33. EXCAVATION OF Teh-1 (KINGSLEY CAVE)

By M.A. Baumhoff

The University of California Archaeological Survey received, in the fall of 1951, several letters from Mr. Jack Hiehle of the State of California Fish and Game Service. In them Mr. Hiehle described a shelter in the mountains east of Red Bluff, California, which was within the boundaries of a Fish and Game Service winter deer range. The Survey had planned to look at the site that winter, but snow made this impossible until the following spring. At that time, four persons, Richard Brooks, Donald Touey, Bernard Fontana, and the author spent a week digging eight test pits in the site, which we had by this time begun to call Kingsley Cave. In the spring of 1953, another crew was sent out by the Archaeological Survey, and this was composed of Archaeologist James Bennyhoff, Assistant Archaeologist Albert Elsasser, W. Atkinson, R. Brooks, L. Burton, D. Pendergast, R. Thomssen, B. Weissberg, and the author. During this second season, excavation of approximately half of the site was completed.

I wish at this time to express the gratitude of the Survey and the author for the very valuable assistance of the Fish and Game Service and Mr. Hiehle. We were given every aid by them in finding and in getting to the site. Without their help, we most surely could not have found the site or reached it even had we known of its existence.

GEOGRAPHICAL BACKGROUND

Kingsley Cave is a rock shelter located 20 miles east of Red Bluff, California (T 27 N, R 1 E, section 21, Mt. Diablo Base Meridian) on the southwestern slope of the Cascade Mountains. It is on the eastern slope of a canyon called Kingsley Cove. The unnamed creek in the canyon is a multipronged tributary of Mill Creek, which is itself a tributary of the Sacramento River. The country rock of this area is basalt, derived from the volcanic disturbance centered around Mt. Lassen. Because the uppermost layer of this basalt is hard and resists erosion, little soil has been formed to relieve the rocky or gravelly hillside.

The site area, at an elevation of 2,000 feet, receives considerable rainfall from the storms which come in from the Pacific and are forced up over California's mountainous eastern wall. Because of this and because the lava which forms the country rock is very porous, therefore capable of storing much water, the streams in the area have a heavy flow the year around.

The vegetation in the area may be classed as being typical of the Upper Sonoran Life Zone. Thus where any soil has formed, the dominant plant growth is chaparral, of which the most common shrubs are Wedgeleaf Ceanothus (Ceanothus cuniatus), Silk Tassel (Garrya fremontia), and Mountain Mahogany (Cercocarpus betuloides). The following trees occur singly or in small clumps: Blue Oak (Quercus douglasii), Black Oak (Q. kelloggii),

Scrub Oak (Q. Dumosa), Interior Live Oak (Q. wislizenii), Digger Pine (Pinus sabiniana), California Juniper (Juniperus californica), California Bay (Umbellularia californica), Buckeye (Aesculus californicum). There are several grasses growing in the area, which, however, die in the early spring. In April of a very wet year, the grass already was observed to be turning brown.

ETHNOGRAPHIC BACKGROUND

Ethnographically, the area around the site was occupied by the Yahi, a subgroup of the Yana Indians. The first extensive white contact with these people began in the 1850's, and from then until 1865 there was sporadic fighting between the Yahi (called the Mill Creeks) and the eastern settlers. The Yahi fought the white men more strenuously than most of the California Indians did. Waterman (1918, p. 43) attributes this in part to the roughness of their country and in part to the fact that "having been pressed for generations by the valley Indians they had learned the art of 'hit and run away'."

At any rate, a final set of killings by the Indians in 1864 led to a concerted drive on the part of the settlers and by 1867 it was thought that the "Mill Creeks" no longer existed. As it turned out, however, they had only gone into hiding; Waterman (1918, p. 57ff.) has collected a number of Indian stories which were thought to be untrue when they were first told but which Waterman believed to be mostly true. These stories were current during the latter half of the nineteenth century. Then in 1908 a party of engineers working on Deer Creek (just a few miles south of Mill Creek) stumbled on an Indian camp and a group of frightened Indians. The Indians ran away and nothing more was seen of them until 1911 when their last survivor was found almost starved in a slaughter-house near Oroville, 32 miles to the south. This Indian, named Ishi, was taken to the Museum of Anthropology at the University of California where he lived until 1916, when he died of tuberculosis. During the course of his stay at the University a great deal was learned about the language and culture of the Yahi.

The following incidents, which occurred at the time the Yahi were in hiding, (Waterman, 1918, p. 59), are of particular interest in connection with Kingsley Cave:

"April, 1871. -- J.J. Bogard, Jim Baker, Scott Wellman, and Norman Kingsley are camped on Wild Horse Corral in Morgan Valley (Map G-7). They are busy 'running' cattle. They find where the Indians had wounded a steer. They follow the animal, the trail being made plain by blood. They finally pick up a broken arrow. When they come to the Indians, the latter skip. Being pressed for time, instead of skinning the animal they cut off chunks of meat, tear the hide off, and throw it into the brush. The next day the whites trail the Indians with dogs, and corner them in a cave and kill about thirty. In this cave there is 'about a ton' of dried meat.

"In the cave with the meat were some Indian children. Kingsley could not bear to kill these children with his 56 caliber Spencer Rifle. 'It tore them up so bad.' So he did it with his 38 caliber Smith and Wesson revolver. (Information from Mr. Norvall, 1915)."

Apparently, Wild Horse Corral in Morgan Valley is no more than two miles north of the site here designated Kingsley Cave. The latter could easily be the cave mentioned in the account. Moreover, the local people call this site Kingsley Cave; also it is located on the system of streams known as Kingsley Cove. All this makes it rather probable that the two sites are one and the same.

In the excavation several infant burials were discovered, but none of these exhibit any bullet holes. However, most of the skeletons are in such poor condition that a bullet hole might not be detected if present. A sternum (breast bone) of an adult was discovered which has a hole through the center of it. This hole looks as though it may have been caused by a bullet because it is much larger in diameter on one side than on the other. This is the only bit of positive evidence discovered and it is inconclusive.

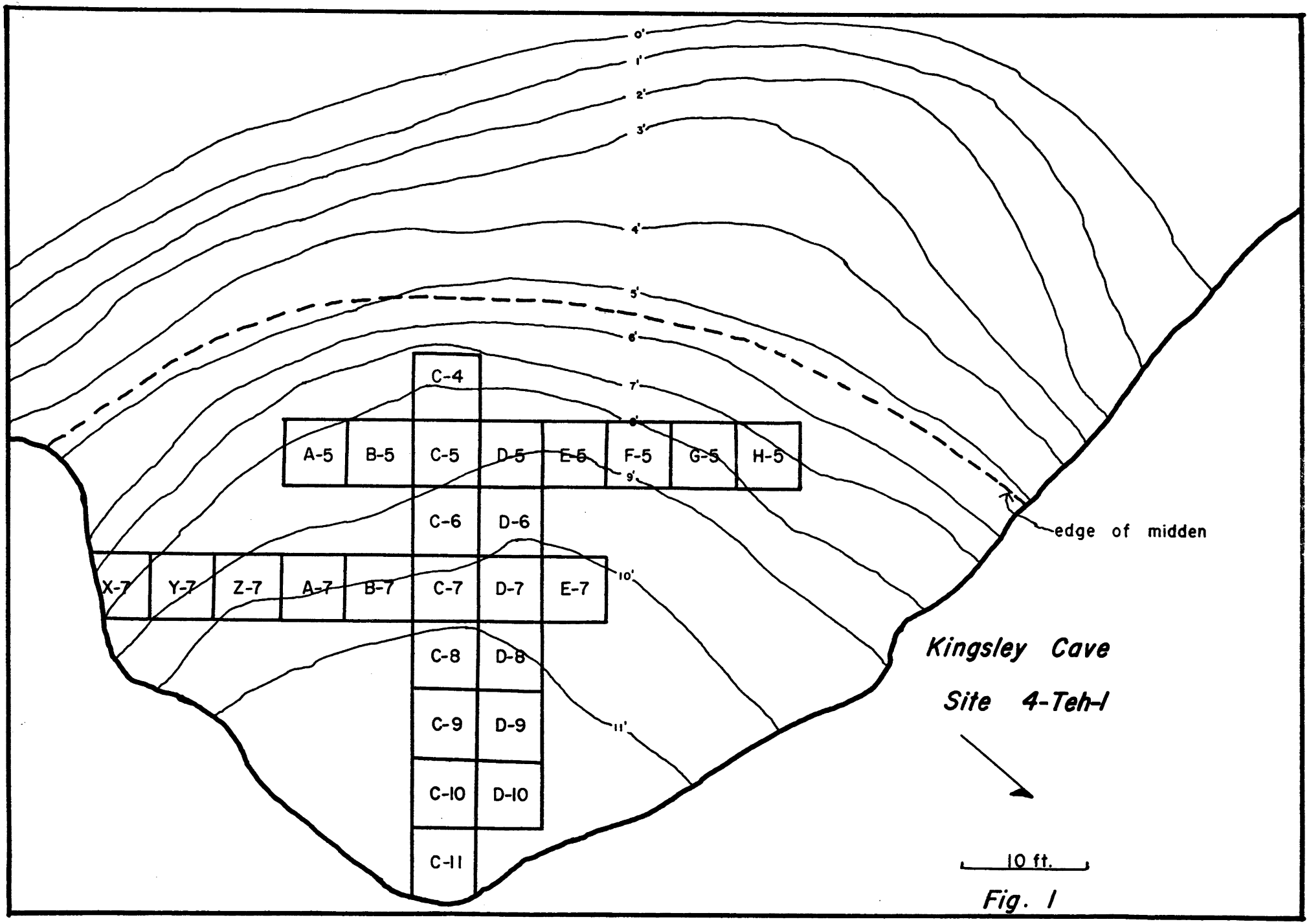
DESCRIPTION OF SITE AND METHOD OF EXCAVATION

The site itself lies in the face of a cliff 200 feet above one of the three forks of the Kingsley Cove stream. The cliff at this point is made up of two layers of lava which have bowed up in the form of an arch. The lower of the two strata was softer and has eroded to leave the upper stratum as the roof of a small cavern.

This shelter runs 40 feet back into the cliff and is 90 feet wide at the mouth. The midden deposit extends 5 to 15 feet beyond the drip-line of the shelter and sloughs down the side of the canyon as a talus. (See figs. 1, 2, and 3). The depth of the midden runs from about 6 inches at the back of the shelter to 6 feet beneath the outer edge of the overhang. It might be even deeper in some places that have not been tested.

The midden is a very fine wind-blown silt, light brown in color, which is mixed with considerable ash of possibly volcanic origin. In one part of the excavation (principally Pits C-7, D-7, and E-7) the deposit is almost solid grey ash (see Pl. 4c). This ash was in close association with a large group of mortars and metates in Pit C-7 (Feat. 1) and with a very congested group of burials in Pit D-7. This area of grey ash is exactly in the center of the site and may be due to a relatively slight amount of dripping in that area. Progressing away from the ashy area toward either end of the site the midden changes color and becomes more compact until at the southwest end of the site it is hard and dark brown; the midden at the northeast end is equally dark but more friable.

In the first, 1952, season, excavation was begun in Trench 5 at the mouth of the shelter and Trench C was extended inward toward the rear of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C-8
D-8
C-9
D-9
C-10
D-10
C-11
edge of midden
Kingsley Cave
Site 4-Teh-1
10 ft.

Fig. 1

the site. In the second season's digging, Trenches C and D were terminated at the inner wall, while Trench 5 was extended to the northwest and Trench 7 to the southeast. It will be noted that starting from the southeast end of the shelter units X, Y, and Z precede units A, B, C, etc. This is because the latter units were designated in the 1952 season without thought of what the names of the southeast extensions would ultimately be.

CHIPPED STONE ARTIFACTS

Chipped stone artifacts were the most abundant specimens found in the site. Materials were preponderantly fine-grained basalt, and obsidian; a few artifacts were of vari-colored cherts. There is no stratigraphic difference between the three materials. Some of the obsidian artifacts are made of the red and black volcanic glass which is characteristic of flows from the Glass Mountain area of Modoc County. The basalt may have come from the country rock in the vicinity of the site but no quarries of this material were observed. There is no evidence as to the origin of the chert. In view of the lack of chipping refuse recovered from the midden it is unlikely that any implements were chipped within the site itself.

Projectile Points

Among the chipped stone artifacts, projectile points were the most abundant. Three hundred and twenty nine whole or fragmentary points were recovered. Of these, 170 were obsidian, 111 were basalt, and 36 were chert. The weight of the basalt specimens is evenly distributed from 0.4 grms. to 4.0 grms., while the weight of the obsidian and chert points falls largely between 0.4 and 2.0 grms. (see fig. 5). The weight distribution would suggest that some of the heavier point types would contain a higher percentage of basalt specimens. This is true, however, only in the case of Type 2, where basalt runs to 54% of the specimens, with a weight average of 2.3 grms. for all the Type 2 specimens.

