Neolithic Statues from ʿAin Ghazal: Construction and Form

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Abstract

Reassembly of five large lime plaster statues from the seventh millennium B.C. following their excavation in 1985 at ʿAin Ghazal, Jordan, provided an opportunity to examine evidence of their construction. For the most part, the statues had lain horizontally during fabrication, and they were made in stages by applying plaster to reed bundles bound with cordage. Full-scale replication of a bust and a figure provided additional information about construction. Plaster probably had to be applied while armatures were horizontal because of the statues' large size; broad, flat, and simple forms were made as a consequence. In order to fashion the complex standing figures, legs were modeled separately and joined to the rest of the statue with plaster. Statues may have been accessorized with wigs, clothing, or other materials to simulate human appearance.*

INTRODUCTION

The discovery during the 1980s of two caches of extraordinary PPNB (Pre-Pottery Neolithic B) plaster statues at the site of ʿAin Ghazal in Jordan has aroused considerable interest among archaeologists as well as the wider public. Numbering more than 30 in total, the caches' busts and standing figures are among the world's oldest known large-scale statues, solidly dated to the seventh millennium B.C. (uncalibrated); they are exceptionally well preserved. From a visual standpoint the faces are compelling, with black bitumen decoration drawing attention to the eyes. Furthermore, because PPNB societies were preliterate, the meaning of the statues remains enigmatic, inviting speculation. Archaeology has provided little additional information about the use of PPNB plaster statues because most have been excavated from pits where they were apparently buried when no longer wanted for their original purpose.[1] Moreover, the practice of making large-scale plaster statues ceased after the PPNB, so that there are no later exemplars to be used as an aid in interpretation. Thus, the principal source of information about meaning is the corpus of PPNB plaster statues itself.

This paper focuses on fabrication of statues in the second of the two caches excavated at ʿAin Ghazal. In particular, it will endeavor to show that the material limitations of plaster used on a large scale played an important role in determining statue forms. Moreover, it will be argued that, in part because of formal limitations, the statues were likely adorned with other materials, for example, clothing and wigs or headgear, during display.

Three types of evidence are integrated to support these hypotheses: construction details visible in the original plaster, information acquired during replication of two statues, and the forms and fabrication of similar PPNB statues. Construction details were observed during reassembly of statues in cache 2 at the Smithsonian Institution and are considered primary evidence, especially the excellent impressions left by entirely disintegrated reed-and-cordage armatures on interior surfaces of statue fragments. Such evidence was thoroughly documented during treatment because it would become inaccessible for study after the statues were reassembled and prepared for museum display.[2] Full-scale replicas of a large bust and standing figure were made in order to better interpret primary evidence. The process provided an unexpected dividend, showing that statue forms had to be relatively flat, shallow, and simple to be successfully made. Closely related statues in the first cache excavated at ʿAin Ghazal in 1983 were examined while they were in the process of treatment at the University of London, giving access to construction evidence. PPNB plaster statue fragments in the Ashmolean Museum in Oxford and the Musée du Louvre in Paris were examined in less detail, in part because restoration has obscured much evidence of fabrication. References to other PPNB material are based on published photographs and written accounts.

OVERVIEW OF PPNB PLASTER STATUES

The first modern discovery of PPNB plaster statues was made by Garstang at Jericho in 1935. He

* I am especially indebted to Kathy Tubb and Sue Gilbert for access to the cache of statues excavated at ʿAin Ghazal in 1983, and to Roger Moorey, Elisabeth Fontan, and Annie Caubet for access to Jericho material. I would also like to thank my valued colleague Rae Beaubien, as well as Patricia Griffin, Ann Gunter, Zeidan Kafafi, Anne Liégey, Robert Mark, Gary Rollefson, and Denise Schmandt-Besserat for their contributions to this paper.

[1] Garfinkel 1994.

[2] Grissom 1997.

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found two caches of relatively realistically rendered statues, each cache said to contain a "man" that was about life-size, a "woman" (with breasts) half that size, and a doll-sized "child."[3] The only known fragments of these caches, however, are those of a "man" in the collection of the Rockefeller Museum in Jerusalem, consisting of a pair of legs and a well-preserved head decorated with shell eyes and radially painted lines,[4] and miscellaneous fragments in the Musée du Louvre in Paris, including a shoulder, a smaller pair of legs (one with a six-toed foot), and a separate fragmentary foot.[5] Kenyon, excavating at Jericho in the 1950s, found a cache of at least three highly stylized busts without sculpted features.[6] The most complete bust, painted yellow overall with eyes and nose possibly outlined by dark paint, is in the Jordanian Archaeological Museum in Amman. From the same find are a similar but more fragmentary yellow-painted bust (1958.771) and a large red-painted section (1958.772), apparently the base of a bust; both are in the collection of the Ashmolean Museum in Oxford.[7] Kenyon believed the statues she found to be later than those found by Garstang, but she noted that the stratigraphic position of the Garstang material was "not very certain."[8] Plaster fragments recently found in the Nahal Hemar Cave have well-preserved impressions of reeds and cordage.[9] Although too limited to reconstruct, they are believed to be parts of at least four statues because analyses show four distinct material compositions.[10]

Given the fragmentary nature of earlier finds, discovery of the first cache of plaster statues at ʿAin Ghazal in 1983 was a remarkable event.[11] The number of statues was large (26), consisting of busts and standing figures with arms, and most statues were substantially complete although badly broken and distorted since burial. Radiocarbon dating of two samples of charcoal closely associated with the statues produced almost the same dates, 6750 ± 80 B.C. (uncalibrated) and 6710 ± 80 B.C. (uncalibrated).[12] Furthermore, the technique of blocklifting the entire cache for laboratory excavation and conservation treatment at the Institute of Archaeology in London resulted in preservation of essentially all material.[13]

Discovery of the second cache of statues at ʿAin Ghazal occurred the following year at the end of the excavation season, so that the contents of the pit were not blocklifted until 1985.[14] They were subsequently transported to a facility of the Smithsonian Institution near Washington, D.C., where they were excavated and conserved.[15] Based on radiocarbon dating of charcoal found below them, statues in the second cache were buried after 6570 ± 110 B.C. (uncalibrated),[16] thus indicating that they are later than those in the first cache. Five statues were reassembled: two standing figures and three two-headed busts (fig. 1). Unattached fragments include two additional heads, one of which is fragmentary. Because of their different sizes and associated torso fragments, these two heads had probably been incorporated in sepa-

[3] Garstang 1935, 166–7; Garstang and Garstang 1940, 57–8.

[4] Both the head and legs were found in deposit 195 (Garstang 1935, pls. 25, 51, 52). Based on photographs shown in Tubb and Grissom (1995, pls. 14, 15), the legs measure about 50 cm, essentially the same length as those of two-legged figures in cache 2 excavated at ʿAin Ghazal. Based on a photograph shown in Garstang (1935, pl. 53), and Garstang and Garstang (1940, pl. 10), the head (IDAM acc. no. 35.3289; fig. 12 here) is a little smaller than that of statue #2 but larger than other heads found in cache 2. Thus, the statue must have been somewhat less than life-size, like figures in cache 2. Radially painted lines on the head are often interpreted as depicting a beard.

[5] Measuring less than 40 cm in height, the legs in the Louvre are smaller than those in Jerusalem and may be those identified by Garstang as belonging to a woman. In which of the two deposits these legs and the shoulder were found is not known, but Garstang (1935, 167) notes that a foot with modeled toes was found in deposit 190, probably the separate fragmentary foot (acc. nos. include AO 18850, 18855, 18856, and 18857).

[6] Kenyon 1960, 91–2, pl. 12.

[7] Small unattached fragments, most of which appear to have been parts of the larger bust sections, are also in the Ashmolean's collection, as are plaster fragments found at Jericho that are white except for red surface paint (acc. no. 1964.698). The latter have also been analyzed and their results tabulated with those of bust fragments (Goren and Segal 1995; Kingery, Vandiver, and Prickett 1988). The interior surfaces of these fragments, however, are unusually smooth, and I have found no convincing evidence that the fragments formed parts of statues.

[8] Kenyon 1960, 92.

[9] Bar-Yosef and Alon 1988, 20–1, pl. 8.

[10] Goren, Segal, and Bar-Yosef 1993.

[11] Rollefson 1984.

[12] OxA-1473 and OxA-1472 respectively (Hedges et al. 1989, 228). Calibrated dates, in this case 7723 ± 122 B.C. and 7654 ± 121 B.C., were done by probability distribution (Method B), % area enclosed (Gary Rollefson, personal communication, 23 June 1999).

[13] Tubb 1985, 1987; Tubb and Grissom 1995. In a series of steps, surrounding soil was removed, and the deposit was encased in polyurethane foam within a wooden crate, built while it remained in situ. Separated from the deposit with foil, the foam immobilized and cushioned the deposit during this process and later for transport.

[14] Rollefson and Simmons 1987.

[15] Then known as the Conservation Analytical Laboratory, it is now called the Smithsonian Center for Materials Research and Education (SCMRE). Grissom 1996, 1997.

[16] The C-14 sample number was Beta-19907 (Simmons et al. 1988). The calibrated date is 7580 ± 110 B.C.

