SOME ARCHAEOLOGICAL SITES IN WESTERN NEVADA

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Archaeological Materials from Winnemucca Lake Caves*

N. L. Roust

Winnemucca Lake is the name applied to a playa lake which occupies a basin of interior drainage located between the Nache and Pyramid mountain ranges in west-central Nevada. The lake is roughly parallel with its larger and better known neighbor, Pyramid Lake, six miles to the west. Like its sister lake, Winnemucca occupies a long, narrow valley, formed by orographic displacement, and is an example of a lake occupying a fault basin. The lakebed is 26 miles in length (north to south) and 2 to 5 miles in width. It has an actual elevation above sea level of 3,853 feet. The closest center of population is the town of Nixon, about 5 miles to the south. This town is one of the seats of the Pyramid Lake Indian Reservation, part of which covers the southwestern section of Winnemucca Basin.

The depth of Winnemucca Lake, like that of Pyramid Lake, varies from year to year. With a relatively constant rate of evaporation (5 to 6 feet per annum), the variation depends primarily on the amount of yearly precipitation and the temperament of the Truckee River, which furnishes the two lakes with their only inlet. The depth of Winnemucca Lake is further controlled by the corresponding depth of Pyramid Lake. The Truckee River empties its primary supply into the latter, and Winnemucca Lake acts as an overflow basin. It has been recorded, in 1876, for example, that the Truckee River has completely bypassed Pyramid Lake and has emptied its entire contents into the Winnemucca basin, raising the lake level there above that of Pyramid Lake. However, the usual situation was that both lakes received their primary water supply at the same time, with Pyramid Lake getting the larger share and with one branch of the lower Truckee going to each. Russell (1885, p. 43) states, "The most interesting feature to the geologist in the present condition of the Truckee River is its bifurcation shortly before reaching Pyramid Lake. . . . the stream divides so as to deliver a part of its waters to Pyramid Lake and a part to Winnemucca Lake. The branch entering Pyramid Lake has the ordinary features of a river winding through an alluvial bottom, and has formed a low-grade delta of broad extent. . . . The waters that are tributary to Winnemucca Lake leave the main stream at nearly a right angle and flow through a deep narrow channel carved in Lahontan sediments. This stream or slough, when measured in September 1882, had a volume of 2,400 cubic feet per second. From the manner in which the bifurcation takes place it cannot be considered as the breaking up of a stream on a delta or an alluvial slope, as in the case of the Carson River after entering the Carson Desert, but must have been originated by the waters overflowing from Pyramid to Winnemucca Lakes, or vice versa." Winnemucca Lake is now virtually dry, since all recent waters from the Truckee River have entered the Pyramid basin only.

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The shoreline areas of Winnemucca and Pyramid Lakes, like those of all the lakes in the lower portions of the Great Basin, are without trees or shrubs, and are clothed with but a scanty growth of desert vegetation, of which varieties of Atriplex and Artemisia are dominant. Of the fauna, fish and waterfowl are the most important.

In former times, the lakes were abundantly supplied with several varieties of food fishes, of which the most famous is the salmon-trout (Salmo purpuratus). Others are Chasmistes cujus and Salmo smaragdus, which are known from this area alone (Antevs, 1925, p. 102), Leucus olivaceus, Leucus dimidiatus, Siphateles lineatus, Squalius lineatus, Squalius galtiae, and Catostomus tahoensis (Cope, 1883, p. 152). Three types of mollusks also occur: Pompholyx effusa, Pyrgula nevadensis, and Pyrgula humerosa.

Many varieties of water fowl are present, including gulls, terns, cormorants, geese, ducks, swans, herons, and bitterns. The most important bird of the area, however, appears to have been the pelican (Pelecanus erythrorhynchos). The area has long been known as one of the major nesting grounds of this bird, and even as late as 1882, two large rookeries were noticed on Anaho Island in Pyramid Lake, each containing some 600-800 young birds (Russell, 1895, p. 62). The high degree of dependence on the pelican for food and other uses by the occupants of the caves becomes apparent in the collection described below.

The material reported on here consists of archaeological specimens obtained by amateur collectors of Sparks and Reno from a series of 30 caves located in the southeast fringe of mountains circling Winnemucca Lake.[1] No site records or depths were kept.[2] Several of the most interesting pieces are missing from the collection--their present location is unknown. The missing pieces were described as a carved wooden bird's head, a field mouse skin blanket, stone points of a variety of types, atlatl darts, and a willow work burial shroud. The available artifacts include wickerwork, coiled and twined basketry; matting, cordage, braid and rope; animal and bird bones; and feather, skin, and wooden objects.

Basketry

Twenty basketry fragments are present in the Winnemucca Lake caves collection. Nine of these are of wicker, 10 are of coiled ware, and one is the apex of a twined bag of tule matting. It is believed that the 9 wicker specimens represent portions of at least 2 baskets, and that the 10 coiled specimens represent a minimum of 3 circular roasting trays. A total of about 6 baskets is thus represented.

Wickerwork

Basket No. 1. This is a conical burden basket of the Humboldt type, and is represented by 8 of the wicker fragments present. Warps are of peeled willow twigs, 2.5 mm. in diameter, with 19 occurring per 10 cm.

Wefts are peeled willow splints, 2.5 mm. in width, and occur in the "over-under" or superimposed construction technique. In some fragments these weft splints are improperly superimposed so that underlying splints are visible. There are 35 weft courses per 10 cm. The weave is ordinary Lovelock wicker with a passive warp and active weft. The weave is more loose than is usual for Lovelock wicker, and this looseness produces a greater separation of the warp elements. Repair is evident in the two largest fragments. Intricate in nature, the repair of each fragment will be discussed in turn.

Specimen No. 2-21523A* measures 21 by 48 cm. and presents a tear running the width of the piece at right angles to the warp. The tear has been repaired by a series of clinch stitches perpendicular to the tear at intervals of 2 to 7 mm. The sewing element employed is an unpeeled willow splint, 3 to 5 mm. in width and of an estimated 174 cm. length. On completion of the clinch stitching, the repair element is returned along the tear, binding alternate pairs of repair stitches together in a wound technique (see Balfet, 1957, Fig. 2, No. 3). The fragment is further repaired by the addition of a wicker patch which serves to strengthen the basket proper. The wicker patch is of finer weave and better construction than that of the main basket. Warps in the patch are not over 2 mm. in diameter and 26 occur per 10 cm. Wefts are tightly woven, superimposed willow splints about 2 mm. in width. This tightness of the weave and narrowness of the weft elements permit 54 weft courses per 10 cm. Part of the wicker patch has apparently been destroyed. The remaining section measures 24 by 10 cm. and occurs superimposed on the basket proper, bound onto the main basket wall by a willow splint corresponding to that utilized in repair of the main tear. The two sections are bound together at intervals of about 4 cm.