Six types totalling 246 identifiable projectile points have been distinguished, as follows:

Type 1. Large, side-notched points (Pl. 2k, l, m). These points are large in both size and weight, and compared with other points from the site, are crudely made. They have straight sides with large parabolic notches placed well up from the base of the point. The vertical distribution of the type is normal (see Table 5) and the proportion of the three materials is not extraordinary, when compared with the total collection of points.

Type 2. Large, square-stemmed points (Pl. 2a, b, c, g, h, i). These are the largest points in the collection but are not so crudely made as some of the smaller ones. These points have straight sides, square or rectangular stems and the vertex of the notch is usually ninety degrees, with a minimum of a tang effect. There is an abnormally high proportion of basalt specimens of this type. This is the only point type which has any possible stratigraphic significance and even in this case it is doubtful. The distribution suggests that these points may represent a type that is earlier than any of the others.

Type 3. Thin triangular points with tapering stems (Pl. 2n, o, p, d). These are among the smaller and more delicately made points. The stems usually taper to a point but they are sometimes rounded. The corner notches are sometimes shallow, but normally are deeply concave and leave sharp tangs. This is evidently one of the best-defined types, as it forms a weight group with very little variation. The proportion of obsidian is somewhat high, but this could be due to chance variation.

Type 4. Leaf-shaped points (Pl. 2q, r, s). These points have considerable variation in quality. They are frequently so poorly made that one may agree with Wallace and Taylor (1952, p. 17), that they are rejects or retouched pieces. Their vertical distribution conforms closely to that of the total point assemblage and they have no abnormal proportions of any materials.

Type 5. Small, side-notched points (2e,f). These points, sometimes called Shoshone points, are triangular in outline and have small side notches toward the basal end. All the bases are slightly concave. There is a high proportion of chert among these points, but the sample is too small to show a trend indicating that this material was consistently used for this type. They were found both shallow and deep in the site.

Type 6. Small tanged points with expanding stems. (See Treganza 1954, Pl. 2c, p, q). These points are like Type 3 except that their stems are expanded and have a concave base, so that they look bifurcated. This type has normal proportions of materials and normal depth distribution (see Fig. 4).

	length (mm)			width (mm)			weight (grms)			obsidian	chert	basalt	Total no.
	max.	min.	avg.	max.	min.	avg.	max.	min.	avg.				
1. Large, side notched. Pl. 2k,l,m.	38	15	23.7	21	9	15.1	5.7	0.3	1.6	34	9	22	65
2. Square stems. Pl. 2a,b,c, h,i,j.	51	13	26.9	31	5	18.6	7.6	0.3	2.3	29	3	37	69
3. Thin triangular, tapering stems. Pl. 2n, o, p.	48	14	24.1	26	6	16.2	3.4	0.3	1.0	39	9	12	60
4. Leaf shaped Pl. 2q,r,s.	40	18	25.3	21	5	13.8	4.2	0.5	1.7	16	8	12	36
5. Small, side notched. Pl. 2f,g.	34	16	24.1	15	8	12.3	1.0	0.4	0.6	3	4	1	8
6. Small, tanged, expanding stem.	29	14	20.3	14	10	12.3	0.8	0.3	0.5	5	1	2	8

Table 1. Projectile Points

In attempting to place the culture of Kingsley Cave in the cultural context of Northern California and surrounding areas it has been found that projectile points are the most useful indicators. They occur in large numbers in many sites and the types are well enough defined, in most cases, to be comparable. The following list summarizes the occurrences of the various types that have been noted in surrounding areas.

Type 1

Placer County	Heizer and Elsasser, 1953, Pl. 1-d, Fig. 7-10.
Mendocino County	Meighan, 1955b, Pl. 4-z, a', b'.
Sacramento Delta	Heizer, 1949, Fig. 14-1, m, n .
Lake County	Harrington, 1948, Fig. 34-e.

Type 2

Siskiyou County	Wallace and Taylor, 1952, p. 16-19.
Shasta County	Smith and Weymouth, 1952, p. 12.
Mendocino County	Treganza, Smith and Weymouth, 1950, p.117
Mono County	Meighan, 1955a, Pl. 3, Fig. 13-16.
Lake County	Harrington, 1948, Pl. 19.

Type 3

Tehama County	Treganza, 1954, Pl. 2-k, l.
Siskiyou County	Wallace and Taylor, 1952, p. 16-19.
Modoc County	Heizer, 1942, Fig. 98-e.
Humboldt County	Heizer and Mills, 1952, Fig. 1-f Loud, 1918, Pl. 15, Fig. 6.
Shasta County	Smith and Weymouth, 1952, p. 12.
Lassen County	Fenenga and Riddell, 1949, Fig. 58-e.
Placer and Eldorado Counties	Heizer and Elsasser, 1953, Fig. 1-d.
Mendocino County	Treganza, Smith and Weymouth, 1950,p. 117. Loud, 1918, Pl. 14, Fig. 6.
Southern Oregon	Cressman, Williams and Krieger, 1940 Table II, type 1.
Sacramento Delta	Lillard, Heizer and Fenenga, 1939, Pl. 24, Fig. 35.

Type 4

Placer County	Heizer and Elsasser, 1953, Pl. 1-c, Fig. 1-3.

Type 5

Sacramento Delta	Lillard, Heizer and Fenenga, 1939, Pl. 24, Figs. 38-39.
Siskiyou	Wallace and Taylor, 1952, p. 16-19.
Shasta	Smith and Weymouth, 1952, p. 12.
Mendocino County	Treganza, Smith and Weymouth, 1950, p. 117.

Type 5 (continued)

Lassen County	Fenenga and Riddell, 1949, Fig. 58-s.
Tehema County	Treganza, 1953, Pl. 2-g, h.
Eldorado and Placer Counties	Heizer and Elsasser, 1953, Fig. 1.

Type 6

Tehama County	Treganza, 1954, Pl. 2-o, p. q.

None of the Type 1 occurrences have been equated with the Late Central California Horizon and some certainly have considerable antiquity. The Placer County (Martis Valley) and Lake County (Borax Lake) sites have each been estimated as being more than a thousand years old. The Mendocino County (Men-500) occurrence is probably of the order of a thousand years old and the Sacramento Delta (Early Horizon, SJo-56) occurrence is about 4,000 years old.

The occurrences of Type 2 in Siskiyou and Shasta Counties are clearly late. Meighan does not feel it is a particularly early type in Mono County (1955a, p. 19). On the other hand, their appearance at the Lake County (Borax Lake) site seems to indicate some antiquity. There may be two types represented at Kingsley Cave as there is a bimodality in both the weight and depth distribution (see Fig. 4 and 5) but no objective basis for segregation has been found. Type 2 has therefore been tentatively classed as a late type with a suggestion of antiquity.

Type 3 has a purely late distribution, i.e., they are presumably not more than 500 years old. Meighan (1955b) includes this type in his Shasta Complex which he dates as post 1600 A.D.

Few recorded occurrences of Type 4 have been found. Some of the larger specimens (Pl. 2-r) are the same as those from the Placer County Martis Valley Complex but only a few of these large ones were recovered from Teh-1. One would think that this type might represent a local specialization, developed in late times. These are not such complicated points that they couldn't have been invented twice.

Type 5, sometimes called the Shoshone point, is well known throughout the Western States. In the Southwest, it begins in Pueblo III times and continues throughout the prehistoric period (Woodbury, 1954, pp. 125-6). The collections of the University of California Museum of Anthropology have been thoroughly examined and it has been found that in the Central Valley these points always occur with clamshell disc beads (the phase marker for Late Horizon, Phase II). The distribution outlined above does nothing to dispel this impression of relative lateness. It is the opinion of the writer that these points always occur in California later than 1200 A.D.

Type 6 occurs only in Tehama County and no doubt represents a local specialization. Its occurrence at Teh-58, a site which contains historic material, suggests that it is a late type.

Scrapers

The scrapers from this site have been divided into types which are here called button scrapers, side scrapers and keeled scrapers. The form of the first category is clear and it seems a well-defined type. The last two types are defined arbitrarily; there was probably no difference in function between them.

Button scrapers are small, round in outline and have a "humpbacked" cross section. Their diameters run from 15 to 21 mm., with an average of about 16 mm. The average thickness is about 6 mm. at the center and the average weight 2.4 grms. The depth distribution of these specimens conforms well with the distributional pattern for all artifacts recovered. There are 46 obsidian, 3 chert, and 3 basalt specimens in this category (see Fl. 1j, m).

Side scrapers are unshaped flakes which have chipping along one or more edges so that they would be suitable for scraping or cutting. They are all flattish, or tabular, with an irregular outline. Of 28 specimens, 19 are basalt, 5 are chert, and 4 are obsidian. Most of these objects occurred in the upper levels of the midden, and are probably late in time. If this is truly the case, then they also may be considered a well-defined type.

Keeled scrapers are like the side scrapers except that they are usually larger and they always have a much greater relative thickness through the center. Of 24 specimens, 22 are basalt, 1 is obsidian, and 1 is chert. The vertical distribution of this type is similar to that of the artifact norm.

Knives

The term "knives" is used here to indicate objects which are shaped, at least in part, and which have bifacial flaking on at least two edges. All these objects may have been hafted. They are divided into "triangular" and "blade fragment" types.

The triangular knives usually have two sides which are straight or concave and a third side which is convex. The straight or concave sides meet at a round or pointed apex which is suitable for hafting. If these specimens actually were thus hafted, then the third side would be left as the cutting edge. This is all speculative, however, as there is no evidence of pitch or other hafting material remaining. Of 10 specimens recovered, 6 are obsidian, 2 are chert, and 2 are basalt. They seem to occur rather deep in the mound, but the sample is too small to draw any conclusions from depth distribution. These specimens are small, averaging about 20 mm. at greatest length and 19 mm. at greatest width.

"Blade fragment" knives are so called because they resemble the tip end of a leaf-shaped blade. They are three-sided, with two of the sides forming what would be the sides of the blade and the third side diagonal to what would be the long axis of the blade. This third side

may or may not have secondary flaking on it. These objects run from 26 to 85 mm. in length with an average of 49.4 mm. and from 9 to 58 mm. in width with an average of 28.18 mm. There are 17 basalt specimens, 1 obsidian specimen and 1 chert specimen. These objects have a normal depth distribution (see Pl. 1h, i).

Blades

Blades are defined as large, well-chipped objects with shaping and sharpening around all edges. Three such objects were recovered from this site. One is of a darkish chert material and has a length of 190 mm. and a width of 48 mm. It is shaped like some of the "Hunting Culture" blades of the Santa Barbara coast -- one edge is straight while the other is convex in outline. The second specimen is an obsidian piece 211 mm. long and 47 mm. wide. It is leaf-shaped, with a long taper from the center to the ends. It is the most crudely chipped of the three blades. The third specimen is a beautifully chipped piece, probably made of chalcedony. It is 51 mm. wide but it had been broken, so that its original length could not be determined. It seems to have been leaf-shaped, but the one tip present is rounder than those of the second specimen (above) and the sides are more nearly parallel than those of the latter.

GROUND STONE ARTIFACTS

Ground stone objects include manos, metates, mortars, pestles, pecking stones, paint anvils, magnesite beads, and a stone flaker. Almost all these objects are made of the volcanic material which makes up the country rock of the surrounding territory.

Manos

All the manos from the site are loaf-shaped. Some of them are shaped around the edges and when this is the case, it appears that it is the result of the use of the mano as a hammerstone, probably for breaking up the grist before grinding it. They run from 84 to 140 mm. in length with an average of 111.9, from 72 to 115 mm. in width with an average of 88.7, and from 45 to 85 mm. in thickness with an average of 60.4. They are all of basalt with varying degrees of vesicularity. Twenty of these objects were recovered (see Pl. 2u).

Metates

Fifty-three metates have been recovered from this site, 17 from the surface, and 36 from the midden. All were made of irregular slabs of the local volcanic material and all are of the slab variety (see Treganza and Malamud, 1950, p. 141) with very shallow grinding surfaces. Lacking pack animals, it was thought to be unduly burdensome to carry metates and

mortars a distance of about two miles to the nearest point of automotive transportation -- notes were taken on the specimens and they were left at the site. They are therefore not included with the bulk of the collection at the University of California Museum of Anthropology (see Pl. 2w).

Pestles

The pestles from this site include two specimens which are well-finished. They were both made from some material other than the country rock, one being dacite and the other undetermined. Both of these specimens are round in cross section and taper severely toward the proximal end. The dacite specimen has a diameter of 62 mm. but the length is undetermined since the specimen is broken. The other well-finished specimen is 386 mm. in length and 50 mm. in diameter.

The other pestles are of basalt and all appear to have been simply cobbles of the appropriate shape which were picked up for this use and not further shaped. They run from 110 to 220 mm. in length with an average of 173.4 and from 55 to 79 mm. in diameter with an average of 62.7. (See Pl. 2t.)

Mortars

Mortars are all of irregular and unshaped boulders or slabs. They are all of the hopper-mortar type, as the indentation averages but 120 mm. in diameter and less than 10 mm. in depth, thus preventing effective grinding without some vessel to hold the meal (see Pl. 2v, x). Sixty-three mortars were recovered from the site, 21 from the surface and 42 from the midden. None of the mortars was returned to the Museum of Anthropology for reasons given under Metates above.