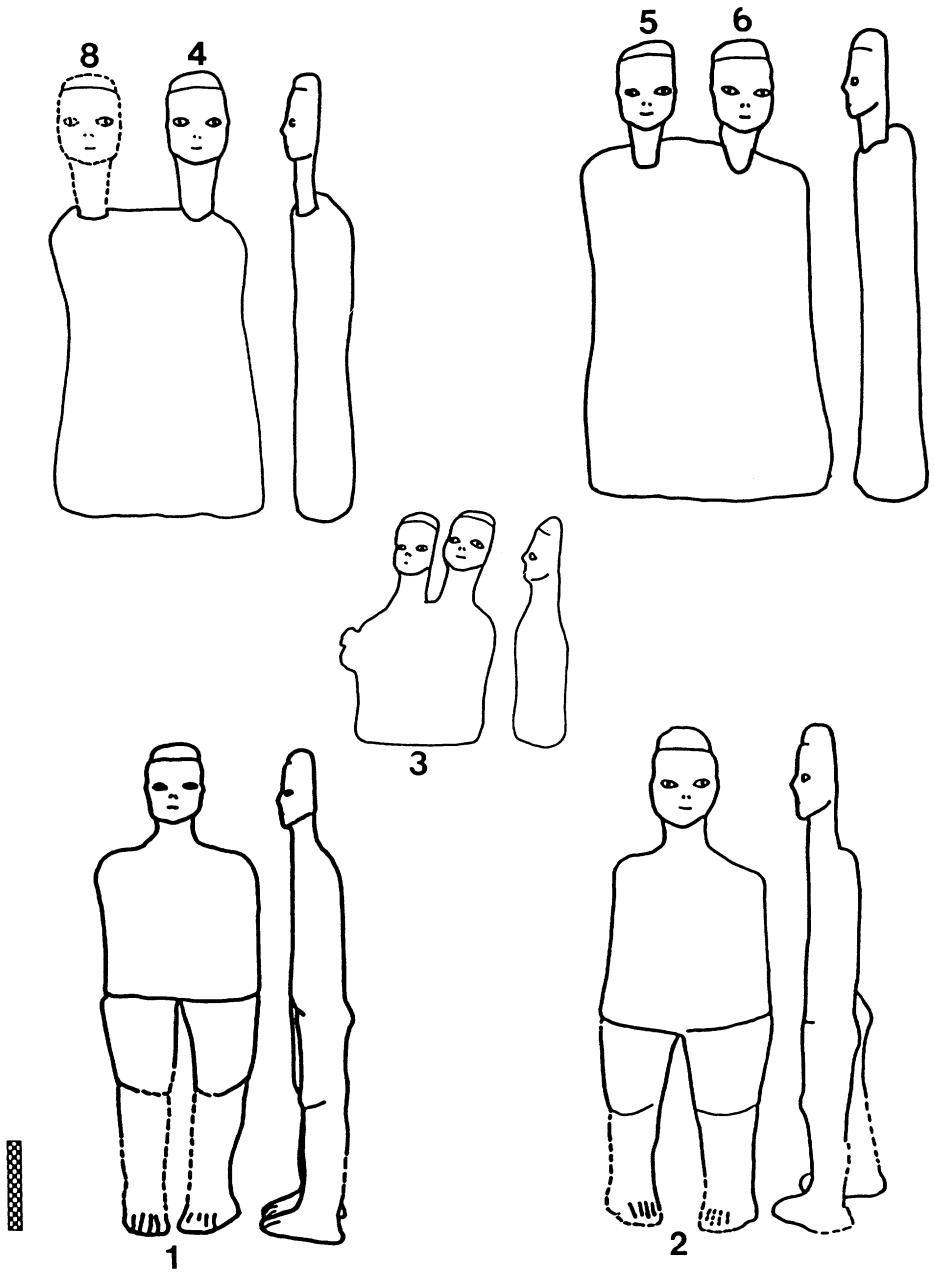

Fig. 1. Drawing of cache 2 statues with numerical designations. Dashed lines indicate modern compensation at perimeters. Scale measures 20 cm.

rate busts, at least one of which had two heads (the second head or heads apparently missing). Thus, it is likely that portions of seven statues had been buried in total, possibly including as many as five two-headed busts.[17] Two-headed representations are unique among known PPNB plaster statues, although two-headed statuettes and ceramics have been found in later millennia of the Neolithic and even more commonly in subsequent periods.[18]

Stylistic similarities of statues in the two caches

[17] Three reassembled statues and the two unattached heads are now displayed at the Jordanian Archaeological Museum on the Citadel in Amman. Statue #2 is on long-term loan to the Musée du Louvre in Paris. All are property of the Department of Antiquities of the Hashemite Kingdom of Jordan.

[18] For examples, see Schmandt-Besserat 1998.

found at ʿAin Ghazal are many, but there are also significant differences. Heads in the two caches are modeled in a generally similar fashion that indicates that they are part of the same tradition. All are shallow in depth, relatively flat on the back, and have recessed brows that suggest the addition of wigs or headdresses made of other materials. Mouths, nostrils, and eye perimeters are defined by incised lines. Shapes of heads in cache 2, however, are essentially rectangular with the addition of pointed chins; bitumen pupils are depicted with slightly truncated diamond shapes; outlines of eyes are pointed at the corners; and features are strikingly similar to those of a plastered skull found at ʿAin Ghazal in 1988,[19] probably because it is close in date. Heads of statues in cache 1, by comparison, tend to be wider toward the top; the bitumen pupils are round; the eyes are larger and more protuberant, and their outlines are usually rounded; and features can be readily differentiated from those of cache 2 and the plastered skull found in 1988. That all busts in cache 2 have two heads while those in cache 1 have single heads is another obvious iconographic disparity.

Differences between the statues' bodies in the two caches seem more pronounced than those between the heads. Torso shapes in cache 2 are rectangular, while those in cache 1 are slope-shouldered and more shapely, having waists. While two-legged figures in both caches are disproportionately shallow in depth, torsos in cache 2 are essentially flat on front and back, but those in cache 1 display slight curvature. Moreover, figures in cache 2 are armless and have no sexual features or body paint, while those in cache 1 have arms, painted stripes or other designs on their bodies, and, in a few cases, breasts or female genitalia.[20] Busts in cache 2 are also flat on front and back surfaces, and constant in depth from base to shoulders, while bust torsos in cache 1 are more rounded, and both wider and deeper at the bottom.

Statues in cache 2 are appreciably larger than those in cache 1 (fig. 2). While the largest two-legged figure in cache 2 measures 104 cm in height compared to a little over 90 cm for the tallest figure in cache 1, the figures in cache 2 are volumetrically even larger because of their blocky shapes and proportionally larger bodies. Only the smallest bust in cache 2 (statue #3) is comparable to busts in cache 1, although at 46 cm in height, it is larger than the tallest bust in cache 1, which measures 35 cm in height. The two large busts in cache 2 (statues #4/8 and #5/6), averaging 86 cm in height, have no equivalent in form or size to busts in cache 1. Because of the larger size of the statues in cache 2, it is hypothesized that aspects of their fabrication had to be different, which would have led to differences in forms, particularly for the bodies.

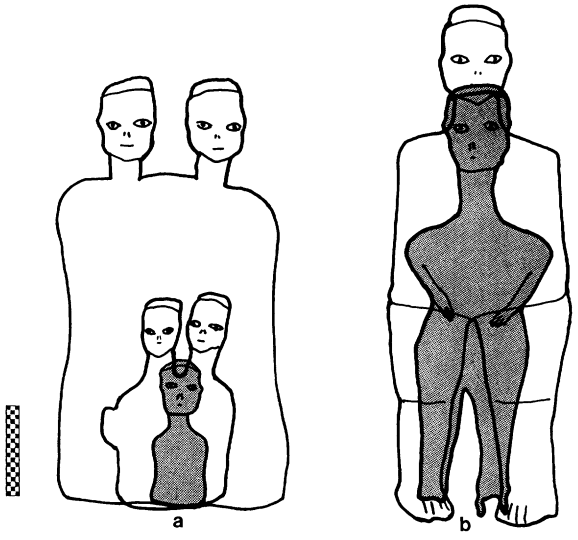

Fig. 2. Size comparison between statues in cache 2 (outlined) and cache 1 (shaded): (a) busts and (b) standing figures. Scale measures 20 cm.

MATERIALS

Knowledge of the properties and general usage of the principal materials used to make PPNB statues is fundamental to understanding their construction. Some of these materials, such as the reeds and cordage used to make armatures, have entirely disintegrated but can be studied through impressions left in plaster. For each material described below, the one used to make statues in cache 2 is described first, followed by material for replicas and other PPNB plaster statues.

Reeds

Fine parallel striations on interior surfaces of plaster fragments allow the principal armature material to be identified as a grass. Edges of individual leaf blades can be discerned, showing that leaves varied from 8 to 15 mm in width. The only grasses in the area that grew this large were *Phragmites* or *Arundo*,[21] both commonly known as reeds. Replication of statue armatures was accomplished with *Phragmites* obtained from a marshy area along the Patuxent River near Washington, D.C.

[19] Simmons et al. 1990.

[20] Tubb and Grissom 1995.

[21] Dr. Joy McCorriston, Assistant Professor, Department of Anthropology, Ohio State University (Columbus, Ohio), kindly provided her expertise in ancient Near Eastern botany to identify these plants (summer 1993).

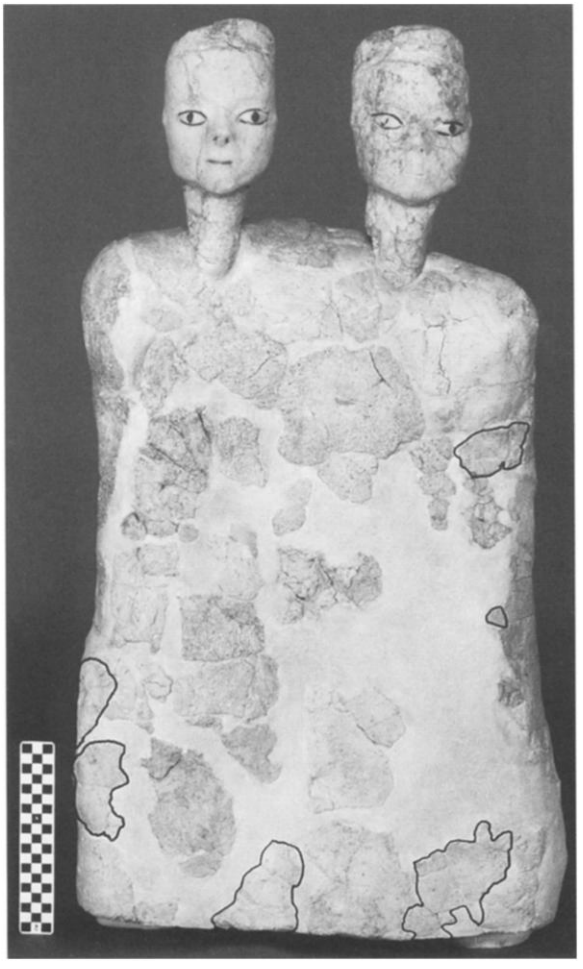

Fig. 3. Statue #5/6, height 88 cm. Torso fragments that displayed cleavage indicative of two plaster applications are outlined. (Courtesy Diane Nordeck, Smithsonian Institution)

Reeds were neatly assembled in bundles that are distinguishable because each bundle had some individual cordage binding. Impressions for these discrete bundles measure from 2 to 6 cm in width. The armature for the small bust was made of at least eight bundles, while armatures for the four larger statues were made of 20 or more. Torsos were constructed on so many contiguous bundles that they left substantial continuous cavities inside each statue after the reeds had disintegrated (figs. 3–8).

Replication showed that both the stem and leaves of the reed were generally used. The stem provided some rigidity to the bundle and organized the leaves that enclosed it, keeping them parallel. Curvilinear impressions of bundle ends indicate that reeds were folded to produce bundles of a particular size, as was clear on the interior of statue #1 (figs. 7–9). Folding a group of reeds to create a bundle precluded cutting and reduced the number of loose ends, and it proved an efficient means of production during replication. Experimentation also indicated that armatures would have been made when reeds were fresh: when dry, they proved difficult to bend and did not align well. The banks of the three wadis located at

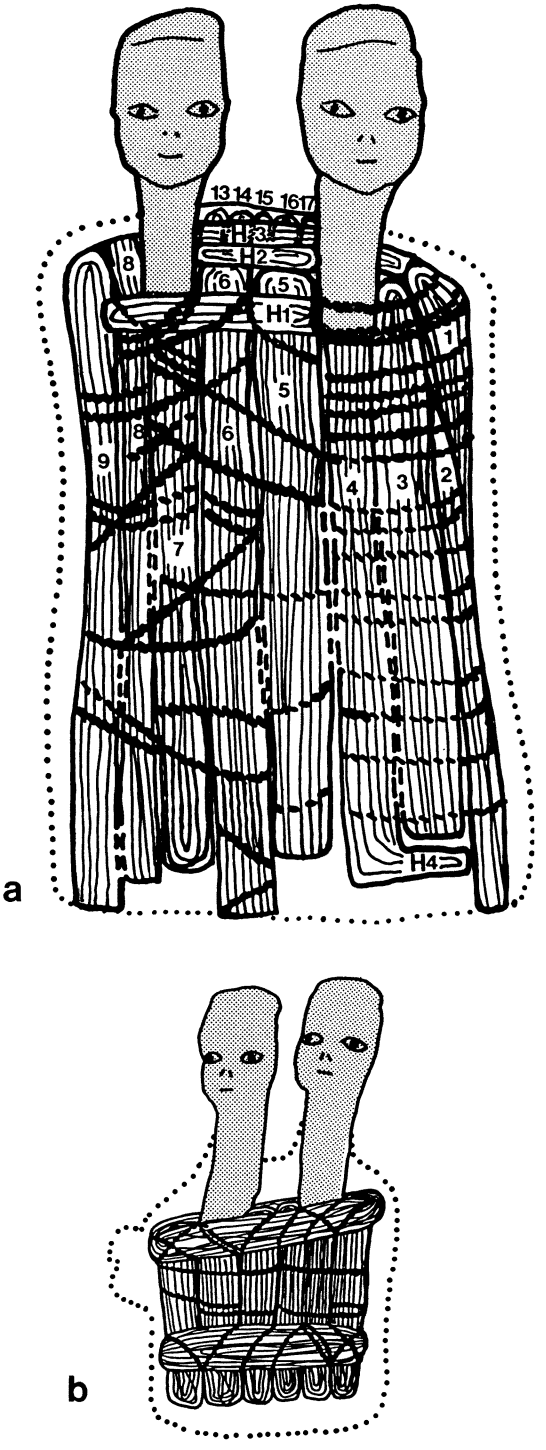

Fig. 4. Drawing illustrating construction of: (a) statue #5/6 and (b) statue #3. Shading indicates the modeled plaster heads and necks around which reed-and-cordage torso armatures were built. Dotted lines around armatures indicate statue perimeters.

