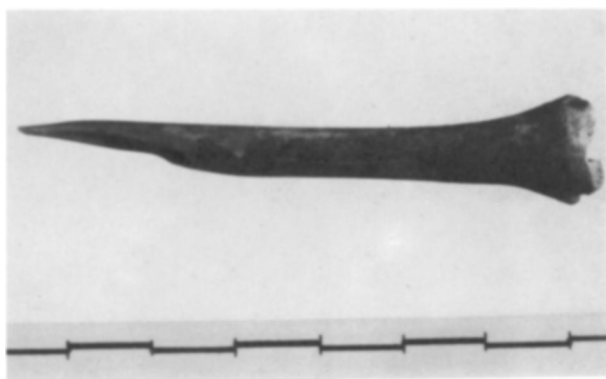




a. Bone Points of Type 3



b. Bone Points of Type 4



a. Bone Points of Type 5



b. Neolithic Bone Implements



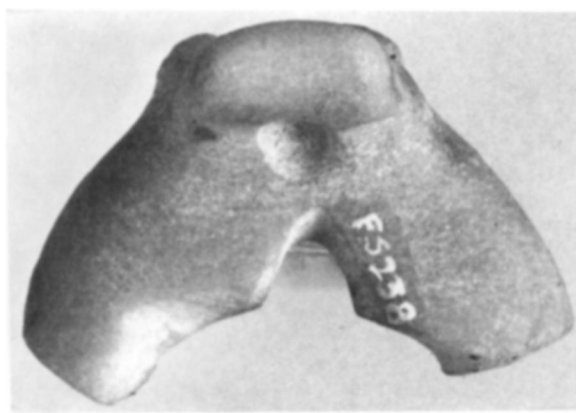
c. L.N. Antler Mattock or Pick (Scale, *ca.* 1:2)



a. Mesolithic Implements of Stone and Bone (Scale, *ca.* 1:2)



b. Neolithic Stone Amulet, Obverse



c. Neolithic Stone Amulet, Reverse

(Scale, *ca.* 2.5:1)



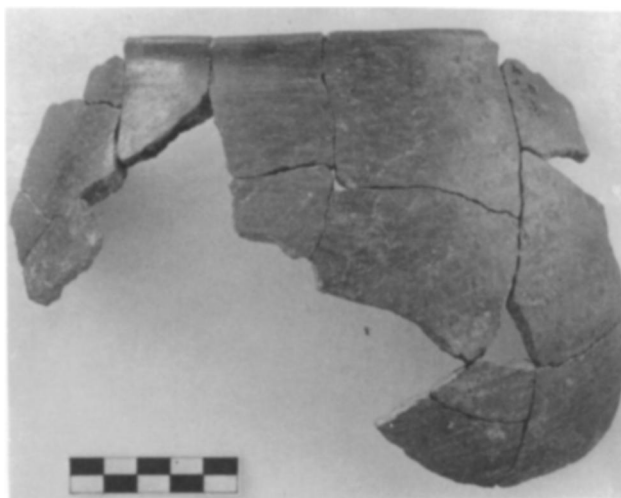
d. Neolithic Objects of Worked Shell



a. Unbaked Neolithic Sherds (Scale, *ca.* 2:1)