The question of the vertical distribution of the grinding tools has been very perplexing. It was first decided that since mortars and metates formed such an overwhelmingly large proportion of artifacts found scattered about on the surface of the site, the surface collection should be disregarded and only the collection from the midden be considered. This was done, and all the grinding tools were grouped together and used to establish a mean depth with which to compare the individual types of grinding tools. It developed that on the basis of such comparison there was no significant depth difference between any of the four tool types.

A disadvantage of such a procedure, however, was seen for example, in that, whereas a metate which occurred at a depth of three inches would be considered a surface piece, a projectile point or some other small object from the same depth would count as having come from the midden. In order to avoid this difficulty, a fraction of the metates and mortars equal to the fraction of the total surface area of the site which had been dug was counted in with the specimens from the midden and then each of the grinding tool types was compared to the depth distribution of the total artifact assemblage. From this comparison it was seen that while the distributions

of the manos, metates, and mortars were certainly different from the total artifact distribution, pestles, on the other hand, were not so different.

It is possible to disregard mortars and metates in a stratigraphic analysis because of the fact that they are so often present in rock features and cairns. For example, if the depths of mortars and metates were recorded without mention of the features or cairns, a picture of an artificially high frequency of occurrence would be presented at that depth. However, even if the cairns or features were mentioned as a factor, there is no way to adapt the data to the procedure followed in the analysis of all the other types of specimens found in the site. On the other hand, if only the specimens found not associated with cairns or features are considered, we could conclude that the mano-metate complex is older than the pestle-mortar complex. This argument in view of the many unexplained details is probably too tenuous to be of much utility.

The depth distribution of the whole grinding tool complex is very strange. In the first place there were a great many mortars and metates on the surface for such a small site. Also, besides the surface collections, there were very few of any of the four grinding tool types in the top two feet of the site, whereas three-fourths of the remainder of the collection come from within the top two feet. It seems almost as if once the grinding tools were within the midden, they "sank" to the bottom of it.

Pecking Stones

There were five stone specimens recovered from the site which showed signs of pecking along one or more edges. Two of them were spatula-shaped, with pecking on one end. These two were 105 and 104 mm. long and 42 and 64 mm. wide. Another pecking stone is an egg-shaped stone 43 mm. long. Finally, there are three fragments which look as though they come from disc-shaped stones with diameters of the order of 100 mm. The pecking is around what would have been the circumferences. They are 15, 19, and 20 mm. thick.

Paint Anvils

There are two of these objects. One of them is egg-shaped and is 72 mm. long by 48 mm. wide. It has a small concavity along one side of it and this hole has a circle of red paint around it. The other specimen is shaped like a doorknob, with a diameter of 100 mm. It has a circle of red paint on one of its flat sides.

Magnesite Beads

There are two of these specimens and both have usual tubular shape for such beads. They have diameters of 12 and 17 mm. and lengths 21 and 22 mm. (Plate 1o).

Other Ground Stone Objects

Finally, there are two other objects of ground stone that should be mentioned. One is a slate slab which is 58 mm. long, 29 mm. wide, and 3 mm. thick. Its edges have been worked, and one surface has several small lines incised in it (see Pl. 1q). Another slate piece, cylindrical but with a taper toward one end is 56 mm. long and 10 mm. in diameter. It may be that this was used as a flaker (see Pl. 1p).

BONE ARTIFACTS

Artifacts of bone from Teh-1 include awls, flakers, fish-hooks, needles, scrapers, pendants, and one bead. All the foregoing objects, so far as is known, are of deer bone. There may be other species represented, but none was identified.

Bone Awls

There are 21 bone awls in the collections from this site. Seven are cannon-bone, 2 are splint (vestigial outer metatarsal), 1 is ulna, 1 is rib, 5 are from some unidentified long bone, and 5 are from an entirely unidentified bone. Awls run in length from 53 to 115 mm. with an average of 79.8 mm. The collection may be broken down as follows, according to Gifford's (1940) classification: Type A, 2 specimens; AlaII, 1 specimen; AlbI, 1 specimen; AlbII, 2 specimens; Ale, 6 specimens; AleI, 4 specimens; Alg, 2 specimens; A2, 1 specimen; 2 specimens are too fragmentary to determine type. Three of the awls have traces of what seems to be pitch near the tip end. The depth distribution of bone awls is normal with respect to the total artifact group. (See Pl. 1r.)

Bone and Antler Flakers

Fourteen flakers are included in the collections from the site. Of these, 5 are antler, 3 are ulna, 1 is cannon-bone, 1 is unidentified long bone, and 3 are unidentified bone. These flakers run in length from 93 to 210 mm. with an average of 112.5 mm. and in width from 11 to 17 mm. with an average of 12.8 mm. This width is measured across the front part of the blade of the piece where the sides run parallel from the tip back for 25 mm. or more. Again following Gifford's (1940) typology, there are 4 of type C2, 5 of type C8 and 5 which were unclassifiable according to this system. These flakers are usually of bones which show little modification, often with only the working tips having been cut down. In the case of two of the specimens made from ulnae, however, the heads have been cut so that the sides are parallel all the way back from the tip. The depth distribution of the flakers runs normally from top to bottom. (See Pl. 1s.)

Gorge Fish-hooks

These small bipointed bone objects fall within Gifford's (1940) type T. Their function has only been guessed at as there is no positive evidence of any attachment. There are two of these objects, one being 53 mm. long by 4 mm. wide with a triangular cross section (see Pl. 1e) and the other 55 mm. long by 4 mm. wide with a semicircular cross section.

Bone Needles

These objects may also be fish-hooks but they are so fine that it seems likely they were used for piercing. From Sapir and Spier (1943, p. 255) we have the following information about the Yana; "To pierce the ear lobe, a short bit of wood was thrust through it from front to back and left there for a week. These awls . . . were 1/2-1 inch in length, sharpened at both ends, and of any sort of wood." This description would fit our specimens perfectly except that ours are made of bone; otherwise, they might well have been used for the same purpose. There are two of these needles or awls in the collections. One of them is 44 mm. long by 5 mm. wide and is flat in cross section. The other is 45 mm. long by 3 mm. thick and is roughly circular in cross section.

Spatulate Objects

There are two of these specimens, both of which appear to be the tip end of some implement, perhaps a scraping tool. They are both about the size and shape of a clarinet reed. One is 11 mm. wide and the other is 9 mm. wide.

Bone Pendants

There are 4 of these objects and all are of an irregular oblong shape. They fit into Gifford's (1940) type Q2. Their lengths are 45, 66, 67, and 59 mm. and their widths are 13, 13, 17, and 14 mm. They are called pendants because bone pendants are mentioned as having been used by the Yana (Sapir and Spier, 1943, p. 255) and also because they resemble in shape and perforation the shell pendant type Z2a (Gifford, 1947) and may have been used in the same way. They also could have been bull-roarers: they have been tried out by the writer as these and they function perfectly well. All four of these objects came from fairly deep in the site, but the sample is too small to allow one to draw any conclusions from this fact. (See Pl. 1f.)

Bone Bead

The lone piece in this category is made from a medial section of the long bone of some artiodactyl. It is 45 mm. long and is cut at both ends. (See Pl. 1k.)

SHELL ARTIFACTS

The shell artifacts in the collections from this site were all made from clam (Saxidomus sp.), abalone (Haliotis sp.), or olive shell (Olivella biplicata). All of these species are salt-water animals and thus must have been traded or brought in from the Pacific Coast. The clams were probably collected by the Pomo at Bodega Bay in Sonoma County and traded from there either as finished beads or bead blanks. This particular trading practice seems to have been prevalent elsewhere in the central part of California. All the abalone ornaments which have been identified are made from the shell of the species Haliotis rufescens. These mollusks occur on the coast opposite the area of the site, as do Olivella biplicata.

Clam Shell Disc Beads

Three hundred and fifty-two of this type have been recovered from the site. The diameters of these beads range from 4 to 23 mm. The diameters tend to group themselves around four modes: 7 mm., 10 mm., 14 mm., and 17 mm. This may mean that the beads in use by these people tended to be of those four sizes, but it could also mean that there are only four strings of beads represented. The depth distribution would indicate that these beads are late in the site. Only 3 specimens occur deeper than 36", and 2 of these are from pit D-9, which is in the area that was disturbed by many burials. This leaves only one bead out of 87 deeper than 36".

Whole Olivella Beads

There were 43 whole Olivella beads recovered from Teh-1. These have the spire ground off square; the remainder of the shell thus was left for stringing. The lengths of these beads run from 11 to 23 mm. with an average of 16.9 mm. The depth distribution of these beads is not out of line with that of the total artifact group.

Olivella Disc Beads

There is only one specimen of this type. It is a piece that was taken from the side of an Olivella shell, drilled in the center and then ground into a disc. It is 7 mm. in diameter.

Square Cut Olivella Beads

There are nine beads of this type. Again they are simply pieces taken from a relatively flat portion of the side of an Olivella shell and drilled in the center. In this type, however, the outside edge is cut in the form of a rectangle. These are 8 mm. long by 6 mm. wide.

Dentalium Bead

As far as is known these beads were usually traded from as far as the State of Washington. One specimen of this type was recovered -- it was found adhering to a glass trade bead. Some of the bead strings in the ethnographic collections of the University of California Museum of Anthropology have dentalia alternating with glass trade beads. The present specimen could have come from a similar type of string. This dentalium was 37 mm. long.

Haliotis Ornaments

Twenty-one abalone ornaments are in the collections from this site. Sixteen of these have been identified as H. rufescens and the other five are thin slices of shell which are impossible to identify.

Ten of the specimens are of Gifford's (1947) Type Z2a. They are oblong in shape with a perforation at one end. The length of these specimens runs from 42 to 81 mm. with an average of 59.8 mm. Their width runs from 14 to 28 mm. with an average of 18.2 mm. (See Pl. 1a) These specimens all occur very deep within the site. They were undoubtedly used in the earlier part of the occupation of the site.

There are three of Gifford's (1947) type S5a. These are small rectangular pieces of shell from which all original surfaces have been removed. They are perforated at one end. The two whole pieces from these collections are 29 and 30 mm. long. Widths of the three specimens are 7 mm. (2 specimens) and 18 mm. (See Pl. 1d.)

Two of the abalone ornaments from this site correspond to Gifford's (1947) type S2a. These pieces are rectangular and have a single perforation on the short side.

Two of the specimens fit into Gifford's (1947) type U2a. These are triangular and have a single perforation near the base. They are 20 and 34 mm. high and 12 and 16 mm. wide, at the bases.

Finally, there are four ornaments of various shapes. The first is in Gifford's type AB6. It is in the shape of a semi-circle and has two perforations at one corner. It is 35 mm. long and 25 mm. wide. (See Pl. 1c.) The second ornament is in Gifford's type S5. It is square and has one central perforation. This specimen is 16 mm. on a side. (See Pl. 1b.) The third one of these variously shaped ornaments is in Gifford's type K2a. It is disc-shaped, with one central perforation. It has a diameter of 25 mm. Finally, there is one specimen which falls into Gifford's type AF4a. This is shaped like a tear-drop and has one perforation near the apex. It is 42 mm. long and 19 mm. wide.

While the distribution of the shell bead and ornament types is in itself roughly suggestive of their age, the following comparative information is offered:

The clam shell disc beads are clearly from the Late Horizon in the Central Valley (see Lillard, Heizer, and Fenenga, 1939, Pl. 28h, i). The large Olivella beads are Lillard, Heizer, and Fenenga's type 1b (Ibid., Pl. 28a), also a Late Horizon type.

Of the Haliotis ornaments, only type Z2a seems similar to any types from the Central Valley. This is most like Lillard, Heizer, and Fenenga's type B1 (Ibid., p. 15), which occurs in the Central Valley in Middle Horizon sites, specifically from Sac-60, 66, and 99. Type B1 occurs occasionally, but in a slightly different form, in Late Horizon sites.

MATERIAL OF CAUCASIAN MANUFACTURE

Objects that have come to the site during historic times are glass trade beads, glass fragments, and one piece of metal. Of 22 pieces, all but 4 were recovered in the top 12 inches of the deposit. This means that the site was definitely occupied in prehistoric times. It also means that the stratigraphy of the site has not been upset by excessive burrowing and digging. This latter is important because the homogeneity of most of the aboriginal artifact types might lead one to the conclusion that the site had been too stirred up to show any stratigraphy.

Trade Beads

There has been a total of 15 trade beads recovered from the site. Six of these glass beads have an opaque white exterior and a clear green interior. They are 4 mm. in diameter. These are comparable to Heizer's type 17a (1953, p. 310) and to Meighan's type 99 (Meighan's classification notes and specimens are deposited in the University of California Museum of Anthropology). Two of the specimens are of clear blue glass, octagonal and faceted. These are 8 mm. in diameter. This is Heizer's type 4 and Meighan's type 145. Two more specimens are tubular pieces of white porcelain which have a diameter of 4 mm. These are like Heizer's type 18 and Meighan's type 194. Three other glass beads are tubular in shape, opaque, and blue in color. They are 4 (2 specimens) and 7 mm. in diameter. Finally, there was one tubular glass bead with a diameter of 6 mm., of a clear green color, which was found with a dentalia bead fitting into it as if they had been strung together.