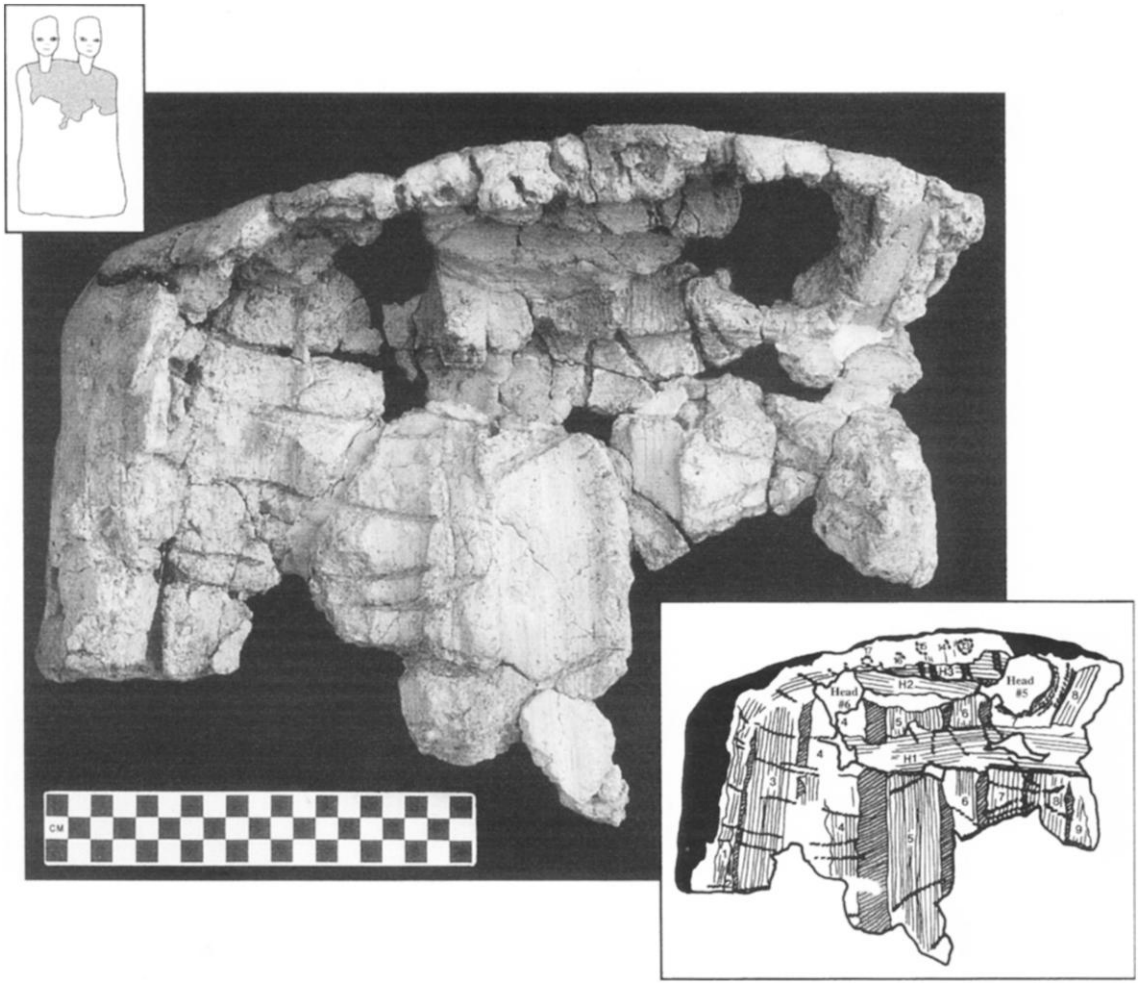

Fig. 5. Interior of upper front and shoulders of statue #5/6 during treatment (location on bust shown by drawing at upper left). In the drawing at lower right, striated impressions of reed bundles are numbered; crests between reed bundles are indicated by hatching; cordage impressions are also marked.

ʿAin Ghazal should have provided inhabitants of the Neolithic village with an unlimited supply.

Reed impressions inside statues in cache 1 are similar to those of cache 2, but bundles were smaller, they did not leave large continuous cavities inside the torsos, and they were far fewer in number. Figures were typically made on armatures composed of only five reed bundles, compared to 26 and 27 bundles for those in cache 2. Busts were made on single bundles, compared to at least eight bundles for the comparable small bust. Information about the size and overall structure of armatures for the Nahal Hemar statues is precluded by the small number of fragments, but reed impressions appear similar to those of material from ʿAin Ghazal.[22] For the Jericho head in the Israel Museum, a cavity left by an armature is visible in X-radiographs extending vertically inside the head; linear density variations parallel to the cavity suggest that it was made by reeds.[23] Legs associated with the head are also reported to bear impressions of reeds.[24] Legs from Jericho in the Musée du Louvre are hollow, indicating that they had been made on disintegrated armatures, but linear striations indicative of reeds were not observed. The Jericho bust sections in the Ashmolean Museum appear to be solid in their present reconstructed form. One small separate red-painted fragment (1958.773) associated with bust base section 1958.772, however, shows tantalizing impressions of what appear to be reeds. Although these may be anomalous, it seems

[22] Bar-Yosef and Alon 1988, pl. 8.
[23] Kingery, Vandiver, and Noy 1992.
[24] Amiran 1962.

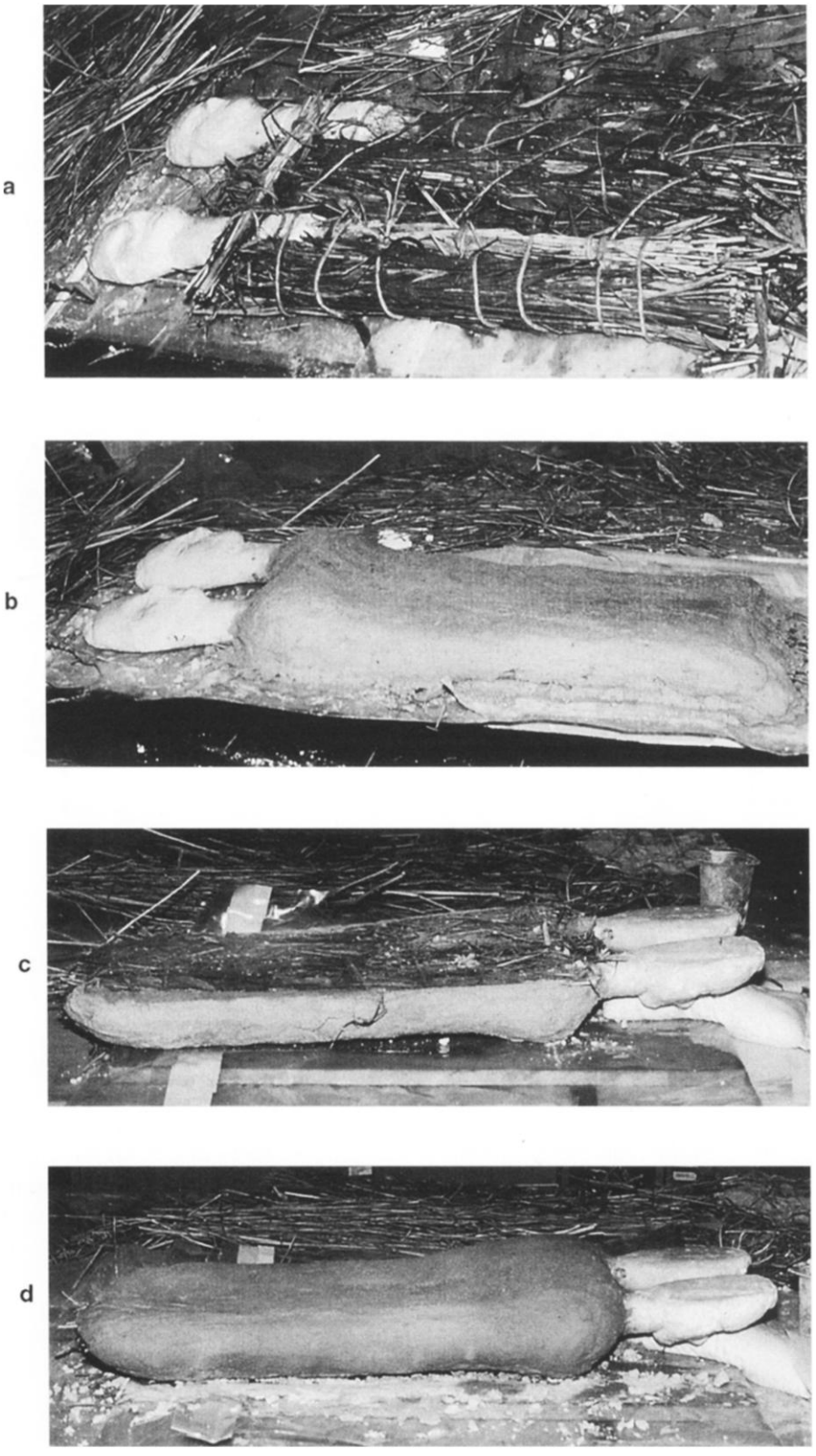

Fig. 6. Making the replica of statue #5/6: (a) heads modeled in plaster and torso armature constructed around them; (b) plaster applied to torso front; (c) bust reversed; and (d) plaster applied to torso back. Plaster on the heads is lighter in color than that on the bodies because a slightly different mixture was used.