Specimen No. 2-21523B measures 21 by 20 cm. and presents in its small area a complex and intricate example of basketry repair. Most of this repair occurs, however, in the wicker patch which has been added to the specimen for strengthening purposes. In the strengthening piece are three parallel tears running through its width. Each of the tears has been repaired by the clinch stitch method, but these stitches are each highly individual and intricate in nature. One tear, 13 cm. in length, is repaired by clinch stitches occurring perpendicular to the tear. The sewing element employed is a single willow splint 2 mm. in width. On completion of the stitching this splint is wound back along the tear, using the clinch stitches as warps, each end looping around two of the stitches. The process is then repeated from the opposite end of the tear, with the splint further fastening the already paired stitches together. This last operation is complicated by the utilization of split stitches which occur over part of the tear course (i.e., the weft passes through the preceding loop, splitting it in half, instead of lying beside it). This process enlarges the splint width to 4 mm. A second tear or break occurs in the approximate center of the specimen and is sewn together by a clinch stitch, 4 mm. in length, perpendicular to the tear

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*This and all subsequent specimen numbers are those of the University of California Museum of Anthropology (UCMA).

course. On completion of the clinch stitching the sewing element, which is a single willow splint 2 mm. in width, is wound back along the tear, binding alternate pairs of repair stitches together. The paired stitches are then secured to each other by a second return of the sewing element. Stitching in this latter course is of the split variety.

The third tear or break is 9 cm. in length, and is repaired by the utilization of a heavy clinch stitch. This stitch, approximately 3.2 cm. in length, occurs parallel to and between every second warp. On the completion of the clinch stitching, the splint is brought back and forth over the tear proper to bind the clinch stitches into groups. The sewing element itself is a single willow splint, noticeable for its width, 5 mm. This width often gives the illusion of close weave.

The only decorative element apparent on the specimen is in the application of a light coat of pitch which protects some of the exterior warp surfaces. Included in the repair, and held onto the surface of the basket fragment by a single willow stitch, is a portion of the skin of a meadow mouse. The skin fragment has an area of about 10.5 sq. cm. The reason for such an element in the repair of the basket proper cannot be determined. Also included in this basketry fragment is a length of Apocynum cordage, occurring parallel with the warp and sewn through the wicker at occasional intervals. The cord is approximately 18 cm. in length, 2 mm. in diameter, and has a Z-twist. The function of the cordage fragment in the basket is also undetermined.

Basket No. 2. This is represented by 2 small fragments (No. 2-21524), the largest of which measures 17 cm. by 21 cm. It is believed that the fragments represent a conical burden basket of the usual Lovelock type. Warps are peeled willow twigs not over 2.5 mm. in diameter, with 28 occurring per 10 cm. Wefts are peeled willow splints 2 mm. in width. These are relatively thin (0.5 mm.) and occur in the side-by-side technique. (This construction pattern is shown also on specimens of site 26-Pe-8 wickerwork.) The paired splints are then woven as one element. (See Baumhoff, this report, p. 15.) Forty-four splints, or 22 weft courses, thus occur per 10 cm. Weave is straight wicker, but is so tightly woven that the basket is more stiff, compact, and rigid than is usual for Lovelock wicker. The larger fragment is a section of the upper basket and shows the selvage technique utilized in the rim. This technique employs the warps of the basket itself. On completion of the wicker weave, the basket warps are bound into pairs by a single course of twined weft. These paired warps are then utilized as one element, 4.5 mm. in width. The last 10 cm. of the 15 cm. allowed to project above the wicker weave are bent down to the left. The paired warps then become the weft of the selvage and are woven diagonally among themselves at a point close to the rim of the basket. The slant of the selvage is in pleasing contrast to the straight wicker of the basket proper, and serves sharply to emphasize the rim (the selvage is the same as that shown by Baumhoff [op. cit., Pl. 1k], except that in the latter case there are two courses of twining at the edge of the wicker).

Coiled Basketry

Tray No. 1. This is a parching tray represented by only one small curvilinear fragment measuring 3.7 cm. in width and 20 cm. in length. It is estimated from the curvature of the fragment that its lower edge lay approximately 11.25 cm. from the center of the tray. The foundation of the specimen consists of peeled willow twigs combined into a three-rod triangular grouping. Rods average 2 mm. in diameter, with individual foundation coils about 5 mm. in diameter. There are 24 coils per 10 cm. Splitting of the stitches occurs on both working surfaces. The stitching element is a single willow splint originally 3 mm. in width, but enlarged to 4.5 mm. by the splitting process. Stitches pass completely around the new coil and under the top rod of the underlying coil, splitting the old stitches in the process. There are 40 stitches per 10 cm. No repair or decoration is evidenced.

Tray No. 2. This is a parching tray of unknown dimensions. It is represented by one specimen (No. 2-21525), the center of the tray itself, which measures 34 cm. in diameter. The foundation consists of peeled willow twigs combined, like those of Tray No. 1, into a three-rod triangular grouping. Rods are about 2.7 mm. in diameter, with individual foundation coils about 8 mm. in diameter. There are 12 coil courses per 10 cm. Splitting of the stitches occurs on both working surfaces. The stitching element is a single willow splint originally 2.5 mm. in width but enlarged to 5 mm. by the splitting process. Stitches pass over the new coil and under the top rod of the underlying coil, splitting the old stitches in the process. Some splitting of the top rod is evident. The only decorative element apparent on the tray is a light coat of pitch which has been applied to the unscorched surface of the specimen. No repair occurs.

Tray No. 3. This is a circular roasting tray, and represents the remainder of the Winnemucca Lake caves coiled fragments (8 pieces, No. 2-21527). These fragments are in general large and match quite readily into their original positions. Construction of the tray was firm but flexible, and the fragments are in a good state of preservation. The diameter of the tray is unknown. The foundation is of peeled willow twigs combined into a three-rod triangular grouping. Variation of this technique occurs, however, with the occasional employment of three rods placed in the horizontal position instead of the usual two. Rods are 2 mm. in diameter in some fragments of the tray and about 4 mm. in others. Individual coils average 7 mm. in diameter but vary from 4mm. to 8.5 mm. There are approximately 20 coil courses per 10 cm. Intentional splitting of the stitches appears on one side only. Some splitting is evident on the reverse work surface, but it is believed that this is accidental. The stitching element is a single willow splint originally 3 mm. in width, but enlarged to 7 mm. by splitting. Stitches pass completely around the new coil and through the top rod of the underlying coil, splitting the old stitches in the process. The top rod is thus split into two sections, and all tensions are exerted on the upper half of the rod only, giving this section the "slat" characteristic which is common to other coiled founda-

tions. Coiling of the basket was in a counterclockwise direction. Formal decorative patterns do not exist in this tray. A heavy coating of red ochre has, however, been applied to the working surface of the specimen, and a corresponding heavy coat of pitch applied to the other side. This gives the tray a distinctive appearance, and serves in addition as a strengthening element. The red ochre in some portions of the surface exceeds 1 mm. in thickness.

