THE ARCHAEOLOGY OF BAMERT CAVE, AMADOR COUNTY, CALIFORNIA

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CONTENTS

Bamert Cave (CA-Ama-3) is located in southwestern Amador County, California, (Fig. 1, Plate 1) in T5N, R9E, in the NE 1/4 of the SE 1/4 of Section 34 (USGS Valley Springs quadrangle). This area was near the ethnographic boundary between the Plains Miwok and northern Sierra Miwok peoples (Kroeber 1929; Bennyhoff 1961). The site lies within the Upper Sonoran life zone, at an elevation of approximately 350 feet above sea level, and 200 feet above the floor of the Mokelumne River valley. The valley floor is grassy, with scattered oaks (Quercus douglassii and Quercus wizlizenii) and buckeyes (Aesculus californica). Trees of these species are also present in the immediate vicinity of the cave. In the riparian environment along the Mokelumne River, cottonwood and sycamore trees occur in groves. A description of the environment of this region, with a detailed discussion of major ecological units and local fauna, can be found in Barrett and Gifford (1933:128-136, 178-190). The geology has been described by Piper et al. (1939).

The site (Plate 1) is an exogene cave formed through weathering in a vertical exposure of andesitic tuff (the Mehrten formation). The cave lies one-half mile east of Rabbit Creek, an intermittent tributary of the Mokelumne River, and 1.5 miles north of the confluence of these two streams. A small spring is located 100 feet west of the site. Data on file at the University of California Archaeological Research Facility indicate that the maximum length (or breadth) of the cave is 90 feet; however, Johnson (1967:27) reports this distance as 78 feet. Similarly, information available to us shows that the depth of the cave (front-to-rear distance) varies from 20 to 80 feet, while Johnson (Ibid.) places its deepest point at 36 feet. Height at the cave mouth is about 11 feet, sloping to a roof height of two to three feet at the rear.

Archaeological investigations at Bamert Cave were originally conducted by the University of California (Berkeley) Archaeological Survey (under the direction of R. F. Heizer and A. E. Treganza) in September, 1950, and again in 1951. Subsequent work at the cave during the 1960's has been done by Sacramento State College and the University of California, Davis, and brief reports on these investigations have been published by Payen and Johnson (1965) and Johnson (1967). A 43-page report on the 1960 Sacramento State College excavations at the site was prepared by Mabry and Theodoratus (ms.)

When first visited by the University of California field party in 1950, the cave contained extensive dry deposits with abundant cultural remains. There were numerous perishable artifacts and other materials (such as plant remains) exposed on the level surface of the deposits, and the bulk of the collection reported here is derived from this provenience. The occupational deposits extended beyond the mouth of the cave (see Appendix I).

To facilitate work at Bamert Cave, the University of California crew imposed a grid of 5-foot squares. Using these units as horizontal controls, the eastern half of the site was excavated (see Fig. 2). Because the deposits

were quite shallow (generally 16 inches or less in depth), vertical controls were not maintained during the course of the excavations. In 1967, the rear sector of the site was dug by a group from the University of California, Davis; a map showing the extent of their work has been published by Johnson (1967: Fig. 3).

The archaeology of this part of Amador County has been summarized by Johnson (1967). He has defined five regional "components" represented in the archaeological record. The earliest of these is a hypothetical Early Man occupation. The other components are termed Early, Transitional, Middle, and Late and these are roughly correlated with the Early, Middle and Late Horizon sequence developed for central California by Lillard, Heizer and Fenenga (1939), Beardsley (1948) and Heizer (1949). Exogene caves in southwestern Amador County (such as Bamert Cave) appear to have been occupied largely in "Late" times (Johnson 1967: 292).

There are six other small caves and rockshelters in the immediate vicinity of Bamert Cave. All are situated in the same geological exposure (the Mehrten formation), characterized by breccia underlain by andesitic sand and tuffaceous sand. The tuffaceous material has weathered out, leaving the caves with a breccia roof. Site Ama-4 (Coyote Cave) lies 100 feet east of Bamert Cave, and was investigated by Johnson (1967). Cultural features and artifacts at the site included petroglyphs, bedrock and hopper mortars, metates, pestles, projectile points, scrapers made on cores and flakes, a considerable amount of debitage (87 cores and 376 flakes), Haliotis and Olivella shell ornaments, bone artifacts (including gorges) and historic materials (beads, flaked glass). Johnson (1967:40) links occupation at the site to both Phase II of his Late component and the Historic period; he also observes that "metates and hopper mortars suggest an older component." Site Ama-5 (Spring Cave), 100 yards east of Bamert Cave, was also dug by Johnson. Uncovered at this site were 117 bedrock mortars and a catch basin located just below a seep spring in the rear of the cave. Artifacts included pestles, a crude triangular projectile point, and a few cores and other chipped stone implements. Johnson (1967:45) interprets the cave as "a milling place and source of water for the occupations of Bamert and Coyote Caves during Late Prehistoric and Early Historic times."

Sites Ama-6 and Ama-7 are also nearby (see Fig. 1), but these caves were not investigated by Johnson (1967). Reconnaissance of the two sites by the University of California, Berkeley, party in 1950-51 provided the following information. At Ama-6, there was a meagre cultural assemblage, consisting largely of worked sticks, mussel shells, lithic waste, acorn hulls and buckeye husks. A row of loosely piled rocks walled off the rear of the cave. At Ama-7, an arrowshaft, cores, faunal remains, acorn hulls and buckeye husks were found. A row of piled rocks, about one foot high, was found across the rear. Site Ama-8 (Harpoon Cave) is located one-fourth of a mile northeast of Bamert Cave. Johnson's (1967) investigations here revealed a probable rock wall (as at Ama-6 and Ama-7) and a probable cache area. Artifacts included cores, a bone tube, a bone

whistle, a bilaterally-barbed harpoon made of antler, and several digging sticks. The site has a very low ceiling and is quite dark, and Johnson (1967:53) believes both of these factors contributed to the minor utilization of the cave by local aboriginal groups. He believes the site functioned as a "quarry and storage area in late times" (Ibid.) Another small cave, Ama-9, was recorded by the Berkeley group. It contained about one foot of cultural deposit; crude stone tools and cores were collected.

For additional data on the distribution of sites in this region, see Johnson (1967).

OCCUPATIONAL FEATURES

Pits. Two pits, used either for caches or for storage, were recorded (Fig. 2). Both were lined with grass and oak bark slabs (averaging four inches wide and 10 inches long), with the upper edges of the pits bordered with stones. One pit was situated in Unit G5, and had a maximum diamter of two feet. The other pit lay at the intersection of Units G4/G5 and F4/F5, and was just under four feet in maximum diameter. Depths of the pits were not recorded. Just to the east of these pits was an area characterized by layers of grass. In this area, and from the cache or storage pits described above, were obtained many of the Historic artifacts (mainly of Anglo-European manufacture) described in a later section. A possible third pit was located in the northwest corner of Unit E4, adjacent to two bedrock mortars. This feature had been lined with grass and had subsequently burned.

Rock alignment. As shown in Fig. 2, a line of rocks stretched across the mouth of an alcove at the eastern end of the cave. There is no clear indication of the function of this alignment, although it could represent the foundation of a low wall which would have closed off the alcove. The age of this construction is not known. However, similar rock alignments are known from three nearby rock shelters, Ama-6, Ama-7, and Ama-8.

Mortar holes. Two mortar holes were found in a large boulder located on the surface of Unit E4 (Fig. 2). The larger of the cavities is approximately nine inches in diameter, and the smaller, six inches in diameter. Depth of the mortar holes is not recorded. Bedrock mortars are present in nearby sites (Ama-4, Ama-5). A broken pestle was found on the site surface.

Petroglyphs. On the rear wall of the cave (see Fig. 2) is a petroglyph panel consisting of 15 vertical and horizontal incised lines or grooves and 12 drilled pits, lying on or between the lines (Fig. 11). This petroglyph style is sometimes called "pit and groove". Payen (1968) believes some of the pits are arranged so as to form "cupule sculptures"; for example, he illustrates "abstracted vulvaform designs and cupule-groove designs" at Bamert Cave in Fig. 4,d of his 1968 paper. For additional description of the Bamert Cave petroglyphs, see Heizer and Clewlow (1973).

Burials. Two burials were found during the course of excavations in 1951. One was a badly distrubed primary interment found in Unit E10. Skeletal remains from this burial cannot now be located in the Lowie Museum. The second burial was uncovered in Unit H4 (Fig. 2). The burial was that of a naturally mummified juvenile, tightly flexed on its left side (Plate 2). The head was covered with a coiled basketry tray (Plate 2,b), and the body had been placed in a large twined burden basket (Plate 2,a). A twined tule pouch (Plate 2,c) had been placed near the head, and cordage (perhaps a carrying net) made from milkweed fiber was wound about the body.

Artifacts associated with the burial are described in a later section and in Appendix X. Non-artifactual items were a large buckeye hull fragment, and an angular siliceous stone found at the knees. Both of these items are assumed to be adventitious rather than deliberate offerings.

Some additional data on juvenile burials in the central California area have been furnished by Heizer (1951). He has described the burial of a 12-year old child from site Ker-185, a cave in Kern County. As in the case of the Bamert Cave juvenile burial, the body had been wrapped in a carrying net of milkweed fiber, and had a piece of tule matting placed over the head of the skeleton. The remains were then placed in a coiled basket for burial.

Hearth. An area of concentrated ashes found at the intersection of Units F3/F4 and E3/E4 (Fig. 2) is interpreted as the remains of a hearth. The feature was about four feet in length and up to two and one-half feet in width.

THE ARTIFACTS

All artifacts recovered during the 1950-1951 archaeological investigations at Bamert Cave are described in this section. Measurements are expressed in centimeters and incomplete measurements are enclosed in parentheses. In those categories containing numerous specimens, the mean dimensions have been indicated; in such cases, only complete specimens were used in these calculations.

CHIPPED STONE ARTIFACTS

Choppers (Figs. 3 and 4)

There are seven specimens, all of which are cobbles with a unifacially-chipped working edge at one end or along one side. These working edges often show considerable heavy wear in the form of dulling and crushing and thus the chopper function is inferred. One example (1-127052) is identical to unifacially-chipped cobbles found in numbers in Humboldt County, northern California (Fig. 4,a). The authors are now conducting wear pattern analyses on the northern California specimens, and we hope to obtain further clues as to their actual use.

Spec. No.	Material	Length	Width	Thickness	Edge Angle	Comments
1-127118	chert	9.0	6.5	2.8	45-70°	
1-127151	quartzite	9.0	8.5	5.1	65-70°	heavily dulled edge with crushing
1-127519	quartzite	8.0	7.8	3.3	70°	crushing along edge
1-120977	quartzite	9.3	5.4	3.5	75°	
1-121005	quartzite	7.6	6.6	3.7	85°	battered edge
1-127137	basalt	8.5	8.7	2.7	55°	heavily dulled edge
1-127052	basalt	10.0	9.6	3.4	65°	dulling and crushing along edge
	Mean:	8.8	7.6	3.5		

Scraper planes (Figs. 5 and 6)

Seven unifaces are classed as scraper planes. All are made on cobbles (or cobble fragments), and are characterized by a flat planar surface and a crudely-flaked dorsal surface or dome.

One specimen (1-127071; Fig. 5,a) is well-made, and was found wrapped in cloth, perhaps a small sack (now missing). Most specimens show no evidence of wear, especially the types of use-wear found on a large series of Oaxacan scraper planes described by Hester and Heizer (1972). Other data on these specimens are summarized below.

Spec. No.	Material	Length	Width	Thickness	Edge Angle	Comments
1-127138	basalt	10.1	7.8	5.7	80°	edge is lightly dulled, with crushing
1-127363	quartzite	9.4	6.9	4.2	60°	may be on a mano fragment
1-127154	quartzite	7.0	6.9	2.8	65°	
1-127071	quartzite	5.3	5.6	2.7	70 to 75°	cloth wrapped
1-127478	quartzite	6.0	4.6	3.4	80 to 85°	
1-127354	chert	7.2	6.6	3.1	65 to 70°	
1-127135	chert	6.8	4.9	2.4	75°	
	Mean:	7.4	6.2	3.5		

Scrapers (Fig. 6)

Three specimens can be termed "side scrapers" (Fig. 6,a,b). They are cobble fragments exhibiting a unifacially-chipped scraping edge along one side. One of these (1-127560) is made of green chert; it is 5.0 cm. long, 3.0 cm. wide and 2.1 cm. thick. Edge angle is 60°, and plant fibers adhere to the scraping edge. There is no evidence of wear under low-power magnification. The second side scraper (1-127056) is made of basalt, and is 6.0 cm. long, 4.4 cm. wide, and 1.8 cm. thick. Edge angle is 60°, and no use-wear was observed. The third specimen (1-127131) is made on a white quartzite flake 5.4 cm. long, 3.0 cm. wide and 1.5 mm. thick, edge angle is 45°, and there is no recognizable wear.

There are also two end-scrapers, both made on flakes. Specimen 1-127509 (Fig. 6,d) is made on a cortex flake of fine-grained light brown chert. Length of the piece is 3.6 cm., maximum width is 3.9 cm., and thickness, 1.8 cm. Angle of the scraping edge is 70°; no wear was noted under microscopic examination. The other end-scraper (1-121009) is fashioned on a flake of translucent light brown chert (Fig. 6,c). It is subtriangular in outline and has a convex bit or scraping edge (edge angle, 60°). Several small flakes have been removed from the ventral surface along the scraping edge, apparently through use. Under 30X magnification, light striations can be seen on the ventral surface, at an angle to the scraping edge. Length of this artifact is 4.2 cm., width, 4.3 cm., and thickness, 2.0 cm.

Projectile point (Fig. 9,a)

A single projectile point (1-127415) is in the collection. It is made of chalcedony, and has a triangular outline, shallow side notches and a concave basal edge. The specimen is made on a flake, and the lateral edges are alternately trimmed. The basal edge is steeply beveled. Length of the specimen is 2.1 cm., width is 1.4 cm., and thickness, .5 cm.

Miscellaneous bifaces (not illustrated)

These are three crudely-bifaced specimens. One is a crude ovate biface, biconvex in cross-section (1-127152); it may be a preform. Length is 7.9 cm., width, 7.6 cm., and thickness, 2.7 cm. A second biface (1-127157) is subtriangular in outline. Length is 8.0 cm., width, 6.4 cm., and thickness, 3.7 cm. Finally, there is a fragmentary biface, with the edges very heavily dulled (1-120994). It is probably a broken knife. Two specimens are of chert, and one is of basalt.

Flaked cobbles (Fig. 7)

Seven cobbles from the site exhibit either bifacial or unifacial flaking. One specimen (1-120979) is an ovate, crudely bifaced piece which may represent the initial stages of core preparation (Fig. 7,b,b'). Another similar specimen (1-127116) apparently represents an attempt at making a scraper plane. Three examples (1-120975, 1-120978, 1-120976) may be cores; one of these (1-120975) has a prepared platform, but was discarded because of repeated hinge fractures when flake removals were attempted. A small ovate basalt biface (1-127119) is probably an exhausted core.

Specimen No.	Material	Length	Width	Thickness
1-120975	chert	9.2	7.8	6.0
1-120979	chert	8.0	7.2	7.0
1-120978	chert	8.8	6.0	3.8
1-120974	quartzite	7.2	6.0	4.0
1-120976	quartzite	10.5	7.4	7.5
1-127116	quartzite	9.7	7.1	3.4
1-127119	basalt	4.0	3.2	2.1
	Mean:	8.2	6.4	4.8

Utilized flakes (Fig. 6,e)

Eight flakes have been modified, either by marginal trimming or through use. All appear to have been used as casual cutting or scraping tools. One specimen (1-120993) is an irregular chert flake with a notch (spokeshave?) and a possible graver tip trimmed on one edge. Another chert flake (1-120986) has one trimmed edge which is heavily dulled from use; in fact, this wear almost totally obliterates the trimming scars. A quartzite secondary flake (1-120988) has two roughly-trimmed edges, one of which is dulled and polished from use, probably as a knife. A large basalt cortex flake fragment (1-127123) is crudely trimmed along one edge; this edge is stained by some type of residue, and has plant fibers adhering to it. Another secondary flake of jasper (1-127140) has a series of tiny flake scars along one edge; this appears to be edge retouch resulting from use rather than from intentional modification. A fragmentary flake (1-127517) in the collection is roughly trimmed along one edge. However, the specimen is probably a portion of a unifacial tool edge, perhaps a resharpening or rejuvenation flake (cf. Jelinek 1966; Shafer 1970). Dimensions of the specimens are given below.

Specimen No.	Length	Width	Thickness
1-120993	3.2	2.3	.8
1-120986	5.1	5.4	1.4
1-120988	5.1	6.0	2.0
1-127123	(9.7)	5.5	2.2
1-127468	5.5	6.6	2.0
1-127517	(3.9)	2.5	1.8
1-127140	5.5	4.1	1.2
1-127568	2.9	2.8	.7
Mean:	3.4	4.4	1.5

Core (not illustrated)

The specimen (1-127364) is a large gray quartzite cobble, ovate in outline. One face of the cobble has been used as a striking platform. Approximately one half of this face is covered with smooth cortex, and this served as a natural striking platform from which several flakes were detached. On the other half of this face, two large flakes were removed across the face, forming a prepared striking platform; this platform was used in the removal of a number of flakes. The core is 16.0 cm. long, 15.5 cm. wide and 7.5 cm. thick.

Lithic waste (not illustrated)

In the collection from Bamert Cave are 109 specimens which result from the tool manufacturing process. These include 38 pieces which we term "chunks" (following the definition published by Deacon 1969), and a number of these are possibly exhausted cores. One of the chert chunks (1-121019) may have been thermally altered ("heat treated"; cf. Crabtree and Butler 1964; Purdy and Brooks 1971).

A number of cases of thermal alteration in the lithic industries of historic aboriginal groups in northern California have been reported by Hester (1972). Another chert chunk is badly fire-cracked, perhaps from use as a hearthstone.

The waste flakes have been sorted according to previously-defined categories (cf. Hester 1971). In general, the flakes are crude and rough and were removed by direct percussion techniques. However, the raw materials being worked by the aboriginal flint-knappers were of poor quality, primarily coarse quartzites, with small amounts of basalt and chert. Most flaking appears to have been done on rounded, smooth-surfaced gravels or river cobbles. The waste flakes show little evidence of use.

There are 28 flakes which can be termed secondary cortex flakes. The dorsal surfaces of these specimens exhibit previous flake removals, but retain portions of the nodular cortex. Most of these flakes are large and thick (up to 6.0 cm. long and 2.2 cm. thick) and consist of quartzite, basalt and chert. There are simple prepared striking platforms (a single flake facet) on 18 specimens, cortex or natural striking platforms on eight, and two specimens have shattered platforms.

Eighteen specimens are interior flakes, detached from the core after the cortex had been removed. Most of these are quartzite, but some basalt and chert specimens are present. There are also two small flakes of jasper (?), reddish in color and translucent. One of these has the attributes of a uniface resharpening flake (Jelinek 1965; Shafer 1970). The interior flakes vary greatly in size, ranging from the small jasper flakes (1.2 cm. long, 2.1 cm. wide and .3 cm. thick) to large basalt examples (7.0 cm. long, 5.0 cm. wide, and 2.2 cm. thick). Striking platforms can be classified as follows: simple prepared platform, 12; cortex, four; shattered, one, and multifaceted,one (this is the possible rejuvenation flake mentioned above).

Twenty-five flakes are categorized as flake fragments (cf. Hester 1971).

OTHER LITHIC ARTIFACTS

Hammerstones (Fig. 6,f)

One specimen (1-127055) is an oval, tabular cobble (siltstone?) battered at one end (a single flake has been removed from the other end). A red stain(?) is present on one face. Such an implement could have been used either in stone-working or in some form of food processing. It is 9.9 cm. long, 6.0 cm. wide and 2.2 cm. thick. Another specimen (1-127435) is an elongate siliceous cobble with marks, possibly resulting from battering, at both ends. It is 9.7 cm. long, 4.5 cm. wide and 2.6 cm. thick. A third hammerstone (1-127485) is a fragment of an elongate quartzite cobble, heavily battered at one end.

Cooking stones (Plate 3)

There are two specimens in the Ama-3 materials which we interpret as cooking stones. One is a fist-sized cobble (1-127064), coated with a film of

dried food material (.05 cm. thick), probably acorn mush (Plate 3,b). Specimen 1-127075 is a broken cobble coated in a similar fashion. The complete cobble measures 11.7 cm. in length, 9.5 cm. in width, and is 4.8 cm. thick; thickness of the fragmentary specimen is 4.7 cm. Use of cooking stones in the preparation of acorn mush by the Central Miwok is described in detail by Gifford and Barrett (1933:147).

Stone bowl fragment (Fig. 9,b)

This artifact (1-120998) is a fragment of a carved soft limestone or tuff bowl. It has been broadly and deeply engraved on the exterior surface with a series of vertical lines, crossed at the bottom by a single horizontal line. Interior and exterior surfaces are roughly smoothed, with scratches (probably tool marks) evident on the interior wall. Estimated height of this small bowl is 3.2 cm.; depth of the interior cavity is 2.5 cm. This form is not ethnographically reported from the area.