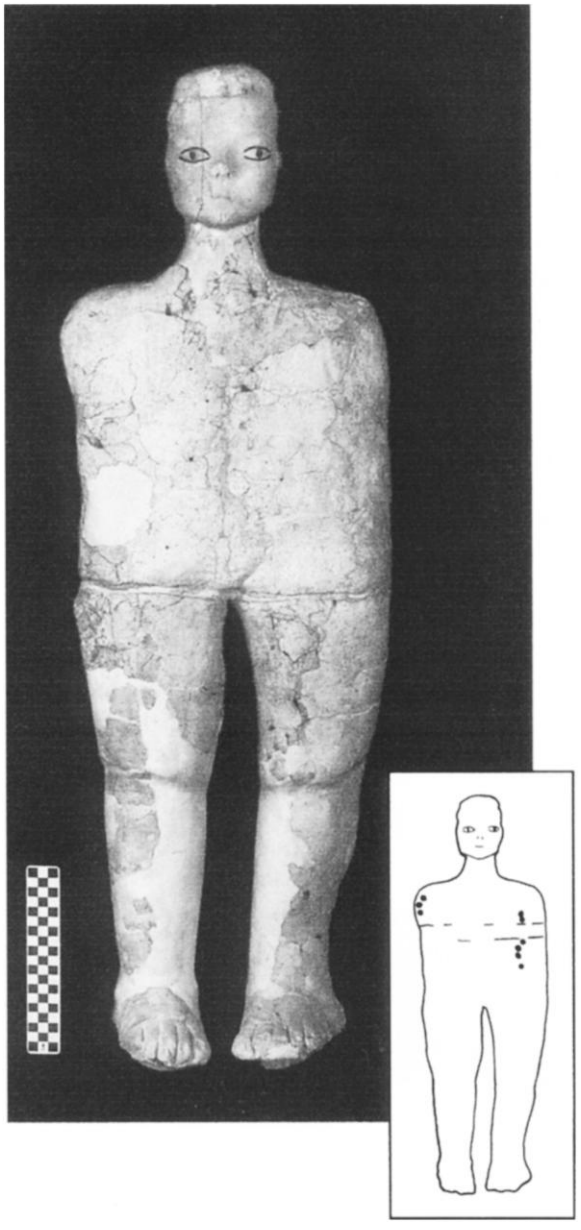

Fig. 7. Statue #1, height 99 cm (Courtesy Diane Nordeck, Smithsonian Institution). Drawing at lower right shows locations of fingertip and linear indentations.

possible that other similar impressions may be present and no longer visible because of reassembly, or they have been lost on account of the plaster's weakness and poor consolidation.

Cordage

Based on S-twist impressions in the plaster, reeds were bound with unspun two-ply Z-twist cordage, which measured 2 to 5 mm in diameter (fig. 5). Cordage may have been made from reeds, since unspun two-ply Z-twist reed or rush cordage has been found in the Nahal Hemar Cave,[25] and reeds were also being used to make the armatures. Commercial jute cordage of approximately the same size as the original was used for binding reed bundles of replica armatures.

Impressions in original plaster show that cordage was closely coiled around the bundle where the neck and head were plastered. Otherwise it was used at more widely spaced intervals, tying bundles together where they crossed or spiraling around the length of bundles.

Impressions of cordage for statues in cache 1 are similar to those of cache 2 in every respect except size: they measure about half the diameter. Just like the statues in cache 2, the head-and-neck bundle was closely bound, except for one bust whose single bundle was unbound; elsewhere on the figures, armatures were bound less frequently. Impressions of cordage are visible at the edges of plaster fragments found at Nahal Hemar, but further information could not be derived from photographs.[26] No cordage impressions have been reported for material from Jericho, nor are impressions of cordage visible in the X-radiograph of the Garstang-excavated head in the collection of the Rockefeller Museum.

Plaster

An extensive program of laboratory analyses showed that plaster was made from ʿAin Ghazal marl, by definition a clay-containing limestone. Around 10 percent of the plaster was acid-insoluble, identified by X-ray diffraction analysis as primarily an expanding-layer clay. Based on laboratory experiments and analytical work, powdered marl is believed to have been mixed with a small percentage of lime (about 10 percent) that had been made by calcining the marl, as well as vegetal fibers.[27] It is noteworthy that plaster used to model three faces on skulls, also excavated at the site and conserved at the Smithsonian, was made from raw material indistinguishable from that for the statues; a higher percentage of true lime was used, however, and the quality of plaster was superior.[28]

Plaster for the replications was made in imitation

[25] Schick 1988.

[26] Bar Yosef and Alon 1988, pl. 8.

[27] Grissom 1997; Griffin, Grissom, and Rollefson 1998; Boulton 1988.

[28] The three plaster faces were blocklifted in the same season as the statues but from a different area. C-14 analysis of burned wood found in strata above them indicates that they were probably buried about 500 years before the statues. Because materials used to make the artifacts were similar, however, including lime plaster, bitumen, and rope, comparisons proved stimulating for research (Griffin, Grissom, and Rollefson 1998).

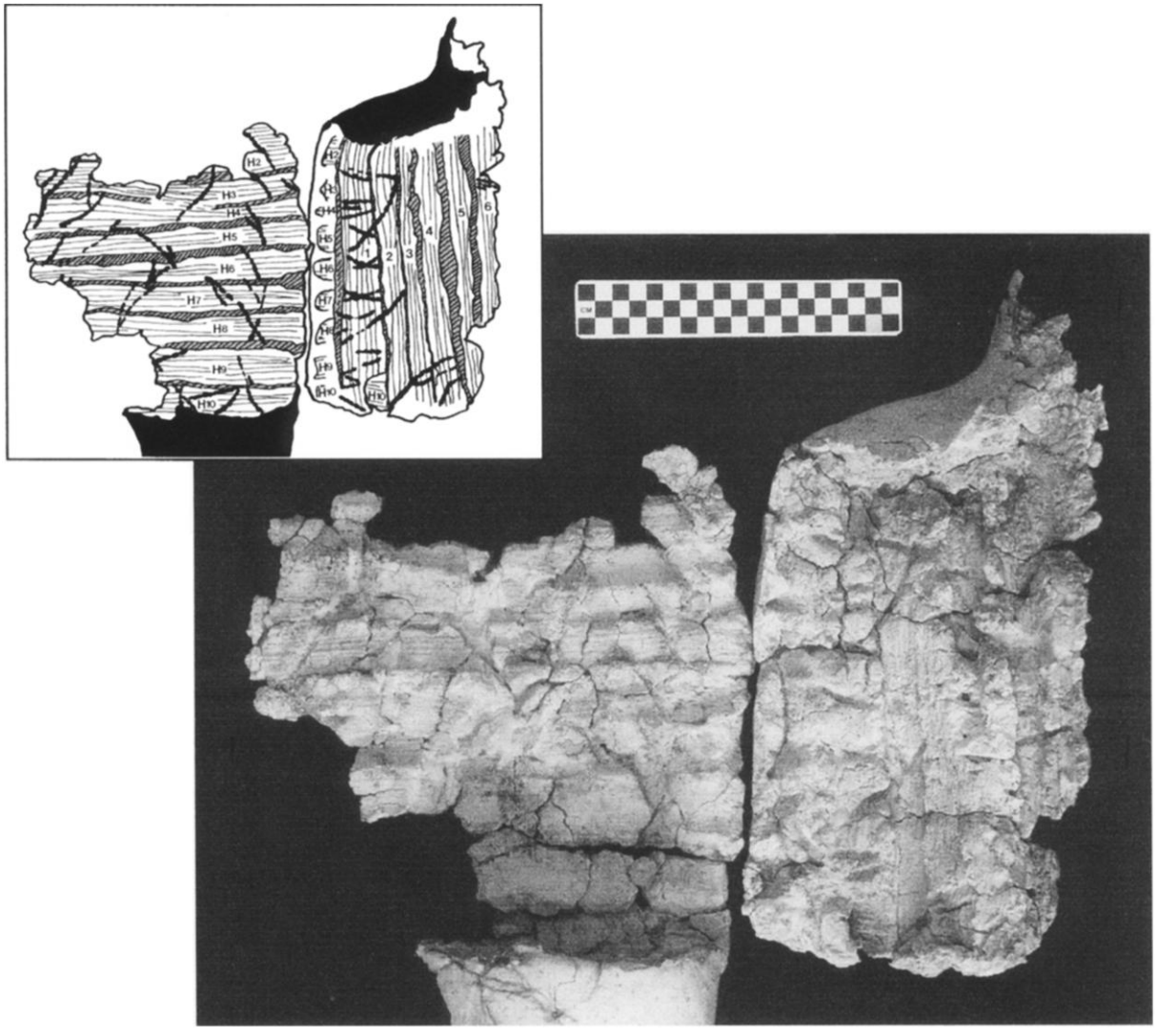

Fig. 8. Torso interiors of statue #1 during treatment: back (on left) and proper left front (on right). In the drawing at upper left, striated impressions of reed bundles are numbered; crests between reed bundles are indicated by hatching; cordage impressions are also marked. Note impressions of curved bundle ends for H2–H10 at the side front.

of the original. It was initially made with marl obtained from ʿAin Ghazal, mixed with a small percentage of commercial lime. However, the supply of marl was limited, and subsequently replication was done with a mixture of chalk or powdered limestone, about 10 percent commercial lime and about 10 percent clay. When one replication mixture was initially prepared without clay, its poor plasticity demonstrated the important role of that ingredient.

Analyses indicate that plaster used to make statues in cache 1 was similar to that used in cache 2,[29] and plaster samples from the two caches appear almost identical in color and texture when placed side by side. The only obvious difference is that statues in cache 1 have a thin coating of whiter material on some surfaces; although as yet unidentified, it seems likely that this was a layer of pure lime. The whiter layer is found covering the exterior of well-preserved two-legged figures (except for the undersides of the feet), but on busts it appears only above a V-shape on the chest. Plaster used to make the Jericho statue at the Rockefeller Museum was also made from marl with a high calcite content, possibly mixed with a small amount of lime.[30] The fragmentary foot from

[29] Tubb and Grissom 1995.

[30] Goren and Segal 1995.