Twined Tule Matting Bag

This bag (No. 2-21588) appears to be cylindrical in shape, and is represented by one fragment which includes the apex and a section of the basket side. The technique of construction corresponds closely to matting bags or "carrying cases" described by Loud and Harrington (1929, Pl. 26e). Structure consists of 6 long courses of rough tule, about 2.5 cm. in diameter, which are folded in half to form the warps of the object. The folds are joined at the base, with the loose warps held in place by a single strand of twined tule weft which encloses them in a clockwise spiral originating at the apex. This twined course is of a 2-ply, down-to-the-right technique, and is approximately 7 mm. in diameter. Its spiral interval is 3.2 cm.

Matting

Ten matting fragments are present in the Winnemucca Lake collection. These are similar to those described by Loud and Harrington (op. cit., pp. 56-60, Pl. 25) for Lovelock Cave, by Heizer and Krieger (1956) for Humboldt Cave, and to those from the Fallon Caves in the collections of the University of California Museum of Anthropology. The 10 fragments are similar in technique, but vary in the material used.

Four of the 10 pieces use rush (Elchorsis) for both warp and weft. No. 2-21528 measures 29 by 7 cm., with 5 or 6 strands of rush per warp element. There are 2 strands per weft, with 16 down-to-the-right twists of weft per 10 cm. Intervals between wefts vary from 7.8 to 8.7 cm. No. 2-21531 measures 16 by 17 cm., with 10 strands of rush per warp element. Each weft has 6 strands, with 7 down-to-the-right twists per 10 cm. No. 2-21536 measures 25 by 3 cm., with 4 rush strands per weft. There are 12 down-to-the-right twists of weft per 10 cm. Included in this fragment is a selvage edge corresponding to Loud's type "g" (op. cit., p. 54). No. 2-21542 measures 26 by 33 cm. It has 12 to 18 strands per warp element and 5 per weft, with 8 down-to-the-right twists per 10 cm. of weft. The average interval between wefts is 11.5 cm.

Three of the 10 fragments have a tule (Scirpus) warp and a rush (Elchorsis) weft. No. 2-21532 measures 20 by 10 cm., with 7 tule strands per warp and 2 rush strands per weft. There are 7 down-to-the-right twists in each 10 cm. of weft. No. 2-21533 measures 38 by 7 cm., with 2 tule strands per warp and 8 rush strands per weft. In each 10 cm. weft

are 12 down-to-the-right twists. No. 2-21558 measures 39 by 19 cm., with 5 tule strands per warp and 8 rush strands per weft. There are 12 down-to-the right twists per 10 cm. of weft, and weft intervals vary from 12 to 14 cm.

The remaining 3 specimens each utilize a different combination of warp and weft material. No. 2-21540 has a single weft row composed of 6 strands of rush (Elchorsis). (The warp cannot be identified as it is entirely missing.) The weft course measures 24.5 cm. in length, with 8 down-to-the-right twists per 10 cm. No. 2-21543 measures 27 by 12 cm., with one grass bundle per warp and with 5 rush strands (Elchorsis) per weft. There are 6 down-to-the-right weft twists per 10 cm., with intervals of 6.5 cm. between wefts. No. 2-21548 measures 13 by 7.5 cm., with 4 strands of cattail (Typha) per warp and 3 strands of tule (Scirpus) per weft. There are 9 down-to-the-right twists of weft per 10 cm. Weft interval is unknown.

Rope

The term rope, as used in this paper, refers to any twisted course of fibrous material at least 4 mm. in diameter. Six such fragments occur in the Winnemucca Lake caves collection. All 6 are of rush (Elchorsis), and show 2-ply, Z-twist construction. Variations in individual specimens are shown in the table below.

Table 1

UCMA Number	Ply & twist	Strands per ply	Length of piece	Diameter
2-21530	2 (Z)	5	27 cm.	9 mm.
2-21545	2 (Z)	8	29 cm.	13 mm.
2-21549	2 (Z)	7	48 cm.	9 mm.
2-21538	2 (Z)	4	47 cm.	10 mm.
2-21529	2 (Z)	5	15 cm.	7 mm.
2-21546	2 (Z)	2	33 cm.	4 mm.

Braid

Four fragments of braid occur in the Winnemucca Lake caves collections. All are of rush (Elchorsis), and employ 3-ply technique. Variations in individual specimens are shown in the table below. No. 2-21539 consists of 2 pieces joined by a square knot. No. 2-21537 also consists of 2 pieces. The shorter fragment has an overhand knot in one end. The longer length is tied around the shorter. In general, the braid specimens correspond closely to characteristic Humboldt Valley types.

Table 2

UCMA Number	Type of ply	Strands per ply	Length of piece	Maximum width
2-21534	3	4	19 cm.	6 mm.
2-21539	3	3	93 cm.	7 mm.
2-21544	3	7	26 cm.	19 mm.
2-21537	3	5	50 cm.	11 mm.

Animal and Bird Bones

Thirteen complete bones or bone fragments are present in the Winnemucca Lake caves collection. Seven of these are pelican leg bones (Pelecanus erythrorhynchos), four are coyote (Canis latrans), and two are unidentified. The coyote specimens include one mandible, one rib, and 2 vertebrae. The 2 unidentified specimens are rib bones, presumably from the same animal, and are combined into a single artifact (see Miscellaneous Artifacts, below). Neither the pelican nor coyote specimens show any utilization other than as a probable source of food.

Feather and Skin Objects

Six miscellaneous feather and skin objects occur. They are described in turn.

Feather Bundle (No. 2-21566). This is a bundle of 4 long feather quills obtained from the wing of a pelican. The wrapping, which measures 22 cm. in length and 3 cm. in diameter, is merely a yellowish skin section of a pelican wing so reversed that all quills normally occurring on the outer surface are

now turned to the interior. The exterior of the packet is consequently smooth and parchment-like in quality.

Bird Skin (No. 2-21565). This is a section of dried pelican skin, measuring 15 by 20 cm., and in a good state of preservation. Like the wrapping of the Feather Bundle described above, it is yellowish and parchment-like in quality, and very thin. Much of the down and many of the original white feathers are present.

Feather. This specimen is a single white pelican feather, 12 cm. in length.

Skin Strip (No. 2-21569). This specimen is a tightly-twisted strip of coyote skin (Canis latrans). Originally about 12 mm. in width, the strip has been reduced to a 6 mm. diameter by the twisting process. The twisting is completed so that the hair of the strip appears on all outer surfaces. The strip is 25 cm. long and 11 complete twists occur in that length. The specimen is highly resilient, tough, and durable. It probably represents a fragment of a twisted skin blanket, and tends to confirm the presence of twisted skin blankets in the area.

Skin Strip. The specimen is a strip of the skin of an unidentified bird and is entirely covered with feather quills. It is 15 cm. in length and is dark brown in color. Its use is unknown.

Skin Strip. This lightly twisted strip of pelican skin is 21 cm. in length and 1 cm. in width. The specimen is exceedingly rough in appearance due to the profusion of quills on its surface. Some down remains. Probable use: cordage.