BONE AND ANTLER ARTIFACTS

Awls (Fig. 8,q-v)

Eight bone tools, interpreted as awls, are in the collection. Three are made from longitudinally-split deer cannon bones. The largest specimen (1-127070) is very highly polished. Specimen 1-127094 has a slightly burned distal end and the tip has been broken off.

Two other awls were made by grinding a sharp point on one end of fortuitous heavy long bone splinters, with the proximal end left unmodified.

A sixth specimen is made from a fragment of mammal long bone, with the articular end of the bone preserved. Two additional examples (1-127095, 1-127437) are awl tip fragments; one of these is burned.

Although vestiges of sinew adhered to the proximal ends of several awls when they were originally found, none are wrapped (or show any evidence of wrapping) like the Miwok examples illustrated by Barrett and Gifford (1933:Pl.39,1-3). According to Barrett and Gifford (Ibid:214 and Pl. 39) awls like these were usually employed in the manufacture of coiled basketry.

Dimensions of complete specimens are indicated below.

Specimen No.	Length	Width	Thickness
1-127070	13.5	1.0	.6
1-127557	9.0	1.3	.6
1-127094	6.0	1.4	.8
1-127068	8.0	.8	.4
1-127379	7.0	.5	.3
1-127066	5.0	.9	.4
Mean:	8.1	1.0	.5

Beads (Fig. 8,m,n)

There are two specimens (1-127414, 1-127502), both made from short segments of bird long bone. The ends have been squarely cut and the exterior surfaces are polished. Lengths are 1.9 and 2.3 cm., and diameters are .5 cm. on both.

Tubes (Fig. 8,o,p)

Two specimens are present, both made from bird bone segments (1-127374, 1-127093). The longest example (Fig. 8,p) has numerous striations on the exterior, probably the result of preliminary smoothing and polishing. The second specimen (Fig. 8,o) is fragmentary, and has incised concentric lines, filled with crudely-incised cross-hatching, on the exterior. It is similar to bird bone tubes of the Late Horizon (Lillard, Heizer and Fenenga 1939:Pl.29). Lengths are 6.0 and 3.2 cm.; the diameter of the complete specimen is .7 cm.

Gorges (Fig. 8,b-g)

Fifteen well-made cylindrical bi-pointed bone objects were recovered from the site. Seven are fragmentary, and one specimen is now missing. Based on the data presented by Barrett and Gifford (1933:189) we interpret these artifacts as gorges used for fishing, of which there is abundant evidence in the faunal collection from the site (see Appendix III).

Dimensions of thirteen specimens follow, two specimens are now missing.

Specimen No.	Length	Maximum Diameter
1-127584	(4.4)	.3
1-127584	(4.3)	.3
1-127584	3.5	.3
1-127584	(3.4)	.3
1-127497	(2.9)	.4
1-127577	3.8	.3
1-127097	5.4	.5
1-127099	5.5	.3
1-127099	4.1	.3
1-127100	(3.6)	.3
1-127067	4.7	.4
1-127369	(3.4)	.3
1-127558	(3.3)	.3
Mean:	4.5	.3

Flaked bone (Fig. 8,h)

One splinter of large animal long bone (1-127437) has a long, tapering tip which appears to have been pressure-flaked, much in the same way one would chip stone. It is 8.5 cm. long, with a width of 1.5 cm., and a thickness of .9 cm.

Antler objects (Fig. 8,a)

Two artifacts are made of deer antler. One (1-27096) is a flat, straight-sided section of what once may have been an awl, or perhaps a flint working tool (cf. Barrett and Gifford 1933:214). Length is 3.3 cm., maximum width, 1.1 cm., and thickness, .6 cm. The other specimen (1-127075) is made from antler tip, and has a hole, 1.0 cm. in diameter, drilled biconically through (Fig. 8,a). We feel that it may be an arrowshaft straightener, due to its similarity to a wooden shaft straightener shown by Barrett and Gifford (1933: Pl. 60, 4). It is 9.9 cm. long, and 1.5 cm. in diameter.

SHELL ARTIFACTS

Ornaments (Fig. 8)

Five artifacts of shell are in the collection, and all served as ornaments. One is a round, deeply-cupped Olivella bead, .6 cm. in diameter and .3 cm. thick (1-127476). It is similar to type G1c of Gifford (1947:69). Two specimens (1-127518, 1-121009) are small centrally-perforated clam shell disc beads, .7 cm. and .9 cm. in diameter, and .2 and .25 cm. in thickness (Fig. 8, j,l). One face of the larger specimen has a series of parallel grooves; both artifacts are typical of Phase II of the central California Late Horizon (Lillard, Heizer and Fenenga 1939:Pl.28). There are two sub-ovoid abalone shell ornaments (1-127092, 1-127586), both perforated near one edge (Fig. 8,i). Lengths are 1.7 and 2.1 cm., and thicknesses, .3 and .15 cm. Finally, there is a rectangular ornament (Fig. 8,k) made of freshwater mussel shell (1-127401). It is perforated near one end and is striated on both faces. Length is 1.8 cm., and it is .1 cm. thick.

According to Barrett and Gifford (1933:251) the Miwok were allowed to journey to the Pacific coast (especially Monterey Bay in Costanoan territory) to obtain Olivella shells. Clam shells were obtained from peoples to the north and northwest of the Miwok (Ibid:253).

WOODEN ARTIFACTS*

Hardwood points (Fig. 10,a,b)

Forty-one hardwood sticks (not identified as to species) have been peeled and scraped and sharpened to a point at one end. It seems likely that these were made to be inserted into cane arrow shafts for use as arrow points.

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* Dr. Robert A. Cockrell, Department of Forestry and Conservation, University of California, Berkeley, examined the wooden artifacts from Bamert Cave. In his opinion, they are in general too badly weathered and dessicated to permit specific identifications without extensive, time-consuming analyses.

The three complete specimens (1-127425, 1-127546, 1-127425) are 10.5, 10.3 and 19.5 cm. long, with diameters of .6, .3, and .9 cm., respectively. Broken specimens range from 3.0 to 23.0 cm. in length.

Hardwood points of this sort are not reported by Barrett and Gifford (1933) in their ethnographic study of the Miwok. Similar specimens were found in later work at Bamert Cave (Johnson 1967) and were termed "arrow foreshafts".

Arrow shafts (Fig. 10,d)

There are two specimens in the collection which probably functioned as arrow shafts. One (1-127044) is made of cane. It is notched at one end (depth of notch, .45 cm.) and there are vestiges of a resin around this end; the resin was probably used for feather attachment. The proximal half of the shaft is broken off. It appears to have been cut about half-way through, and then snapped. Near this break, there is a small charred area. Length of the specimen is 32.0 cm. and maximum diameter is .7 cm.

The other possible arrow shaft fragment (1-127539) has two concentric grooves at one end (this is probably the distal end of the shaft). Length of the specimen is 43.0 cm. and maximum diameter is .7 cm.

Digging sticks (not illustrated)

Five wooden artifacts were used as digging sticks. Four are made of unidentified hardwood, and the fifth, possibly of willow. Ethnographic Miwok digging sticks were usually made of mountain mahogany or buckbrush (Barrett and Gifford 1933:197; see also Pl. 59,4). The largest complete example has a polished shaft and a wedge-shaped distal end (this end is slightly charred). Two other specimens are apparently complete, but are smaller. Both are made of polished brown hardwood, with beveled and use-polished distal tips. Both tips may have been firehardened. A fourth specimen is made of willow, and is shattered on the proximal end. The distal end is very smooth from use and the tip is blunted. The fifth example is made of hardwood, has a blunted tip and the proximal end is burned. Part of the shaft has been longitudinally scored, probably a result of the smoothing process. A description of the techniques used by the historic Miwok in making digging sticks is provided by Barrett and Gifford (1933: 197).

Specimen Number	Length	Diameter
1-127538	60.0	2.0
1-127538	34.0	1.5
1-127526	29.0	2.0
1-121051	(52.0)	2.0
1-121050	47.0	1.4
Mean:	42.5	1.8

Fire drills (not illustrated)

Although no wooden fire hearths with drill pits were recovered from this site, we do have three specimens which may have functioned as fire drills. One (1-127426) is a hardwood shaft, 34.0 cm. long and 1.5 cm. in diameter. One end is polished and smoothed. The second specimen (1-127538) is a softwood (perhaps elderberry or buckeye; cf. Barrett and Gifford 1933:195) shaft 40.0 cm. long and 1.0 cm. in diameter. One end is worn and charred. The third specimen (1-127556) is fragmentary, and appears to have been the lower end (distal end) of a fire drill. The tip is charred. Present length is 5.0 cm., and diameter is 1.0 cm.

Sections of cut sticks (not illustrated)

There are 6 cylindrical sections of sticks which have been removed from larger pieces by a grooving (or notching) and snapping technique. Lengths range from 3.0 to 12.0 cm.

Miscellaneous worked sticks (not illustrated)

Approximately 100 twigs and branches of willow, greasewood, elderberry, buckeye and other unidentified trees, exhibit slight evidence of modification. Such alterations include cut ends, peeled or scraped surfaces, points, and burned or polished ends. They probably result from a variety of activities; some may have been fire pokers and others, small digging sticks.

One specimen, a willow stick (1-127045) 31.0 cm. in length and 2.0 cm. in diameter, shows signs of having been cut with a metal knife, as does specimen 1-121049 (length, 59.0 cm.; diameter, 1.4 cm.). Several other sticks also bear evidence of the use of metal knives and axes. The more crudely worked specimens were apparently cut or shaped with stone tools.

Another specimen is a slightly curved wooden shaft, 43.0 cm. long. One end is charred and the other ground to a conical point. There are two concentric grooves near one end. It is possible that this piece had some ceremonial function, such as a part of a dance plume similar to that illustrated by Gifford and Barrett (1933:72).

Several sticks are encrusted with unidentified matter. Some may have served as stirrers when acorn mush was being prepared. Others may have been incorporated into rat nests.

Peg or stake (Fig. 10,c)

This is a cylindrical section of unidentified hardwood (1-127461). One end is pointed (it may have been shaped by a charring and scraping technique), and the opposite end is flattened and lightly battered. The specimen may be the distal end of a digging stick which was for some reason severed, and used subsequently as a peg, or stake. Length of the specimen is 17.6 cm., and diameter is 2.7 cm.

Sharpened splinter (not illustrated)

A brown hardwood splinter has been sharpened at one end. Use is not known. Length is 5.0 cm., width, .5 cm., and thickness, .2 cm.

BASKETRY AND OTHER VEGETAL ARTIFACTS

Coiled tray (Plate 2; Plate 4,d)

A coiled basketry tray was found with the burial of a juvenile (Plate 2). It is a small, nearly flat tray, circular in outline, 29.3 cm. in diameter, and is .6 to .8 cm. in thickness. A technical description of the artifact appears in Appendix X.

Other coiled basketry (Plate 4,c)

There is a fragment (10.0 x 3.3 cm.) of a coiled basket (1-127063). A similar specimen from Bamert Cave is reported by Johnson (1967:28). Additional comments on this fragment are provided in Appendix X.

Large twined burden basket (Plate 2)

The juvenile burial described earlier had been placed between two halves of a large twined conical burden basket. It seems to have been an old and worn-out basket at the time it was used for the interment. L. E. Dawson has given descriptive data on this specimen in Appendix X.

A similar Miwok burden basket is illustrated in Barrett and Gifford (1933: Pl. 54), and a discussion of Miwok twined baskets is provided in the same source (p. 230 ff). Among the Miwok, these large conical baskets were used in food-gathering activities, such as the collection of acorns and other plant foods.

Twined basketry fragments (Plate 4,a,b,e)

There are three fragments of twined basketry in the collection. One of these is a large fragment of a twined conical basket with a coiled patch (Plate 4,e). Two other smaller fragments were also made by the twining technique (Plate 4,a,b). For technical descriptions of these specimens, see Appendix X.

Stiff twined basketry fragments (Plate 4,a,b)

The collection includes two fragments of stiff, open twined basketry (1-127083), both of which are described in detail in Appendix X.

Grass bundle (Plate 3,a)

A bundle of grass has been wrapped and tied, and may have been intended for use as basket-making material (1-127352). Length of the bundle is 19.8 cm., width varies from 7.6 to 9.0 cm., and thickness averages 7.7 cm.

Bound fiber (not illustrated)

This specimen (1-127085) is a mass of soft fiber (unidentified), wrapped at one end with a twist of the same material. Length is 42.5 cm., and it is about 3.7 cm. in maximum diameter. Function is unknown.

Tule mats (Plate 2)

A rectangular tule mat was found folded in half over the face of the juvenile burial (see Plate 2,c). This mat is 43.0 cm. long and about 35.0 cm. in width. There is a single tule stalk in each warp course, and there are 10 wefts (also of tule, except for a single weft of cordage) spaced about 4.0 cm. apart.

Also in the Bamert Cave collection is a badly damaged tule mat fragment (not illustrated). It is coarsely twined, with two tule stalks in each warp course, and tule wefts twined about 11.0 cm. apart.

Barrett and Gifford (1933:244) attribute tule mats to "people of the lowlands" (Plains Miwok).

Carrying net (Plate 2,b,c)

A probable carrying net was found partially wrapped around the juvenile burial. The net is composed of 2-ply left-twist cordage, apparently manufactured of milkweed fibre (cf. Barrett and Gifford 1933:246). These cords average .2 cm. in diameter. It was not possible to estimate the original size of the net as parts of it are obscured by the burial.

Cordage (not illustrated)

There are a number of pieces of aboriginal cordage in the collection. One specimen (1-127087) is a two-ply string made by two left-twist elements, each of which consists of a two-ply right-twist cord. The string is wrapped with feather quills, and is 9.5 cm. in length.

Also present is a two-ply right-twist cord (1-127081) and several very fine two-ply right-twist cord fragments.

Barrett and Gifford (1933:246) note that the Miwok used various bast fibers for making string, expecially milkweed (Asclepias sp.), Fremontia californica, and Apocynum cannabinum.

ARTIFACTS OF ANGLO-EUROPEAN MANUFACTURE

A number of objects from Bamert Cave are clearly of Caucasian manufacture (Fig. 9; Pl.5). Some or all of these may have been obtained by historic Indian inhabitants from gold-mining camps in the region, or they may represent infrequent Anglo-European use of the cave as temporary shelter. Some of these materials were found in the cache pits described earlier; unfortunately, exact provenience information has been lost.

These Historic artifacts are itemized below:

1) Rusted iron table knife (round point); original handle missing and replaced by 1/2" spiral-wrapped cotton cloth; length of specimen, 23.0 cm. (1-127046; Pl.5,a).

2) Neck and top of hand-blown glass bottle (1-127563; Fig. 9,g).

3) Fragments of thin, pale-green bottle glass; unmodified.

4) Half of thin brass lid with stamped decoration (1-127405; Pl. 5,c).

5) Bone comb with one end broken off (1-127404; Plate 5,b).

6) Triangular piece of cut leather (1-127034).

7) Match box label (1-127042), with the following partial legend:

"...AGH's Friction matches
1...Twelfth Street between...
6 AV. New York"

8) Fragments of music manuscript, drawn on heavy paper with staff printed (1-1270

9) Three miscellaneous fragments of paper, one with printed designs (1-127043, 1-127454).

10) Two playing cards and fragments of two others (Plate 5,d-e; 1-127039; 1-127038 1-127040); see Appendix VII.

11) Buttons: (a) flat bone button (Fig. 9,e); 1.6 cm. in diameter; 4 holes (1-1270 (b) cloth-covered button (Fig. 9,f); 1.6 cm. in diameter (1-127033); (c) flat brass button; 1.9 cm in diameter (1-127090); (d) small bone button, 1.0 cm. in diameter, 4 holes (1-127378).

12) Beads: (a) faceted translucent green tubular glass bead (1-127089); 1.5 cm. long and .6 cm. in diameter (Fig. 9,c); (b) white vitreous porcelain bead (Fig. 9,d) .4 cm. in length and .5 cm. in diameter (1-127067); (c) 13 minute spherical white porcelain beads (each about .15 cm. in diameter), strung on aboriginal cordage (1-127581).

13) Blanket fragment; coarse weave; thin horizontal band design (1-127036).

14) Miscellaneous cloth fragments (24 pieces); some have colored patterns; all are probably garment fragments (1-127551, 1-127559, 1-127541).

15) Nails: (a) 2 square nails, 5.0 and 7.5 cm. long (1-127043; Fig. 9,h); (b) horsehoe nail, 4.0 cm. long (catalog number illegible); (c) bent nail or heavy wire fragment, 9.4 cm. long (1-127898).

16) Four pieces of string and twine (1-127373; 1-127428; 1-121003; 1-121002).

17) Rectangular iron object, possibly a knife handle; 7.5 cm. long (catalog number illegible).

MISCELLANEOUS ARTIFACTS AND MATERIALS

Bird quills (not illustrated)

There are five short fragments of bird quill, to which redheaded woodpecker feathers have been attached with fine cordage (1-127399 to 1-127402). Lengths range from 2.7 to 3.9 cm.

Red ochre (not illustrated)

This is a lump of red ocher, 3.4 mm. in length (1-120999).

Moss (not illustrated)

The collection includes several thin sheets of dried moss (1-127552).

Pitch (not illustrated)

The specimen is a lump of pine pitch, with several imbedded pine needles (1-127087). It is 3.0 cm. long, 15 cm. wide and 1.0 cm. thick.

Quartz crystal (not illustrated)

This object (1-127155) is a highly fractured and battered quartz crystal, 3.3 cm. long, 2.1 cm. wide, and 1.3 cm. thick.

ARTIFACTS FOUND IN LATER INVESTIGATIONS

Payen and Johnson (1965), Johnson (1967) and Mabry and Theodoratus (ms.) have described or illustrated a number of artifacts obtained during excavations at Bamert Cave in the 1960's. These investigations have never been fully published.

A list of these artifacts is given below:

1) serrated Stockton type arrow point of obsidian (Payen and Johnson 1965; Pl. 1,A,k; Johnson 1967: Fig. 45,V).
2) a Desert Side Notched arrow point (Johnson 1967: Fig. 43,T).
3) a small side notched arrow point (Johnson 1967: Fig. 45,Y).
4) two triangular arrow points with concave bases (Mabry and Theodoratus ms.:16).
5) a triangular biface, perhaps used as a perforator or drill (Payen and Johnson 1965: Pl.1,A,n; Johnson 1967: Pl.15,E).
6) a triangular biface used either as a projectile point or as a knife (Payen and Johnson 1965: Pl.1,A,p).
7) mano and mano fragments (Mabry and Theodoratus ms.:14).
8) an arrowshaft fragment (Johnson 1967:Fig. 46,G').
9) hardwood arrowpoints ("arrow foreshafts"; Johnson 1967:Pl.14,Y,Z).
10) a bipointed wooden object (Payen and Johnson 1965:Pl.1,B,k).
11) bone gorges (Johnson 1967:Pl.13,W; Mabry and Theodoratus ms.:29).
12) a coiled basket fragment (Johnson 1967:Pl.23,C,D).
13) Olivella and clamshell beads (Mabry and Theodoratus ms.:31)

14) Anglo-European artifacts, including metal cartridge cases, glass fragments, a porcelain button, a fragment of canvas, and 109 small glass trade beads (green, white, red, and blue specimens represented; Mabry and Theodoratus ms.).

SUMMARY AND CONCLUSIONS

In this paper, we have described archaeological materials collected from the site of Bamert Cave (Ama-3) by University of California, Berkeley, investigations in 1950-51. Subsequent excavations have been carried out by other institutions, but the results have been only briefly published (Payen and Johnson 1965; Johnson 1967) or remain in manuscript form (Mabry and Theodoratus, ms.).

We are not certain just when the earliest occpancy of Bamert Cave occurred. As Johnson (1967) has noted, exogene caves (like Bamert Cave) were used heavily during "Late" times in this section of Amador County. Most of the lithic tools from the site, such as choppers, scraper planes, scrapers, utilized flakes, and so forth, are not temporally diagnostic. However, the projectile points include one example of the Stockton type (Johnson 1967), an arrow point style common in the Late Horizon in the central California sequence (Lillard, Heizer and Fenenga 1939; Hester and Heizer 1973). There are also shell beads which can be linked to Late Horizon time. The Late Horizon covered a long time span, from ca. A.D. 300 up to the historic era (Heizer 1964:127). There are several triangular and side notched arrow points (such as the one shown in Fig. 9,a), but only one clearly fits into a known type. This is a Desert Side Notched point reported by Johnson (1967). It is of the "Delta" subtype defined by Baumhoff and Byrne (1959), and which probably appeared in the central California area around A.D. 1500. Radiocarbon evidence from the western Great Basin indicates that Desert Side Notched points continued to be used into protohistoric and historic times (Hester 1973). The triangular arrow points from the site are reminiscent of the Cottonwood series of the western Great Basin, similar in age to the Desert Side Notched series. Thus, there is evidence, on the basis of these projectile point "time markers", of probable Late Horizon occupation at Bamert Cave, and of habitation at the site which continued into the protohistoric and historic periods. Supporting the possibility of historic aboriginal occupation is an abundance of Anglo-European artifacts from the site. These could conceivably be linked to sporadic use of the cave (as temporary shelter) by Anglo-Europeans (miners, cowboys, or others) in the 19th century. However, we are inclined to believe that most of these historic objects represent occupation by remnants of the Miwok (or possibly other displaced Indian groups) during the first half of the 19th century. These aboriginal inhabitants of the site would have obtained the Anglo-European materials from nearby mining camps or ranches or through other contacts. Some of these objects clearly point to Indian use, including glass beads strung on aboriginal cord, and a stone tool wrapped in a cloth bag.