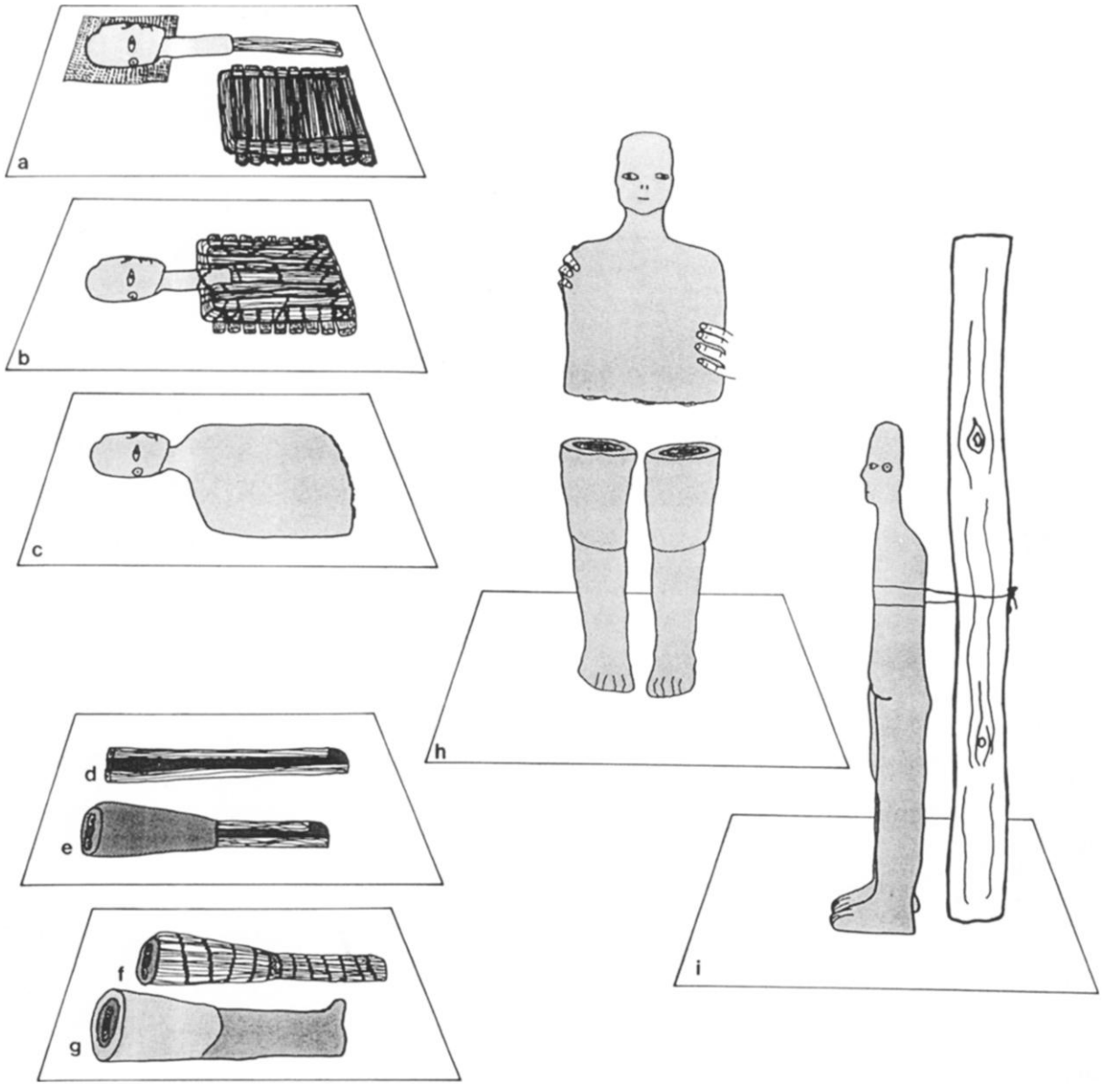

Fig. 9. Drawing showing stepwise fabrication of a figure in cache 2: (a) head and neck plastered while lying on a mat, and back of armature fabricated; (b) head-and-neck and other vertical bundles attached to the armature front; (c) torso plastered; (d) several bundles assembled with plaster to form a leg core; (e) plaster applied to the upper leg; (f) thin layer of reeds added, and cordage spiraled around the leg; (g) final layer of plaster applied to the leg, and modeling of the foot begun; (h) legs placed upright, feet (especially heels) completed, and torso placed on the legs (cf. finger locations to indentations shown in fig. 7); (i) join between legs and torso filled with plaster, buttocks modeled, tops of thighs delineated, and statue secured with cord (cf. cord location in fig. 7). Shading indicates plaster.

Jericho in the Louvre seems to have been made with similar plaster but with more siliceous material in a lower layer.[31] In contrast, other Jericho fragments in the Louvre appear to have been made entirely of uncalcined marl. The plaster of the Jericho busts excavated by Kenyon is visibly poor in quality, especially two core layers that are medium brown in color and made from marl of about equal parts calcite and silica; a white surface layer of plaster is more calcite-rich and finer in quality.[32] Fragments found in the

[31] Bouquillon 1998.

[32] Goren and Segal 1995. Analytical techniques used by Kingery, Vandiver, and Prickett (1988) provide less precise information about constituents but also indicate that the Kenyon-excavated statue plaster was inferior to the "man" excavated by Garstang.

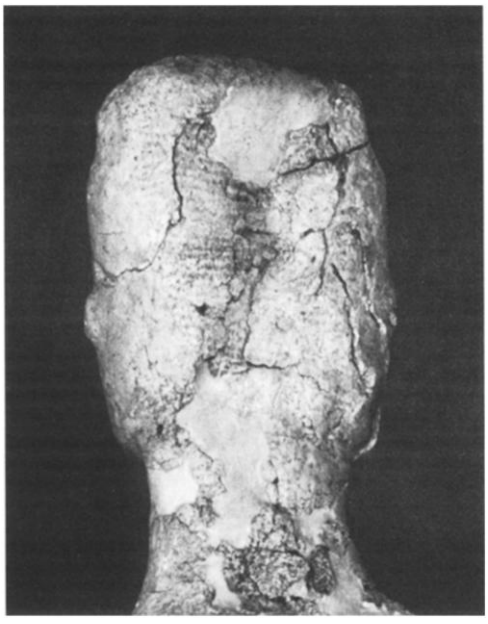

Fig. 10. Back of head of statue #1.

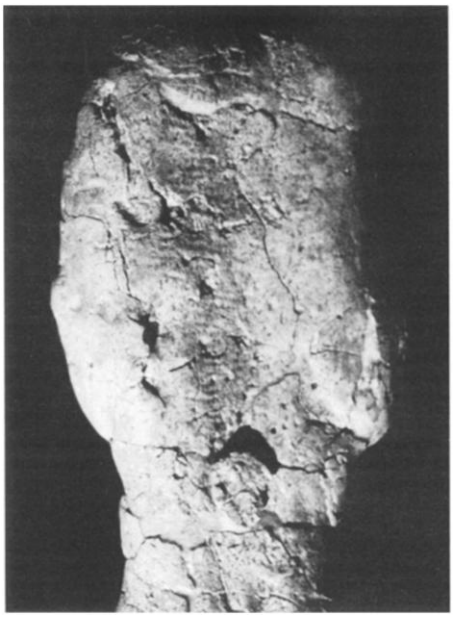

Fig. 11. Back of head of statue #2.

Nahal Hemar Cave were made of high-quality plaster, the matrices consisting of calcined material.[33] Such differences in plaster composition provide data for theories of technological development and interchange of ideas.[34] There is little evidence that they affected the sculptural products, however, since smooth surfaces and shaped forms were achieved for nearly all sculptures. Only the simplified forms of busts excavated by Kenyon might be attributed to the limitations of poor-quality plaster.

PLASTER APPLICATION

A general description of plaster application is useful as background for detailing the complex fabrication of statues in cache 2. The most fundamental feature is that most plaster appears to have been applied to the uppermost surfaces of armatures as they lay horizontally, requiring reversal to apply plaster to the opposite surfaces (fig. 6). Next, plaster was separately applied to model different portions of the statues: head and torso for the busts; head, torso, and legs for the two-legged figures. Finally, the four larger statues were placed upright only for the last stage of fabrication: for completion of the base of the large busts, and for final assembly and finishing of the standing figures (fig. 9).

Evidence that most plaster was applied while armatures lay horizontally is ample. First, the curvature of bundle impressions is flattened front and back (fig. 5). Second, the front and back torso surfaces of the statues are flat, as are the backs of the heads (figs. 10, 11); and depth from the base to the shoulders of the busts is constant (fig. 1). Finally, the meeting of front and back applications at the sides, necessitated by horizontal application, was indicated by one of only two areas of plaster cleavage found on the bodies: at the sides of a torso. Apparently where the second application slightly overlapped the first, it subsequently separated because the first layer had dried before the second was applied (fig. 3). The probable reason for horizontal construction was shown during replication. When plaster was applied to full-scale armatures in upright position, it either fell off or slumped toward the base, regardless of consistency.

Whether other PPNB statues were plastered horizontally is less clear, in part because of limited access to evidence. The shape of the Garstang-excavated head from Jericho, however, suggests horizontal construction (fig. 12): it is flat and squared-off on the reverse, reminiscent of the backs of statue heads in cache 2 (figs. 10, 11). It also seems likely that the heads in cache 1 were plastered horizontally because they are similarly flat in shape and many neck cavities appear flattened. The torsos of the two-legged figures in cache 1 are perhaps even more shallow in depth than those in cache 2, suggesting that they were

[33] Goren, Segal, and Bar-Yosef 1993.

[34] Kingery, Vandiver, and Prickett 1988; Goren and Segal 1995.

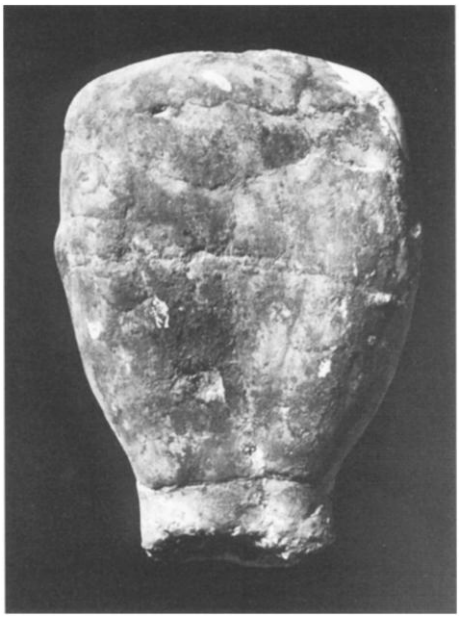

Fig. 12. Back of head of statue excavated by Garstang at Jericho. Rockefeller Museum, Jerusalem, Israel Department of Antiquities and Museums 35.3289. (Courtesy Israel Museum)

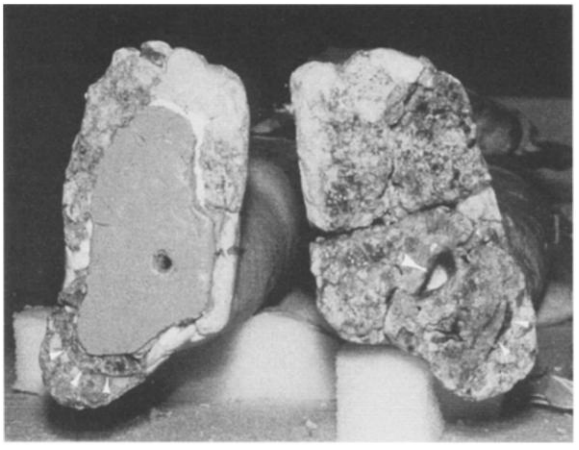

Fig. 13. Feet undersides of statue #1 during treatment. A small elliptical reed-bundle cavity is indicated by a large arrow on the foot at the right (the plaster perimeter is glossy because of adhesive). Narrow curvilinear gaps that indicate separate plaster application to model the heels are indicated by small arrows. Auxiliary support layers obscure the center of the foot on the left.

plastered while horizontal. Other evidence for these figures, however, does not confirm horizontal plastering: bundles do not appear to have been flattened, and front and back surfaces are slightly rounded.

One limitation of horizontal construction is that only one face of a statue can be plastered at a time. In order to plaster the opposite face, the partially plastered armature has to be reversed while it is still damp. If it is too dry at the time of reversal, "new" plaster does not adhere properly to "old" where applications meet, as was illustrated by cleavage found on statue #5/6 (fig. 3). On the other hand, it was found during replication that even when plaster was made with the least possible amount of water, it fell off armatures if they were moved just after application. When allowed to dry overnight, however, the plaster seemed to "stiffen," and reversal was accomplished. Thus, it seems likely that there was a short drying period before reversal.