Wooden Material

Twenty-two wooden specimens appear in the Winnemucca caves collection. Eleven of the fragments are lengths of willow twigs (Salix), evidently used as binding material. These average 9 mm. in diameter and show wear on the bent sections. Three of the specimens are wooden sticks about 20 cm. in length and 2.5 cm. in diameter. Their use is undetermined. The remaining specimens, however, are more distinct in nature and merit individual mention.

Bark Twist (No. 2-21574). This large specimen consists of 4 strips of a stiff bark identified as cottonwood (Populus). The specimen is 30 cm. in length and 7 cm. in width. Each individual strip is about 2 cm. in width, and is intertwisted with the others. The whole of the series is folded back upon itself and the resultant 8 loose ends then twisted together. The use of such an object must remain but a matter of conjecture--possibly it is a tool for the lifting and removal of boiling stones.

Bark Knot. This is an overhand knot of willow bark (Salix). Use is unknown.

Cane Sections. These are almost identical specimens, each of the two being 13 cm. in length and 6mm. in diameter. One end of each section has been cut off square. Use: possible arrow foreshaft fragments.

Firedrill. Twenty-nine cm. in length and 1 cm. in diameter, this specimen is of an unidentified softwood which is straight-grained and highly smoothed. Loud and Harrington (op. cit., Pl. 49b) identify similar items as fire drills.

Firedrill (No. 2-21556). This is a cottonwood (Populus) stick on which some bark remains. It is 21 cm. in length and 1.8 cm. in diameter. The ends of the specimen are well worn in a circular manner indicating utilization of the object as a firedrill.

Knife Handle (No. 2-21551). This is a well-worked specimen, and is flat on one side. It is 13 cm. in length, 4.4 cm. in width, and 1.4 cm. thick at its maximum. It is believed that this specimen in conjunction with another similar fragment served as the handle of some type of knife. The specimen tapers gradually from one end to the other, with the thickest portion at the point of normal heavy stress, i.e., where knife blade and handle would meet. Hilt width here is 4.4 cm. and thickness is 1.4 cm, as compared to a width of 3.7 cm. and a thickness of 0.7 cm. at the tip.

Bow Section (No. 2-21563). This specimen is 16.5 cm. in length and 5.5 mm. in diameter. The white wood of the fragment is supple in nature and is peeled, straight-grained, and highly smoothed. It is believed to be willow (Salix). There is a notch 1.5 mm. deep, which encircles the specimen 2.5 mm. from the worked end. The chipping of this notch and of the tip, itself, is skillfully executed and remarkably uniform in character. Thong discoloration is evident in the notch area.

Miscellaneous Artifacts

Several objects and artifacts occur in the collection that cannot be logically placed in other sections of this paper. They are therefore listed below.

Bone Hoop (No. 2-21572). This specimen, which has been mentioned previously, is a distinct artifact composed of 2 animal ribs. These ribs, 7 mm. in width, are so tied together that they form an incomplete hoop 17.5 cm. in maximum diameter. Apocynum cordage binds the two elements together. The cordage is 2.5 mm. in diameter and about 55 cm. in length. It is of the 2-ply, S-twist technique, and is notable for the tightness of twist. Use of the bone hoop, itself, is unknown.

Fiber Bundle (No. 2-21559). This is a relatively large and loose bundle of raw Apocynum, reddish in color.

Rush (No. 2-21535). This coil is composed of 14 green spike rushes (Elchorsis) which appear to be otherwise unmodified.

Coil (No. 2-21547). A coil of willow (Salix) withes measuring 12.5 cm. in diameter. The withes average 71 cm. in length and 3 mm. in width. They were probably used for basketry and lashing.

Cordage. One separate fragment of cordage occurs. This is of Apocynum, is 2 mm. in diameter, and is of the 2-ply, S-twist technique. It corresponds closely to typical Humboldt cordage with the exception that it is impregnated with an oil or grease which serves both to strengthen the cord and give it a slippery texture. The fragment is 26 cm. in length and is firmly twisted.

Clay Lumps. Five samples of lumped grey ochre are present. One of the specimens has been partially scorched by fire, which has annealed the particles. The other specimens, however, are in excellent preservation and give off their grey color on touch. The burned specimen weighs 111 grams. The other specimens weigh respectively 49.4, 90.3, 99.5 and 266.7 grams. Total weight of the 5 specimens is 616.9 grams. Grey ochre was probably used as coloring pigment.

Fiber Apron (No. 2-21560). This specimen is a woman's apron measuring 30 cm. in width and 25 cm. in length. It is light brown in color and is skillfully constructed from some unidentified grass fiber. The specimen consists of an upper border which secures a mass of vertical fibers hanging beneath it. The technique of construction corresponds so closely to that used in the woman's apron found in Lovelock Cave as described by Loud (ibid., p. 53, Pl. 19a), that we quote his description here: "Some of the fibers are apparently 20 inches long, being bent at the middle to form the upper border of the specimen and secured by a course of woof twining. The woof is a cord about 3 mm. in diameter. Three cm. below the upper border there is a second course of woof beneath which all the fibers hang loose. The mass of fiber is 1 cm. thick at the tightly bound upper border and 2 cm. thick where it hangs loose." Stays or ties for holding the apron in place are not apparent in the specimen from the Winnemucca Lake caves collection.

Willow Artifact (No. 2-21550). The final artifact in the Winnemucca Lake caves collection is an object 75 cm. in length and of varied width. It is composed of 3 peeled willow sticks which are braided together at one end, and bent to form a hoop at the other. The sticks are 10 mm. in diameter. Utilization of the artifact is a subject for conjecture. Too light for heavy employment, we can only conclude that the tool is a specialized one for the performance of some distinct task, light in nature, but as yet undetermined.

Conclusions

In the preceding pages archaeological specimens from Winnemucca Lake caves have been described. No dating of the collection will be attempted because the context from which the specimens were derived is unknown--it is not known, for example, whether the wicker basketry and coiled basketry are from the same or different sites.

The importance of the collection is in the evidence it presents on the distribution of the Lovelock Culture, an important regional specialization of Jennings' Desert Culture. The Lovelock Culture is best known, of course, from excavations in the Lower Humboldt Valley. From excavations in the Fallon area we know that essentially the same culture, with its distinctive combination of textile techniques, is also present in the Carson Sink (Grosscup, 1956). In Lassen County, California, to the west, the cultural inventory recovered at the Karlo Site fits neatly into that of the Lovelock Culture (Riddell, 1956), so we may conclude that that area too was once part of the Lovelock Culture province. Thus as investigation proceeds we find evidence that the Lovelock Culture was not narrowly localized to the sink of the Humboldt but was spread quite widely over the western Great Basin. It is beginning to look, in fact, as if the Lovelock Culture was once characteristic of the entire Lake Lahontan region. Several gaps remain before such a statement can be made categorically (for example, we do not know about Walker Lake or about the Humboldt Valley north of Lovelock) but the present paper fills one of the gaps on the western fringe of the province. The specimens described, especially the wicker and coiled basketry, indicate that the bearers of the Lovelock Culture once occupied the Pyramid Lake--Winnemucca Lake Basin and that that part of the Lahontan System is therefore part of the Lovelock Culture province.