Assuming that Bamert Cave was occupied at least as early as Late Horizon times, we would like to consider the problems of site function and the times

during the year when the site may have been utilized. There is evidence for a variety of aboriginal activities at Bamert Cave. The use of the cave for burial and for the caching of artifacts has been documented. In addition, there are petroglyphs on the rear wall which might be linked to ceremonial or magical activities (especially the cupule designs in the opinion of Payen 1968:37). However, most of the archaeological evidence points to the utilization of the cave as a camping site. There is an abundance of faunal and floral remains, presumably brought into the cave through hunting, fishing, and foraging activities. Evidence for hunting comes from the presence of the bones of deer (the most important food mammal for historic Miwok; Barrett and Gifford 1933:178), rabbits, squirrels, and rats (see Appendix IV). There are, however, few stone points, and the major type of projectile tip seems to have been a hardwood point (41 examples were found). The occurrence of a number of bone gorge fishhooks attests to the importance of fishing; the bones of king salmon, large minnows, and sucker were recognized (see Appendix III).

Floral remains were probably introduced into the cave in several ways. As Cook and Heizer (Appendix I) point out, quantities of grass and straw could have been brought into the cave for use as bedding. However, many of the plant remains were obviously gathered as foodstuffs. These include numerous acorns and buckeye nuts (perhaps a staple in the diet), pine nuts, gourds, and bulbs (Appendix IX). The digging sticks and burden baskets found at the site were among the equipment used in food-gathering. Processing of the plant remains, especially acorns, buckeyes and seeds, was done with the aid of the bedrock mortars in the cave, or possibly at nearby site Ama-5, the scene of much aboriginal milling activity. The encrusted cooking stones from the site indicate the preparation of acorn (?) mush. Other plant foods consumed by the occupants were recognized in the analysis of four coprolites, described in Appendix V. A corn cob and several kernels were found in the deposits. These have been examined by Volney Jones (Appendix VI), and apparently represent a form derived from a mixture of Southwest and Mexican types---the kind of corn which could have been introduced during the Mission era in California.

Foraging activities probably also included the gathering of river mussels, since the shells of about 60 specimens were found in the cave deposits (Appendix VIII).

The lithic tool kit at Bamert Cave, consisting of choppers, scraper-planes, scrapers, and flakes, was probably used for processing plant and animal foods, as well as for the working of wood, hides and other raw materials. A scraper and a flaked cobble still have tiny plant fibers adhering to the working edges. Some of the stone tools may have been in use during the historic era, since one of the scraper planes was found in a cloth bag. Flint-knapping debris at the site indicate the heavy use of locally-available raw

materials in the form of cobbles of coarse-grained quartzite. Tools were made by direct percussion techniques, using quartzite and siltstone(?) hammerstones. Primary decortication flakes are absent in the debitage sample, suggesting that the roughing-out of tools or the initial phases of core reduction were carried out elsewhere.

The presence of several bone awls suggests that basket-making may have been one of the activities which took place at Bamert Cave (cf. Barrett and Gifford 1933).

Since it is unlikely that the surrounding environment could have provided sufficient resources for year-round occupation at Bamert Cave, we are of the opinion that the cultural remains at the site represent recurrent short-term habitation by groups of hunters and gatherers (cf. Cook and Heizer in Appendix I). According to Barrett and Gifford (1933:137) the Miwok moved seasonally to "different altitudes" as a part of their subsistence activities. We do have some data which indicate the specific times of the year at which the site was visited. For example, W. I. Follett's analysis of the fish remains (Appendix III) led to the identification of salmon, present in this general region during September, October and November. The analysis of coprolites (Appendix VII) indicates the consumption of plant foods available in late spring and early summer, and of cottontail rabbits which, according to ethnographic accounts, were taken primarily during summer rabbit-drives. Of course, these rabbits could have been hunted at any time of the year. Acorns would have been gathered in the fall; by late autumn and early winter the acorns fall from the trees (Barrett and Gifford 1933: 143). Buckeyes were reportedly eaten only when the acorn crop failed (Ibid:149). A lengthy discussion of historic Miwok subsistence activities is presented in Barrett and Gifford (1933:136-195).

One remaining problem is the tribal identity of the protohistoric and historic aboriginal occupants of the site. This is not a question which can be answered with any degree of assurance. The basketry provides some clues. For example, the tule mats might be linked to the Plains Miwok (Barrett and Gifford 1933), but these could have been obtained by other Miwok groups through trade. A coiled basket fragment from the cave (Plate 4,c) closely resembles the coiled basketry made by the northern Sierra Miwok (see Appendix X). The coiled basketry tray found with the juvenile burial is similar to Plains Miwok specimens. However, this burial, with the presumed Plains Miwok coiled tray, was placed in a large twined burden basket comparable to those made by the Sierra Miwok (Appendix X). We cannot be more definite about the attribution of these basketry items, as there are few ethnographic Sierra and Plains Miwok specimens available for detailed comparison. Since Bamert Cave is located along the supposed boundary between the Plains Miwok and the northern Sierra Miwok, we can assume that peoples of either or both of these Miwok groups could have lived at the site at certain times.

Plate 3: Artifacts from Bamert Cave.

a, grass bundle (1-127352).

b, cooking stone (1-127064) encrusted with dried food material (acorn mush?).

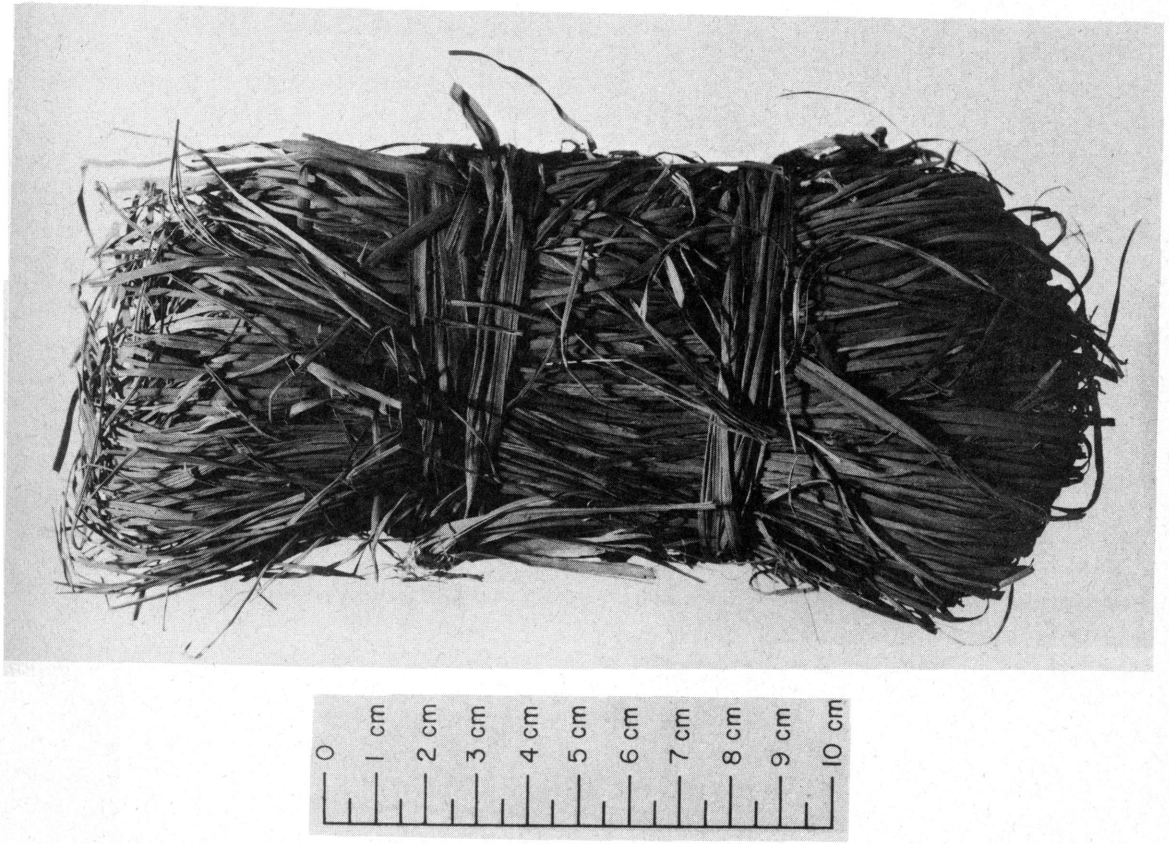

Plate 3

Plate 5: Artifacts from Bamert Cave.

a, iron knife (1-127046).

b, bone comb (1-127404).

c, thin brass lid (1-127405).

d,d' both sides of playing card (1-127038).

e, playing card fragment (1-127039).

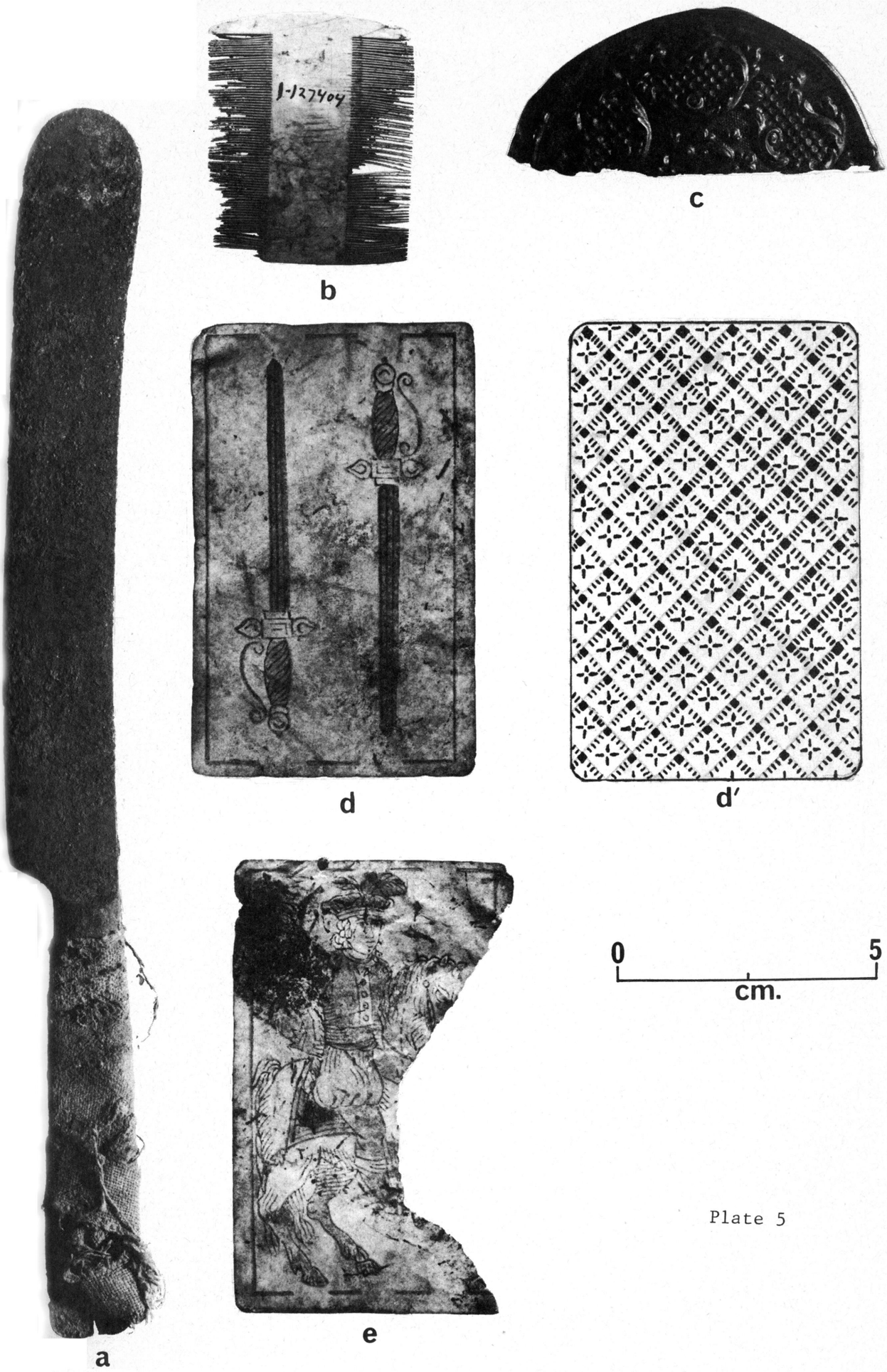

Plate 5

Figure 1,a Location of Bamert Cave in California.

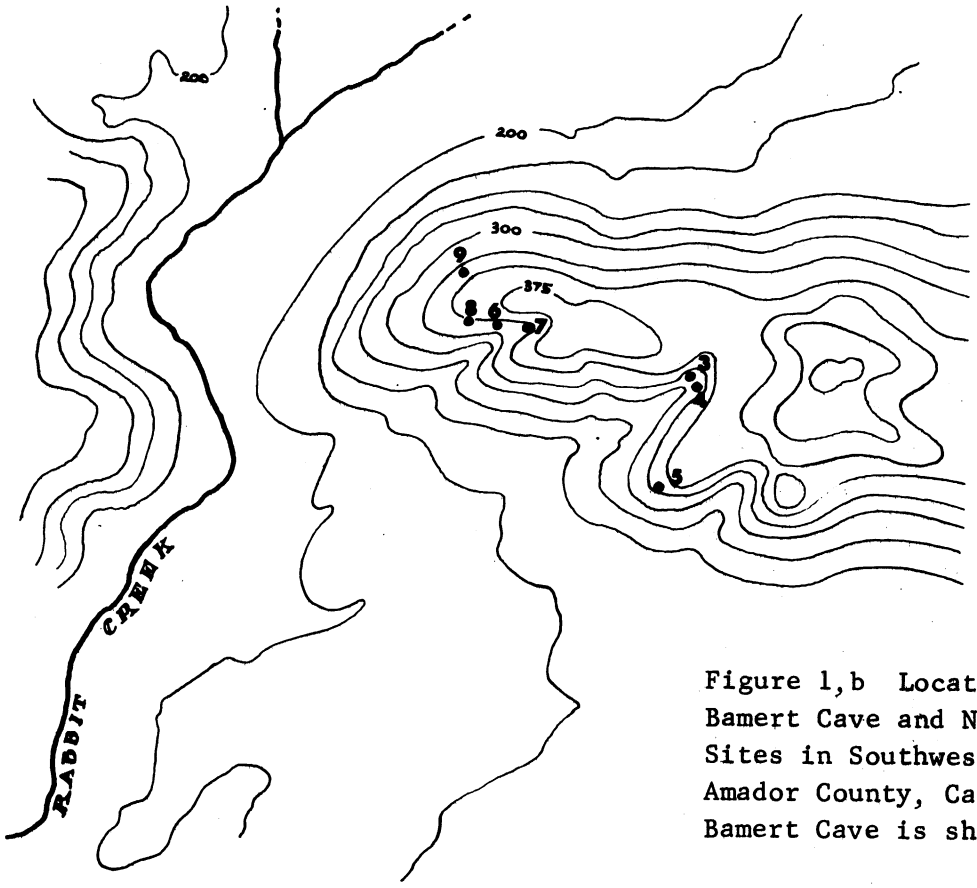

Figure 1,b Location of Bamert Cave and Nearby Sites in Southwestern Amador County, California. Bamert Cave is shown as 3.

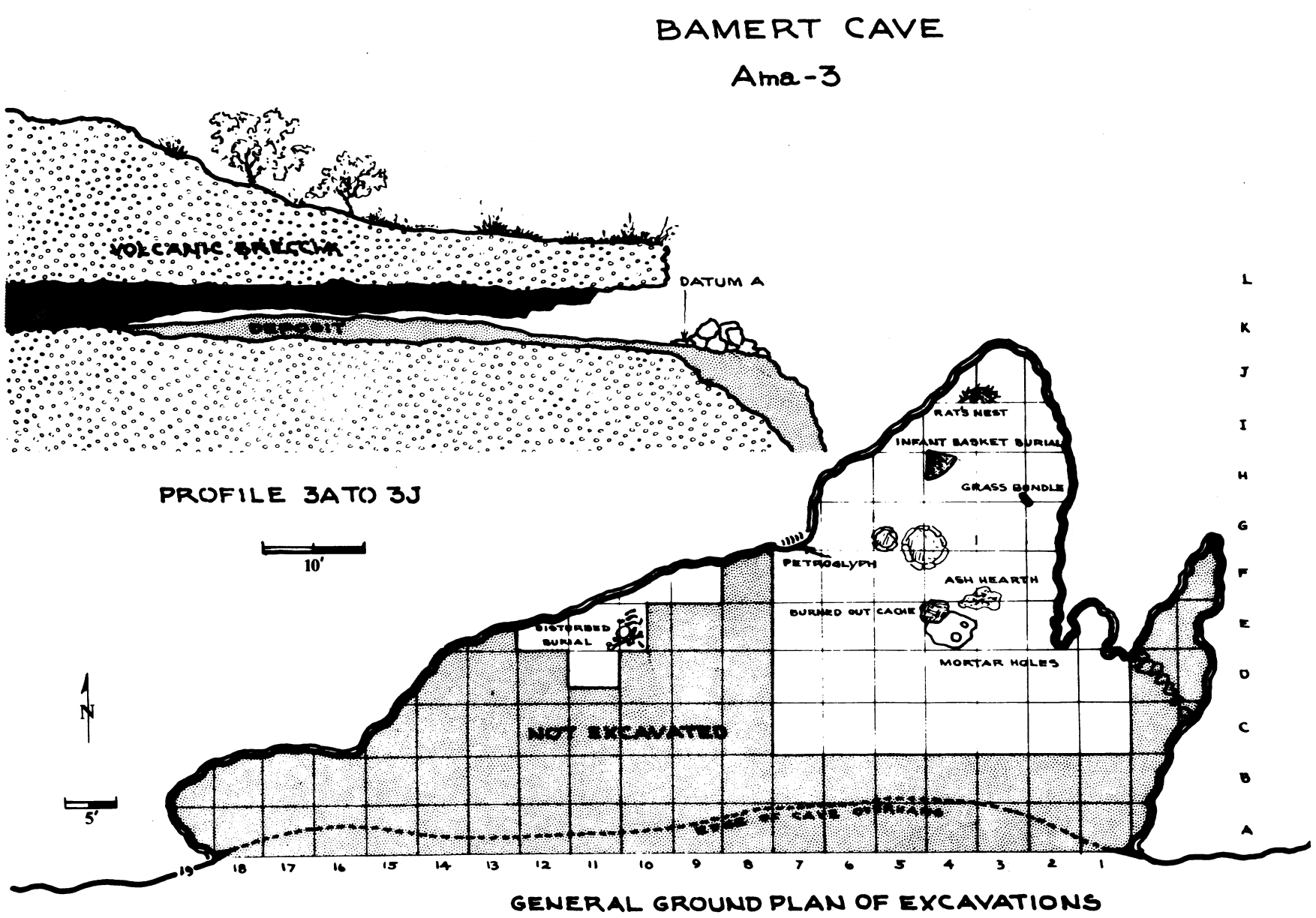

Figure 2. Upper, profile of shelter and deposits; Lower, plan of excavations.