Glass Fragments

Eight glass fragments have been recovered from the site, 5 of which are amber in color, 2 green, and 1 clear. One of the green pieces is a wall fragment from an octagonal bottle. One of the amber pieces is a neck fragment, another the center portion of a flat, "inside-swelling" or convex bottom of a bottle. Two other amber pieces have flaking along one edge.

Stratigraphic level (in inches) of Occurrence:	0-6	6-12	12-18	18-24	24-30	30-36	36-43	42-48	48-54	54-60	60-66	Total
Projectile Points:	74	38	23	14	24	17	18	9	8	3	3	231
Type 1	21	10	5	3	6	8	3	3	1	1	1	62
Type 2	17	9	5	4	8	5	7	5	3	1	1	65
Type 3	20	9	8	4	5	2	3	-	1	-	1	53
Type 4	11	6	4	2	3	2	4	1	2	-	-	35
Type 5	3	2	-	1	-	-	-	-	1	1	-	8
Type 6	2	2	1	-	2	-	1	-	-	-	-	8
Point Fragments	29	8	12	18	8	14	7	-	2	-	-	98
Knives:	10	2	2	3	4	2	3	2	-	-	-	28
Type 1	2	1	-	1	3	1	1	1	-	-	-	10
Type 2	8	1	2	2	1	1	2	1	-	-	-	18
Scrapers:	40	12	5	9	9	7	4	4	4	2	-	97
Button	17	7	4	5	8	1	1	2	3	2	-	50
Side	14	3	1	3	-	3	1	1	-	-	-	26
Keeled	9	2	-	1	1	3	2	1	1	-	-	21
Blades	-	-	-	-	-	1	1	-	-	1	-	3
Pecking Stones	3	1	-	1	-	-	-	-	-	-	-	4
Paint Anvils	-	-	-	1	-	-	-	-	1	-	-	2

Table 2. Occurrence of Artifacts*

*Not included in this table are specimens with: (a) burial association
(b) no location data

	0-6	6-12	12-18	18-24	24-30	30-36	36-42	42-48	48-54	54-60	60-66	Total
Magnesite Beads	-	-	1	-	-	-	-	-	-	-	-	1
Incised Stone	-	-	-	-	-	1	-	-	-	-	-	1
Stone Flaker	-	-	-	-	-	-	-	-	1	-	-	1
Manos	-	1	-	2	1	2	3	6	2	-	-	17
Pestles	1	2	1	1	1	-	2	3	2	-	-	13
Metates	2	-	4	1	4	5	10	9	1	-	-	36
Mortars	6	1	3	7	7	6	8	10	-	-	-	48
Bone Awls	6	3	3	1	-	3	2	-	1	1	-	20
Flakers	3	2	2	2	1	3	-	-	1	-	-	14
Bone Fishooks	1	-	-	1	-	-	-	-	-	-	-	2
Bone Needles	-	-	-	1	-	1	-	-	-	-	-	2
Bone Scrapers	2	-	-	-	-	-	-	-	-	-	-	2
Bone Pendants	-	-	-	1	2	1	-	-	-	-	-	4
Shell Beads:	38	12	17	13	10	10	3	4	1	1	-	109
Clam Disc Beads	35	8	14	13	7	7	1	1	1	-	-	87
Whole Olivella	3	4	3	-	2	3	2	3	-	1	-	21
Olivella Disc	-	-	-	-	1	-	-	-	-	-	-	1
Dentalium	-	-	-	-	1	-	-	-	-	-	-	1

Table 2 (Continued)

	0-6	6-12	12-18	18-24	24-30	30-36	36-42	42-48	48-54	54-60	60-66	Total
Haliotis Ornaments:	1	1	1	3	4	1	3	1	-	2	-	17
Type Z2a	-	-	-	3	1	-	3	-	-	2	-	9
Type S5a	-	1	-	-	1	-	-	-	-	-	-	2
Type S2a	-	-	1	-	1	-	-	-	-	-	-	2
Type U2a	-	-	-	-	-	-	-	-	1	-	-	1
Various Types	1	-	-	-	1	1	-	-	-	-	-	3
Historic Material:	16	1	1	1	1	-	1	-	-	-	-	21
Glass Beads	10	1	-	1	1	-	-	-	-	-	-	13
Glass Fragments	6	-	1	-	-	-	1	-	-	-	-	8

Table 2 (Continued)

BURIAL COMPLEX

A summary of the burial data is given in Table 3. The orientation of the bodies is random, with all directions but south represented. The skeletons were found always in flexure, usually tight, but not consistently so. Skeletons lay on either side, on the back, or on the face. Grave offerings occurred with both children or adults. Offerings usually took the form of beads; in three cases evidences of necklaces were present. Cairns occurred on most of the burials outside the "congested" area, which was in and around pit C-8. These cairns were simply large rocks including some mortars and metates which have been piled over the body. The rocks were not carefully placed, hence it may be assumed that they were placed there simply to discourage animals from digging out the bodies.

The question of whether this cave is the site of the massacre which is mentioned by Waterman (1918, p. 59) may be illuminated by examining the position and location of some of the burials. First it is interesting to note that only one of the skeletons (out of 30 burials) is definitely identifiable as being male. Then we may note that there are two groups of children, with a total of six individuals, which were buried in such a way that no position and very little articulation could be determined. The first of these groups consists of burials 5, 6, 10, and 19, with which were found considerable numbers of grave offerings, but which appear to have been simply dumped into the ground. Burials 12 and 13 show similar treatment. This is approximately the treatment one would expect if the bodies were buried hurriedly when any survivors of a massacre, for example, wanted to leave the spot. Also, it might be suggested that the single male burial was an old interment which had been disturbed by the child burials, so that it could not represent a person who had been among the group massacred. This is no proof that the massacre occurred at this site or even that it occurred at all, but it does indicate that these individuals were not buried with the normal procedure as is represented in other parts of the site.

That there was a great deal of disturbance in this site even in normal times cannot be denied, however, for even the burials which had rocks placed over them are in many cases much disturbed.

ROCK FEATURES

Four clusters of rocks were uncovered in the course of the digging which were thought to be significant enough to be classified as features. This is aside from the rocks which were piled over burials.

Feature 1. This was a group of rocks piled in close contact with each other; it included 3 mortars and 9 metates in the cluster. It filled the greater part of the area of Pits C-7 and C-8 and its greatest depth was 45 inches. It had an oblong outline, was 9 feet in length, 3-1/2 feet in

width and 2 feet in thickness. The rocks appear to have been piled in a purely random fashion with no attempt at structuring. The fill in this feature is a grey, ashy midden which is found only in that part of the site in and around the feature itself. There was no great amount of charcoal included in the feature to indicate that it had been used in connection with burning.

Feature 2. This was a group of rocks similar to those in Feature 1; it included 2 mortars and 3 metates. It occurred in Pit C-9 and its maximum depth was 57 inches. It was roughly circular in outline with a diameter of 3 feet and a vertical thickness of 30 inches. The fill in this case is the normal dark brown midden of the site. This feature almost connects with Feature 1, so it was very likely an extension of it. If this is the case, then the fill in Feature 1 has no direct connection with the latter, but is simply the normal midden in that section of the site.

Feature 3. This was another pile of rocks of the same order as the above two features. There was one mortar included in this group. The fill here is the same as in Feature 1, although the midden is not so "fluffy" as that associated with Feature 1. This feature was located in Pit A-7 at a depth of 36 inches. It was 24 inches long, 22 inches wide, and had 25 inches of vertical thickness. There was a fire pit and ash lens located 5 inches above this group of stones. (See Pl. 3f.)

Feature 4. This was a pile of rock similar to the other features. It occurred in Pit A-7 at a depth of 32 inches. It was circular in outline, with a diameter of 23 inches and a vertical thickness of 13 inches. The fill in this feature is like that in Feature 3.

The above descriptions are of little or no help in discovering the functions of these groups of rocks. They are offered only as records of an interesting phenomenon, the explanation of which probably lies in the distant future.

UNMODIFIED MAMMAL BONE

List of Species

Lagomorpha

Lepus californicus -- jack rabbit
Sylvilagus sp. -- cottontail

Rodentia

Citellus beecheyi -- ground squirrel
Thomomys bottae -- gopher
Neotoma cinerea -- wood rat
Erethizon dorsatum -- porcupine

No.	Sex	Age*	Orient.	Depth	Pit	Position	Associated artifacts and other data.
1	-	-	-	42"	B-5	--------	Isolated skull.
2	F	A	NW	40"	C-5	Tight flex on back	Many rocks in area. Probably had cairn. Undisturbed.
3	?	C	NW	15"	C-6	Loose flex on rt. side	Rocks cover upper body. Lower body missing, probably disturbed by Bur. 2.
4	?	C	NE	9"	C-7	Tight flex on face	1 trade bead (Heizer Type 4), 1 abalone ornament Type S5a, 38 clam shell disc beads. No cairn. Undisturbed.
5 & 6	? ?	C C	- -	14" 14"	C-8 C-8	------- -------	1 whole olivella bead, 1 whole abalone shell, 99 clam shell disc beads. Both skeletons were in one grave. Both were totally disturbed.
7	-	-	-	33"	C-7	-------	Isolated skull.
8	-	-	-	---	---	-------	The number 8 was not assigned to any burial.
9	?	A	W	60"	C-5	Loose flex (?)	Rocks covered the lower part of the body.
10	?	C	SW	9"	D-9	Tight flex on face (?)	52 clam shell disc beads. No cairn. May be part of Bur. 5 and 6.
11	-	-	-	16"	D-10	-------	Isolated skull.
12 & 13	- -	C C	- -	17" 17"	E-7 E-7	-------	Two young children disturbed before they were skeletons. Some articulation but no position remains. 12 pine nut beads, 35 clam shell disc beads, 14 whole olivella beads, fragment of Z twist cordage.
14	F	A	-	14"	D-8	-------	Badly disturbed. May be part of Bur. 18, having been disturbed by Bur. 15

Table 3. Burial Data

*F - female C - child
M - male A - adult

No.	Sex	Age	Orient.	Depth	Pit	Position	Associated artifacts and other data
15	F	A	W	28"	D-8	Tight flex on back.	42 clam shell disc beads in necklace. Pestle frag. (?). Some rocks over it, may have been cairn. May have disturbed Bur. 14, certainly disturbed Bur. 18.
16	?	A	-	6"	D-8	-------	Isolated leg.
17	?	A	SSW	26"	D-8	Tight flex (?) on rt. side.	Has a good cairn (Feat. 2). Badly disturbed, most bones missing.
18	?	A	-	26"	D-8	-------	Most of the bones are missing. Apparently disturbed by Bur. 15. May be part of Bur. 14.
19	F	A	NW	10"	D-8	On back.	Legs missing so cannot tell about flexure. Pine bark beneath skeleton. No cairn.
20	M	A	-	13"	D-8	------	This burial was entirely disturbed.
21		A	-	31"	D-8	On back.	Very little articulation.
22	?	A	SW(?)	43"	D-8	Tight flex on back(?).	Only one leg and the skull remained so position is unsure. One large pestle, broken in half, was placed beside the skull. Feat. 6 may have been a cairn for this burial.
23	?	A	NE	28"	A-7	Tight flex on left side	A good cairn was over the pelvis yet the skeleton was badly disturbed.
24	F	A	SE	25"	B-7	Tight flex on face	Several rocks over skeleton, probably cairn.
25	?	A	SW	12"	D-6	Tight flex on left side	No cairn.
26	?	C	?	37"	Z-7	-------	Too badly disturbed to tell position or orientation even though there was a cairn over it.

Table 3 (Continued)

No.	Sex	Age	Orient.	Depth	Pit	Position	Associated artifacts and other data
27	?	C	?	30"	Z-7	-------	Too badly disturbed to tell position. Under cairn.
28	?	A	NE	31"	D-8	Tight flex on rt. side	10 square cut olivella beads strung with 17 whole olivella beads over the ribs.
29	F (?)	A	N	23"	Y-7	Loose flex on left side	Ash pit at south end of burial. No cairn.
30	?	A	-	29"	D-8	-------	No cairn. Too badly disturbed to tell position or orientation.

Table 3 (Continued)

UNMODIFIED MAMMAL BONE (Continued)

List of Species

Carnivora

Canis latrans -- coyote
Mephitis mephitis -- striped skunk
Felis (Lynx) rufus -- bobcat

Artiodactyla

Cervus roosveltii -- elk
Odocoileus cf. Columbiana -- deer

The only bone that occurred in any quantity was that of the artiodactyls. There were no bones from juvenile artiodactyls taken from the site. Since deer in this region are always born in June or July, this probably means that the Indians did not live at the site during the summer or fall. The deer usually leave this area early in the spring -- perhaps in April, and it is possible that the Indians followed them up into the mountains. Another indication of the seasonal habits of the people is the dearth of fish bone in the site. The site is only a mile from Mill Creek, which is today the best salmon stream in the state (according to Mr. Jack Hiehle of

the State Fish and Game Service). This might mean that they were not living at the site in August when the salmon go up the rivers and streams to spawn. According to Dixon, however, the bones of the spring salmon were always eaten and never left about (Sapir and Spier, 1943, p. 252) and this might also account for the lack of salmon bone.