Notes

1. The earliest notice of the caves in this region is that of Fremont (1845) who passed Pyramid Lake in 1844. He says that they went by the lake, "passing on the way several caves in the rock where there were baskets and seeds" (p. 218).

2. The caves were allegedly dug in violation of the Antiquities Act of 1906. The materials recovered have been deposited in the University of California Museum of Anthropology by the Federal Government. The only public record of the excavations is in the Nevada State Journal (newspaper) for August 1, 1948. In the absence of exact location data, we have arbitrarily assigned this material to a specific site, designated 26-Wa-4.

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Excavation of a Cache Cave in Pershing County, Nevada*

M. A. Baumhoff

Site 26-Pe-8 (hereafter referred to as Pe-8) is a small cave situated approximately 1.5 miles southeast of the Leonard Rockshelter. The deposit is protected in a dry crevice penetrating twenty-five feet into the base of a large rhyolite outcropping. At the entrance of the cave the actual elevation is 4,350 feet, which Dr. Ernst Antevs determined with a Paulin altimeter. Antevs also noted that this site was above the highest pluvial beach levels. Above the cave entrance rises the cliff face of the rock outcropping which extends north and south about 100 yards in either direction. Below the cliff a very steep talus slope drops for about 250 feet.

One excavation trench (see Fig. 2b) of 5 by 5 foot units was laid out in such a manner as to cross the center of the deposit at the entrance and completely include the rear of the cave where the walls were about five feet apart. Excavation took place on July 20-21, 1950, with units 1, 2, 3, and 4 being completely dug to the deposit base. The artifact bearing deposit was composed of dry, powdery dirt, wind-blown plant material, loose bat guano, and rock fragments exfoliated from the cave roof. In unit 1 a sterile layer of concentrated bat guano occurred from a depth of 18 to 36 inches. This layer extended into unit 2 between 30 and 40 inches, and sloped off into unit 3. Below the sterile guano layer there was a loose angular rock fall base, which was the extended edge of the large rock fall piled up at the cave mouth. This rock layer formed the cave base and, after being found at a depth of 36 inches in unit 1, it graded down to 42 inches in unit 2, to 48 inches in unit 3, and finally in unit 4 the cave floor was solid rock at 56 inches (see Fig. 2a).

The greatest concentration of artifacts was in units 3 and 4. In this area were found large portions of coiled basketry trays and wicker burden baskets which serve to emphasize the cave as a cache location. The far rear of the cave, unit 4, was the deepest, with deposits and artifacts reaching to a depth of 56 inches. But at this depth the cave bottom is only a few inches wide as the cave walls converge downward.

There was probably one cache in the cave (in units 3 and 4) originally, with the few artifacts elsewhere having been scattered or dropped by the people who used the cave, or by pack rats and coyotes.

Artifacts

Wicker Basketry

The wicker from Pe-8 is the same type as that recovered from Lovelock and Humboldt Caves. To date, this peculiar wicker has been found only in

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westcentral Nevada. It is found quite generally in the Humboldt Valley and is known to a lesser degree on its fringes. According to Weltfish (1930, p. 491), it "is not duplicated in modern North American basketry." Its concentration in the Humboldt Valley could be explained by the intensity of excavation relative to the surrounding area, but this does not seem likely. In all probability, it is simply a local specialization.

Wicker basketry has pliable wefts and stiff, unpliable warps which radiate from the starting point at the bottom of the basket. Mason (1904, p. 228) says, "The weaving is plain and differs from checkerwork only in the fact that one of the elements is rigid." Lovelock Wicker is peculiar for two reasons: the wefts are always double ribbons of willow and the weft courses are always pushed up against one another so that no intervening spaces are left.

This basketry is adequately described by Heizer and Krieger (1956), and by Loud and Harrington (1929, pp. 60-64), except that they fail to distinguish between the type in which the double weft ribbons are layered one on top of the other (Pl. 1i) and the type in which the two ribbons are placed side by side (Pl. 1j). While this distinction may prove in the long run to be of little or no significance, it is probably best to note it until we find such to be the case.

Wicker basketry was the most common artifact found in Pe-8, just as it was at Lovelock and Humboldt Caves. Of 275 basketry specimens, 236 were fragments of wicker burden baskets. Of these, 214 were layered weft, and 22 were side-by-side weft. The stiff willow warp element ranges from 1.5 to 5 mm. in diameter with an average of 2.8 mm. The two willow ribbons of the weft are from 1.5 to 4 mm. in width with an average of 2.7 mm. Of course, in the side-by-side variety the total weft course will be twice as wide. There are about 9.8 weft courses per inch and about 5.8 warp elements per inch. The variability in these baskets is similar to that of those recovered from Lovelock Cave.

No attempt has been made to discover the total number of baskets represented by the fragments recovered because of the poor condition of the material.

Selvage, repairing, apexes and tump line attachments. The selvage here is the same technique as that described for Humboldt and Lovelock Caves, wherein the warps are bent back at the rim and woven diagonally among themselves to the rim of the basket proper where they are secured by a course of twining (see Pl. 1k; and Loud and Harrington (op. cit., Pl. 27a, b, c). Repairing is the same process of mending of tears and patching of holes that is described in Heizer and Krieger (see also Pl. 1b; Loud and Harrington, op. cit., Pl. 27f). The one apex recovered is as described for Humboldt Cave. It shows eight courses of heavy twining before the wicker starts (Pl. 1a). No tump line attachments were found at Pe-8.

Decoration. On only about a dozen fragments was any visible design apparent since it had, in most cases, been worn off. However, inasmuch as the design in this type of wicker is accomplished by introducing a weft with bark on one side and giving it a half twist to make it appear and disappear in the appropriate places, the half twist will remain visible on the back side even when the bark has completely worn off. Moreover, even when the bark has worn off, there almost always remains a shred of it along each weft course, hence when even minute pieces of bark are discovered it is a simple, though often tedious, matter to follow along the course of the weft and, observing the twists, to block out on grid paper the sections that have the bark side out. This method can be used only with the layered weft type of basket since the only decoration on the side-by-side type is in the form of horizontal bands. It is evident that in the side-by-side type a twist would disfigure the weft ribbons or push them together. This presents, incidentally, another reason for separating the two types of Lovelock Wicker.

A total of 80 pieces (or about 35 per cent of the wicker specimens) showed design when analyzed by the above method or by direct observation. Of these, 23 were W-shaped zigzag, 12 were pennant shaped (see Pl. 1c), 6 were horizontal lines, 5 were N-shaped zigzag, 3 were vertical lines, and 1 was a diagonal line (Fig. 1). There were 27 fragments in which decoration was present but where design was not observable because of such factors as, for example, small size of the fragment.

Loud and Harrington (op. cit., p. 62) report that about 75 per cent of the decorated pieces from Lovelock Cave have merely horizontal bands. The horizontal band decoration does not require the half twist and is apprehended by direct observation rather than analysis of weft twists. It is not entirely clear, therefore, why designs on the Lovelock Cave specimens should be easier to make out than those of the Pe-8 basketry. Either age, amount of use, conditions of preservation, or combinations of these could explain the discrepancy. Aside from this, the design percentages of the Lovelock Cave and Pe-8 specimens are much the same.