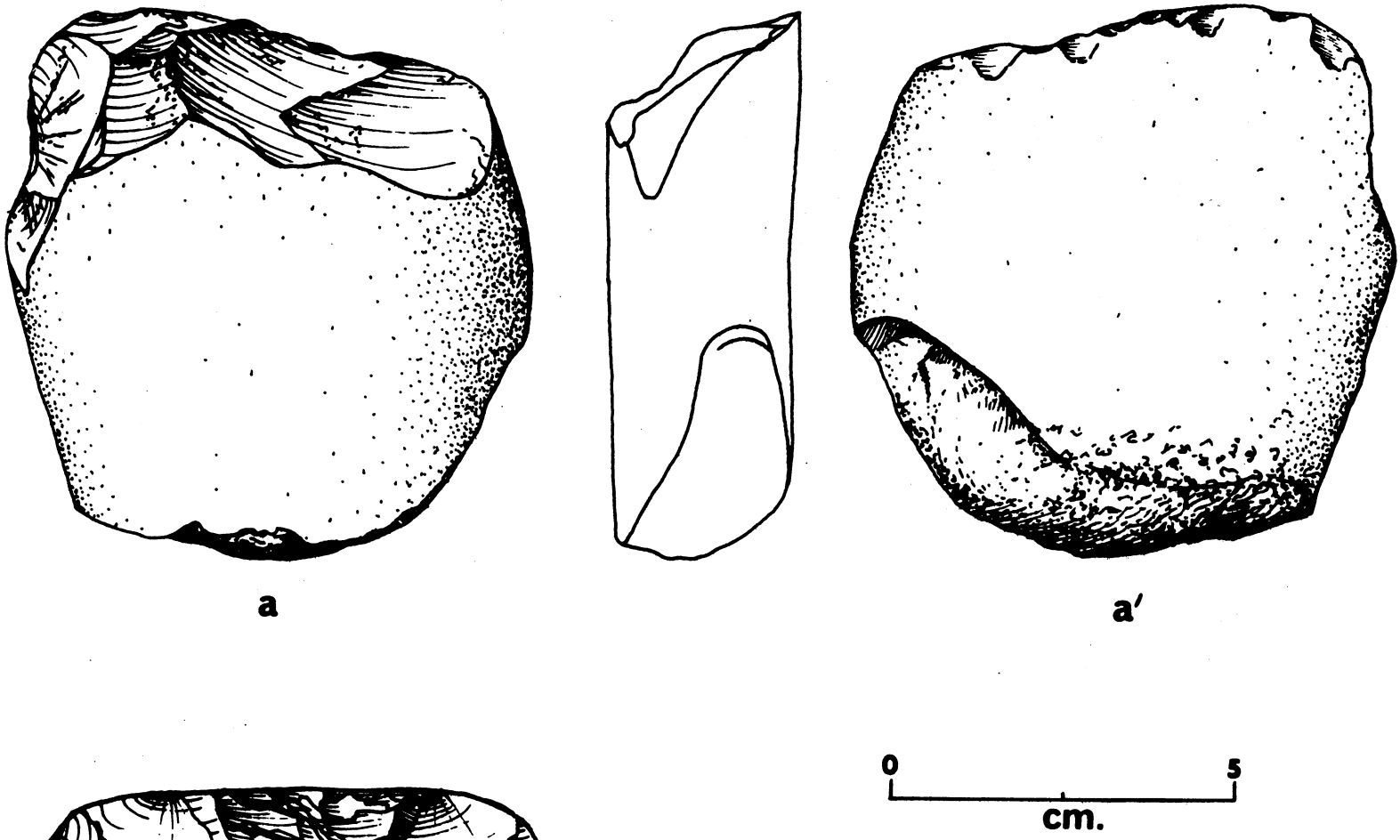

Figure 3.

Choppers from Bamert Cave.

a,a' (1-127137)

b (1-127519)

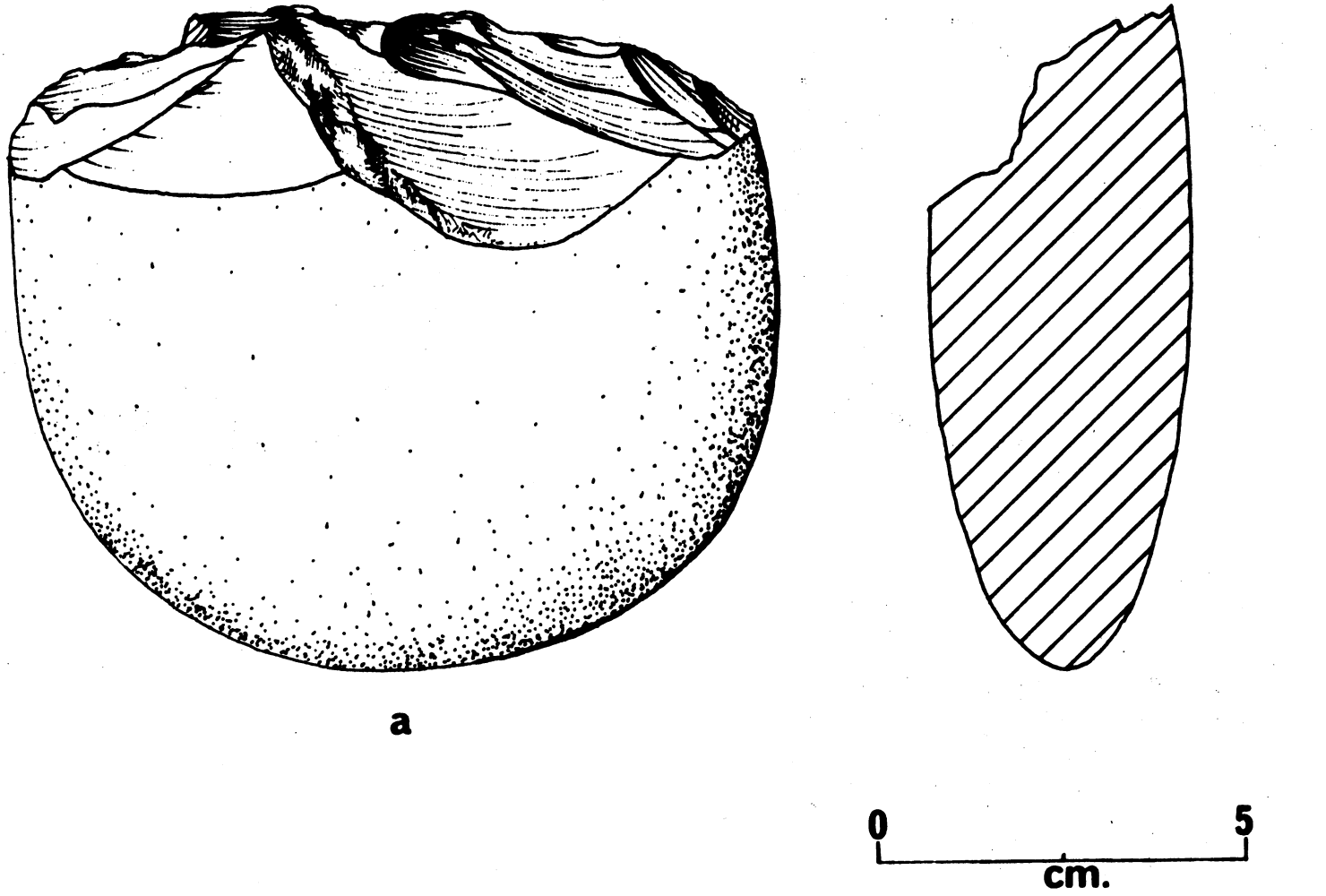

Figure 4. Choppers from Bamert Cave.

a, (1-127052); b, (1-1270977)

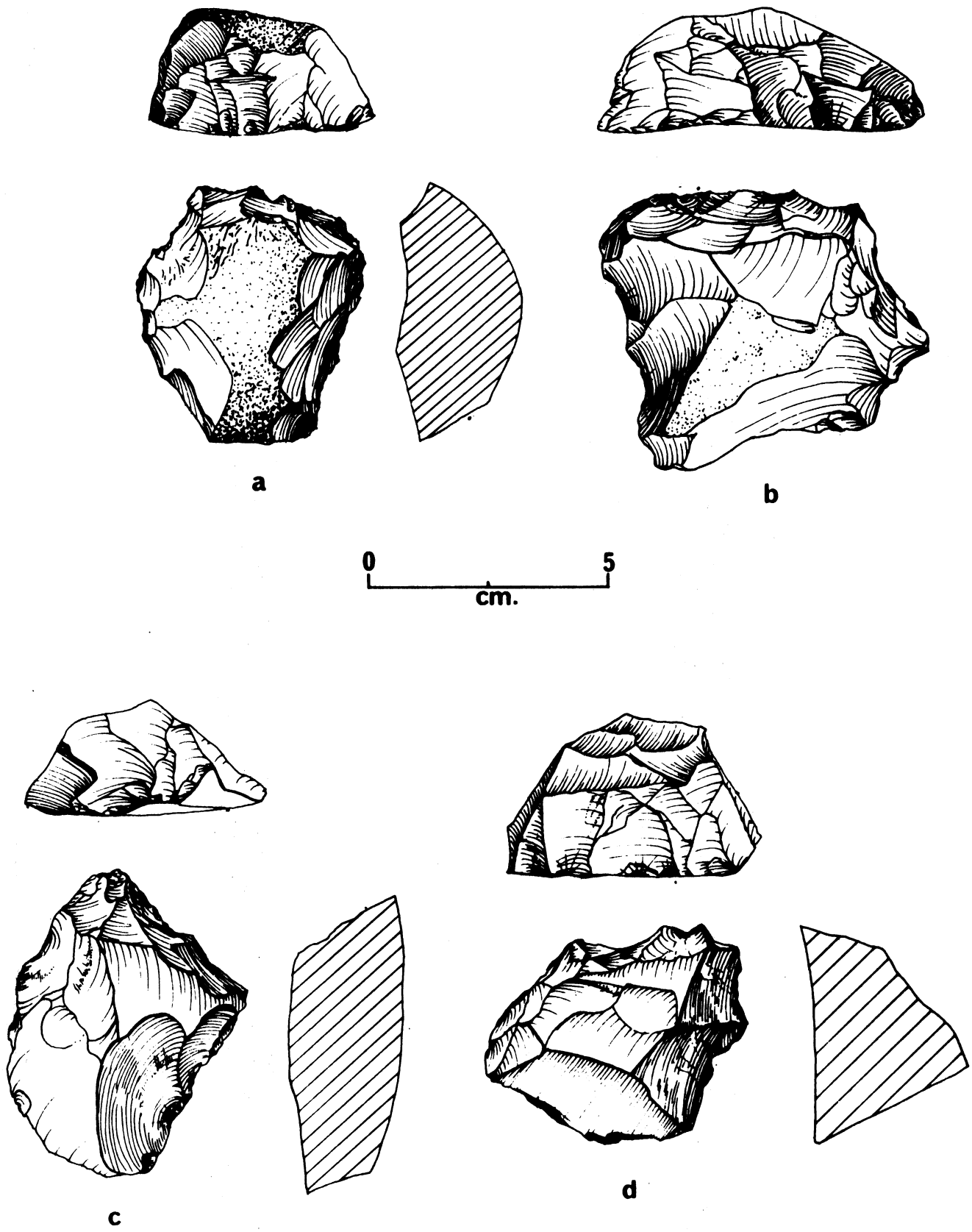

Figure 5. Scraper Planes from Bamert Cave.

a (1-127071); b (1-127534); c (1-127135); d (1-127478)

Figure 6. Artifacts from Bamert Cave

a,b, side-scrapers (1-127560, 1-127056)

c,d, end-scrapers (1-121009, 1-127509)

e, utilized flake (1-127568)

f, hammerstone (1-127055)

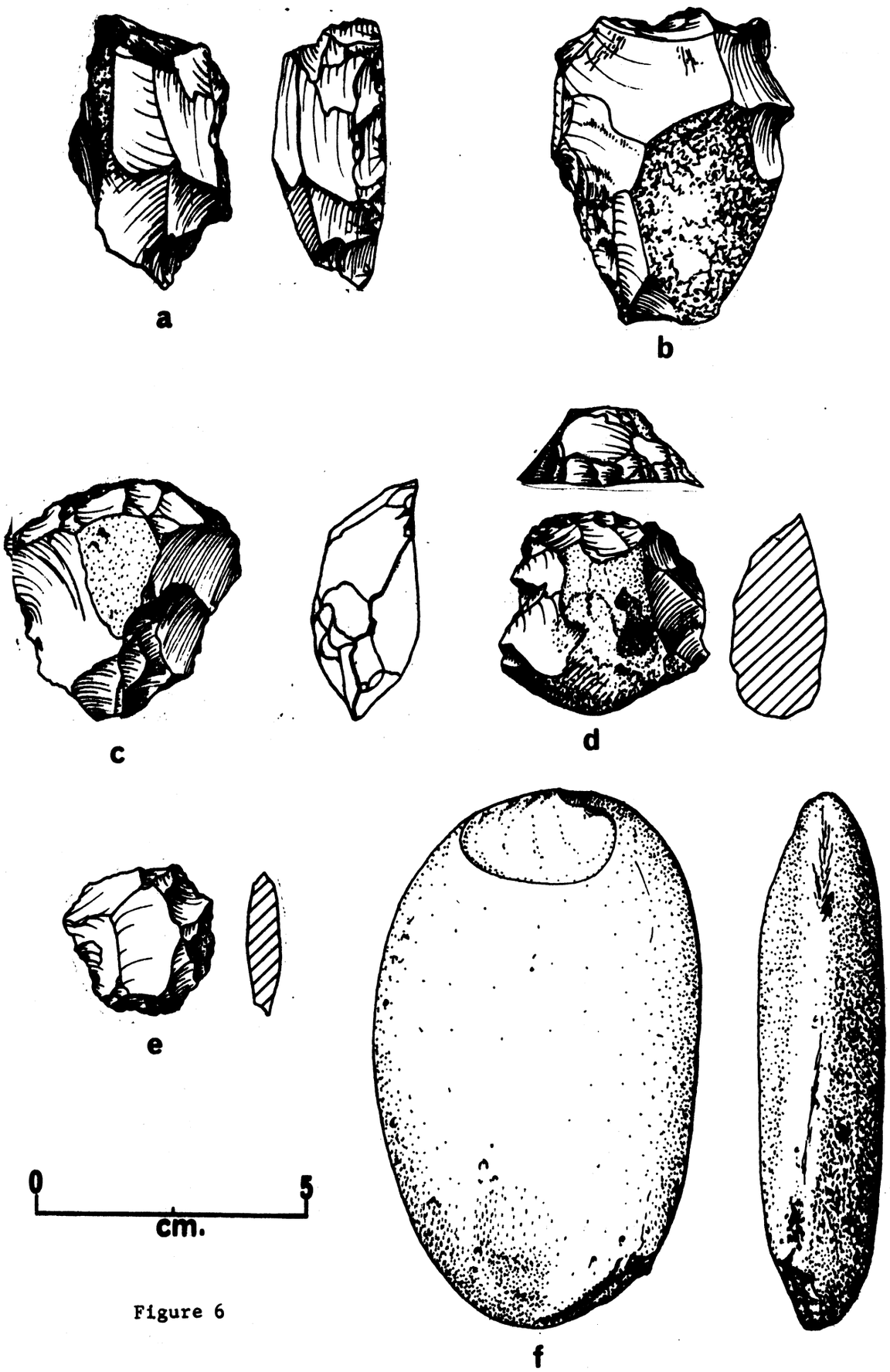

Figure 6

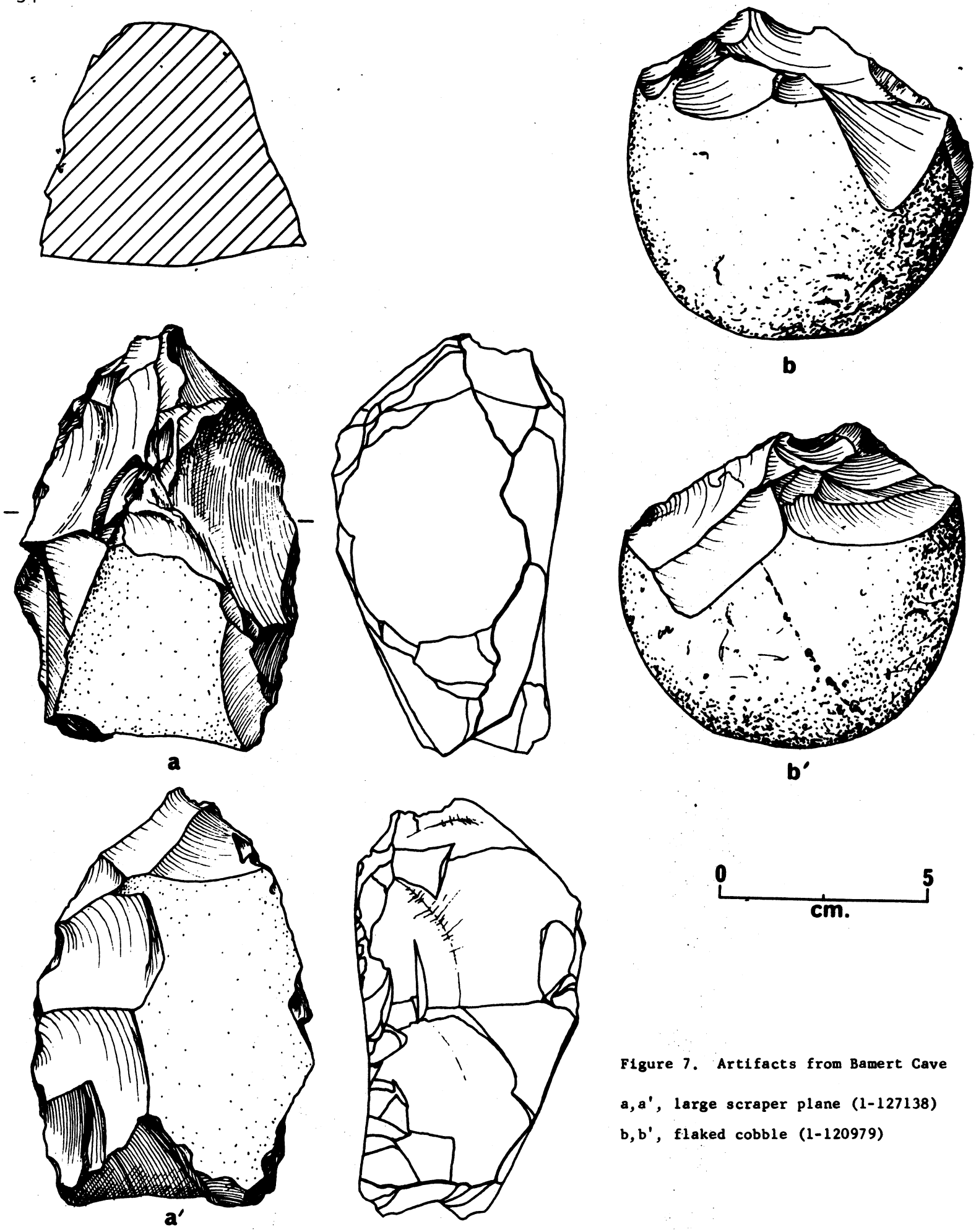

Figure 7. Artifacts from Bamert Cave

a,a', large scraper plane (1-127138)

b,b', flaked cobble (1-120979)

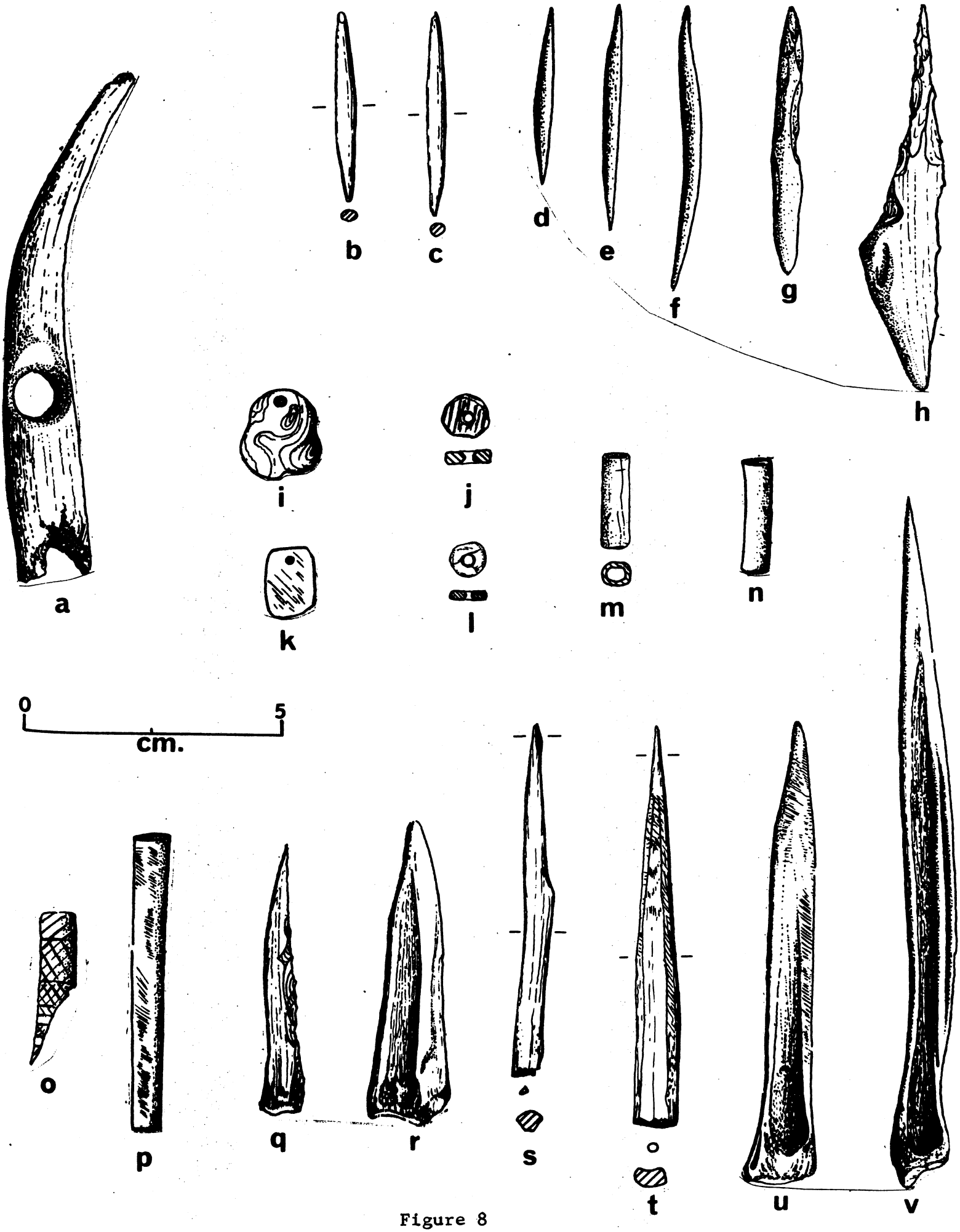

Figure 8

Figure 9. Artifacts from Bamert Cave

a, projectile point (1-127415)

b, stone bowl fragment (3 views: 1-120998)

c, green glass bead (1-127089)

d, white porcelain bead (1-127067)

e, bone button (1-127033)

f, cloth-covered button (1-127033)

g, bottle fragment (1-127563)

h, square nail (1-127403)