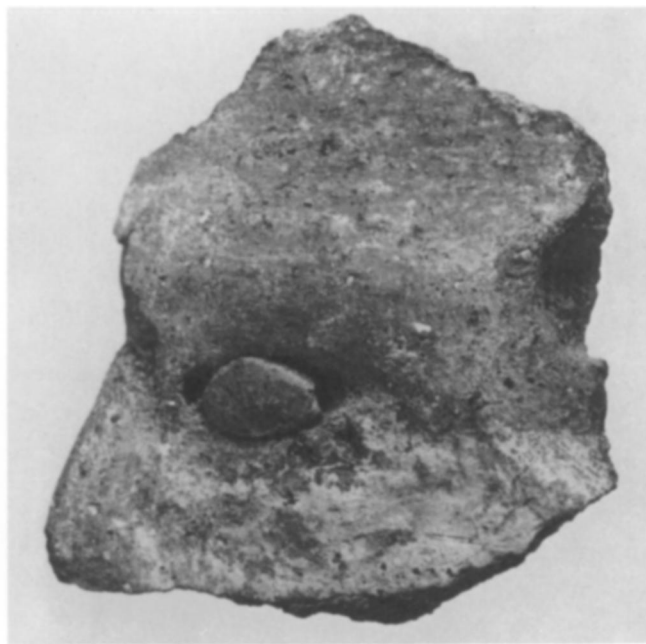
b. E.N. Red-patterned Jar Fragment



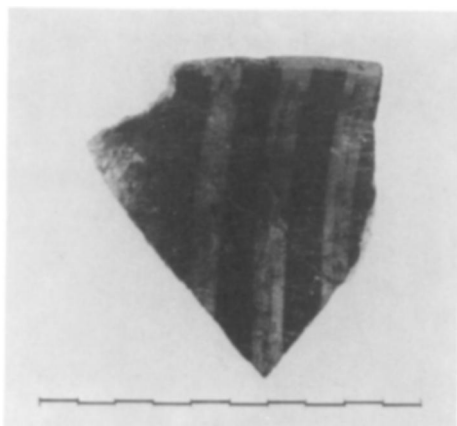
c. E.N. Burnished Monochrome Jar Fragment



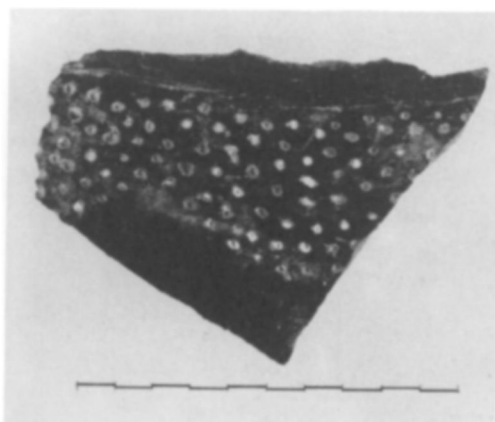
d. E.N. Jar Fragment with Knobbed Decoration



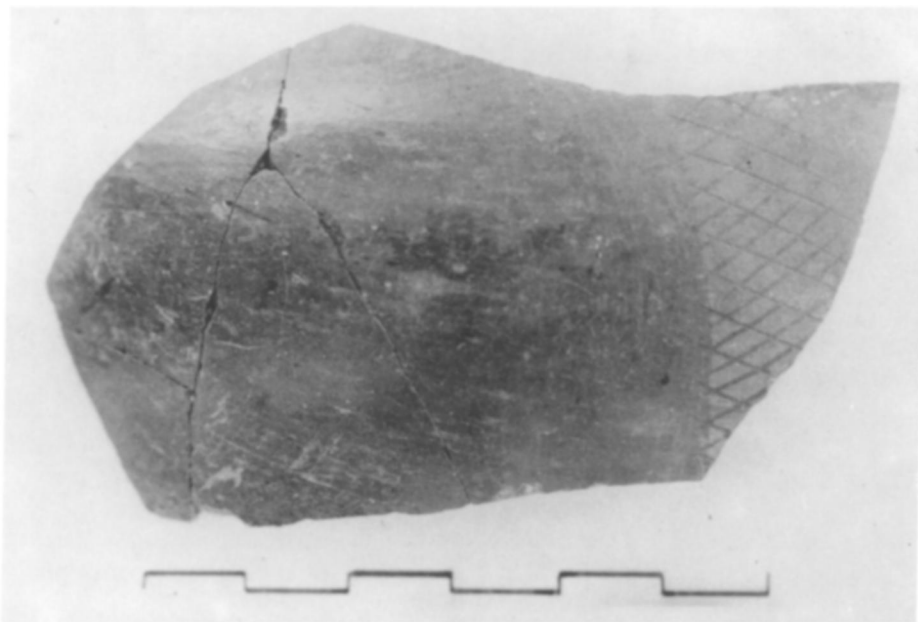
a.-b. Sherd from "Face-pot" (Scale, *ca.* 2.5:1)