Coiled basketry. A total of forty-seven pieces of coiled basketry was removed from the cave (this kind of basketry is illustrated by Heizer and Krieger, op. cit., Pl. 18, 19). The specimens vary in size from quite large sections to minute fragments often difficult to analyze structurally. The smallest piece, for example, measures 3 cm. by 1 cm. Conversely, the two almost complete parching trays which were recovered are 61.8 and 62 cm. in diameter. These two large specimens are the sections between the outer edges and the centers of originally larger trays. One basketry section recovered is undoubtedly the missing center section of one of the large trays referred to, while many other various sized fragments must represent other missing coils of both trays. No attempt has been made to construct outer bordering edges of the trays, though there appears to be enough fragmentary material to do this. As an estimate, the totality of coiled basketry most probably represents the torn and fractured parts of three complete flat basketry parching trays. None of these show surface curvature to suggest that other types of coiled receptacles may have been present in the cave.

In addition, in each instance one side of the artifact is charred and encrusted with a thick layer of material, probably resulting from the parching of seeds.

Each individual piece was carefully analyzed to determine the plan of the foundation, number of stitches per 10 cm., number of circuits (coils) per 10 cm., and the type of stitching. Without exception, the foundation was found to have the basic plan of three-rod-triangular with the apex rod of the triangle being split by the stitching or sewing element. The sewing is of split-stitch type with the stitching of each course split on one side by the stitching of the next course. The average number of stitches per 10 cm. is 25 while the number of coils is invariably 20.

The rods used in the foundation are stiff willow twigs with the diameters of the individual elements averaging about 3 mm. The pliable sewn wefts are thin flat ribbons and are about 3 mm. in width. Occasionally on a number of specimens the same flat willow stripping was used to repair or reinforce certain areas which had become worn. This patching was done in an irregular pattern and seems to have been sewn in places where the basketry had been weakened by stitches burned through by coals during use.

It will be noted that coiled basketry is the second most common type of artifact in the cave, being exceeded quantitatively only by wicker ware. A similar situation obtained with the Lovelock and Humboldt Caves material.

Weltfish (1932b, p. 110) points out that one of the predominant types of Lovelock coiling is on a three-rod-triangular foundation with a split type of stitching. The basketry is described as "coarse" textured. In Lovelock Cave this artifact type occurs through all levels with the only distinguishing criterion being types of feather decoration (ibid., 1932a, p. 110). No examples of decoration either by feathering or other means are to be found among the Pe-8 coiled basketry, but there is no question that Pe-8 ware can be duplicated typologically by many Lovelock Cave specimens. Weltfish (op. cit., p. 39) discusses the historical distribution of triangular type foundations and points out the definitely limited area of occurrence in North America. Tschopik (1939, p. 105) presents an extensive areal and temporal distribution of coiled basketry and treats of the specific three-rod-triangular foundation in addition to other forms. Cressman (1942, p. 45, passim) discusses many instances of three-rod-triangular coiling from archaeological sites in Washington and Oregon. The type of coiling noted for the Pe-8 material thus seems to have a definite areal distribution centering in the western United States. Weltfish (1932a, p. 40) regards this distribution as attesting to historical relationship between the groups which occupied the area in question.

Twined basketry. One piece of stiff twined ware was recovered in which both the wefts and the warps were placed well apart. The wefts are thin willow ribbons and are woven in a simple down to the right twine. The warps are stiff willow twigs about 3 mm. in diameter (both the weft and the warp material are the same as those of Lovelock Wicker), which tend to converge at one end, indicating that the object was probably a conical burden basket (Pl. 1e).

Also recovered was a piece of typical Catlow twined basketry, the same as that described by Cressman (op. cit., p. 34). It is very fine and pliable, has a two-strand S-twist warp and a weft that is woven in a simple down to the right twine (Pl. 1g). The only peculiar factor is the introduction of two and one-half courses of three strand twine, apparently for decoration. Loud and Harrington (op. cit., Pl. 30b) show a similar piece.

Matting and cordage. There is a total of nine pieces of twined tule matting from Pe-8, none of which is notably different from the twined tule matting collected at Lovelock Cave. There are at least two pieces and perhaps four in which there are two courses of weft every three inches or so. These two courses are very close to each other, one of them being down to the right and the other up to the right twine so that as a pair they give the appearance of braid (cf. Loud and Harrington, op. cit., Pl. 24g, 25i). Two fairly large fragments have the ordinary down to the right twining (ibid., Pl. 24a, c, d, f). One piece of matting selvage found simply had its warps bent back on the warps next to them and secured in the manner shown by Loud and Harrington (op. cit., p. 57, Fig. h). The weave type of the remaining pieces was not distinguishable because the specimens were too fragmentary.

The cordage and rope from Pe-8 are also much the same as the specimens from Lovelock Cave. There are two pieces of large, two-strand, S-twist rope about 2 cm. in diameter, and two pieces of smaller cordage. One of the latter has a standard two-strand, S-twist while the other, although similar, has a third strand wrapped tightly around it. This is different from the two-strand and spiral type reported by Loud and Harrington (op. cit., p. 79) because here there is no attempt to completely cover and hide the basic twine.

Miscellaneous objects. Four pieces of leather thong similar to those shown by Loud and Harrington (op. cit., Pl. 43h) were recovered. Three leather thongs which were wrapped in porcupine quills were recovered (Pl. 1h). This sort of object is unreported from either Lovelock or Humboldt Caves, but Orchard (1925) describes a wrapped twinework (actually the piece is wrapped lattice work) from Lovelock Cave in which the wrapping is of porcupine quill.

Several pieces of worked wood were recovered but all except one were simply blunt ended sticks whose function is not known. The one exception is a hardwood specimen with both ends pointed and of the same shape, about four inches long and half an inch in diameter at the center (Pl. 1f). It probably was used as a projectile point. Heizer and Krieger (op. cit., p. 71, Pl. 13d) recovered six of these objects from Humboldt Cave and called them game darts or double pointed gaming shafts. Conceivably it could also have been employed as a union or splice for two pieces of arrow cane.

Only three artifacts of stone were recovered from Pe-8, of which two were a 650 gm. hammerstone and a large piece of red ochre which may be

from a natural deposit in the cave. The third item was a black obsidian projectile point, 41 by 19 by 3.5 mm., weighing 2 gm. The point has straight sides and a concave base (Pl. 1d).

The only bone artifact recovered was a rectangular piece of human skull (probably from temporal or sphenoid bones) measuring 20 by 30 by 4 mm. The convex surface is polished and the concave surface bears traces of pitch. The pitch would suggest that it was used as an appliqué ornament of some kind. Also it may have been a casting die for a game.

Conclusions

In ascertaining cultural and historical provenience or importance of the material from this small cave, it must be emphasized that typologically all the artifacts can be duplicated by finds made both in Lovelock and Humboldt Caves. This has been pointed out in the description and discussion of the individual specimens where reference was made to similar artifacts described and illustrated by Loud and Harrington (op. cit.) and by Heizer and Krieger (op. cit.).