On the evidence of the deer bone, it is possible to say that the site was probably used only for a winter camp, the occupants going up higher in the mountains with the deer in the springtime. They would probably remain in the higher mountains to collect pine nuts in the fall before returning to the lower altitudes when the deer came down at the beginning of winter. It is worthwhile to note that the area around the site is today used by the Fish and Game Service as a winter deer range.

STATISTICAL ANALYSIS

In order to test the significance of depth differences of various artifact types, the following method was used. The vertical distribution of each artifact type except projectile points was taken and compared with the mean depth for the total configuration of artifacts. In the case of the projectile points, each type was compared to the total assemblage of points rather than to the total assemblage of artifacts. By doing this it was possible to determine the depth of each point type relative only to other point types. It would probably have been desirable to treat the other artifact types in a like manner but it did not seem possible to consider any of them as a sub-class of any group other than the total artifact assemblage.

The chi-square test for goodness of fit was used for the comparison (see Fisher, 1950, p. 78). Thus if m is the number expected in any class and $m + x$ is the number observed in any class, then chi-square equals the sum of the ratios x^2/m.

For example, the mean depth for all points is 13 inches. Thus we would expect any point type which is neither "early" nor "late" to occur in equal numbers above and below this mean. Within point type I there are 62 specimens; therefore, we would expect 31 to fall on either side of the mean. It is observed, however, in table 4 that 30 fall above and 32 fall below this mean.

	below 13"	above 13"	Total
No. observed ($m + x$)	32	30	62
No expected (m)	31	31	62
Ratio (x^2/m)	.0312	.0312	.0624 (= chi-square)

Table 4. Calculation of Chi-square

Reading off the table of probabilities for chi-square (Fisher, 1950, p. 112) it is seen that the figure .0624 has a probability around .8. This means that if a sample of 62 points (the number of points comprising type I) were taken at random from the entire assemblage of points it would be at least this far (i.e. difference between m + x and m) from its expected distribution eight times out of ten.

Thus probability should be less than .2 before any significance is attached to the observed deviation. In biological experiments it is usual to require that the probability be less than .05 before concluding that the deviation is significant. It is felt that in this case it is necessary to accept .2 as the level of significance, for otherwise we would need a prohibitively large sample to verify the indications of stratigraphy. Ordinarily, when .2 is taken as the level of significance the conclusions derived therefrom must be used with great care. In the present application, however, the sequence verified by the statistical analysis is in accord with previously known Californian sequences in assigning the older types to the lower levels and the more recent types to the higher levels.

Table 5 below shows probabilities associated with each artifact type. It will be observed that point type II, historic materials, Haliotis ornaments (type Z2a), and side scrapers are the only types showing significant deviation. Point type II and Haliotis ornaments are relatively deep while historic materials and side scrapers are relatively shallow.

Artifact Type	Probability
Point Type 1	between .90 and .80
Point Type 2	between .20 and .10
Point Type 3	between .30 and .20
Point Type 4	between .90 and .80
Point Type 5	between .50 and .30
Point Type 6	1.0
Obsidian Points	between .50 and .30
Basalt Points	1.0
Chert Points	between .70 and .50
Button Scrapers	between .80 and .70
Bone and Antler Flakers	1.0
Bone Awls	between .50 and .30
Historic Material	less than .01
Haliotis Ornaments (Z2a)	less than .01
Whole Olivella Beads	between .80 and .90

Table 5. Probabilities Associated with Artifact Types, Site Teh-1.

Artifact Type	Probability
Triangular Knives	between .30 and .20
Blade Fragment Knives	between .50 and .30
Side Scrapers	between .10 and .05
Keeled Scrapers	between .90 and .80

Table 5 (Continued)

SUMMARY AND CONCLUSIONS

The Kingsley Cave site is in the California foothills to the east of Red Bluff. It seems to have been used as a winter camp by peoples who went higher into the mountains in the spring or summer. The economy of these people was based in part on the deer which made the surrounding territory their winter range and in part upon some kind of seed which was ground in mortars and metates -- probably acorns, and pine nuts. They may also have subsisted partly on fish, although there was no evidence of this in the site. The site was historic in part and might have been the cave in which about 30 Indians were massacred by the early white settlers.

In Fig. 8 is given the cultural sequence as it appears from the excavation thus far performed. These data indicate that manos and metates were used with greater frequency than mortars and pestles in the lower levels of the site. This interpretation is complicated by the presence of a large number of mortars and metates concentrated in rock features and burial cairns, but seems otherwise to be reasonable. Other artifact types which occur with relatively great frequency at depth (below 36", for example) are type Z2a Haliotis ornaments and type 2 projectile points. Objects occurring generally above the 30" level in the midden are side scrapers, clam shell disc beads, and items of historic manufacture.

All of the artifact types described here correspond with types already known from Northern California. Projectile point type 1 from Kingsley Cave occurs in sites which can be equated in time with at least the Middle Horizon of Central California. Projectile point, type 2, although occurring in some later prehistoric sites in Siskiyou and Shasta counties, on the basis of its occurrence at Borax Lake probably should be considered a type almost as old as type 1. Haliotis ornament type Z2a occurs in the Central California Middle Horizon. Clam shell disc beads found at Kingsley Cave are of the type utilized to mark Phase II of the Late Horizon in Central California. Projectile point types 3, 5, and 6 are clearly of late

prehistoric or early historic affiliation, i.e., not more than a few hundred years old. The combination of hopper mortars and metates was used by the Yana in historic times but it is not known how far back in time this may be projected.

Two alternative interpretations may be offered to explain the occurrence of late types with those of greater antiquity. One is that the occupation deposit of the site may represent but a brief span of time, with the relatively older artifact types being mere survivals in this area. This would explain how the "late" forms such as projectile point types 3 and 5 occur at the same levels as do artifacts identified as precedent forms on the basis of their occurrence elsewhere in actual time sequences.

The other interpretation is that the site was occupied first by a group using some of the older artifact types such as projectile point types 1 and 2 and Haliotis ornament type Z2a. Subsequently people from the Central Valley moved in, probably around the time of the earliest appearance of Caucasians in the latter area. The valley people brought with them the Late Horizon type artifacts, and because of intensive use of the site as a cemetery these artifacts were distributed throughout certain parts of the midden. Thus the appearance of homogeneity of the artifact assemblage would be emphasized, because the greater part of our excavation was in the cemetery area.

The second explanation (above) is probably the more valid of the two. In either case, the predominant influence appears to be from the west, (as is seen, for example, in the occurrence in the probable early occupation of Haliotis ornaments, and in the later, of clam shell disc beads and projectile point type 3). Presumably the latter artifacts were accompanied by others; however, since the archaeology to the east of Kingsley Cave is imperfectly known, it is not certain that the western influence is in reality so strong as it appears to be.

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EXPLANATION OF PLATES

PLATE 1

a. UCMA 1-133375. Type Z2a Haliotis ornament. Pit D-5, 39" d.
b. UCMA 1-133377. Type S5 Haliotis ornament. Pit C-9, 0-6" d.
c. UCMA 1-133376. Type AB6 Haliotis ornament. Pit C-9, 0-6" d.
d. UCMA 1-133374. Type S5a Haliotis ornament. Pit C-8, 6" d.
e. UCMA 1-133368. Gorge fish-hook of bone. Pit C-8, 4" d.
f. UCMA 1-133371. Bone pendant. Pit C-5, 34" d.
g. UCMA 1-133372. Antler flaker fragment. Pit C-5, 48-54" d.
h. UCMA 1-133362. Blade-fragment knife of basalt. Pit C-6, 0" d.
i. UCMA 1-133361. Blade-fragment knife of basalt. Pit A-5, 63" d.
j. UCMA 1-133363. Button scraper of chert. Pit A-5, 58" d.
k. UCMA 1-133373. Bone bead. Pit A-5, 6" d.
l. UCMA 1-133360. Keeled scraper of basalt. Pit A-5, 10" d.
m. UCMA 1-133364. Button scraper of obsidian. Pit A-5, 40" d.
n. UCMA 1-333365. Triangular knife of obsidian. No location.
o. UCMA 1-133367. Magnesite bead. Bur. 5.
p. UCMA 1-133366. Stone flaker. Pit C-8, 32" d.
q. UCMA 1-133365. Incised slate object. Pit C-7, 17" d.
r. UCMA 1-133369. Bone awl. Pit C-8, 6-12" d.
s. UCMA 1-133370. Bone flaker. Pit C-5, 23" d.

PLATE 2

a. UCMA 1-133344. Type 2 basalt point. Pit A-5, 30" d.
b. UCMA 1-133345. Type 2 basalt point. Pit C-5, 24" d.
c. UCMA 1-133346. Type 2 basalt point. Pit A-5, 60-66" d.
d. UCMA 1-133356. Type 3 chert point. Pit C-8, 39" d.
e. UCMA 1-133354. Type 5 chert point. Pit C-9, 6-12" d.
f. UCMA 1-133353. Type 5 basalt point. Pit C-8, 0-6" d.
g. UCMA 1-133348. Type 2 basalt point. Pit C-6, 19" d.
h. UCMA 1-133349. Type 2 quartzite point. Pit C-7, 30" d.
i. UCMA 1-133347. Type 2 basalt point. Pit C-5, 35" d.
j. UCMA 1-133355. Unique basalt point. Pit C-8, 20" d.
k. UCMA 1-133351. Type 1 chert point. Pit C-5, 36" d.
l. UCMA 1-133352. Type 1 obsidian point. Pit C-9, 0-6" d.
m. UCMA 1-133350. Type 1 basalt point. Pit C-6, 32" d.
n. UCMA 1-133342. Type 3 chert point. Pit C-7, 0-6" d.
o. UCMA 1-133341. Type 3 obsidian point. Pit C-7, 0-6" d.
p. UCMA 1-133343. Type 3 basalt point. Pit C-8, 20" d.
q. UCMA 1-133359. Type 4 obsidian point. Pit C-6, 35" d.
r. UCMA 1-133358. Type 4 basalt point. Pit A-5, 40" d.
s. UCMA 1-133357. Type 4 chert point. Pit B-5, 50" d.
t. UCMA 1-133379. Basalt pestle (square in cross section). Pit C-8, 2"d.
u. UCMA 1-133378. Basalt mano. Pit A-5, 37" d.
v. Field No. 459. Basalt hopper mortar. Pit C-6, 24" d.
w. Field No. 465. Basalt metate. Surface.
x. Field No. 444. Basalt hopper mortar. Surface.

PLATE 3

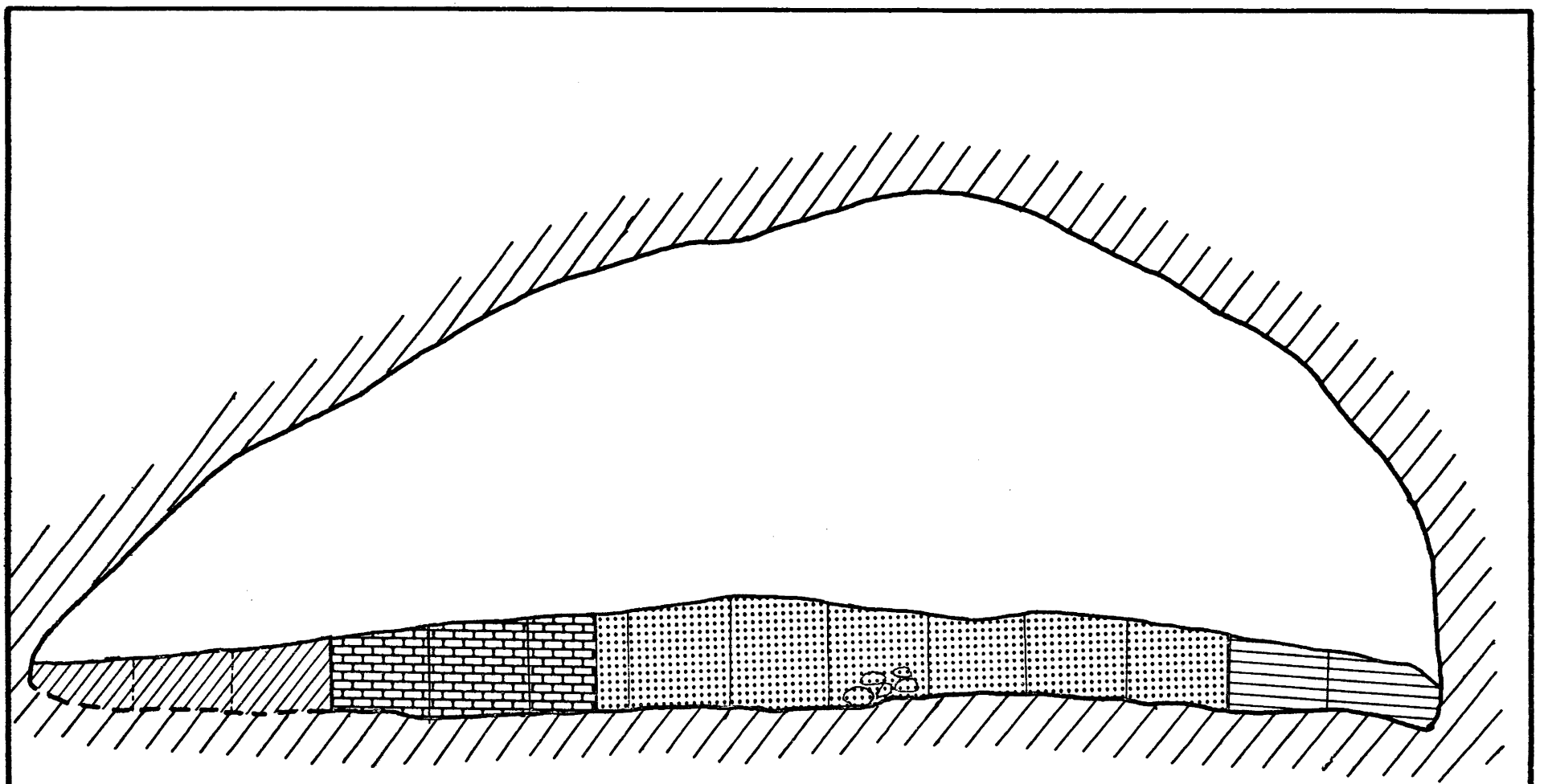
a. Burial 15 with pseudo-cairn still remaining over skeleton.
b. Burial 15 with rocks removed from skeleton.
c. Burial 23 with cairn over skeleton. The placement of the rocks indicates that they were put on the burial deliberately.
d. Burial 23 with cairn removed.
e. Burial 29 showing loose flexure. Note ash pit to rear of skeleton.
f. Feature 3. The unstructured nature of the rock features can be seen here.