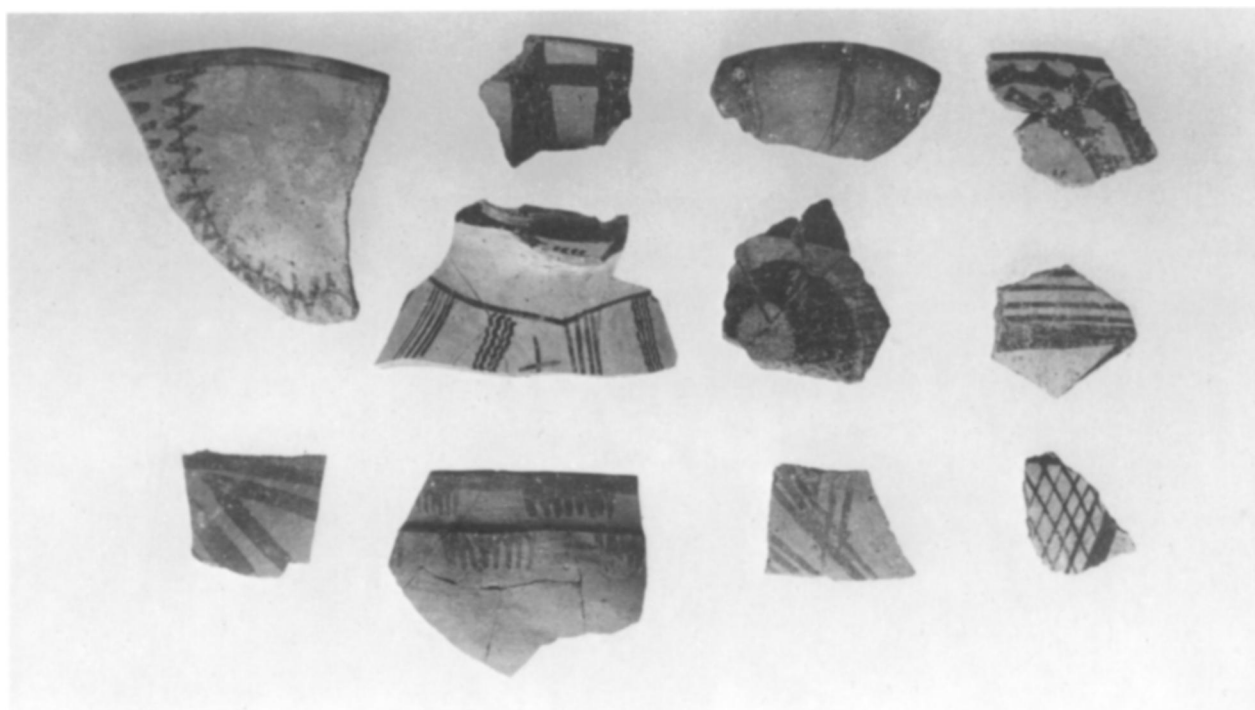
c. Black Burnished Sherd with White Painted Decoration



d. Black Burnished Sherd with White Filled Decoration



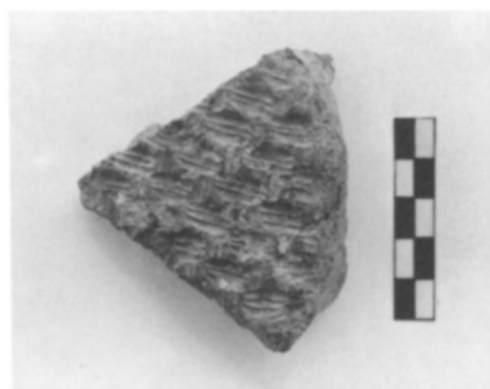
e. Black Burnished Sherd with Burnished Decoration



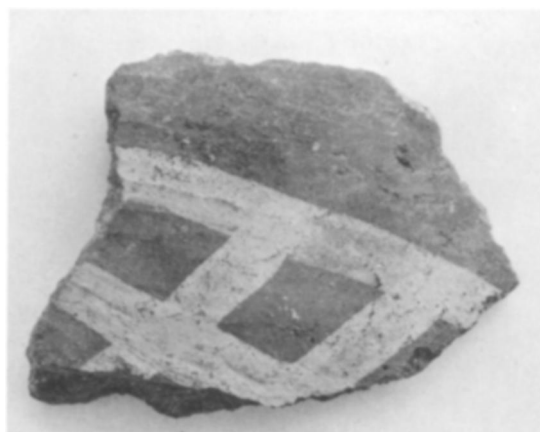
a. L.N. Painted Sherds (Scale, *ca.* 1:3)



b. L.N. Sherd with Applied Decoration  
(Scale, *ca.* 1.5:1)



c. L.N. Base with Mat Impression



d. L.N. Sherd with White Painted Decoration  
(Scale, slightly less than 1:1)



a. L.N. Crusted Ware Sherds (Scale, *ca.* 1:2)



b. L.N. Clay Figurine (Scale, *ca.* 1:2)



c. L.N. Clay Figurine (Scale, 3:4)



d.-e. L.N. Clay Head (Scale, *ca.* 1.5:1)





a. Late Neolithic Clay Figurine (Scale, nearly 2:1)

THOMAS W. JACOBSEN: EXCAVATIONS IN THE FRANCHTHI CAVE, 1969-1971. PART II.