Site Pe-8 was undoubtedly a small storage cave with only occasional and limited visits from man since there is no true occupation midden. No workshop material, fire hearths, nor food refuse was present.

The relationship of the Pe-8 specimens to those from Humboldt and Lovelock Caves may be seen in the following table.

Table 1

	Humboldt Cave		Lovelock Cave		
	Early	Late	Early	Middle	Late
Wicker*	+	-	+	+	+
3-Rod coiled trays	+	-	+	+	+
Openwork stiff twining	+**	-	-	+	-
Catlow twining	-	+	-	+	-
Tule matting	+	+	+	+	+

(continued on next page)

Table 1 (continued)

*As noted in the text previously, neither Krieger nor Harrington distinguished between side-by-side wicker and layered wicker. Gordon L. Grosscup has recently surveyed the Harrington collections in the Museum of the American Indian, Heye Foundation, and he informs us that the specimens from Harrington's stratipit include 20 fragments of wicker basketry, of which 19 have layered weft and only one has side-by-side weft. The single piece with side-by-side weft was found in the fourth level from the top of the stratipit and is therefore to be attributed to the Middle Lovelock period.

**There were only three pieces of this from Humboldt Cave, all from deeper than 24 inches (Heizer and Krieger, op. cit., p. 54).

The table indicates that the few objects recovered from Pe-8 are the same as those from the lower levels of Humboldt Cave and the middle levels of Lovelock Cave. The only exception is Catlow twined basketry which occurs only in the upper level of Humboldt Cave but in the middle levels of Lovelock Cave. The Humboldt Cave material includes 16 fragments of Catlow twined basketry representing 5 baskets, while the Harrington stratipit material from Lovelock Cave includes only a single specimen, that one coming from level 4. These facts indicate that greater reliance is to be placed on the Humboldt Cave evidence and Catlow twined basketry is to be regarded as a relatively late manifestation in the lower Humboldt Valley. On the other hand, if Pe-8 is to be regarded as representing Middle Lovelock culture (on the basis of the side-by-side wicker and the openwork stiff twining), then the presence of the Catlow twined fragment lends additional weight to Harrington's evidence for an earlier introduction of Catlow technique, either as trade objects or as a local skill.

It has been argued elsewhere (Baumhoff and Heizer, 1958) that the few specimens of the fine coiled basketry found in Lovelock and Humboldt Caves represent trade pieces from California. On the same basis it is reasonable to believe that the Catlow twined basketry in the Lovelock region also represents trade items. We present below the frequencies of Catlow twined basketry fragments as against total basketry fragments from Lovelock Cave (Loud's collection), Humboldt Cave, and Pe-8.

Table 2

	Lovelock Cave	Humboldt Cave	Pe-8
Total basketry fragments	1115	2058	275
Catlow twined fragments	9*	16	1

*As nearly as can be told from Loud's description. There certainly were not more than 31 pieces (Loud and Harrington (op. cit., p. 69).

Catlow twining is a difficult skill to acquire and to do so one would have to make many baskets, more than are indicated by the relative frequencies of the technique as shown in these collections.

If the Catlow twined baskets were in fact trade pieces they probably came from northeastern California or southern Oregon, where the most common basketry technique of the historic Indians was of this variety (Barrett, 1908). Cressman suggests (1956, p. 467) that it is associated with the sandals from beneath the pumice at Fort Rock Cave which have been dated by radiocarbon at 9,000 B.P. But it must be noted that although there were fragments of mats and strings and between 75 and 100 sandals from beneath the pumice, only one piece of basketry was recovered and this not by Cressman but by visitors who were in the cave in the absence of excavating personnel (ibid., 1942, p. 39). Furthermore the piece does not seem to be Catlow twined basketry. It does not have the twisted warp, the principle identifying characteristic of the type.

If we discount this evidence, then it is seen that the evidence for the antiquity of Catlow twined basketry in southern Oregon comes from Catlow Cave itself and from Roaring Springs Cave. Cressman (op. cit., Tables 3 and 4) found Catlow twined basketry at all levels in both caves. He now believes that the earliest levels of Roaring Springs Cave date from about 2,500 B.C. while the earliest levels of Catlow Cave date from 2,000 B.C. (ibid., 1956, Chart 3).

The date of the Catlow twined specimen from the Lovelock Cave stratipit can be interpolated from radiocarbon dating. Level 2 of the pit has been dated at 1686 + 220 B.P., while a date of 3112 + 260 B.P. has been obtained for level 5 (Libby, 1954). These dates indicate that the Transitional Lovelock period (levels 3 and 4) covers a period somewhere in the time from 1 to 1,000 B.C. Since the Lovelock Catlow twined specimen comes from this period, it is clear that it could easily have been traded from

the southeastern Oregon-northwestern California area. The same conclusion applies equally to the specimen from Pe-8.

The similarities between the Pe-8 specimens and those from the Lovelock Cave stratipit enable us to assign an approximate date to the Pe-8 cache. Aside from materials which are present throughout the several periods of the Lovelock Culture, there are three artifact types from Pe-8 which occur only in the Middle Lovelock period--openwork stiff twining, Catlow twine, and side-by-side wicker. The cross-dating here is tenuous because of the small size of Harrington's sample--he has only one specimen of each of these types. Since all three types agree in the dating, however, it is probably safe to say that the Pe-8 cache dates from the Middle Lovelock period or slightly before the time of Christ.