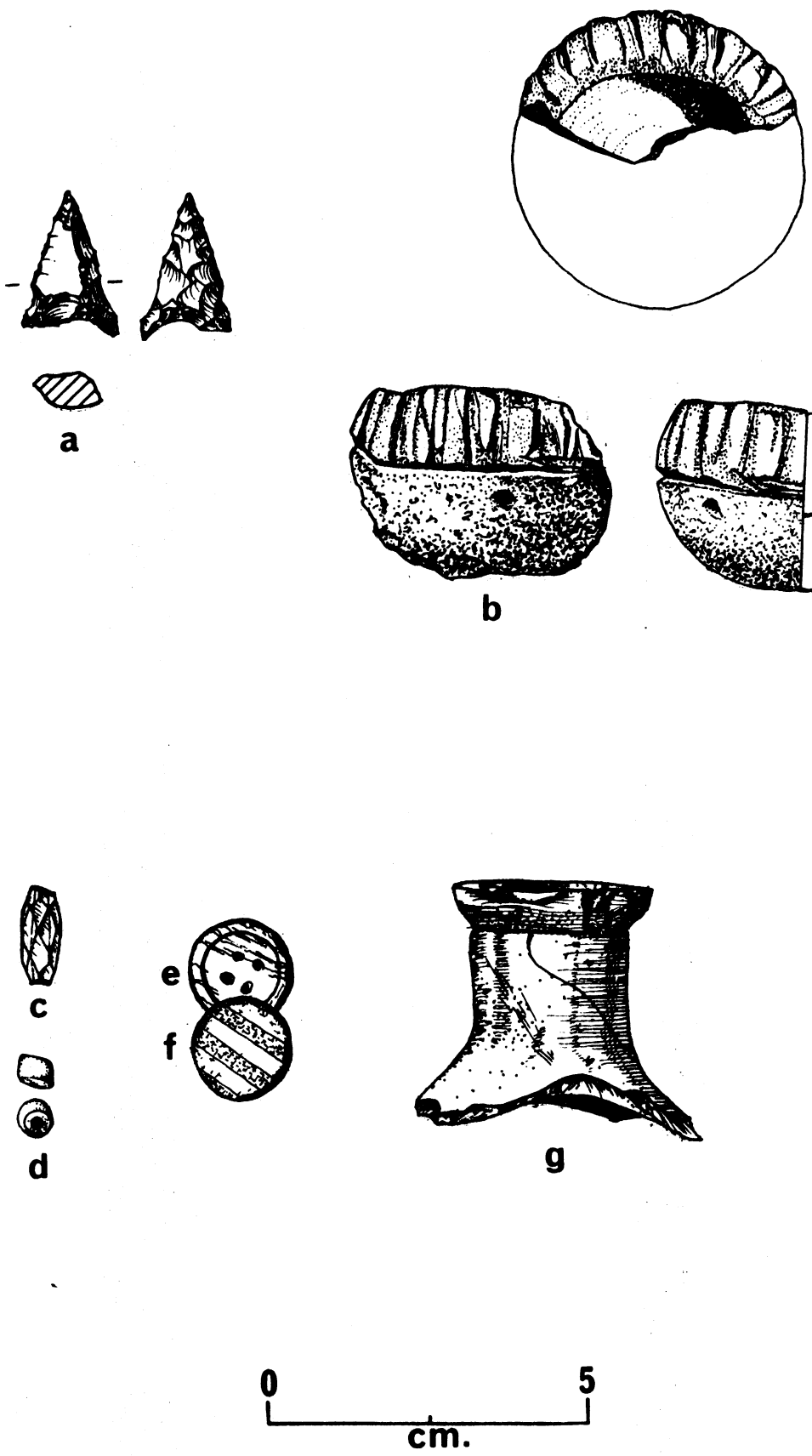

Figure 9

Figure 10. Wooden Artifacts from Bamert Cave.

a,b, hardwood arrow points (1-127425, 1-127108)

c, wooden peg or stake with end view (1-127461)

d, cane arrowshaft fragment (1-127044)

Note different scales for a-c, and d.

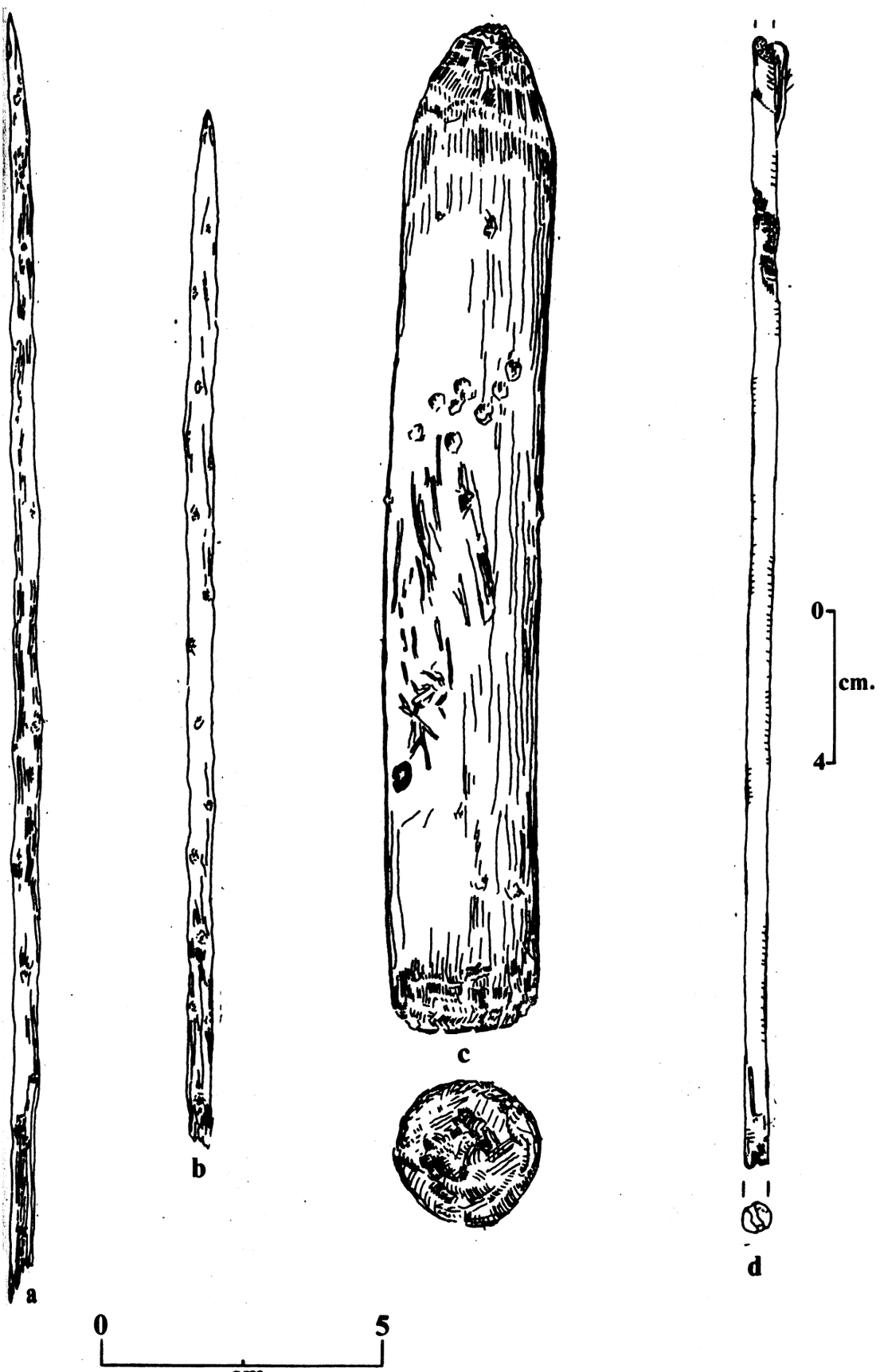

Figure 10

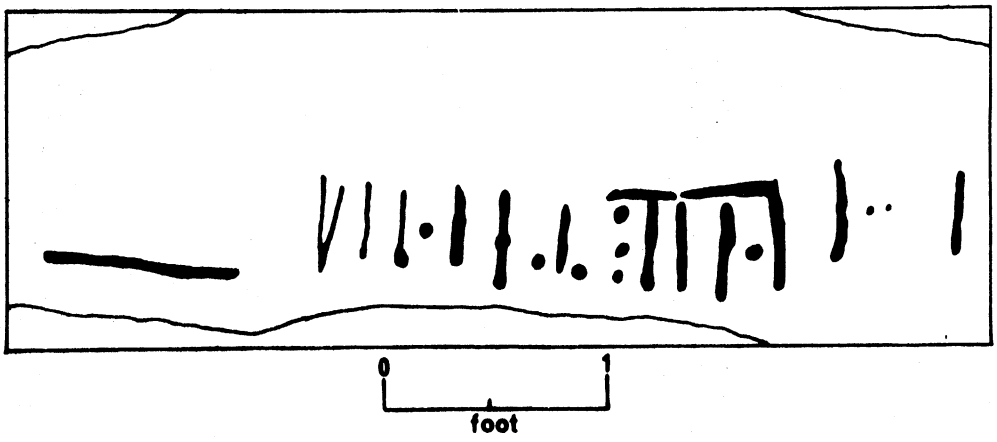

Figure 11. Petroglyph panel from Bamert Cave (Ama-3) Amador County, California.

Drawn from Heizer and Clewlow, 1973.

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Appendix I

AMADOR 3: THE STUDY OF A DRY CAVE DEPOSIT*

S. F. Cook and R. F. Heizer

We have been fortunate recently in discovering a cave site (Ama-3) containing a single extensive deposit, part of which was exposed to the weather, part protected by the overhanging roof. A direct comparison of the deposit in the two parts, one wet and the other dry, is therefore within the scope of physical analysis.

Inside the cave the occupation midden has been preserved in a dry and undisturbed condition so that even the most delicate plant tissues, like leaves and grass, though thoroughly desiccated have undergone no other apparent physical or chemical alteration. The deposit, however, extends in an unbroken horizon out past the mouth of the cave and beyond any shelter to a region fully exposed to winter rains. In this peripheral area the matrix appears to consist principally of rock and dark soil, thus resembling that of most open sites.

We were able to secure four samples of the material inside the cave (interior or dry deposit) and two samples from well outside (exterior or wet deposit). Although the small number of samples precludes any rigid statistical analysis, nevertheless certain differences between the two areas show very clearly. The data are presented in Table 1, in which the individual components are expressed in terms of percentage of total weight of the samples.

It is evident that the stable materials -- rock, bone, charcoal, and shell (freshwater mussel)--appear at substantially the same level of concentration in both the wet and dry parts of the deposit, as would be expected in a homogeneous accumulation. The rock found in the samples is derived from two distinct sources. One is the cave itself, the walls of which consist of a soft friable sandstone possessing some cohesive strength but poorly adapted for hearths or stone boiling. Hence the occupants were forced to bring in rocks of greater density and tougher consistency. Accordingly we find this denser and tougher rock comprising from 8 to 16 per cent of the total weight. On the whole, if we allow for the small number of samples, we may conclude that no significant change takes place in the relative quantity of inorganic constituents of a habitation midden during exposure for one or two centuries to the normal outdoor

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* Reprinted in part from "The Physical Analysis of Nine Indian Mounds of the Lower Sacramento Valley", by S. F. Cook and R. F. Heizer (University of California Publications in American Archaeology and Ethnology, Volume 40, No. 7, 1951.)

climate of Central California.

The perishable matter makes up approximately 4.5 per cent of the weight of the dry deposit. Careful separation of the component pieces reveals that the bulk of the material consists of grass, straw, seeds, and very numerous minute vegetal fragments the nature of which could be determined only with a microscope. The remainder is composed largely of whole or broken hulls of acorn and buckeyes, nuts which seem to have been an important dietary staple. There is also a considerable quantity of wood scraps, most of them in a perfectly preserved condition. Finally, there are many dried oak leaves. Collectively these objects form exactly the type of refuse and debris which we could expect the former occupants to derive from the neighboring vegetation, the debris being scattered at random throughout the interior of the cave.

Of the two samples (nos. 1 and 6 in table 1) from the wet deposits, one contains no indication whatever of the organic debris found in such profusion in the dry deposit. The other shows small traces (approximately 0.04 per cent) of acorn hull and grass. The grass may have blown in from the adjacent fields during recent times. This almost complete disappearance of plant residues from the wet, exposed deposit is definite evidence that whatever material of this nature the wet part of the site originally contained has been entirely decomposed within a period of not much more than one hundred years. It is also reasonable to deduce that at the time of occupation many, if not all, of the open sites of the Central Valley and near-by foothills resembled in texture and composition the dry deposit now found in the Amador cave. This deduction is discussed further in the following section.

With respect to the life of the cave inhabitants we may conclude that the natives brought in large amounts of grass and straw, probably to sleep on. Small twigs and leaves were scattered about in profusion, since many of the scraps appear to have been worked on by human hands. The many worked wood artifacts include digging sticks, arrow-shaft fragments, and other implements. Local acorns and buckeye nuts were gathered and hulled inside the cave; otherwise no such mass of hulls could have accumulated. From the relative frequency of the two kinds of husk it may be inferred that both types of nut were consumed in roughly equal quantities. The high level of charcoal, furthermore, indicates many fires, which blackened the walls of the cave, if one may judge by smoke-blackened walls and roof and the loose fragments of cave rock covered with a soot layer. Intense application to cooking is indicated also by the high percentage of imported rock, which could have been used only for hearths and boiling stones. This inference is further corroborated by the discovery of several fist-sized boulders still covered by a dried film of flour mush, probably derived from acorn flour. The picture thus emerges of intensive human activity, directed principally toward gathering and preparing foodstuffs: bulbs, acorns, buckeye nuts (indicated by husks), meat (indicated by numerous mammal and bird bones) and shellfish--freshwater mussels from the river a few miles away. These activities must have been concentrated in relatively short periods of time during which the cave provided shelter and piles of grass served as bedding.

This theory of the cave as a transitory home for food-gathering expeditions is supported by the huge numbers of rat and mouse pellets in all the dry samples, amounting to approximately 1 per cent of the total mass. The pellets are not found primarily on the surface or in pockets, as they would be if these rodents had been active since the last occupation, but are distributed uniformly throughout the mixture. Hence it may be argued that during the occupation era there were frequent periods long enough for rats and mice to enter the cave, burrow through the refuse, and perhaps even go through a breeding cycle. Any cave exhibits strong evidence of rodent habitation but the enormous quantity of fecal material in this particular cavern postulates some special attraction for the animals. The fresh residues from extensive culinary operations would be just such an attraction.

TABLE 1

ANALYSIS OF SIX SAMPLES FROM SITE AMA-3

Components	Composition of samples (Percentage of total weight)[a]							
	From wet part of site			From dry part of site				
	1 (11,030 gm.)	6 (10,505 gm.)	Mean	2 (9,000 gm.)	3 (8,853 gm.)	4 (8,965 gm.)	5 (7,718 gm.)	Mean
Rock								
Total	20.00	18.38	19.19	12.62	14.32	18.46	14.35	14.80
Imported	14.03	16.33	15.18	9.46	10.35	9.73	8.16	9.42
Wood								
Charcoal; carbonized	0.666	0.660	0.663	0.605	0.465	0.607	0.509	0.546
Scraps	0.0	0.0	0.0	0.2288	0.3028	0.2678	0.3122	0.2779
Bone	0.0746	0.0733	0.0740	0.0417	0.0316	0.1177	0.0833	0.0685
Shell and seed hulls								
Mussel	0.0079	0.0250	0.0165	0.0024	0.0022	0.0878	0.0037	0.0240
Acorn and buckeye	0.0189	0.0	0.0094	0.5910	1.1690	1.6620	0.7630	1.0460
Leaves	0.0	0.0	0.0	0.0189	0.0949	0.0357	0.0195	0.0422
Grass, straw, seeds, undetermined plant fragments	0.0182	0.0	0.0091	2.8490	3.3580	3.1320	3.1920	3.1330

[a] The very fine residue (dirt) which was not segregated brings the total of each column to 100 per cent.

Reconstruction of an Open Site

From the appearance and composition of the dry deposit found in the Amador cave, it may be possible to draw certain inferences concerning the surface, or active, habitation layer of other sites during the time of actual occupancy. As a concrete example we may consider the Johnson mound, site Sac-6, which lies about seven miles northeast of Thornton.

The probable composition of the surface layer, say the uppermost six inches, may be computed directly from the data derived from Ama-3. If we assume, as is reasonable, that the living conditions and the plant and animal environment were quite similar at both sites, then the relative differences between the wet and dry parts of the Amador deposit may be considered to hold for Sac-6 without much modification. Specifically, the deposit in the wet part of the cave has undergone the same changes that produced the present-day mound matrix at Sac-6, whereas the dry deposit may be regarded as simmulating what the fresh, unaltered surface of Sac-6 was during the period of inhabitation. Applying the Amador cave data directly to the analyses of column samples for Sac-6, given in table 3, we get the following comparison. (All figures are per cent of total sample weight.)

	Present soil of Sac-6	Aboriginal surface layer of Sac-6 at time of occupation (calculated)
Rock and clay	11.47	7.12
Bone	0.63	0.58
Shell	0.06	0.08
Charcoal	0.30	0.25
Total organic matter	---	4.50
Acorn hulls	---	1.05
Wood scraps	---	0.28
Leaves	---	0.04
Grass, straw, seeds, and other plant fragments	---	3.13
Soil, powdered clay, etc.	87.55	87.47

The soil and the imperishable materials in the aboriginal surface layer appear in almost the same amounts as in the weathered deposit of today. The primary difference is the presence of 4-5 per cent organic matter in the aboriginal surface layer. It would be erroneous to assume, however, that the physical appearance and consistency of the Sac-6 surface was identical with what we now find inside the Amador cave.

The Amador cave material was laid down continuously on a surface which, being always dry, was preserved from decomposition during occupancy as well as throughout the time elapsed since abandonment of the site. The Sac-6 midden material was deposited continuously on a surface that was dry in summer but wet

in winter. Hence animal and plant residues were subject to decomposition during the wet season only. We may visualize the condition at Sac-6 somewhat as follows.

In May and June the ground dries out and becomes dusty from great quantities of fine soil and clay. The inhabitants bring in grass and straw for beds, and brush and twigs from firewood are scattered about. Acorn hulls and small animal bones are distributed over the surface, as well as household rubbish of all descriptions, and these particles are trampled into the upper layer of dust which begins to take on the consistency of the dry Amador deposit. As the long dry season continues, the surface layer resembles more closely the dry deposit at Ama-3, but when the late autumn rains begin, the dry dust becomes a sea of mud, incorporating within it all the refuse deposited during the summer. Now, with the advent of moisture, the fecal material and bits of dried animal flesh rapidly decay and, under the influence of molds and bacteria, such lighter plant fragments as leaves and grass stems begin to decompose. To be sure, new deposits are laid down, but in these decomposition also proceeds with rapidity. By March or April, when the ground begins to dry out, most of this material has probably disintegrated, leaving intact only such hard and indurated substances as the fiber of leaves and grasses and the woody parts, together with the bones of the animals. By June, therefore, the previous summer's increment has largely disappeared. The cycle then repeats itself.

It is thus apparent that the deep dry deposit of the type found in the Amador cave never got a chance to accumulate in an open site and that exposed deposits remained always in the incipient stage of formation, best developed in late summer and fall, retrogressing in winter and spring. The inhabitants thus lived half the year upon a dusty surface partly covered with grass, sticks, leaves, acorn hulls, cast-off domestic refuse, and both human and animal fecal matter, whereas winter turned the surface into a muddy mass within which all these materials slowly rotted. The extent of the putrifactive process is graphically indicated by the amount of the organic component preserved in the Amador cave deposit.

TABLE 2

MEAN VALUES OF CERTAIN COMPONENTS IN ASH SAMPLES FROM SITE SAC-6

Components	Percentage of total weight[a]	
	Ash samples (8)	Random soil samples (37)
Rock and clay	13.86	11.47
Bone	2.549	0.624
Fish bone	2.114	0.176
Shell	0.064	0.058
Charcoal	1.257	0.298
Obsidian	0.0198	0.0107

[a] The very fine residue which was not segregated brings the total of each column to 100 per cent.