PLATE 4

a. View of Kingsley Cove and Mill Creek Canyon looking toward the south, taken from near Kingsley Cave.

b. View of Kingsley Cave taken from the south and looking north.

c. View of the excavation at Kingsley Cave. The rocks piled up in the background at the rear of the cave are the mortars and metates which were left at the site.



Undug Midden

Dark Brown Midden

Grey Ashy Midden

Brown Compact Midden

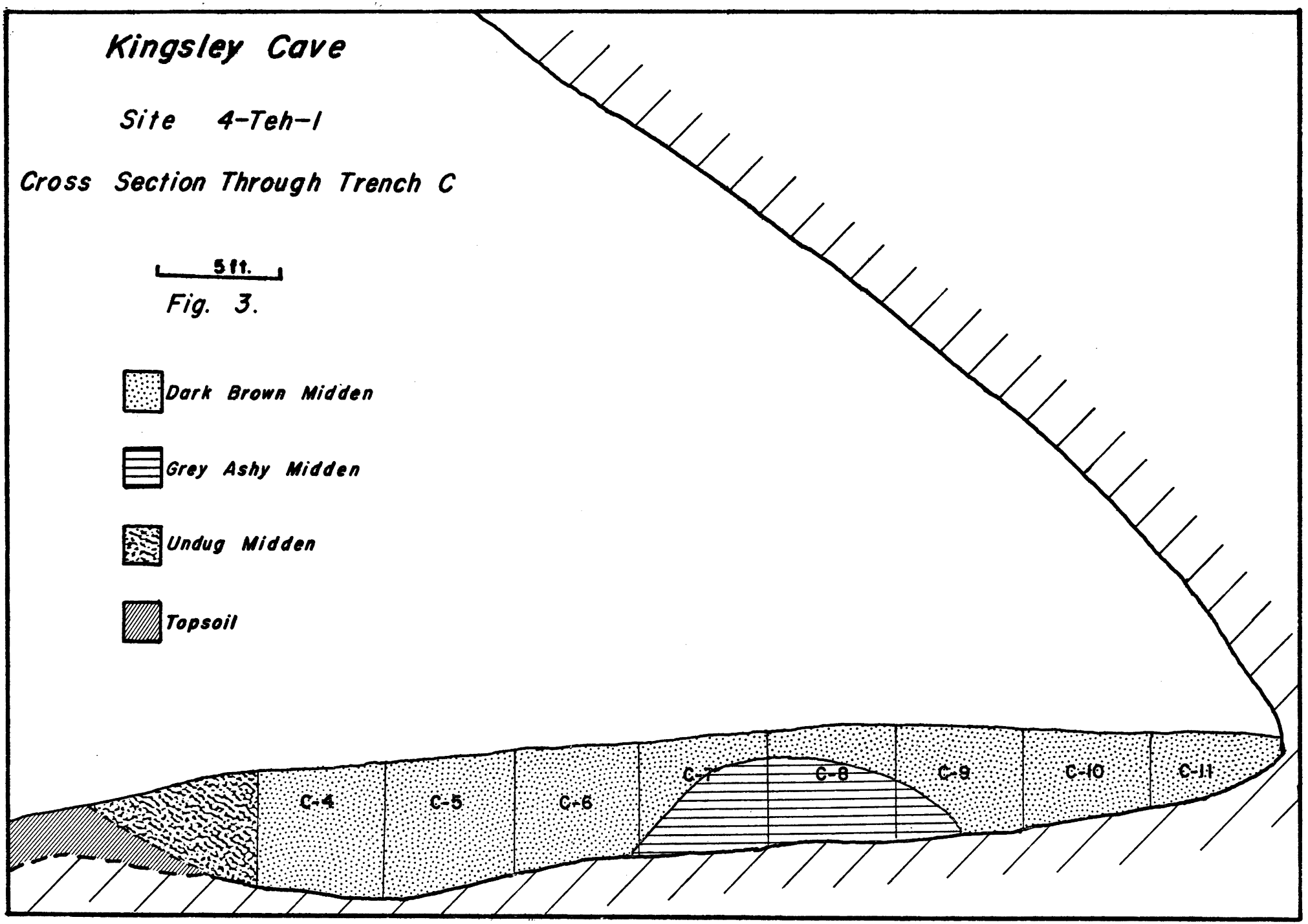
Kingsley Cave

Site 4-Teh-1

CROSS SECTION THROUGH TRENCH 7

10'

Fig. 2


Kingsley Cave
Site 4-Teh-1
Cross Section Through Trench C
5 ft.
Fig. 3.
Dark Brown Midden
Grey Ashy Midden
Undug Midden
Topsoil
C-4
C-5
C-6
C-7
C-8
C-9
C-10
C-11

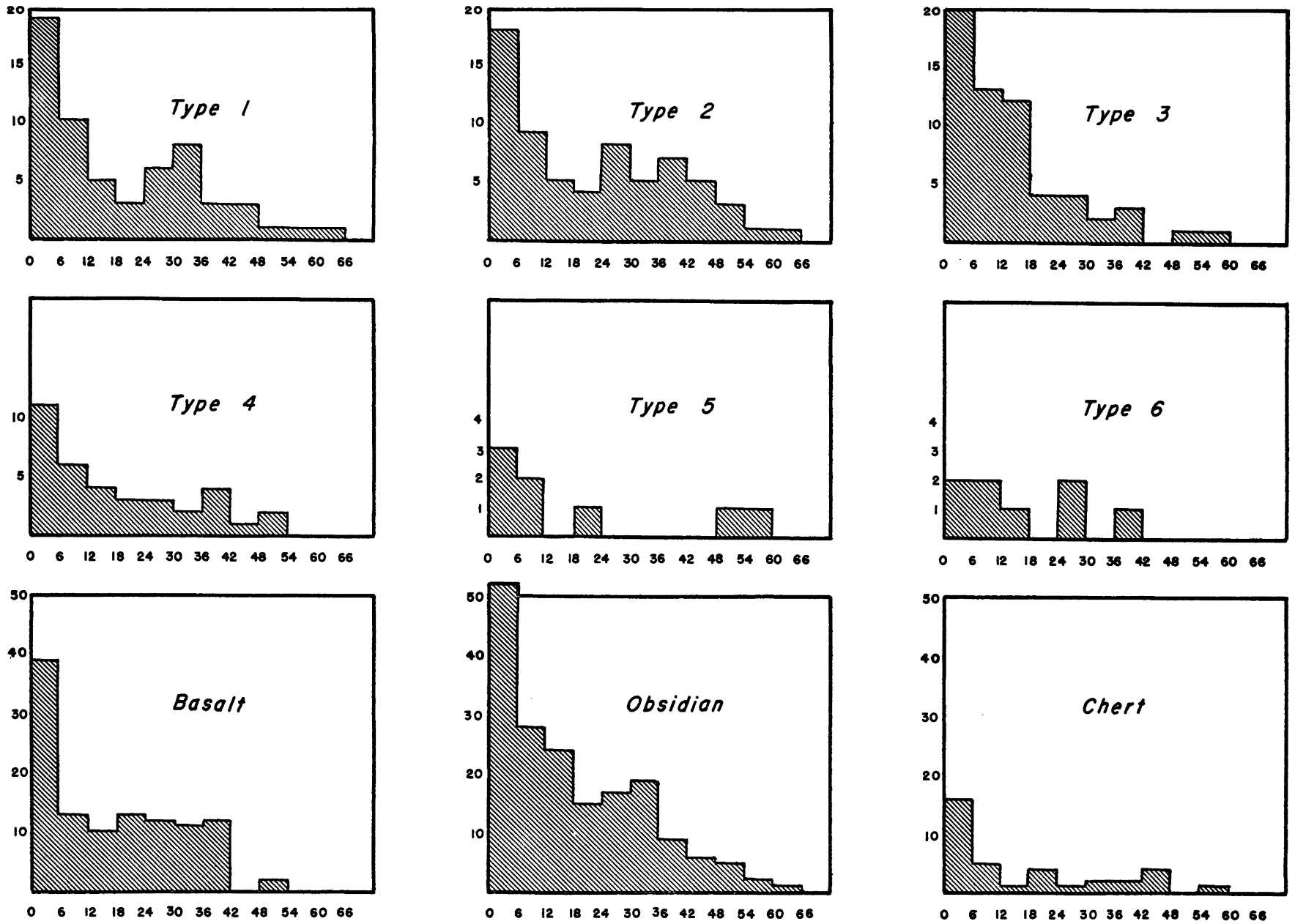


Fig. 4. Depth Distribution of Point Types & Materials.

Frequency on left. Depth below in 6 inch units.

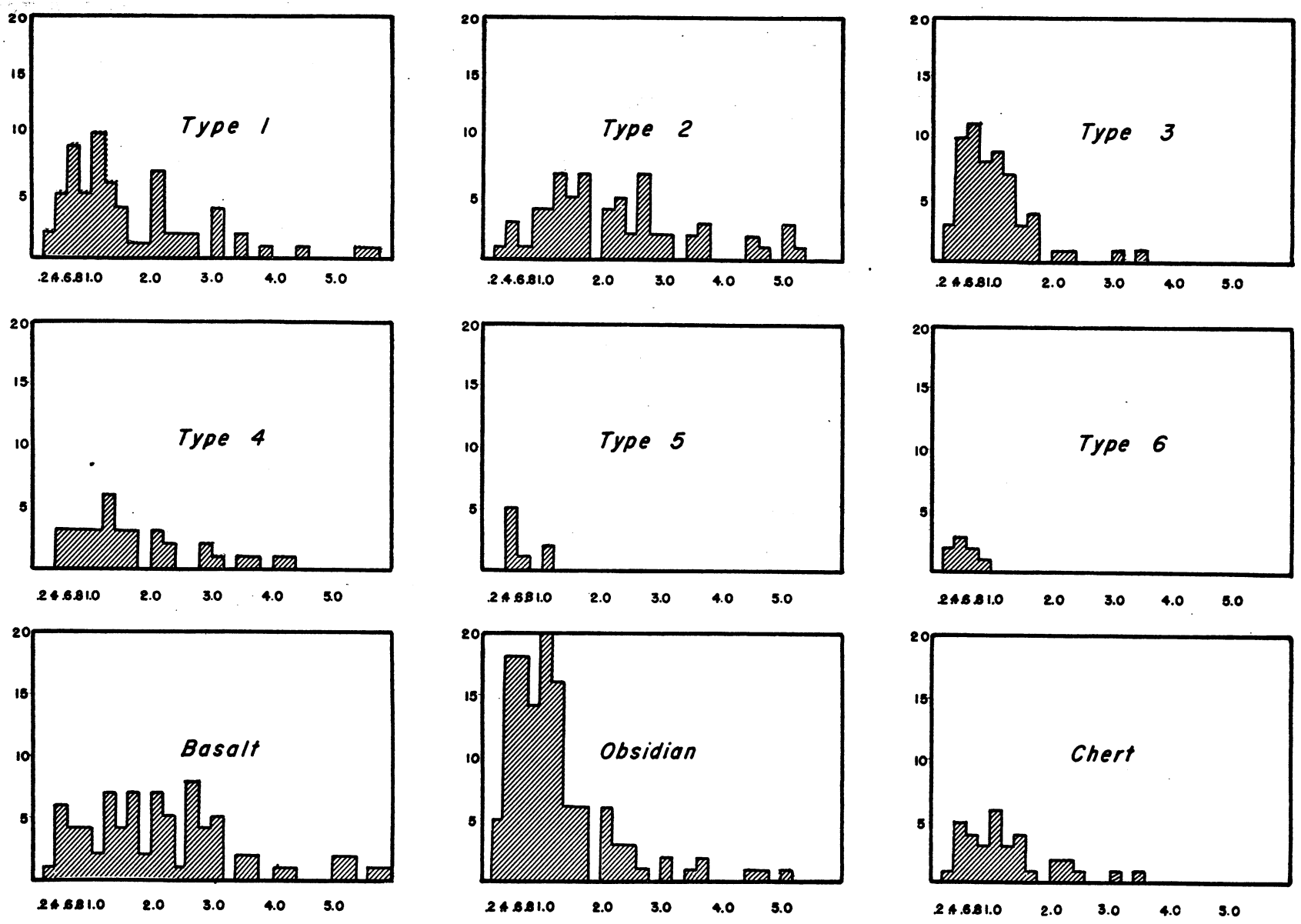


Fig. 5. Weight Distribution of Points & Materials.