A rigid auxiliary support was likely used to assist with reversal. When replications were manipulated without support, plaster fell off the armatures, apparently because of the considerable weight of the wet plaster and flexing of the wet reeds. Reversal was successfully accomplished by sandwiching partially plastered armatures between wooden boards. Flat surfaces on the front and back of the statues facilitated reversal since they made parts easier to sandwich between the boards and reduced the possibility of flexing. For the same reasons as for reversal, auxiliary supports were likely used to orient busts or figure parts upright. This was accomplished during replication by tilting boards on which the busts or figure parts rested until they were vertical.

With the exception of the small bust, there is solid evidence that the statues in cache 2 were upright in the final stage of fabrication, probably for the most part to make them more stable during display. Surfaces on the undersides of feet and bust bases are flat, and these surfaces had clearly been formed by pressing fresh plaster against a flat surface rather than by hand modeling (fig. 13). The forming surface might have been one of the burnished plaster floors found at ʿAin Ghazal, not fresh enough for the statue plaster to adhere to it. Slight plaster flanges where plaster meets the floor and horizontal striations on exterior surfaces near the bases confirm that finishing work was done there, after the statues were upright.

Flat and generally even smoother surfaces on the bottoms of all statues in cache 1 and the bottom of the Jericho bust fragment in the Ashmolean Museum (1958.772) indicate that these statues were upright when plaster was fresh at their bases. Moreover, although heads were probably modeled while flat, torsos of busts in cache 1 and of Kenyon-excavated busts may have been entirely plastered while upright: they are larger in every direction at the bottom, apparently because plaster slumped downward during upright modeling. Slight spreading of plaster where the figures in cache 1 meet the floor confirms

that at least the feet had been modeled when the statues were upright. The position of these figures at other points has not been otherwise elucidated, although fabrication seems to have differed from that for statues in cache 2 in several respects. Leg bundles were apparently set into the floor, since evidence found during excavation indicates that bundles extended as much as 18 cm below the feet.[35] It seems likely that this task was done prior to modeling the legs with plaster because it would have been difficult to accomplish the manipulation required to set the bundles and simultaneously keep plaster intact if the legs had already been modeled. Moreover, the generally columnar shape of the legs suggests upright plastering, as it contrasts with the flattened shapes of the horizontally plastered legs of statues in cache 2.

As will be detailed in the next section, evidence indicates that plaster was applied to cache 2 torso armatures in a single layer, except for slight overlapping at the sides. Multiple application layers were found on the head and legs, but the appearance of the plaster is identical throughout. This contrasts with visibly different plaster layers found on Kenyon-excavated busts from Jericho and some Garstang-excavated fragments in the Musée du Louvre. For statues in both 'Ain Ghazal caches, no evidence of the specific application method was noted, such as edges of wads or slabs. During replication, application by the handful seemed natural, and the plaster handfuls merged easily once applied. Horizontal strip application of plaster, posited for the Garstang-excavated Jericho head on the basis of cracks and density variations seen in X-radiographs, did not seem a useful technique when attempted during replication.[36]

Plaster surfaces of bust torsos in cache 2 are marked by groups of more or less parallel striations, apparently because these surfaces received little or no further attention after plaster was applied. Similar striations were produced when plaster was spread broadly across armatures during replication, formed by dragging coarser particles across the surface. Plaster above the forehead and on the back of each head also appears unsmoothed.

Surfaces of faces, in contrast, are entirely smooth and without striations, and only close examination of the bodies of figures reveals remnants of striations, nearly obscured by smoothing. Smooth surfaces were easily imitated on replicas, accomplished by rubbing with the fingers and occasional wetting. The best time for smoothing was found to be after the plaster had dried for a day; at that point, modeling was not disturbed. For statues in cache 1, all surfaces of heads and two-legged figures appear to have been smoothed, while bust torso surfaces appear less carefully finished and somewhat lumpy.

Replication of the statues required several days each: seven for the standing figure and four for the large bust (three days is estimated for the small bust, but its replication was not attempted). Replicas cracked when not covered loosely with plastic sheeting in a building where relative humidity is maintained at about 45 percent. Thus, it is expected that covering the statues was done to slow their drying. Complete drying of the replicas required more than a month.

STATUE CONSTRUCTION

Construction of statues found in cache 2 is detailed in the order of original fabrication. First, fabrication of the heads and necks is described for all statues because each head and neck was made in the same way and completed before its body armature was constructed. Then the narrative is divided into three parts, as subsequent construction and plastering of torso armatures around the plastered necks differed for the large busts, small bust, and two-legged figures. Separate construction of the legs, as well as their joining to the base of the torso, is also described in the section on the figures.

Heads

Construction of the heads is well documented by xeroradiography (fig. 14), and it is more complex than that of the statues in cache 1, which seem to have been modeled with a single layer of plaster. In brief, a reed bundle measuring nearly the combined length of the head and torso was assembled (fig. 15a). To form the head and neck, plaster was applied to one end of the bundle in two layers with cordage in between. Then the torso armature was built around the lower portion of the bundle, overlapping the lower edge of plaster on the neck.

Described in more detail and illustrated by head #4,[37] the first or inner plaster layer was made with a small amount of plaster added directly to the reed bundle (fig. 15b). In nearly all cases, this reed bundle was flattened so that it was substantially wider

[35] Tubb 1985, 117, pl. 5.

[36] Kingery, Vandiver, and Noy 1992.

[37] Head #4 is the proper left head of statue #4/8. Heads were assigned numbers during excavation before it was known that any statues had two heads, and such dual designations have been retained.

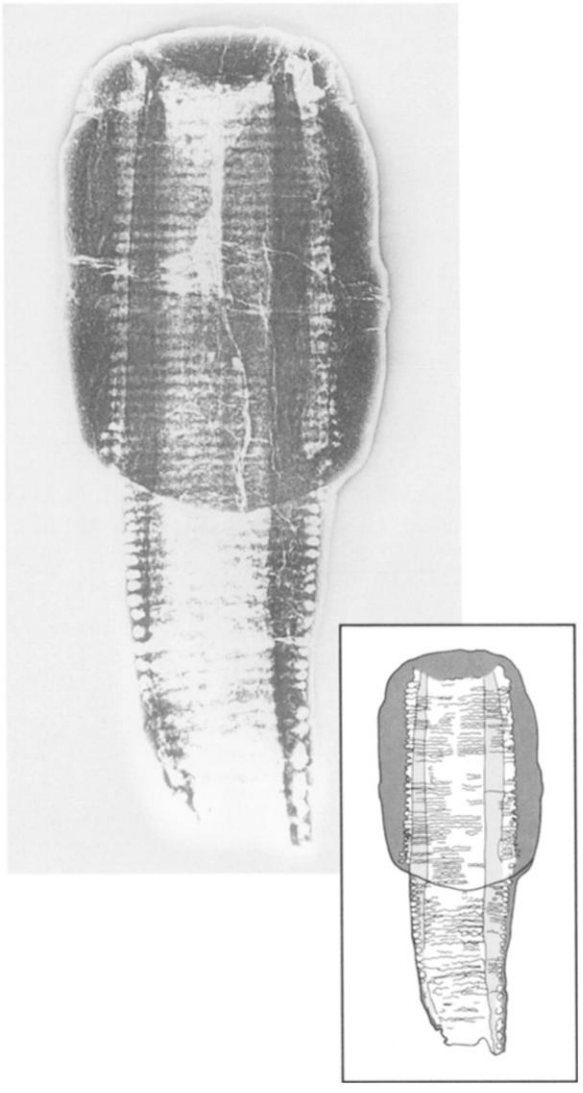

Fig. 14. Xeroradiograph of statue head #4. Drawing of a section through the head at lower right identifies the first application of plaster by light shading and the second application by dark shading; cordage is indicated by horizontal squiggles.

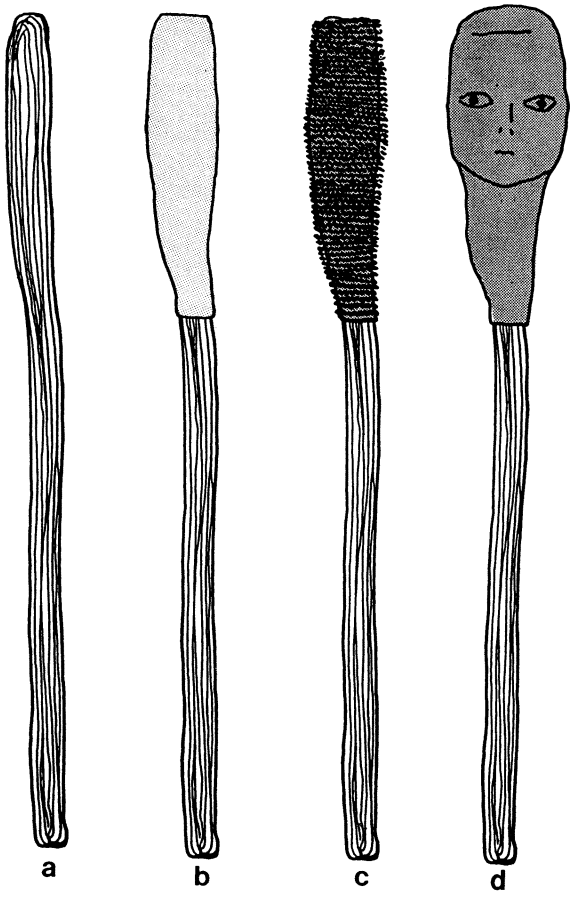

Fig. 15. Drawing showing stepwise fabrication of statue head #4, based on its xeroradiograph (fig. 14): (a) reeds folded to form a bundle the combined height of the head and torso; (b) first layer of plaster applied to the bundle, with extra plaster placed at the sides of the head; (c) cordage spiraled closely around the first layer of plaster; and (d) a second layer of plaster added, features modeled, and bitumen applied.

than deep, for example, the reed-bundle cavity inside head #4 measured about 4 × 2 cm in cross section. Flattening is also visible in the neck's external shape because the neck plaster is essentially uniform in thickness. Extra plaster is present at the sides of the head: for head #4, the first layer averages 1.5 cm in width on each side while it measures as little as 0.2 cm at the center. Cordage was then wrapped closely around the entire plastered portion of the bundle (fig. 15c). Thus, this first plaster layer is characterized by vertical reed impressions on its inner side and parallel rows of horizontal cordage impressions on the outer side. Because of extra plaster at the sides and the cordage layer, the composite armature inside a head was often about twice as wide as the reed bundle, increasing to about 8 cm for head #4.

The second and outer layer of plaster is characterized by parallel rows of horizontal cordage impressions on its interior surface. It is minimally attached to the inner layer by plaster that squeezed between the coils of cordage. The outer layer thinly covered the armature on the neck and the back of the head, while on the front it was thickly applied for modeling facial features (fig. 15d). During plastering, the armature surely lay on a horizontal surface, found to be the only reasonable position during replication. The back of the head must have been plastered first because the head could have then been reversed and plaster applied for the features; in reverse order, modeling of protrusive features like the nose would have been jeopardized. During replication it was

found that the head, in contrast to body parts, could be turned over immediately after plaster had been applied and before it had stiffened, probably because of its small size and closely bound armature. Since plaster on the back of the replicated head was relatively wet at this point, it conformed closely to the working surface after reversal. This produced a flat shape on the back, almost square at the sides, remarkably similar to that of the original heads. Moreover, the back was impressed by the material on which it lay, just as regular patterns must have been impressed on the backs of some original heads, perhaps from mats on which they rested (fig. 10, 11).[38] These impressions could easily have been smoothed off. It is most plausible that the maker chose not to remove them because he knew that they would be covered by a wig or headdress and hence would not be seen. Similar impressions appear in an early photograph of the back of the Garstang-excavated head from Jericho (fig. 12), but none has been found on statues in cache 1 or reported for other PPNB statues.