TABLE 3

COMPOSITION OF SAMPLES FROM NINE VALLEY SITES AND ONE COASTAL SITE (SON-299)
(Percentage of total weight)[a]

Components	Sac-6	Sac-106	Sac-107	Sac-151	Sac-96	SJo-43	Sac-52	Sac-145	Sac-54	Son-299
	Field or pit samples									
Baked clay	5.407	0.759	1.107	0.972	0.891	3.440	0.0	0.236	0.010	0.0
Rock	0.237	0.454	0.878	0.332	0.404	0.481	1.652	0.011	1.946	1.245
Bone	0.0634	0.0102	0.0177	0.0254	0.0192	0.0724	0.0038	0.0038	0.0065	0.0522
Shell	0.0087	0.0022	0.0013	0.0016	0.0017	0.0586	0.0	0.0005	0.0	1.3140
Obsidian	0.0017	0.0003	0.0002	0.0	0.0002	0.0008	0.0	0.0	0.0	0.0
	Column samples									
Rock and clay	11.47	4.67	7.77	5.61	7.09	7.76	15.72	1.18	8.86	4.69
Bone	0.6238	0.2486	0.2313	0.2020	0.2954	0.5715	0.1149	0.3519	0.0475	0.1088
Shell	0.0577	0.0192	0.0247	0.0220	0.0341	0.5300	0.0102	0.0120	0.0043	27.1500
Obsidian	0.0107	0.0006	0.0016	0.0	0.0170	0.0038	0.0004	0.0004	0.0010	0.0004
Charcoal	0.2982	0.0389	0.0584	0.0258	0.0871	0.0392	0.0632	0.0123	0.0192	0.0080

[a] The very fine residue which was not segregated brings the total of each column to 100 per cent.

Appendix II

HUMAN SKELETAL MATERIAL FROM BAMERT CAVE, AMADOR COUNTY, CALIFORNIA

Janet M. Sawyer
Department of Anthropology, University of California, Berkeley.

The human skeletal materials described in this paper consist of one complete, immature individual excavated at the site of Bamert Cave, Amador County, California.

1. Age, sex, race, and pathology

This skeleton (Lowie Museum of Anthropology catalogue number 12-8313) is outstanding in its degree of preservation: most of the bones remain in articulation, wholly or partially covered by integument. Scalp hair and features of the soft anatomy are still in evidence, e.g., a desiccated right ear with a prominent Darwin's tubercle.*

The remains are those of a child. The state of epiphyseal union (humerus head to greater tubercle but not conjoined ramus) and dental eruption (M_1^1 in occlusion) place this individual in the 6-7 year range. While immature skeletons are quite difficult to sex, I feel that features of the frontal bone, mandibular ramus, and proportions of the ilium to ischium suggest this specimen's designation as a male. The decisive soft part anatomy, here, is wanting. On this point, therefore, I would defer to the opinion of the late T. D. McCown, who was more experienced in the range of variation to be expected among American Indians. His diagnosis of female should stand, but I would suggest a slightly older age than he.

The archaeological situation of this skeleton strongly suggests Amerind ethnic affinities. The general morphology of the skull, characteristics of the dentition, and the nature of the scalp hair verify this racial diagnosis.

The probable cause of death is not evidenced, at least by those bones which could be examined. No nutritional-disease effects are reflected by enamel hypoplasia on those teeth present. The only visible possible pathology, or variation from normal, is a bilateral depression in the temple (pterion) region. This is particularly evident on the right side, where it reaches a depth of .6 cm. There is no sign of artificial cranial deformation. As regards the dentition, there are no carries but attrition is extremely heavy especially on the deciduous first molars.

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* Photographs taken shortly after discovery show the quite remarkable state of preservation of this naturally mummified body. Unfortunately, the integumental portions of the body were severely damaged by Dermestes during storage in the Lowie Museum (R.F.H. and T.R.H.).

2. Individual measures and observations

Metric characters (in millimeters)

Cranium:
- maximum length = 154
- basion-nasion = 82
- maximum breadth = 135
- minimum frontal breadth = 87
- maximum frontal breadth = 106
- basion-bregma height = 112
- basion-prosthion = 83
- biorbital breadth = 86
- upper facial height = 52
- anterior interorbital breadth = 21
- orbital breadth = 32 (R)
- orbital height = 31 (R)
- nasal breadth = 22
- nasal height = 40

Mandible:
- maximum projective length = 85
- length body = 67
- bicondylar breadth = 96
- bigonial breadth = 78
- bimental breadth = 38
- minimum breadth ramus = 29 (L)
- condylar height = 47 (L)
- coronoid height = 44 (L)

Long bones, maximum lengths without epiphyses:
- humerus = 190 (R)
- radius = 146 (R)
- ulna = 164 (R)
- tibia = 216 (R)
- fibular = 205 (R)

Discrete traits

Since the 25-30 discrete cranial variables are most useful in a population context, only those which deviate from the usual condition will be listed for this single specimen: os astericum, right and left; hypoglossal bridge, left only; complete supraorbital foramen, right and left. The first lower molars exhibit the five Y-pattern and have a sixth cusp.

General

The child represented is very roundheaded (hyperbrachycranic). And while there is a general tendency towards broadness of skull during the juvenile period, had this individual reached maturity it would have been decidedly round or medium-broad headed. Viewed in norma verticalis the skull is spheroid and in norma occipitalis, hayrick shaped. The face is somewhat diminutive in height and

breadth, beneath a slightly narrowed and sloping forehead. The malars are not large but possess lateral and inferior marginal processes. The orbits are large with sharp borders. There is a rather wide inter-orbital space. The nasal bones are concavo-convex and the nasal aperture is wide with a very rounded lower border. The facial profile is straight, the mandible showing a medium mental eminence and upright ascending ramus.

3. Growth, bone lengths, and weight

The bone length available for this individual can be compared with data from the living, of known age and sex. Appended are graphs (Fig. 1) of long bone growth, measured between the epiphyseal plates, recorded from x-rays of a modern U.S. sample (Maresh, 1955). It will be noted that there is little male-female difference in size at these ages. The long bone lengths of the Ama-3 skeleton are indicated by a star.

To be taken into account here is the fact of differing "environmental conditions, particularly the rather harsh conditions of primitive groups... have been shown to have a slowing effect upon the rate of biological development" (Johnston, 1968:60). With respect to the slight arm:leg disparity for Ama-3 versus U.S. white children, it is interesting to note that Johnston found that the arm of the Indian Knoll child is "consistently larger relative to the leg than is observed in the American white sample" (1968:63). Lest one be tempted to read off an age for the skeleton under consideration from these charts, however, be reminded of individual and population variability as well as the studies of Lewis and Garn (1960) on living children, which indicate that dental calcification affords a more useful and reliable estimate of chronological age.

Special note: estimated from data on the living (Comas, 1960; Tanner, 1962) a 6-7 year-old female might be expected to weigh 15 (-20) kilograms.

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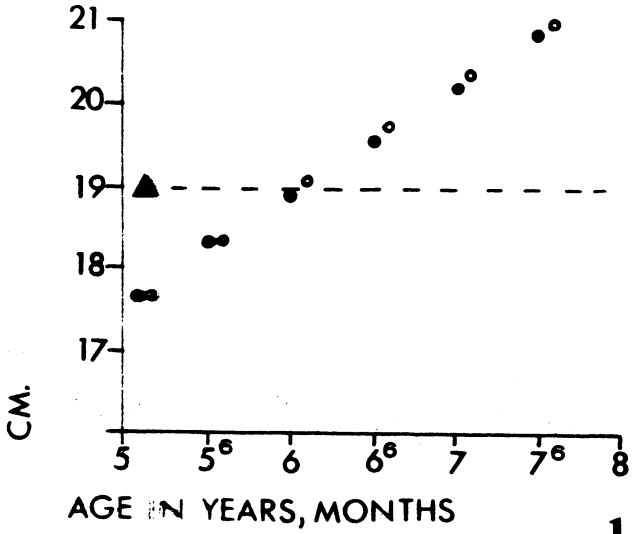
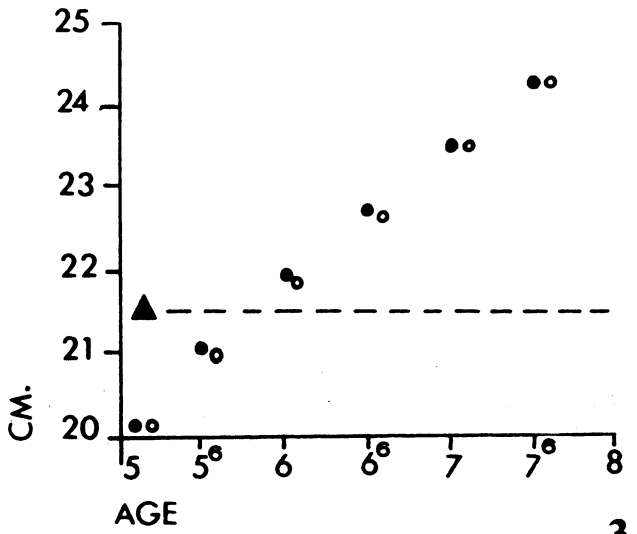
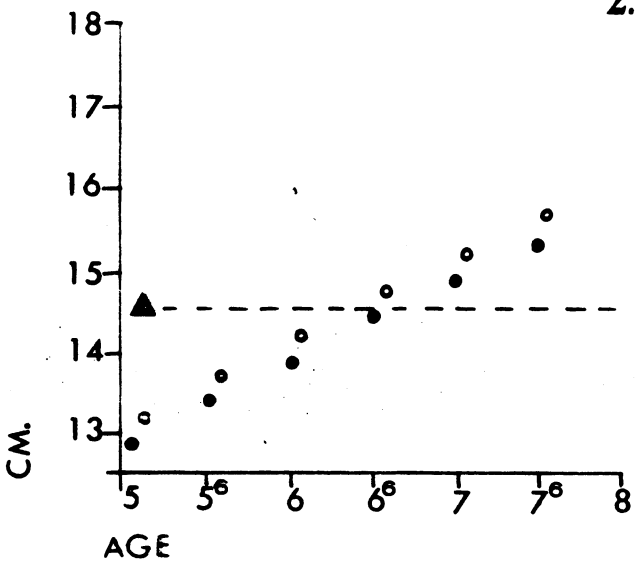


1. Humerus



3. Tibia

2. Radius



4. Fibula

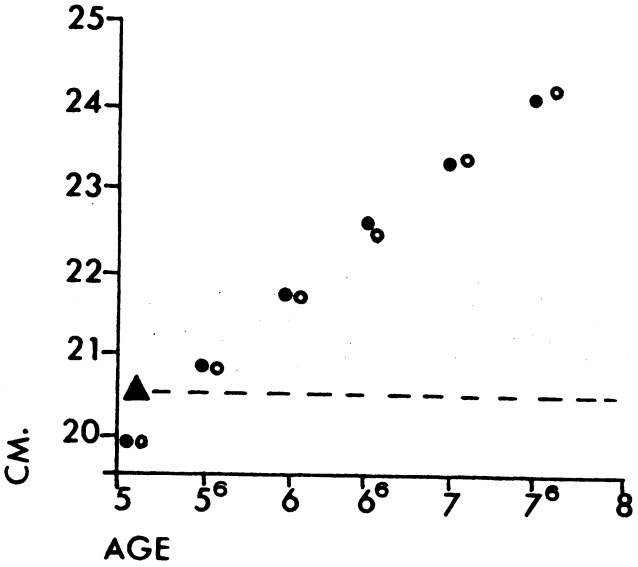


Figure 1. LONG BONE GROWTH

• females ○ males ▲ Ama-3

Appendix III

FISH REMAINS FROM BAMERT CAVE, AMADOR COUNTY, CALIFORNIA

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It has been my privilege to examine a collection of 23 fish remains recovered by Dr. Robert F. Heizer and the late Dr. Adan E. Treganza during 1950 and 1951 at Bamert Cave (Ama-3), in extreme southwestern Amador County, California.

Bamert Cave is a large open cave, facing south, in Township 4 north, Range 10 east, about 13 miles generally southwest of the town of Jackson. (See Cook and Heizer 1951:283-288, Map 2, Pls. 23, 24a; Heizer 1952:3, map following p. 7). It is one of a considerable number of open caves within the watershed of the Mokelumne River (see Payen and Johnson 1965: Map 1, No. 1), near the western boundary of Northern Miwok territory as delineated by Kroeber (1925:Pl. 37). The cave is about one and one-fourth miles north of the Mokelumne River and one-half mile east of its tributary Rabbit Creek, at an elevation of about 350 feet above sea level. The elevation of the river at a point nearest the cave is slightly less than 200 feet (see Jackson Quadrangle, 1938). The cave appears to have been last occupied about A.D. 1800-1850; earlier use of the cave may extend into the full prehistoric period (see Cook and Heizer 1951:285, footnote 5).

I wish to express my appreciation to Dr. Robert F. Heizer of the University of California Archaeological Research Facility, for permission to report on these fish remains and for information and advice; to Dr. Thomas R. Hester of the Department of Anthropology, University of California, for information; to Mrs. Lillian J. Dempster of the California Academy of Sciences, for assistance with the manuscript; to Mr. Maurice C. Giles of the California Academy of Sciences, for enlargements of the photographs.

FISHES REPRESENTED

The fish remains from Bamert Cave represent the king salmon, the hardhead, and the Sacramento sucker. Catalog numbers of the remains are those of the Lowie Museum of Anthropology, University of California, Berkeley. (One fragment, catalog No. 1-127398, is undetermined.)

Trouts--Salmonidae

King salmon, Oncorhynchus tshawytscha (Walbaum)

This species is also called chinook salmon, quinnat salmon, and spring

salmon. It was called "kosimo" by the Miwok (see Barrett and Gifford 1933:188). When it leaves the ocean on its spawning migration up the rivers, this salmon is an excellent food fish, but its quality deteriorates during its stay in fresh water. Nevertheless, it is known to have been utilized by aboriginal peoples far removed from the ocean, as at Deer Creek Cave on a high tributary of the Snake River system in northern Nevada (Follett 1963). A colored plate of this species was published by Hudson (1917).

Material: Articular and angular (1-121037), Plate 1; 4 crushed vertebrae, articulated (1-121847); caudal fin, 2 cleithra, frontal, hyomandibular, mesocoracoid, and 2 vertebrae (1-127088); basipterygium (1-127445); posttemporal (1-127472); 3 vertebrae (1-127383, 1-127533, 1-127553); 2 vertebral fragments (no catalog number). These remains represent fish about 25 to 36 inches (63 to 91 cm.) in total length and perhaps 8 to 21 pounds (3.6 to 9.5 kg.) in weight (see Snyder 1931:Tables 2,3, for length-weight relationships).

Minnows--Cyprinidae

Hardhead, Mylopharodon conocephalus (Baird and Girard)

As a food fish, this large minnow is bony and somewhat tasteless, but it is easily captured, and is known to have been utilized by Indians elsewhere in California. It may have been included in the Miwok name "toinoyo" (see Barrett and Gifford 1933:189). A photograph of the hardhead was published by Follett (1928:Fig. 91).

Material: Cleithrum (1-121041), representing a fish about 17-1/2 inches (44 cm.) in total length.

Suckers--Catostomidae

Sacramento sucker, Catostomus occidentalis Ayres

This sucker, although bony and tasting of the river water, was utilized by California Indians. The Bamert Cave people may well have used it as food. "Nearly all the...fishes, which could be caught, served as food [of the Miwok]" (Barrett and Gifford 1933:137). But suckers of the size represented in the present material may also have been used as bait in fishing for sturgeon (see Barrett and Gifford 1933:189).

Material: Caudal vertebra (1-123397); 4th to 10th precaudal vertebrae, articulated (1-127073), Plate 2; 1st to 3rd precaudal vertebrae, articulated, and lower pharyngeal (1-127088). These remains represent fish about 12-1/2 to 17-1/2 inches (32 to 44 cm.) in total length.

The anterior aspect of the lower pharyngeals of this species was illustrated by Follett (1965:39, Pl. 4, Fig. A).

DISCUSSION

Perhaps significantly, none of these fish remains was charred. It would seem possible that some hunter other than man could have captured the fishes that are represented in this collection. A bear could have caught the salmon while they were spawning, and could have carried them to the cave. A coyote could have found a salmon that had spawned and died, and could have carried or dragged a part of it or perhaps the entire fish. A bear or a coyote or a raccoon could have caught the hardhead or the suckers in a desiccating overflow pond of the river. A wood rat could have found the bones at some little distance from the cave and could have carried them into the cave. (Bones of the Sacramento sucker have been found beneath a nest of the golden eagle; see Follett 1954:7, 10.)

But numerous archaeological materials from Bamert Cave, other than faunal remains, are noted by Heizer and Hester (this volume). Unless the human occupation was intermittent, these associated materials would seem to indicate that the fishes represented in this collection had been captured by aboriginal inhabitants of the cave.

These fishes would appear to have been those most readily available to the Bamert Cave people. The salmon, on their spawning migration from the sea, presumably ascended the Mokelumne River to the region of the cave--arriving probably during September or October, but the greatest numbers during November (see Clark 1929:29, 35, Fig. 14). The hardhead and sucker were presumably resident in that part of the river, and could have been caught at all times except during the winter floods. All three species could have been captured by one or more of the Miwok fishing techniques discussed in some detail by Barrett and Gifford (1933:187-190).

EXPLANATION OF PLATES

Plate 1 Right articular and angular, length 64 mm., representing a king salmon (Oncorhynchus tshawytscha) about 25 inches (63 cm.) in total length and perhaps 8 pounds (3.6 kg.) in weight; catalog No. 1-121037.

Plate 2 Precaudal vertebrae, 4th to 10th (articulated), length of series 36 mm., representing a Sacramento sucker (Catostomus occidentalis) about 16 inches (41 cm.) in total length and perhaps 1.5 pounds (0.7 kg.) in weight; catalog No. 1-127073.

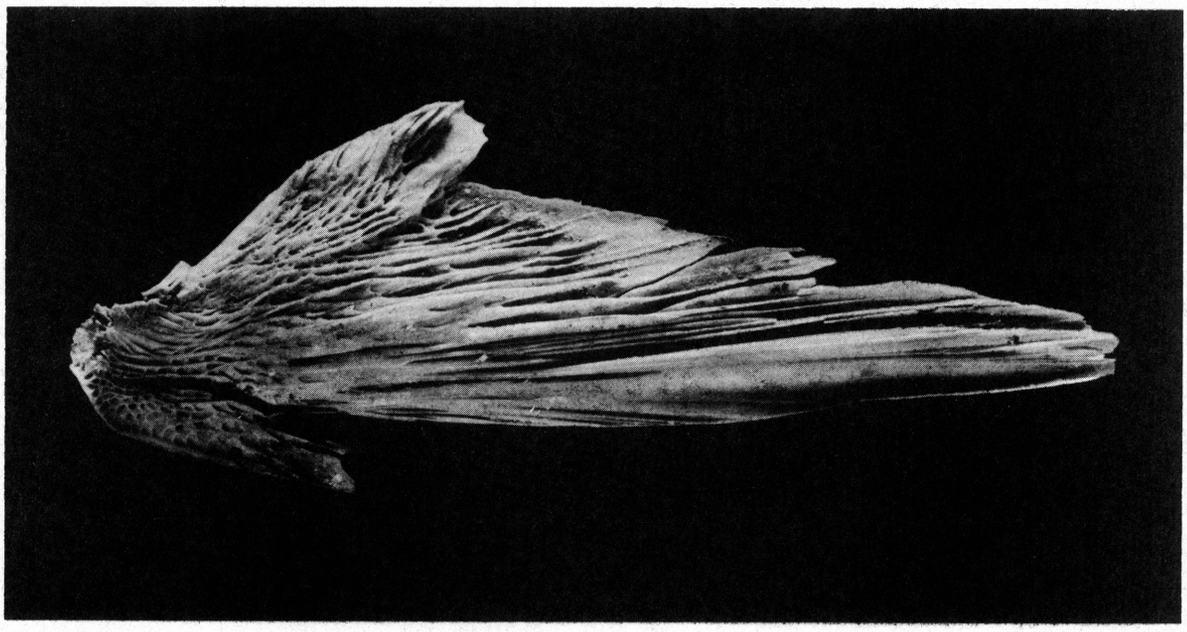

Plate 1

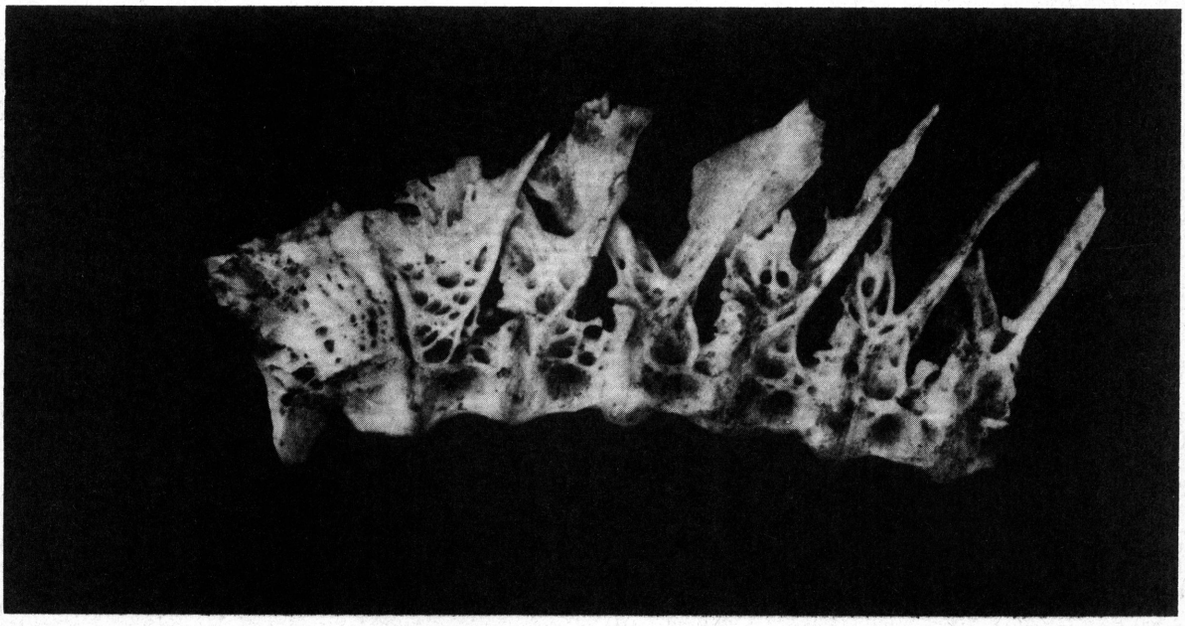

Plate 2

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Appendix IV

MAMMALIAN REMAINS FROM BAMERT CAVE, AMADOR COUNTY, CALIFORNIA

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Museum of Vertebrate Zoology, University of California, Berkeley

Faunal remains from Bamert Cave, Amador County, California have been analyzed and a list of represented species appears below. Identifications were facilitated through the use of comparative collections in the Museum of Vertebrate Zoology, University of California, Berkeley.