Frequency on left. Weight below in 0.2 grm. units.

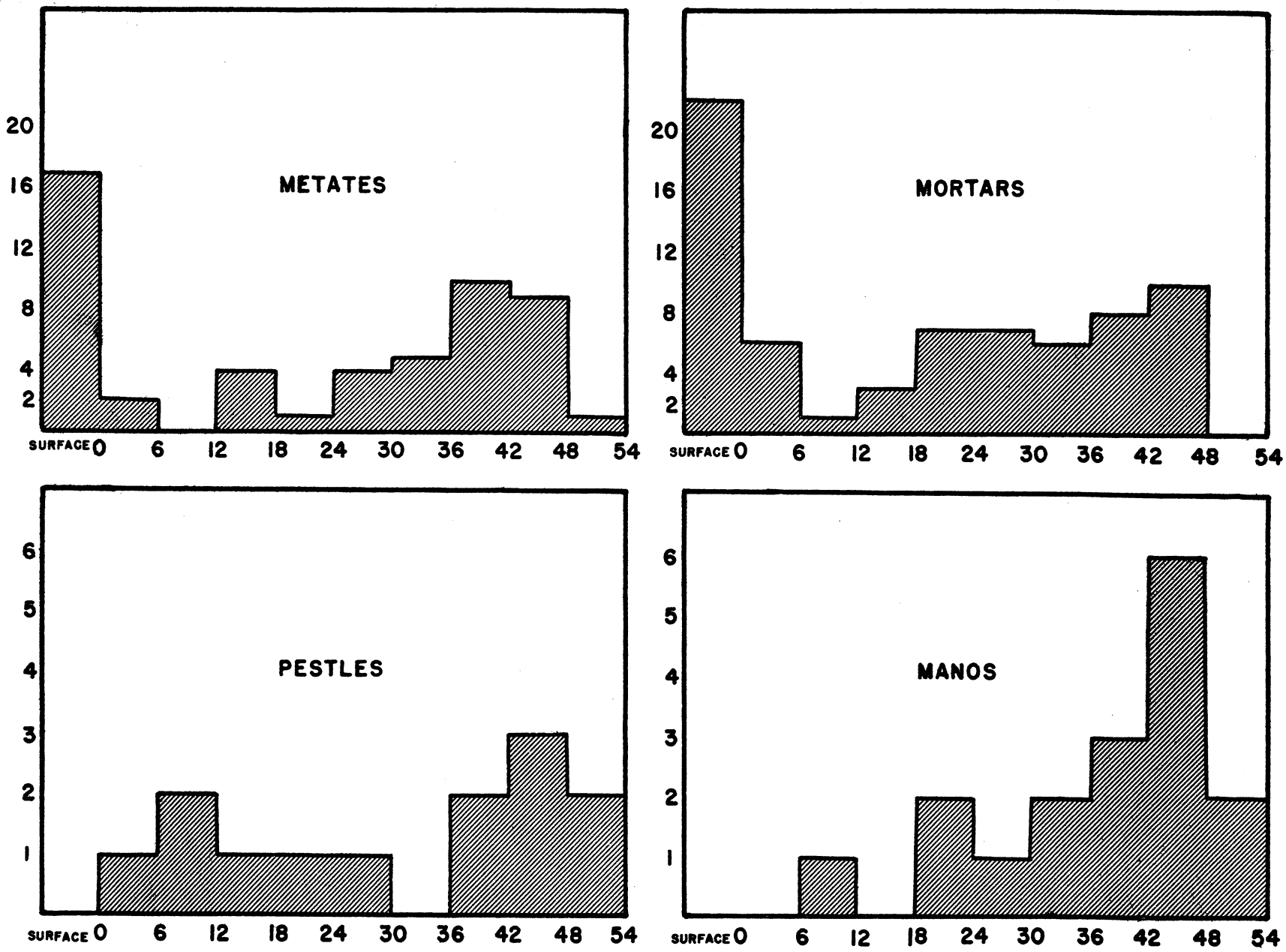
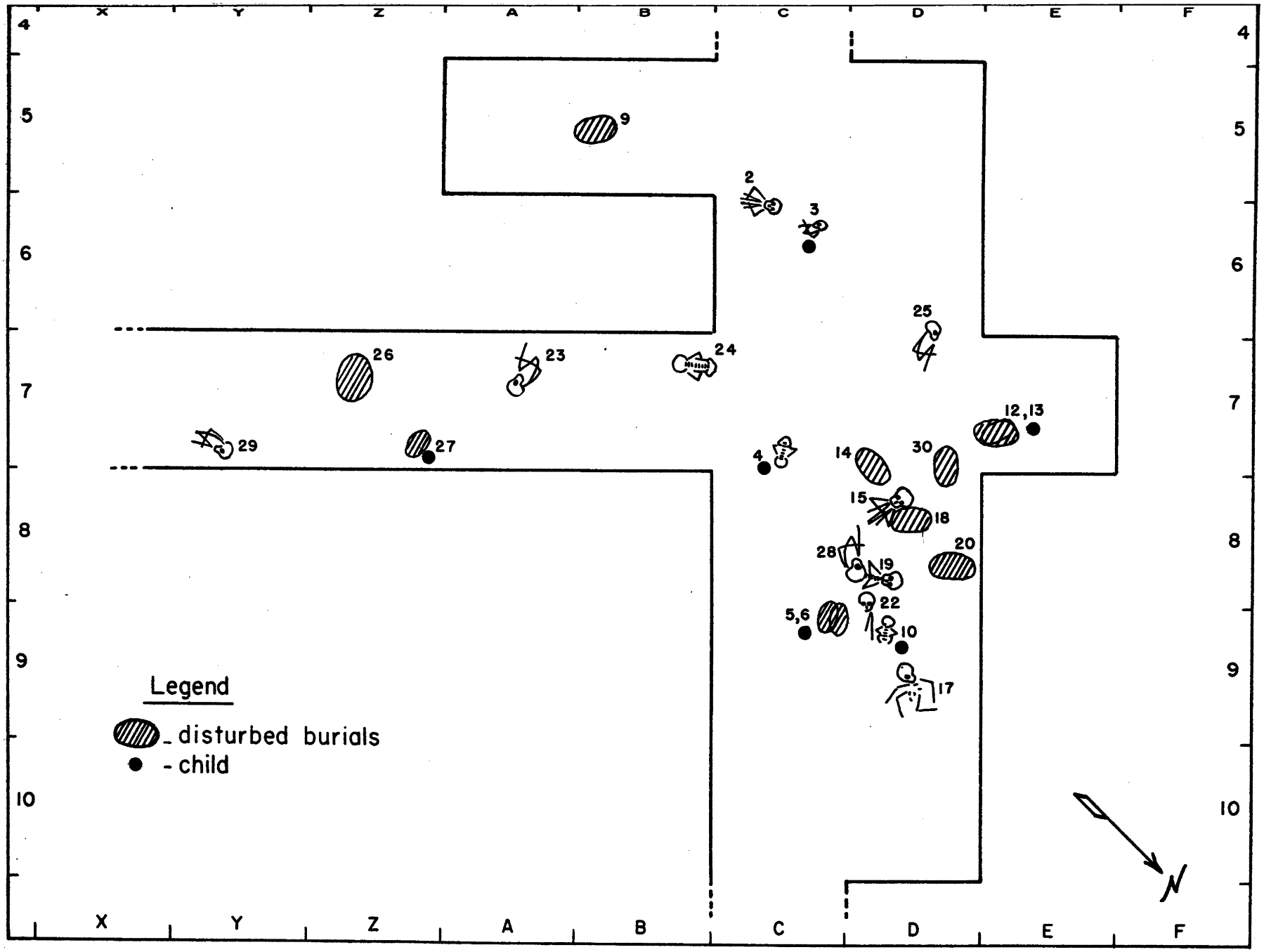
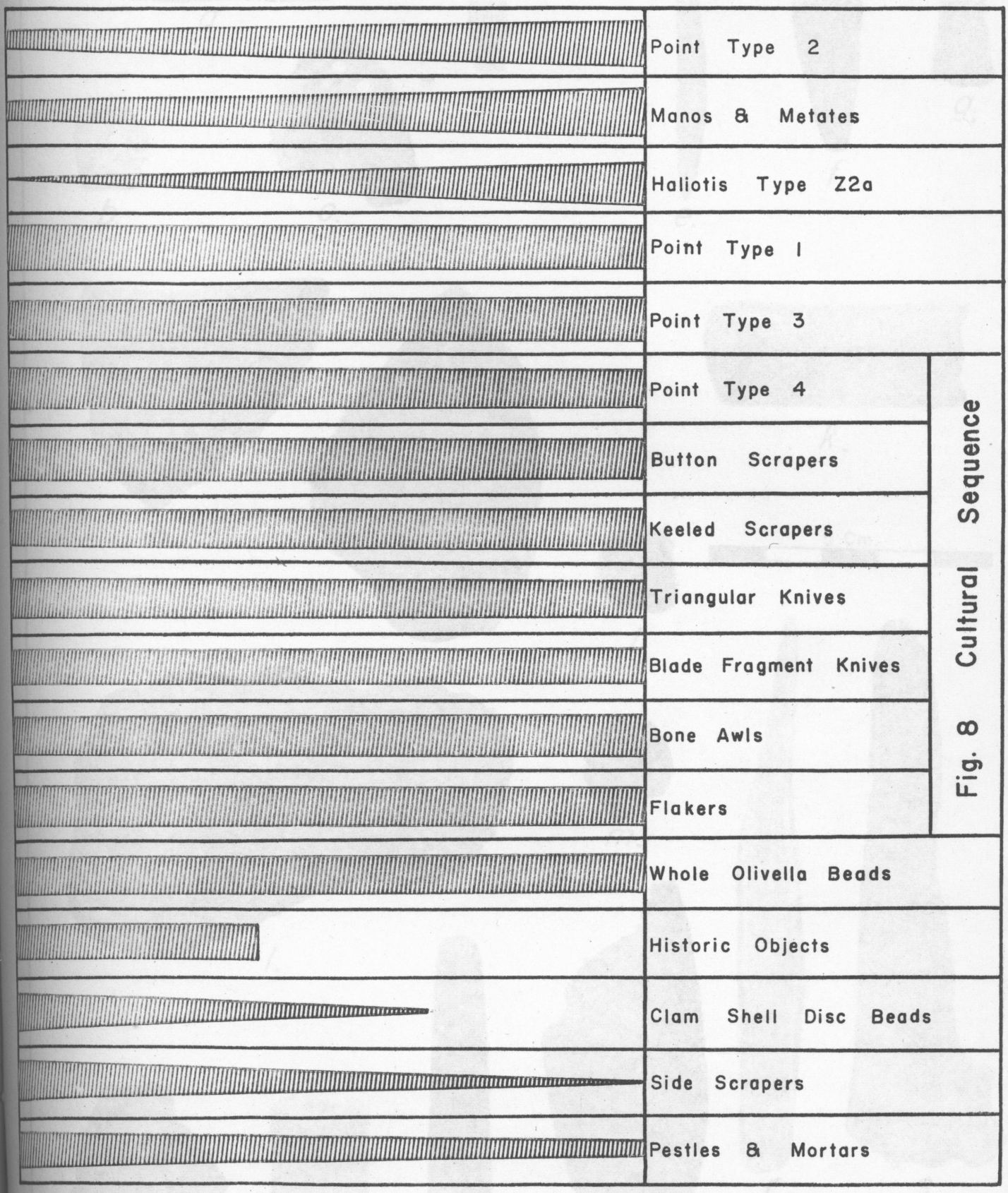


Fig. 6. Depth Distribution of Grinding Tools.