Replication experiments also shed light on larger questions of head construction methodology presented by the flattened reed bundle, the extra plaster at the sides of the head, and the application of plaster in two layers. Attempts to reproduce extra plaster at the sides of the heads showed that extra plaster was intentional from the beginning: it could be replicated only when stiff plaster was placed at the sides of the bundle and the bundle carefully wrapped in order not to dislodge it. It did not accumulate just by the weight of the plaster or simply by pressing the bundle flat after wrapping. Even when plaster was quite stiff, it squeezed out between the cordage coils, leaving only a thin layer inside. The probable reason for the extra plaster and flattened bundles became clear only when faces were modeled for the replicas: plaster slumped around the edges of the cordage-wrapped armature, limiting the width of the area on which features could be readily modeled. Thus, it has been concluded that the composite armature served to increase the width of support for the faces, making it easier to create heads that were wider than the necks. Replication experiments showed that more plaster could be added onto the sides of the head after plaster had dried overnight, but this method proved unsatisfactory because the additions tended to crack.

Experiments in replication also demonstrated that close coiling of the head-and-neck bundle produced a more rigid bundle, even when wet, and indicated at least one reason why this was important. During torso construction, the heads and necks would have been horizontal but elevated above the working surface, and a rigid bundle would have prevented breakage of the thinly plastered necks. As a precaution, heads were supported with sandbags when torsos were made during replication (fig. 6), but in the absence of rigid neck bundles this might not have prevented breakage of neck plaster. Cordage would also have provided purchase for adhesion of plaster on the heads. Neck plaster was quite thin, as little as 0.6 cm in total, and might have otherwise cleaved off the relatively smooth reeds.

That torso armatures were built around the lower ends of the head-and-neck bundles when the heads were finished is best illustrated by a remarkable separation between torso plaster and the lower portion of the neck of head #6 that it had enclosed, apparently because of prior drying of the neck plaster. When excavated, the neck appeared to measure 18 cm in length, but close examination subsequently revealed that the lower 9 cm of plaster had been enclosed by the torso during fabrication, leaving only 9 cm exposed on the statue. The portion that had been inside the torso exhibited a relatively smooth outer surface similar to the exposed neck surface, providing evidence that the necks (and by extension the heads) had been completed prior to fabrication of the torso armature. Separation of plaster layers in the neck area of statue #39 in cache 1, the "Pacha Mama," indicates that its head and neck were also plastered first.[39]

Large Busts

Torso armatures for the large busts, statue #5/6 (fig. 3) and statue #4/8, were made by adding vertical bundles between bundles on which the heads and necks had been completed, as well as at each side (figs. 4a, 5). Horizontal bundles (H1 and H3) were placed across the shoulders in front of and behind the vertical bundles, and a third short horizontal bundle (H2) was placed in between the heads. A second set of smaller vertical bundles was placed at the back of the armature, impressions of some of their upper ends visible between pairs of cordage impressions behind H3 (bundles 13–17). When cordage binding was imitated for the replication, it produced a tightly bound armature at the shoulders, probably necessary to secure two heads. Elsewhere, however, cordage had to be loosely tied to imitate the original wide armature shape; when tied more

[38] Cf. twined basketry shown in Schick 1988.

[39] K. Tubb, personal communication, August 1998.

tightly, the torso armature became cylindrical and the binding too close together.

Plaster was applied to one face of the torso, then the opposite face, as illustrated by photographs of the replica (fig. 6). Plaster was not added to make a natural transition between necks and shoulders, as was done for the two-legged figures, and the reason for its absence remains a puzzle. Perhaps a sloping neck interfered with "dressing" the busts with applied materials or constituted unnecessary modeling because the maker knew this area would be covered with other materials.

Plaster cleavage at the base of the statue provides evidence that plaster was added at the bottom after the bust was raised upright, probably to even out irregularities (fig. 3). Specific areas of cleavage can be correlated with places where reed bundles were short of the bottom, such as below bundles 3 and 4 (fig. 4a). Replication showed that evening the bottom edge could only have been done at the time the statues were righted: prior to that point, plaster did not stay in place at the base of short bundles because it was unsupported.

Reed-bundle impressions show that some bundles extended to the bottom of the busts, but much of the bottom surface of the more complete bust (statue #5/6) was solid plaster. Bust replication indicated that it is unlikely that reeds would have extended through the bottom to serve as anchors, however, as appears to have been the case for figures in cache 1. This would have required insertion of several bundle ends in properly spaced holes in the floor or ground during the already difficult process of erecting a heavy, still quite damp statue. Thus, the large busts could have been easily pushed over from the front or back because of their breadth and shallow, constant depth.

Small Bust

The armature for the small bust, statue #3, differed from the large busts most significantly in that horizontal reeds were present not only at the shoulders but also toward the bottom (fig. 4b). As a result, the armature was tighter and more compact. Plaster was applied as on the large busts, but reed bundles were covered by several centimeters of plaster at the bottom. Moreover, the base is not completely flat and shows evidence of hand smoothing, indicating that it was entirely plastered while horizontal. Although the bust cannot sit upright on its own at present, probably because of distortion that it suffered during burial, it may have done so when it was originally displayed, perhaps seated in soft dirt or sand.

In contrast, the somewhat smaller busts in cache 1 are absolutely flat on their bottoms, clearly formed against flat surfaces when the busts were vertical. Their dimensions increase in every direction toward the bottom, apparently because of sagging attributed to upright plastering. The single vertical reed bundle inside each bust extended from the head about halfway into the torso so that the lower half of the bust was made of solid plaster. Because of such differences in fabrication, these busts are far more stable in upright position than statue #3.

Figures

Compared to the busts, construction was more complex for the two-legged figures, statue #1 (fig. 7) and statue #2. Probably to reduce the size of parts that had to be manipulated, each leg seems to have been made separately from the torso (fig. 9). Impressions of vertical thigh bundles are substantially posterior to those of vertical torso bundles, and continuity between those bundles is also precluded by horizontal bundles that span the lower edge of the figures' torsos. Furthermore, evidence shows that legs were fabricated in multiple layers while horizontal, probably on account of their substantial size. Multiple applications would have lessened the possibility of cracking of the large mass of plaster during drying, especially at the thighs. Furthermore, drying of the lower layers of plaster would have allowed these top-heavy parts to be stood up, yet the outermost layer would still have been fresh enough to achieve a reasonably good join to the torso. The multiple reversals required for applying several layers of plaster to the legs lying horizontally also make it inconceivable that a single armature could have been used for the complex bodies of the figures, given the difficulty of reversing the simpler forms of the busts a single time. Use of single continuous armatures inside figures in cache 1 was probably made possible by their smaller size.

Armatures for figure torsos differed in several respects from those for busts. Instead of consisting primarily of vertical bundles, the torso armature was made of complete sets of vertical bundles at the front and horizontal bundles at the back (figs. 8, 9a, b). Moreover, impressions indicate that a single long reed bundle was bent into an inverted U-shape to define the perimeter of the sides and shoulders. When the original armature was imitated exactly during replication, a tight shallow composite was produced. The completed head and neck were attached in front of the horizontal bundle that defined the shoulders (fig. 9b), giving a "hunchback" effect to the plastered figures (fig. 1). In contrast to the fabrication of the busts, the head was not sandwiched between pairs of

horizontal bundles at the shoulders, perhaps because only one head had to be secured or because the torso construction of the figure was so strong.

As in the case of other statues, the torso and head would have been lying on a horizontal surface during armature construction and application of plaster (fig. 9c). Extra plaster was added at the base of the neck to create a more natural transition to the shoulders, but the torso shape remains blocky, contrasting sharply with the waisted torsos of figures in cache 1. It might be hypothesized that the torso was intentionally rectangular and armless so that it could withstand lifting and attachment to upright legs. Indeed, this task was more easily accomplished during replication than had been anticipated.

Because they would need to be in a comparable state of dampness when attached, the legs were probably made so that they were completed at the same time as the torso. Evidence shows that fabrication of each leg began with assembly of several reed bundles measuring the length of the finished leg (fig. 9d). Plaster was applied between the bundles as they lay horizontally. A second layer was applied around the upper legs, and it is largely responsible for the considerable heft of the thighs, particularly in the case of statue #2 (fig. 9e). A layer of reeds was then applied to the plaster, probably consisting only of reed leaves (excluding stems) because the gap left by the layer is so narrow (fig. 9f).[40] This reed layer may have been used to facilitate the next step: the spiraling of cordage around the entire length of the composite. Then the final layer of leg plaster was applied, probably including preliminary modeling of the toe area (fig. 9g). When legs were replicated, a minimum of five days was required because plaster had to stiffen overnight after each application, including separate applications to the front and back for each layer circumscribing the legs, so that they could be safely moved for application of the next layer of plaster.

When the final layer of plaster was stiff, the legs would have been placed upright. Considering their top-heavy forms, replica legs were found to be surprisingly stable in upright position, although leveling the feet seemed essential to provide a more solid base. At this point the heels seem to have been added somewhat peculiarly to one side of the feet, most likely to stabilize the legs (fig. 13). Narrow curved gaps and especially flat surfaces on the bottoms of the heels provide evidence that they were modeled after the figures were upright. To accomplish righting each leg during replication, the board on which it rested was carefully tilted until upright, pivoting where the heel would be. During this process it became clear why the heel was probably modeled after the leg was upright: had it been modeled before righting, the pivoting would have damaged it.[41]

Evidence indicates that reed bundles did not extend below the figures as they did for figures in cache 1. While reed impressions continue to the bottoms of the feet, there is only a small elliptical aperture (2×0.8 cm) on the bottom of the single reasonably complete foot (fig. 13). Much smaller than reed-bundle cavities at the bottoms of figures in cache 1, its size is only a fraction of that in the ankle and lower calf, and a bundle of such small size could scarcely have provided anchorage for the figures. Moreover, anchoring bundles would have complicated erection, shown to be difficult enough during replication.

That the torso was then placed on the upright legs is supported indirectly by evidence. The torso and legs show clear evidence of separate fabrication, the legs were upright when the feet were completed, and attachment of the torso could have been easily achieved only after the legs were upright. This sequence is supported by evidence of buttock modeling when the torso and legs were joined. A slight internal gap is present between one buttock and plaster underneath, apparently because of partial drying before the buttock was modeled. Modeling of the buttocks would logically have been done at this point because the buttocks are located exactly where the torso and legs join and their protrusion would have been difficult to retain if they had been modeled when the figures were horizontal.

Probably because statues or statue parts were largely manipulated while lying on rigid supports and the plaster was allowed to stiffen before manipulation, finger impressions are rare. Finger impressions on the torso of statue #1 may have been impressed at the only time plaster had to be manipulated without support: when the damp torso was lifted for placement on the legs (figs. 7, 9h). The torso replica was

[40] No evidence of this layer was noted inside the legs of statue #1, and it may have been omitted, perhaps because the legs are slimmer than those of statue #2.