Faunal List

Odocoileus hemionus, Mule Deer, 2 adults, 1 juvenile
Sylvilagus auduboni, Desert Cottontail, 4 individuals
S. of. auduboni 4 individuals
Lepus californicus, Blacktail jackrabbit, 1 individual
Lepus townsendi, Whitetail jackrabbit, 2 individuals
Urocyon cineoargenteus, Gray Fox, 1 individual
Neotoma fuscipes, Dusky-footed Woodrat, 2 individuals
Thomomys bottae, Valley Pocket Gopher, 1 individual
Sciurus griseus, Western Gray Squirrel, 2 individuals
Spermophilus beechyi, California Ground Squirrel, 2 individuals
Sus scrofa, pig (feral?), 2 very young juveniles

Most of the mammals represented in the collection from Bamert Cave probably lived in the site vicinity. The majority of them have rather broad habitat preferences, primarily including chaparral, deciduous woods, and the open spaces in between (Ingles 1965). The pig (Sus scrofa) may represent historic Indian or Anglo-European use of the site, or perhaps post-occupational introduction through natural means (carnivores or scavengers). Many of the bones were burned and most of the larger long bones had been split, probably to obtain marrow. There is no evidence of carnivore gnawing. None of the species in the collection is particularly abundant; each is represented by less than five individuals. It is reasonable to suggest that they are the result of short-term hunting activities carried on quite near the site.

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Appendix V

ANALYSIS OF HUMAN COPROLITES FROM BAMERT CAVE, AMADOR COUNTY, CALIFORNIA

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Four coprolites were collected by the University of California, Berkeley, investigations in Bamert Cave. When the material from the cave was being re-examined in preparation for the writing of the present report, the coprolites were rediscovered. We decided that it would be interesting to analyze these fecal materials as they represented the first prehistoric coprolites from California to be analyzed in comparison to studies in Utah, Nevada, the Tehuacan Valley, etc. (cf. Ambro 1967; Callen 1963, 1967; Cowan 1967; Fry 1968, 1970; Heizer 1967a, 1967b; Napton 1969; Napton and Heizer 1970; Roust 1967). Although the sample is small and almost certainly does not adequately represent all of the feces left by the inhabitants of the cave, the materials recovered from the four coprolites seem to relate to prior descriptions of Miwok food items (Gifford and Barrett 1933) and to the ecosystem in which the cave lies.

The coprolites were reconstituted employing methods described by Napton and Heizer (1970:90-96). They were soaked in jars containing a .05% solution of Na_3PO_4 in water for five days, during which time they were manually shaken to aid in the process of breaking down the materials. Prior to their being reconstituted they were weighed as whole samples and then one-half or more of this amount was taken for analysis and the remainder saved for possible future reconstitution. When the coprolites have broken up they are put through a series of screens, one with 1/8" mesh and two others with .0058" (.147 mm) and .0195" (.495 mm) meshes; the material collected in the 1/8" screen constitutes the bulk of the materials identified and analyzed, while the material collected on the two smaller screens represents the fines and are usually broken fragments of materials noted in the 1/8" screen. The materials which passed through the fine screen were allowed to settle in the jars for a period of three to four days; then the brown liquid was poured off and the sediments taken and dried in the jars and then kept. Sometimes the fines, the sediments and the liquid are searched for pollens and parasites, but I was unable to do this at the time. I still have those materials and hope to have them analyzed later.

The materials collected in the 1/8" screen are put into petri dishes and the materials are handpicked with the aid of an illuminated magnifier. Student volunteers Maurine Hataye and Paula Stevens were a great help in the sorting of these materials in a tedious process of manually segregating hundreds of tiny seeds, pieces of grass, etc. into their containers and identifying these when possible at that time. The coprolites collected from Lovelock Cave and reported

upon by Napton and Heizer (1970:87-129) were not manually separated, but rather were dried and analyzed under the microscope as whole unpicked samples and visual estimation of volumetric percentages were made in this manner. This is a good method to employ when the coprolites being analyzed are from an already well-known area and where earlier researchers have manually segregated coprolite components to ascertain the total range of materials contributing to the diet of the prehistoric inhabitants of an area. However, no coprolites from California had been analyzed by previous researchers, so it was decided to manually sort the materials. Most of the materials picked from the coprolites were unidentifiable by the writer at the time of procurement, and it was only through the aid of a number of specialists in other fields that I was able to identify and attempt to interpret the remains recovered.*

The Data

Coprolite #1
original weight: 11.6 gms.
sample weight: 10.0 gms.
weight of saved sample: 1.6 gms.
color: grey/black

Constituents:

- fines: 40%
- sediments: 30%
- insect larvae: 25%. "Crane flies", order Diptera, family Tipulidae
- insects: 5%. Head capsules of Carabidae (ground beetle) and elytral and leg fragments of Scarabidae.
- grit: trace

Coprolite #2
original weight: 18.0 gms.
sample weight: 10.0 gms.
weight of saved sample: 8.0 gms.
color: light grey/brown

Constituents:

- grass stems and leaves: 40%. Mature or summer material, not green.
- fines: 35%. Includes pieces of grass
- sediments: 15%
- mammal fur: 2%

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* I would like to thank the following persons who aided in the identifications of faunal, floral and insect remains: Dr. J. R. Anderson and Dr. E. I. Schlinger, Departments of Entomology and Parasitology, U.C. Berkeley; Mr. D. Barbe and Mr. T. Fuller, California Department of Agriculture, Sacramento; Dr. E. Doyen and Mr. E. Rogers, Department of Entomology, U.C. Berkeley; Dr. H. Heady, Department of Foresty, U.C. Berkeley; Ms. S. Holbrook, graduate student, Zoology, U.C. Berkeley; Dr. G. Sensabaugh, Department of Criminology, U.C. Berkeley; and the Tropical Disease Laboratory, San Francisco Medical Center.

Coprolite #2 (continued)
Calachortus sp. (albus?) or fairy lantern: 3%
Erodium botrys seeds and awns: 2%
insects: 2%. Elytral and leg fragments of Scarabidae
grit: trace
unidentified seed: one

Coprolite #3
original weight: 35.5 gms.
sample weight: 18.0 gms.
weight of saved sample: 17.5 gms.
color: grey/black
Constituents:
fines: 40%. Includes much masticated or ground Madia sp.)
Madia sp. (tarweed): 30%. Seed casings.
sediments: 25%
Dipodomys heermanni (kangaroo rat): 1%. Teeth.
ratlike rodent: 2%. Postcranial and articular portion of mandible, probably of kangaroo rat.
unidentified bone fragment: 1%
mammal fur: trace
grit: trace, possibly glass or obsidian.

Coprolite #4
original weight: 27.5 gms.
sample weight: 15.3 gms.
weight of saved sample: 12.2 gms.
color: grey/brown
Constituents:
grass and plant stems: 60%
fines: 25%. Includes pieces of plant fibers.
sediments: 10%
Sylvilagus sp. (cottontail): 1%. Vertebrae.
unidentified bones: 3%. Includes another vertebra and some rib bones which may also be cottontail.
grit: 1%
hairs: trace. Five black human hairs.
unidentified seed: one

Discussion and Interpretation

Coprolite #1 is an enigma; on visual inspection it looks as though it may have been burnt. From the constituent list (see Data) it is difficult to appraise the diet which made up this particular coprolite or to identify it certainly as a human contribution. Approximately 70% of the material is represented by the fines and sediments, and these have not been inspected by palynologists to determine if there are any traces of plant remains. Twenty-five

percent of the sample is represented by Tipulidae ("crane flies"). According to Drs. Anderson and Schlinger: "The larvae occur in a wide variety of habitats, e.g. moss, decaying/rotting logs, leaf mold, detritus, feces, mud, soil, plant roots, etc. There are also many aquatic species whose larvae are found in both standing and flowing water." Oldroyd (1964:19) states that: "No other single family of flies quite equals the versatility of Tipulidea in its choice of larval habitats." The fly larvae are thus not a help in determining environmental conditions. According to Dr. Doyen the Carabidae head capsules are also enigmatic, as they do not lay their eggs in dung. It is possible that the head capsules were in some stored grain, and that when this was ingested the head capsules were also consumed. Although there are a number of these head capsules, it seems unlikely that they were purposely ingested as they are minute in size (.5 mm) and thus could not have played a major role in the diet. The elytral and leg fragments of Scarabidae may be attributed to activity after deposition or they may have been consumed either purposely or inadvertently along with other food. The same with the exception of purposeful ingestion may also explain the grit (cf. Fry 1970:248). Thus, little can be said of the diet or environmental situation which resulted in this sample.

Coprolite #2 is more reflective of human activity. Forty percent of this sample was grass stems and leaves which are mature or summer materials and not green. Fines and sediments contribute 50% of the sample; the fines also include pieces of grass and would add to that percentage. Calachortus sp. (fairy lantern) scales made up 30% of the sample. These plants are not noted in Barrett and Gifford (1933) as a food resource for the Miwok groups, but it may be that they are one of the materials which had not been ethnobotanically reported at that time. The plant blooms in May. Erodium botrys seeds and stems are also present in the sample. This plant is also not mentioned in Barrett and Gifford as a food resource or medicine. It is a Mediterranean plant which has been naturalized in California. It too is productive in the spring and winter. The Scarabidae elytral and leg fragments again say little about environment. Some material which appears to be mammal fur is also present. The material represented by this sample would then point to a late spring-summer occupation.

The constituents represented in coprolite #3 tend to reflect the ecosystem of which the cave was a part. Madia sp. or tarweed (including many crushed seed casings in the fines) make up the bulk of the sample, 70%. This plant is known as Yō'wa by the Southern and Central Miwok (Barrett and Gifford 1933) and U'-tah' to the Northern Miwok (Merriam 1905). Apparently they were not very effective in winnowing the "pusela" or chaff from the seeds, as these are what was picked from the sample. According to Barrett and Gifford (1933:154) the seeds of the tarweed were collected by women in midsummer within the period of a week or so. They were stored and often kept a year until the next harvest. Sediments make up only 25% of the sample. Perhaps 3% of the sample was represented by Dipodomys heermanni or kangaroo rat, the only species to occur in the area. Barrett and Gifford (1933:183) state that: "Rats were killed by means of an acorn fixed under a stone, so that when gnawed the stone fell on the rat." According to Merriam (1905), the Northern Miwok called Dipodomys Se-wal'-lah. The

small fragment of a clear glasslike material may be either a clear man-made glass fragment or obsidian which was accidentally ingested (cf. Fry 1970:239; Hester 1973).

More than sixty percent of the materials recovered from coprolite #4 were grass stems and leaves (including a portion of the fines). These have not been identified, but again, as in coprolite #2, they were mature plants. Fines (including plant fibers) account for 25% of the sample, and sediments make up 10%. One vertebra has been identified as that of Sylvilagus sp. or cottontail, and one other vertebra and some rib bones may also be those of cottontail. The bones may be those of a juvenile which was born in the spring or early summer. Cottontails (known as hī'ga by the Plains Miwok, hīka'kū among the Northern Miwok and To'ssebe to the Central Miwok) were caught mainly with a rabbit net in summer (Barrett and Gifford 1933:182). These long nets were either set in a straight or V-shaped line, sometimes near the base of a hill. The rabbits were driven into this and were clubbed by men as they became entangled in the nets. Rabbits were second in importance to deer as a meat resource among the Miwok groups. Although the bones of the cottontail account for only 3% of the sample and the Dipodomys remains were only 3% of sample #3, they may represent a larger percentage of food actually consumed but butchering techniques meant that only a small percentage of the bones from this meal would be ingested. The bones which are in the coprolites are probably attributable to accidental ingestion while eating the meat. Five black hairs were found, and these may have fallen into the meal during one or more stages of food preparation. The one unidentified seed does not appear to represent an important item of diet. Grit may again have been accidentally ingested or perhaps became incorporated in the material after the coprolite was deposited on the cave floor.

With such a limited number of coprolites it is difficult to arrive at any significant conclusions reflecting ecological relationships or to derive any inclusive dietary lists. Two plants not noted by Barrett and Gifford but represented in the coprolites are Erodium botrys and Calachortus sp. All plants and leaves represented in the coprolite material would be available in late spring and early summer. It is known that Madia sp. or tarweed was collected in summer and stored for use through the year; it is not known if the other plants were stored. Cottontails were also mainly take in summer drives often participated in by entire villages. The kangaroo rat may have been taken at any time of year. The presence of the ground beetle head capsules would not apparently have been deposited in the coprolite after it was excreted. How these capsules came to be ingested is unknown. It thus appears that the dietary remains represented in this small sample represent occupation of the cave during at least the spring and early summer and possibly longer. The plant and faunal remains found in the samples were available within the surrounding Upper Sonoran life zone.

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Appendix VI

CORN FROM BAMERT CAVE, AMADOR COUNTY, CALIFORNIA

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The three lots of corn described here were received on January 7, 1952 from Robert F. Heizer of the University of California, Berkeley, for study and report. The specimens consist of one corn cob and five kernels recovered from archaeological deposits at Bamert Cave. The site contained primarily aboriginal materials, but the corn is attributed to the historic period, and more specifically to the period around 1830 to 1850.

Our treatment of these materials constitutes Report No. 329, Laboratory Nos. 4374-4376 of the Ethnobotanical Laboratory, Museum of Anthropology, University of Michigan. The lots are discussed under the numbers assigned them by the excavators, with these followed by our laboratory numbers in parentheses. Photographs of the specimens are on file at the University of Michigan, and in the Archaeological Research Facility, University of California, Berkeley.

University of California 1-127386 (4375)

This item is a corn cob which is remarkably well preserved and fresh looking, with most of the somewhat shredded husks still attached. The cob is 11.2 cm. long, but a small portion of the tip has been consumed by insects. The cob formerly bore 12 rows of kernels, but none is now attached. Except in the immediate butt area, the rows are fairly straight and regular. The form is generally spindle-shaped, that is, tapering rather uniformly from the butt to the tip. In cross-section, the cob is elliptical or compressed at the butt end, with a maximum butt diameter of 2.8 cm. and a minimum butt diameter of 2.4 cm. By whatever standards it may be judged, this was a small ear of corn.

University of California 1-127371 (4375)

This lot consists of three corn kernels, all of which are of a pale yellow or lemon color. All have flinty, translucent endosperm in the exterior portions, but a center of white starch is visible through the surface layer. One of the kernels is incomplete, having been damaged by insects. The soft interior starch has been virtually consumed in the damaged kernel, but most of the hard exterior area left intact. It may be remarked, incidentally, that the Hopi Indians assert that in storage the softer varieties of their corn are attacked by corn weevils, but that the harder varieties are avoided by these insects.

All three kernels have longitudinal grooves ("husk striations") visible on the upper surface, and none shows any tendency toward denting. The general

salmon. It was called "kosimo" by the Miwok (see Barrett and Gifford 1933:188). When it leaves the ocean on its spawning migration up the rivers, this salmon is an excellent food fish, but its quality deteriorates during its stay in fresh water. Nevertheless, it is known to have been utilized by aboriginal peoples far removed from the ocean, as at Deer Creek Cave on a high tributary of the Snake River system in northern Nevada (Follett 1963). A colored plate of this species was published by Hudson (1917).

Material: Articular and angular (1-121037), Plate 1; 4 crushed vertebrae, articulated (1-121847); caudal fin, 2 cleithra, frontal, hyomandibular, mesocoracoid, and 2 vertebrae (1-127088); basipterygium (1-127445); posttemporal (1-127472); 3 vertebrae (1-127383, 1-127533, 1-127553); 2 vertebral fragments (no catalog number). These remains represent fish about 25 to 36 inches (63 to 91 cm.) in total length and perhaps 8 to 21 pounds (3.6 to 9.5 kg.) in weight (see Snyder 1931:Tables 2,3, for length-weight relationships).

Minnows--Cyprinidae

Hardhead, Mylopharodon conocephalus (Baird and Girard)

As a food fish, this large minnow is bony and somewhat tasteless, but it is easily captured, and is known to have been utilized by Indians elsewhere in California. It may have been included in the Miwok name "toinoyo" (see Barrett and Gifford 1933:189). A photograph of the hardhead was published by Follett (1928:Fig. 91).

Material: Cleithrum (1-121041), representing a fish about 17-1/2 inches (44 cm.) in total length.

Suckers--Catostomidae

Sacramento sucker, Catostomus occidentalis Ayres

This sucker, although bony and tasting of the river water, was utilized by California Indians. The Bamert Cave people may well have used it as food. "Nearly all the...fishes, which could be caught, served as food [of the Miwok]" (Barrett and Gifford 1933:137). But suckers of the size represented in the present material may also have been used as bait in fishing for sturgeon (see Barrett and Gifford 1933:189).

Material: Caudal vertebra (1-123397); 4th to 10th precaudal vertebrae, articulated (1-127073), Plate 2; 1st to 3rd precaudal vertebrae, articulated, and lower pharyngeal (1-127088). These remains represent fish about 12-1/2 to 17-1/2 inches (32 to 44 cm.) in total length.

The anterior aspect of the lower pharyngeals of this species was illustrated by Follett (1965:39, Pl. 4, Fig. A).

in such characteristics as; tapering (spindle-shaped) cob, the tendency toward thin wedge-shaped kernels, presence of starch caps, and differential shrinkage of kernels inducing a tendency toward denting.

Both of the races or complexes involved were present in northern Mexico, reaching the Southwest from there, most likely already in hybridized condition. Any corns which may have diffused from Mexico through the chain of California missions might well have been of this same type. So, one need look no farther than the aboriginal neighbors to the east and south to derive the Bamert Cave corn. Had it been brought overland from east of the Rocky Mountains by white settlers the typology would have been much different.

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Appendix VII

PLAYING CARDS FROM BAMERT CAVE, AMADOR COUNTY, CALIFORNIA

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Two nearly complete cards and two fragments of playing cards were recovered from Bamert Cave by the University of California, Berkeley, field party. At first it was thought that the cards were Tarot cards, the two nearly complete specimens being the "two of swords" and the "knight of wands" or "clubs" (see Plate 5 of Heizer and Hester). After consulting Hargrove (1930) it was found that they are actually playing cards, either Spanish or American ones printed for Mexican use. The Spanish apparently did not know of Tarot, but rather played a game known as hombre with a deck of forty cards. The deck had many of the same cards used in the Tarot decks of Italy and France. The two of swords is definitely in the Spanish tradition, as the swords are straight two-edged rapiers while the Italian and other Tarot swords are normally curved and crossed single-edged swords. In addition, the knight of wands is carrying a heavy knotty club in the Spanish style, different from the smooth clubs in the Italian and French cards. Earlier the Italian and French were making cards for the Spanish for the game of hombre, and they contributed the designs which were later adopted by the Spanish and Mexicans for their playing cards. The one side fragment with a small head on the side is especially interesting; I have not been able to find any other examples of Tarot or Spanish cards which could match this fragment.* It would be interesting to find out what card this represents, in an attempt at determining the date of manufacture of the cards as well as the country of origin. The back of the cards, pictured in Plate 5 of Heizer and Hester (this volume), may be useful in identifying the age and location of manufacture. The cards are similar to those printed in Madrid in 1792 and are also very much like those printed by the Dougherty Card Company in 1849. The edges are rounded like the American deck rather than the square corners of the earlier Spanish deck, and they are the same size as the Dougherty deck. The Dougherty deck was printed in New York and was intended for use by the Mexicans still living in California and the Southwest. It is probable that the cards are from an American deck which was derived from the Spanish hombre deck.

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* I would like to thank Mr. J. Lafler of Oakland for his help in the identification of the cards.

As to how the cards came to be deposited in the cave one can only speculate. They may have been picked up by an Indian in a mining camp or from a ranch in the area. If so, the cards probably date prior to ca. 1860, since after this date the Miwok had for the most part been driven from the region. Alternatively, the cards could have been left there by a caballero or miner who sought shelter in the cave for a while.