KINGSLEY CAVE, SITE 4-Teh-1

Fig. 7


Point Type 2
Manos & Metates
Haliotis Type Z2a
Point Type 1
Point Type 3
Point Type 4
Button Scrapers
Keeled Scrapers
Triangular Knives
Blade Fragment Knives
Bone Awls
Flakers
Whole Olivella Beads
Historic Objects
Clam Shell Disc Beads
Side Scrapers
Pestles & Mortars
Fig. 8 Cultural Sequence

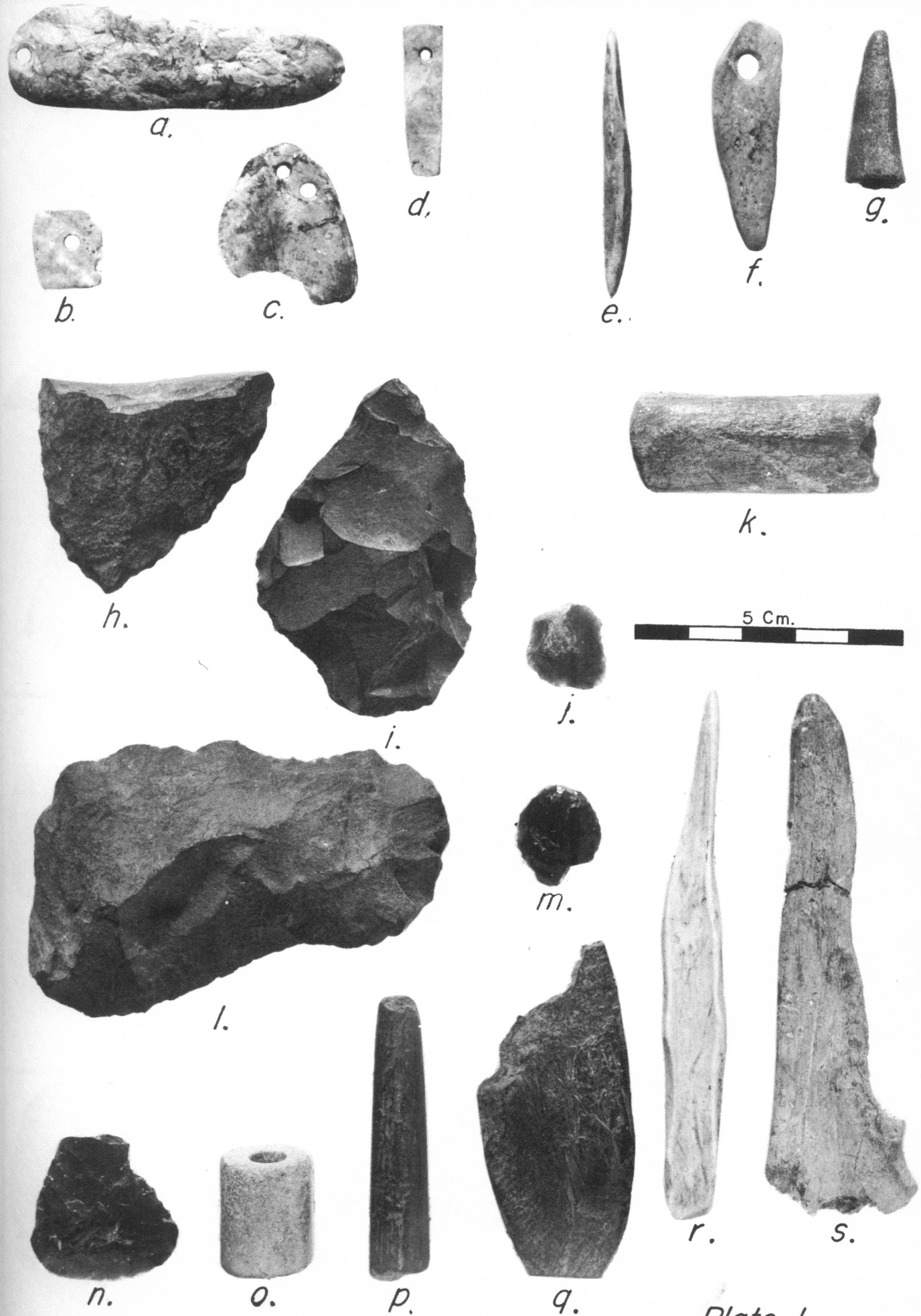
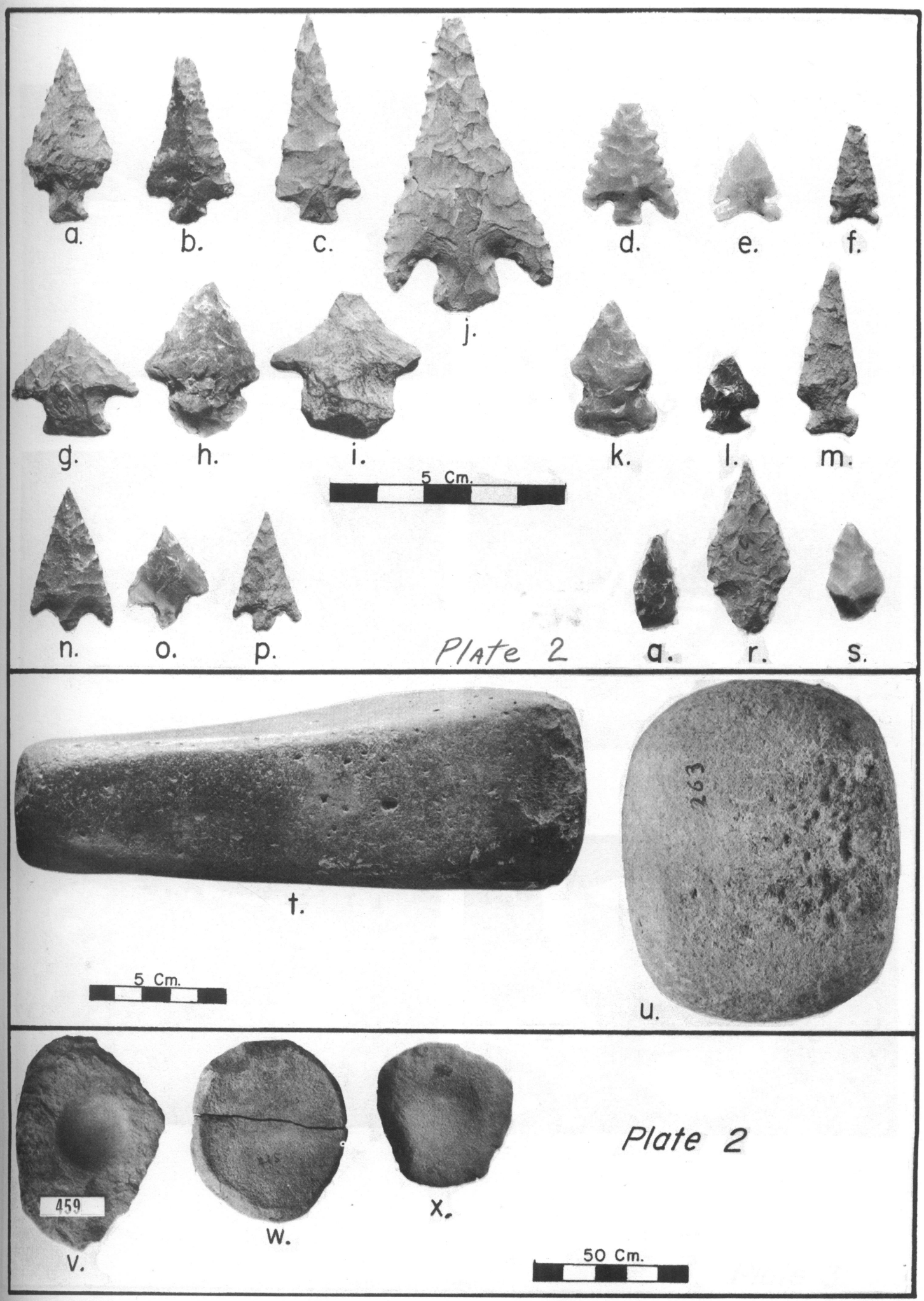
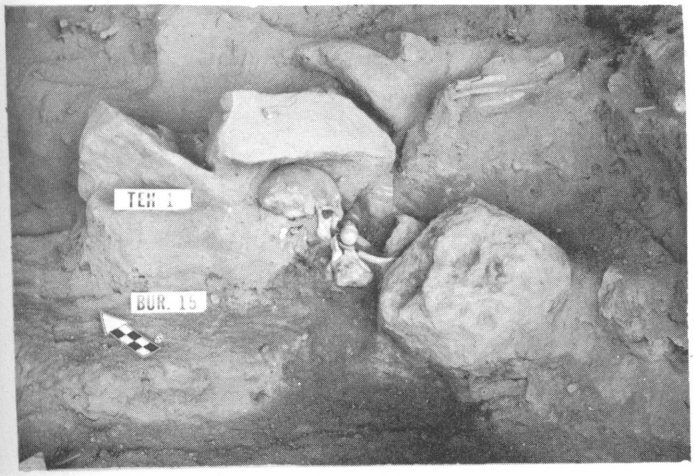
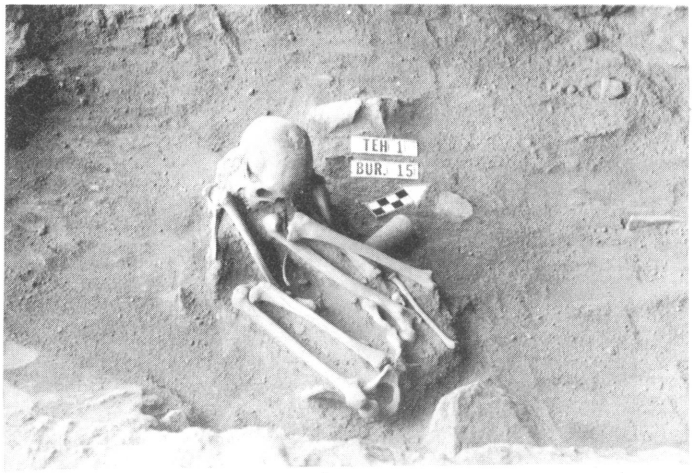


Plate 1


a.
b.
c.
j.
d.
e.
f.
g.
h.
i.
5 Cm.
k.
l.
m.
n.
o.
p.
Plate 2
q.
r.
s.
t.
5 Cm.
263
u.
459
V.
W.
X.
Plate 2
50 Cm.



a.



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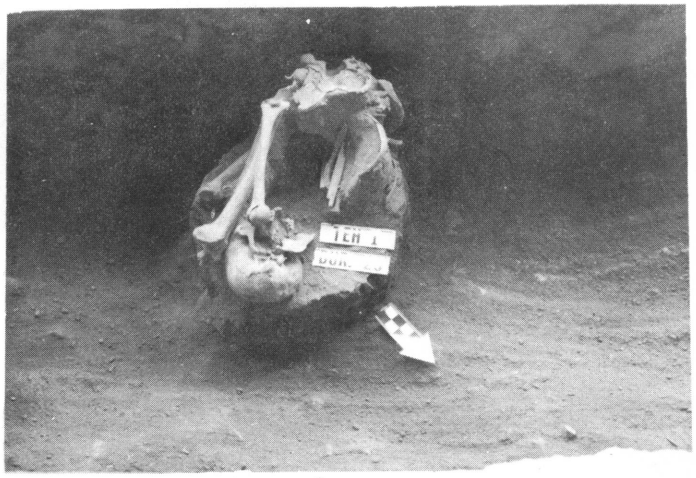


d.

PLATE 3

e.

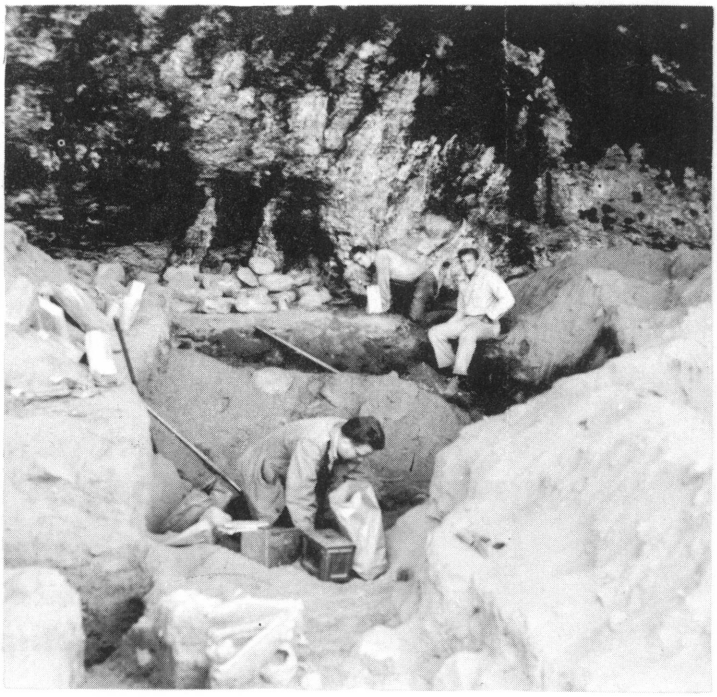
f.

Plate 3

a

PLATE 4

b



c

Plate 4