[41] Alternatively, the leg might have been tilted upright in the opposite direction, leaving a previously modeled heel unaffected, but this seems less likely because it would have precluded preliminary modeling of the toe area when the last layer of plaster was applied while the legs lay horizontally. The toes would have been more important to the upright stability of the legs when the legs were first placed upright. Moreover, although gaps indicative of drying between applications were found between leg and heel, no such gaps were present between leg and toes.

secured with ties across the chest as a precautionary measure until the plaster had dried, in keeping with parallel indentations across the front chest of statue #1, which may have been left by similar ties.

ROLE OF THE ARMATURE

Reed armatures allowed a reduction in the amount of plaster needed to make the statues. Thus, they minimized cracking from shrinkage of plaster during drying and decreased the weight of the completed statues. They also served a passive structural role during construction as forms on which plaster was applied until it had stiffened.

Contrary to expectation, armatures for statues in cache 2 did not seem to play a significant structural role once the statues were upright. This was demonstrated when the replica bust was righted: plaster was accidentally broken off, and exposed reeds bent like cooked spaghetti, having been wetted by absorption of water from the plaster. The statue sagged dramatically to one side and collapsed. Moreover, although the reeds would have regained some rigidity after drying, there is evidence that the plaster was self-supporting after it had dried, regardless of the reeds. Even after more than nine millennia and complete decomposition of the armatures, the thinly plastered necks supported heads when held vertically before auxiliary supports were added. The armature's limited structural importance may also explain why a single armature was not used inside the two-legged figures. A single armature of requisite size would have been incredibly difficult to turn over for plastering the opposite face and would not have provided any structural advantage.

Armature shapes are reflected in the final shapes of the statues to a surprising degree because in many places plaster was applied in an even layer. For example, the square shoulders reflect the application of a uniform layer of plaster to the box-shaped form of the torso armature. Even small details of the armatures can be seen in the plaster, although in some cases they were probably inadvertent. For example, a slightly protruding "sternum" on statue #1 reflects location of the head-and-neck reed bundle in front of other torso bundles. The anterior location of heads on the large busts and standing figures also reflects greater armature behind than in front, while centered heads on the small bust (#3) reflect even distribution of torso armature (fig. 1). That *form followed armature* became particularly evident during replication of the torso armatures. Plaster was applied until surfaces were relatively even and reeds adequately covered, without an attempt being made to replicate the original plastering very precisely; nevertheless, results were nearly identical to the original statues in shape and plaster thickness.

The role of the armature and the degree to which final shapes reflect armatures were quite different for the statues in cache 1, probably in part because of their smaller scale. Armatures took up proportionately less space inside cache 1 statues. Those for the two-legged statues resembled stick figures, and varying amounts of plaster filled in areas between perpendicular members of the armatures, with more modeling done on the surfaces. Jericho statues excavated by Garstang seem to have had simple armatures, probably similar to those of figures in cache 1, but comparison is limited by minimal information and the absence of a torso.

CONSTRUCTION AND FORM

A desire for great scale appears to have been fundamental in determining forms for the statues in cache 2. The replication process demonstrated that when statues of this size were made, plaster *had* to be applied with the armatures horizontal and that flat, broad, shallow, simple shapes resulted.

Flat surfaces were probably necessary to facilitate manipulation, allowing parts to be readily sandwiched between rigid auxiliary supports for reversal or tilted for raising upright. Torso armatures were designed to be flat, but fabrication of the statues in horizontal position further flattened reed bundles and statue forms because of the weight of the plaster on the movable armatures. The flattening of armatures is reflected in flattened curvature of bundle impressions for both the original statues and the replications. The flattened front and back surfaces of thighs and torsos, as well as the flattened backs of heads, reflect the flattening of the original statue forms. Similar shapes were produced naturally during replication.

Disproportionately large breadths were necessary to accommodate the two heads on the busts. Moreover, a wide torso could be easily made without significantly increasing the difficulty of fabrication, favoring increase in width to create sizable statues. On the other hand, adding more bundles or plaster to substantially increase depth and create a more three-dimensional statue could not be accomplished if construction was horizontal. Plaster would sag or fall off at the statue's sides if too much of it was applied.

Simple shapes were necessitated by the demands of reversal and righting the statues. Protrusions on the front and back could be damaged by these processes. Moreover, significant overhangs on the sides, such as shoulders above a waist, might fail for lack of support when large statues were placed upright in a damp state; this probably accounts for the straight sides of

the statues. Exterior detailing is limited, and after the statues were upright, it seems to have been restricted to areas that were recently joined and where plaster would have been fresh. It includes modeling of the figures' toes and buttocks, as well as the delineation between torso and legs on the front of the figures. Because shapes of the plaster torsos were so simple, it seems likely that they were meant to be decorated with clothing and other accessories. In that case, the torsos served mainly as large supports for other materials.

Smaller size must have enabled bodies of two-legged statues in cache 1 to be modeled in a more shapely, detailed manner that may have made adornment with clothing unnecessary. It probably also permitted upright modeling of torsos for busts.

PRESENTATION

That PPNB statues were displayed upright seems clear. Despite their relatively high centers of gravity, the statues in cache 2 that were excavated at 'Ain Ghazal are remarkably stable when standing, even now, after considerable breakage and distortion since burial. In addition, dirt was found caked on a bottom surface as if the statue had been standing for some period of time. Deposits of orange-red pigments typical of those used to decorate plaster floors and walls were also found on statue bottoms, as if pigment had been rubbed onto them while the statues were displayed on painted floors. That the statues were "used goods" and not made strictly for burial is indicated by the wide distribution in the pit of pieces of one statue (#5/6), which suggests that the figure was already broken at the time of burial. The flat bottom surfaces on statues in cache 1 and on the red-painted bust fragment from Jericho (1958.772) also indicate that they were upright during fabrication and presumably during display.

Two-legged figures and large busts in cache 2 were probably displayed near their place of fabrication. The thinly plastered necks of the large busts and legs of the standing figures would have been particularly vulnerable to breakage during transport. The four larger statues are also quite heavy: statue #5/6 is estimated to have weighed about 28 kg, since its remaining fragments weigh nearly 17 kg. While reed anchorage has been ruled out for statues in cache 2, sticks or the like could have been pushed into reed-bundle apertures at the bottom of the large statues to secure them after plaster had dried. This would have improved their stability, just as reassembled statues are now secured with stainless steel pins for museum display. The lighter weight of figures in cache 1 would have made them easier to move, but their reed anchorage would have limited portability. The small bust in cache 2 and all busts in cache 1 can be considered portable because of their small sizes and compact shapes.

Adornment with separate clothing and wigs or headgear seems almost certain. Although no evidence of applied decorations was found during excavation, such items might have been removed when the statues were buried, and decorative organic materials would be expected to decompose in any case. Possible clothing materials might have included animal skin, woven bast fibers, or knotted network.[42] In addition to these materials, wigs or headdresses could have been made from reeds, hair, or feathers. In the case of bust torsos in cache 2, the unrealistically blocky, armless shapes and surfaces that seem to have been intentionally left unsmoothed suggest removable coverings. The bust torsos in cache 1 may also have been covered, since the white surface layer on the faces terminates in a V-shape at the neck, as if they were dressed with V-necked garments or draped to leave such shapes. Partial adornment, perhaps with capes and skirts or loincloths, seems most plausible for bodies of figures in cache 2. Although they are blocky, unpainted, and armless, surfaces were smoothed and some body parts are modeled, including buttocks, knees, and toes. Invariably recessed brows and unsmoothed plaster where hair is normally found argue convincingly for decoration with wigs or headgear on all statues in cache 2, as do the recessed brows on statues in cache 1 and the Jericho head in the Rockefeller Museum. There are many precedents in the ancient Near East for the adornment of statues with wigs in periods following the Neolithic.[43]

"Dressing" the statues may have created far different and more realistic appearances. Wigs would have eliminated the ghostlike, alien images of the heads, often observed by viewers of the statues.[44] Sleeved garments or shawls could have produced the illusion of arms. Accessories could have been used to distinguish between the seemingly identical twins of the busts, perhaps identifying them as male and female. Use of clothing and other decoration might also have provided the statues with enough three-dimensionality for display in the round, although their relatively shallow shapes suggest display in front of walls or in niches.

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[42] Schick 1988.

[43] Matthiae, Pinnock, and Scandone Matthiae 1995, 298–302, 314–5, 318; Mazzoni 1984, 54–6.

[44] Schmandt-Besserat 1998.

THE ARTISANS

Technically skilled in their work, the statue makers successfully created large statues in plaster. Replication demonstrated that this was not a simple matter. The beauty of the facial modeling attests to significant artistic ability; in this respect, the maker of the statues in cache 2 appears to be superior to the maker of the statues in cache 1. Consistency of modeling suggests that the heads in cache 2 might have been made by a single hand, but in any case the heads are sufficiently alike to indicate contemporaneity. Similarity of modeling to that of the plastered skull found at ʿAin Ghazal in 1988 also indicates some relationship, whether stylistic or chronological.

Although differences between finely modeled faces and simple unsmoothed bust torsos might reflect a division of labor between two makers, such as master and apprentice, a single individual might have fashioned both heads and bodies, as was the case for the replicas. Lack of torso smoothing seems to have been intentional, and a craftsman may simply have conserved time and labor by not smoothing out surfaces or shaping forms that would be unseen.

Relatively few plaster statues have been found in proportion to the extent of excavated PPNB remains, but there are indications that statue making was a well-established activity. Several distinct types of statues existed, and exemplars of each type were fabricated in a similar manner. Armatures for statues in cache 2 played an especially prominent role in determining statue forms, and, as a consequence, there seems to have been less creativity at the plastering stage, especially in modeling the bodies. Probably necessitated by the desire to create larger statues, the complex armatures for these statues seem to reflect progression from the simpler ones used for cache 1, perhaps consistent with later dates of fabrication. The simplified body forms of statues in cache 2 seem inconsistent with the complexity of their armatures; but the bare plaster bodies now exhibited probably do not reflect the complexity of the statues as they were originally seen, adorned with clothing and headgear.

CONCLUSION

Close examination of plaster statues excavated at ʿAin Ghazal in 1985 indicates that their fabrication on reed-and-cordage armatures was complex, more so than other known PPNB plaster statues. It establishes that statues were fashioned largely while horizontal and that they were made in stages. In the case of two-legged figures, the torso and legs were made separately and joined. Full-scale replication of a bust and a figure proved valuable in establishing that size probably dictated many aspects of construction and form. Such large-scale statues had to be made in stages while horizontal, and, because of horizontal construction, shapes that were broad, flat, shallow, and lacking protrusions were produced. This implies that it was the desire for size that was paramount in creation. Perhaps to compensate for plainness imposed by the limitations of large-scale fabrication, clothing and wigs or headgear were added, resulting in appearances that would have been substantially different from those now presented by the unadorned statues.

Finally, it should be emphasized that it was the blocklifting of the cache followed by laboratory excavation and conservation treatment that permitted so much material to survive and be documented. Similar methodology should be contemplated in the future when plaster statues are discovered. Moreover, detailed examination at the time of reassembly and replication of statues should be encouraged to provide a more complete picture of statue making and the PPNB societies that made them.

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