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tendency is toward globular (isodiametric) form, but this is modified by angularity, with lateral planes due to crowding of the kernels. The dimensions are:

Width	Length	Thickness
8 mm.	7 mm.	5 mm.
8 mm.	7 mm.	5 mm.
7 mm.	6 mm. (incomplete)	5.5 mm.

University of California 1-127430 (4376)

Under this number are two corn kernels which are identical to those in the previous lot in color. The dimensions of these are:

Width	Length	Thickness
7 mm.	7 mm.	6 mm.
7 mm.	9 mm.	3 mm.

The first of these is similar in every respect to the three kernels described in the previous lot. The second diverges considerably in several respects. It is no longer than wide, thin, and wedge-shaped. The interior white starch extends nearer the surface to form what is referred to as a "starch cap", and husk striations are absent. There is a shallow crease or "dent" at the tip of the kernel.

Interpretation

The cob and kernels are fairly consistent with each other, so the kernels well may have come from this cob or other quite similar cobs. Kernels with the degree of divergence represented may be found on the same ear of corn. The type of corn found in this California site fits very well into the aboriginal corn pattern of the western Pueblos, and that of the archaeological corn of the upper Colorado River drainage. It is quite similar in most respects to some of the smaller modern Hopi varieties, and would be at home, for instance, in the corn assemblage from Zion Park, Utah, described by Jones (1955:195-196). In that paper, I summarized briefly the typical characteristics of western Anasazi ethnological and archaeological corns.

Carter and Anderson (1945) postulated that the corns of the Indians of the Southwest represent primarily a blending of two "races" or "complexes", their "Basketmaker" and "Mexican Complex". In the western Anasazi area, representatives of these complexes seldom are found in classical form, but rather in admixture with advanced genetic introgression. Jones and Fenner (1954:111-115) have demonstrated that such blending already was characteristic in the Basketmaker II period very early in the Christian era.

The specimens from Bamert Cave exhibit precisely a combination of features of these two complexes of corn. Derived from the Basketmaker Complex are: elliptical cross-section of cob, isodiametric and angular form of kernels, husk striations, and row number of twelve. The Mexican Complex has left its impress in

Appendix IX

PLANT REMAINS FROM BAMERT CAVE, AMADOR COUNTY, CALIFORNIA

John Strother

Herbarium, University of California, Berkeley

Most of the plant remains from Bamert Cave, all of which are fairly well-preserved, have been examined. Not all of these materials could be identified; however, the following plant identifications were possible:

Quercus sp.	oak (leaves, acorn shells and cups)
Lathyrus lanszwertii Kell.	wild sweetpea
Gramimeze (Calamagrostis?)	reed grass
Marah sp.	gourd family (seeds)
Borage?	herbs; Braginaceae family (seeds)
Eriodictyon sp.	benth (leaves)
Scrophularia?	figwort
Pinus sp.	pine (nuts)
Oenothera sp.	herbs
Apocynum sp.	dogbane (fruit)
Aesculus sp.	buckeye (hulls)
Unidentified seeds	
Unidentified bulbs	

Appendix X

DESCRIPTION OF CERTAIN BASKETRY FROM BAMERT CAVE, AMADOR COUNTY, CALIFORNIA

Lawrence E. Dawson

Lowie Museum of Anthropology, University of California, Berkeley

Six specimens of basketry from the Bamert Cave collections have been analyzed. These are: (1) a coiled basket fragment (Plate 4,c); (2) the coiled tray from the juvenile burial (Plates 2 and 4); (3) a large twined burden basket, also from the juvenile burial (Plate 2); (4) large fragment of twined conical basket with coiled patch (Plate 4,e); and, (5) two small fragments of twined baskets (Plate 4,a,b).

1. Coiled Basket Fragment (1-127063)

Overall size: 10 cm. by 3.5 cm.; 0.6 cm. thickness.
Form: Apparently a shallow circular tray greater than 37 cm. in diameter.
Foundation: 3-rod triangular bundle, the top rod larger than the other two.
Work Direction: Leftward, as held by the worker.
Work Face: Concave side.
Stitch Type: Mixed interlocking and split on the back face.
Sewing Strand Material Class: Has the appearance of sedge (Cladium mariscus?) rootstock fibers split into half-round strands.
Foundation Material Class: Whole peeled shoots, perhaps willow.
Stitch Count: 8.5 stitches per inch, 6 coils per inch, 51 stitches per square inch. $\frac{8.5 \text{ stitches}}{6 \text{ coils}} = 1.42$ index of texture.
Splices: (Only one partially preserved splice observed) fag end concealed in foundation bundle, moving ends bound under by successive stitches.
Use Pattern: Work face (concave side) shows abrasion and incrustation of dried organic material, probably seed oil.
Mending: Break between coil rows mended by coarse "darning" of four large stitches with a strand of split shoot material.

Interpretation and Comparison:

Probably part of a coiled parching and meal tray closely similar to those known from the northern Sierra Miwok (no Plains Miwok examples have been seen or examined). The mending practice is consistent with Sierra Miwok inclination to do extensive mending before discarding a basket.

2. Coiled Basketry Tray (1-164170b; found with juvenile burial).

Size: 29.3 cm. diameter, 2.5 cm. deep.
Work direction: Leftward, as held by the worker.
Work Face: concave side.
Foundation: triangular bundle of three peeled shoots, the top rod larger than the two others.
Start: Partly obscured by food incrustation, but appears to be a bundle of

finely split material wound with a weft strand for a centimeter or two, then curled into a tight spiral with a small hole in the center, and the first coiling stitches begun on the periphery of the spiral. The hole is later closed over with a few stitches.

Coil ending: broken away, but was apparently tapered.

Sewing strand: sedge rootstock fibers split in halves.

Stitch type: mainly split on the back face, a few interlocking stitches here and there.

Spacing of stitches: about 1 mm. gap between stitches throughout, enough to expose the foundation to view.

Splices: fag ends concealed in the foundation bundle, moving ends bound under successive stitches.

Rim finish: simple self-rim.

Stitch count: 8.4 stitches per inch, 5.5 coils per inch, 46 stitches per square inch, $\frac{8.4}{5.5} = 1.53$ index of texture.

Designs: no decoration.

Use patterns: food clogged on both faces; break-outs along the rim; stitches on concave side. Corresponds to ethnographic Sierra Miwok meal shaker and seed parching trays in use pattern.

Interpretations and Comparison:

Almost every feature of this basket is comparable to northern Sierra Miwok examples with one notable exception: the stitch type. The stitches are split on the back face, whereas those of the northern Sierra division are of the interlocking type, even ones collected from around Ione in the lower foothills bordering on Plains Miwok territory. The Lowie Museum has only one coiled basket with some claim to Plains Miwok provenience; it is from the James Barr collection and is said to have been "the personal work basket of old Chief Wallentien of the Miwok rancheria between Clements and Lockeford" (presumably Lelamne). This basket has the same stitch type as the piece under consideration, and furthermore closely resembles it in index of texture and spacing of stitches. These resemblances suggest a cultural ascription to the Plains Miwok for this burial, and a dating to the historic period (perhaps mid-1800's) may be inferred from the apparent use of a metal knife in the pointing of warp sticks in the twined burden basket of the same burial.

3. Twined Burden Basket, in two halves (1-164170c; juvenile burial).

Size: reconstructed whole basket measured 67 cm. height, 63 cm. diameter.

Work habit features: woven from point of base upward and rightward, working on the exterior face. Weft strands pulled to the front (toward the worker) with each turn of twining.

Warp material: whole peeled shoots.

Start: worn away.

Warp arrangement: conical from the start.

Warp insertions: butts sharpened (apparently with a metal knife) and wedged into a row of twining so that they project on neither face.
Degree of warp slant: 8° to the left of vertical (more pronounced in the upper part of the basket).
Warp selvage: warp ends turned down to the left forming a bundle about 1 cm. thick which is wound with a leftward spiralling weft strand, the turns averaging about 1.5 cm. apart. Onto this bundle a peeled shoot hoop, 8 mm. thick, is sewn with a leftward course of coiling (done with an awl).
Weft material: split peeled shoots.
Weft face: round face of strand toward the weaver (exterior face of basket).
Main construction weave: two strand twill twining over pairs of warp elements (diagonal twining).
Spacing of weft rows: openwork with a pair of weft rows that are perhaps both woven at the same time. The space between pairs of rows varies from 8 mm. to 15 mm.
Slant of turns in the weft helix: up to the right.
Splices: fag ends trimmed on back face, pinched between the other two strands; moving ends continue doubled with the new strand for a few turns until used up.
Weft turn count: average about 3.5 weft turns per inch, and 3.3 weft courses per inch.
Decoration: none.
Use patterns: thick clogging on one part of basket inside and outside, apparently before it was broken. The clogged material on the exterior shows an unidirectional aspect evidently from a grating operation. Imbedded coarse soaproot fibers suggest the material being grated. Two small burnt holes, perhaps from coals, burnt on interior face.

Interpretations and Comparison:

The basket is in every way, except for the paired weft courses, comparable to ethnographic burden baskets of the Sierra Miwok.

4. Large Fragment of Twined Conical Basket With Coiled Patch (1-127351).

Size of fragment: 31 cm. wide, 31 cm. long.
Work habit features: woven from point of base upward and leftward, the exterior face held toward the weaver. Weft strands pulled to the back face with each turn of twining.
Warp material: whole peeled shoots.
Start: (not present)
Warp arrangement: apparently conical from the start.
Warp insertions: butts sharpened (not with a metal knife) and wedged into a row of twining so that they projected on neither face (some now project because of break-outs in the weft).
Degree of warp slant: 2° to 5° to the left of vertical.

Warp selvage: (not present)
Weft face: round face of strand toward the weaver (exterior face of basket).
Main construction weave: two strand twill twining over pairs of warp elements (diagonal twining).
Spacing of weft rows: 2 to 3 mm. space between rows; warp shows clearly.
Slant of turns in the weft helix: down to the right (except for three rows in the design band).
Splices: fag ends caught under a turn of the alternate strand on the back face, ends project downward behind the first warp crossed by the new strand; moving ends pass over only one warp stick in the last turn, the same one crossed first by the new strand, and is trimmed on the back face with the stub appearing directly underneath and a little behind the fag end.
Weft turn count: 4.3 weft turns per inch, 4.4 weft rows per inch, 18.9 turns per square inch.
Decoration: a horizontal band of chevron design four weft rows wide crosses the middle of the fragment. It is carried out in alternating dark and light weft strands, the light one being the sedge root used elsewhere in the basket. The dark strand appears to be an unsplit rootstock fiber, perhaps of an Equisetum rush. The weave is the same twill twining as in the rest of the basket, but the three upper weft rows of the band have up-to-the-right slant of turns accomplished by drawing the wefts to the work face, instead of to the back, with each turn of twining. The black strands are abraded away on the work face of the basket, but are preserved on the back face.
Use patterns: much abrasion and many break-outs of weft elements on the work face, but almost none on the back face. In the lower margin of the fragment is a patch done in coiling to mend a hole 10 cm. wide by 6 cm. high. The patch is coiled downward from the upper periphery of the hole. The foundation used is a bundle of whole and split peeled shoots; the stitch type is mixed interlocking and split on the back face. The sewing strand is sedge root, the same as the twining weft.

Interpretations and comparison: This fragment is almost certainly from a twined conical burden basket, yet is so different from that of the burial (1-164170c) that it seems unlikely to belong to the same line of tradition. Nor does the piece compare to any basket in the Lowie Museum's extensive ethnographic collections. Only one basket (1-51459, unfortunately lacking provenience,(but of general Miwok type) has the same unusual black root material used in the designs.

5. Two Small Fragments of Twined Baskets (1-127083)

Size of fragments: 7.0 cm. by 10.6 cm. and 3.7 cm. by 7.0 cm.
Work habit features: apparently woven from point of base upward and rightward, working on the exterior face; weft strands pulled to the front (toward the worker) with each turn of twining.
Warp material: whole peeled shoots.
Degree of warp slant: 9° to the left of vertical (the larger fragment).
Weft material: split shoots with the bark left on.

Weft face: round face of strand toward the weaver, (exterior face).
Main construction weave: two strand twill twining over pairs of warp elements (diagonal twining).
Spacing of weft rows: average of about 3 mm. space between weft rows.
Slant of turns in the weft helix: up to the right.
Weft turn count: 3 turns per inch, 4 rows per inch, 12 turns per square inch.

Explanation of Plates

Plate 1: Bamert Cave (Ama-3), Amador County, California (1950).*

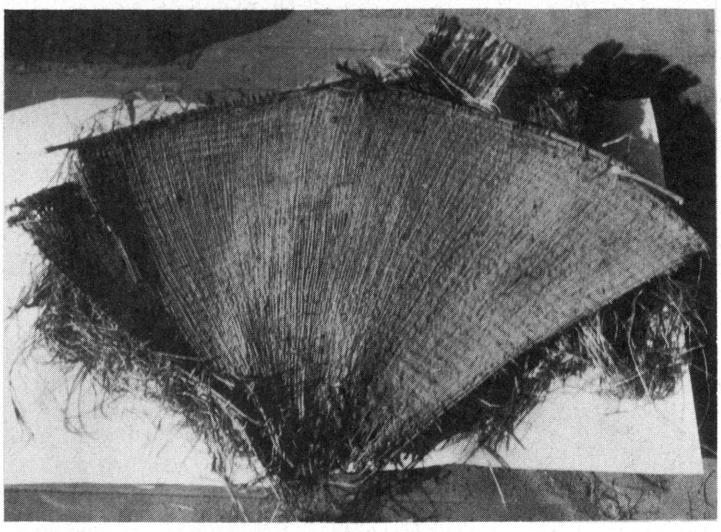
Plate 2: Juvenile Burial from Bamert Cave.*

a, view of burial as discovered. Skeleton lies between two halves of twined burden basket.

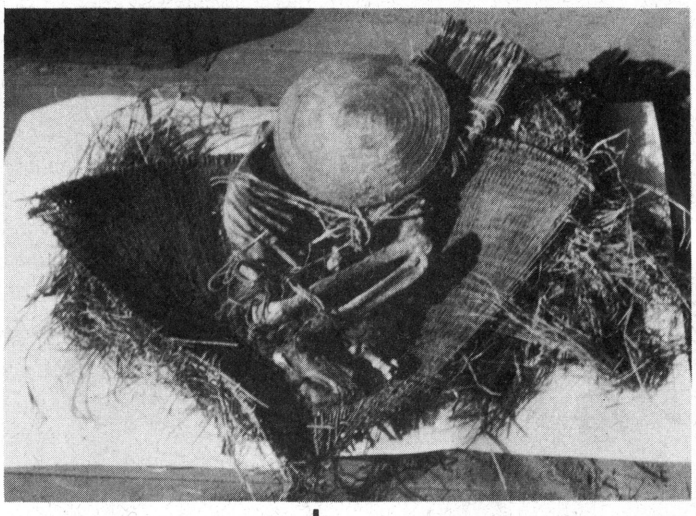
b, upper half of burden basket removed; note coiled tray over head.

c, coiled tray removed; note tule mat over face, and carrying net wrapped around body.

Plate 1



a



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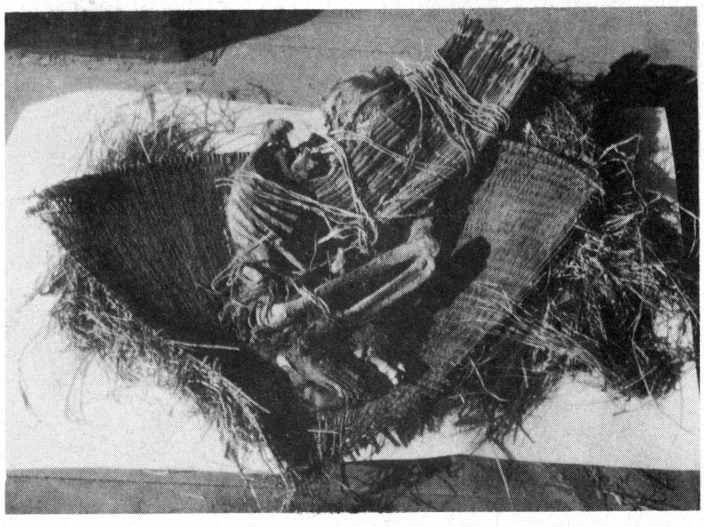


c

Plate 2

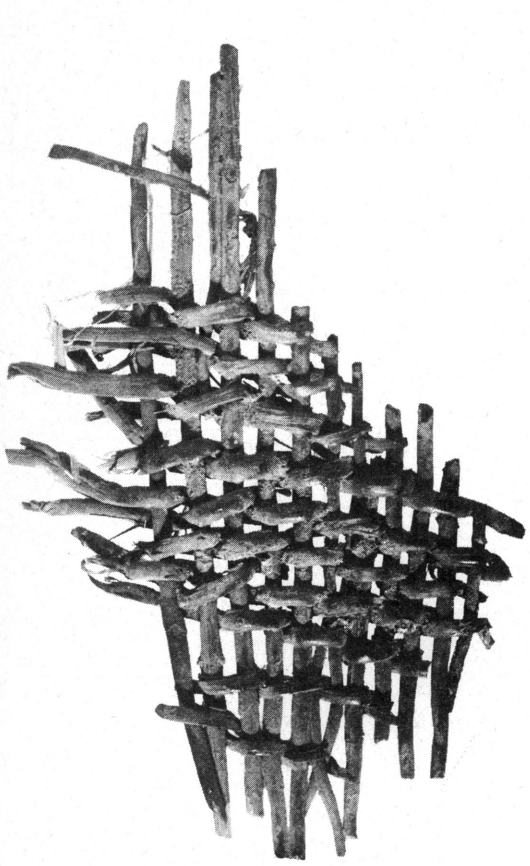
Plate 4: Basketry from Bamert Cave.*

a,b, stiff twined basketry (1-127083).

c, coiled basket fragments (back face; 1-127063).

d, close-up of coiled tray (from juvenile burial; see Plate 2).

e, twined basket fragment (back face; 1-127531).



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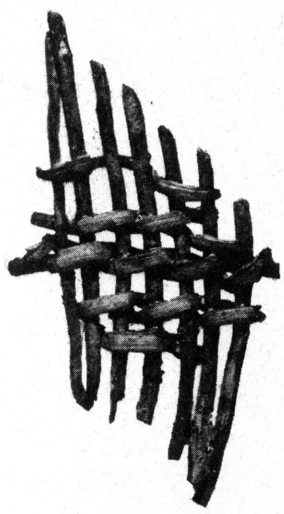

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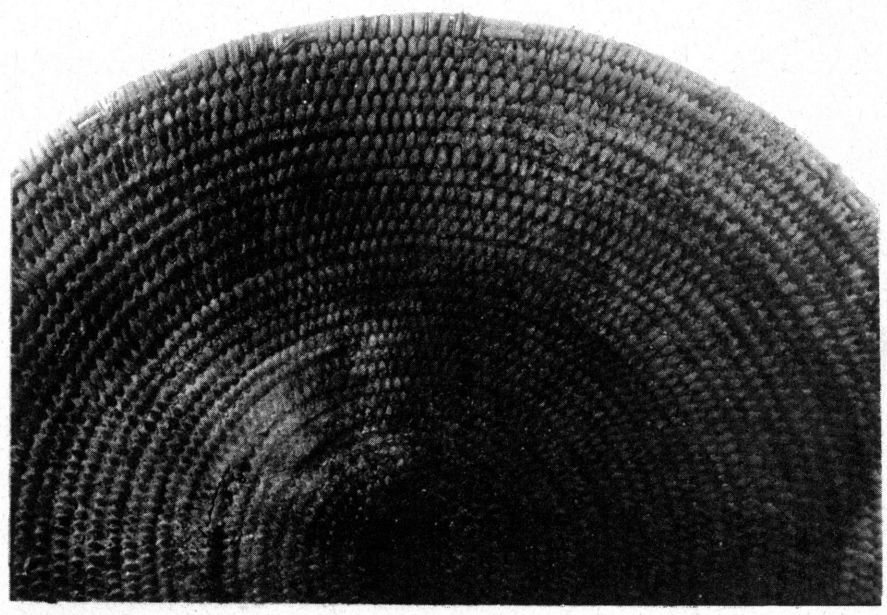

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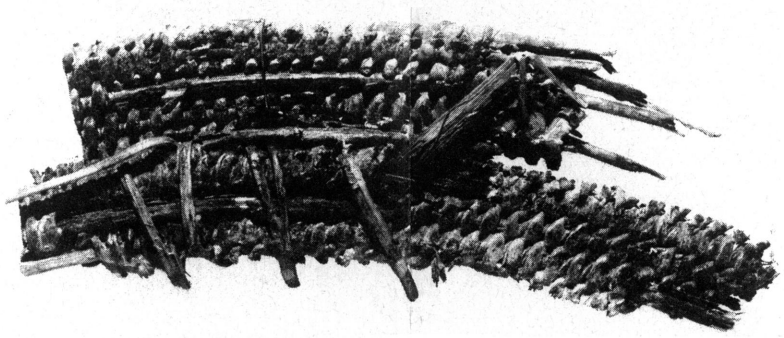

c

0 4
cm.

e

0
1 cm
2 cm
3 cm
4 cm
5 cm
6 cm
7 cm
8 cm
9 cm
10 cm

Plate 4