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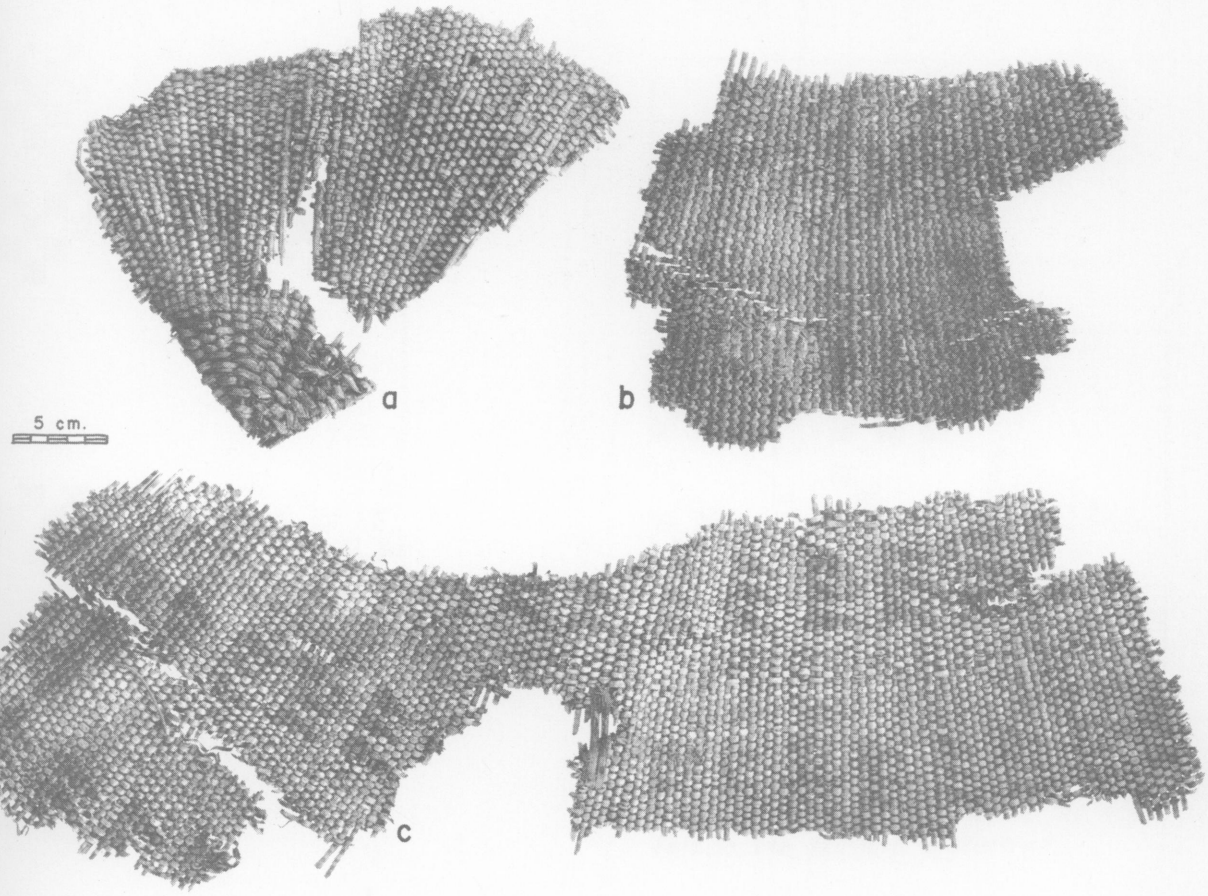


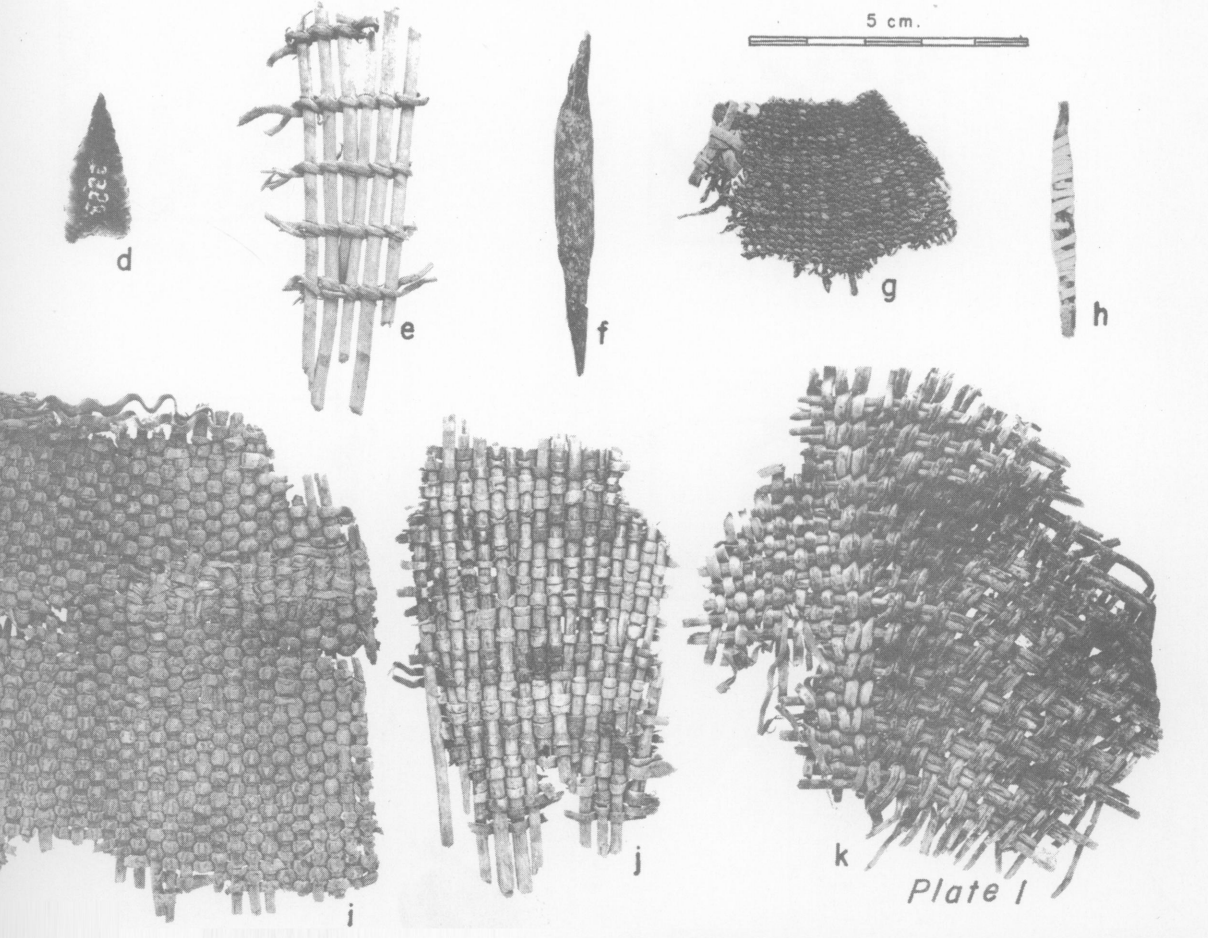
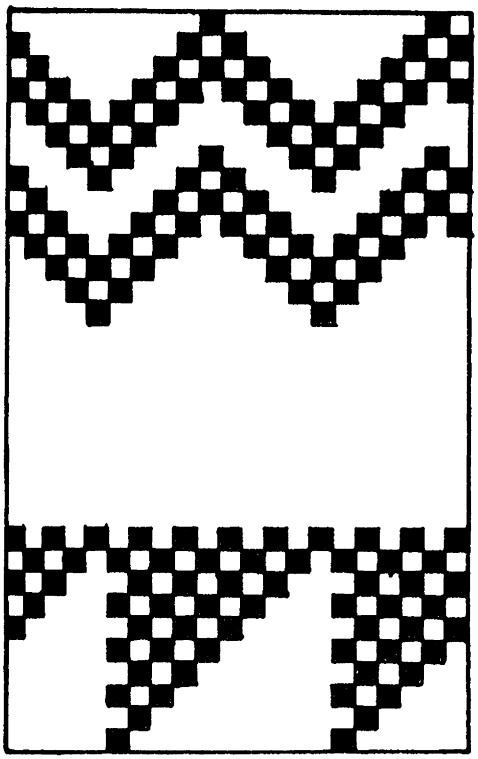


Plate I



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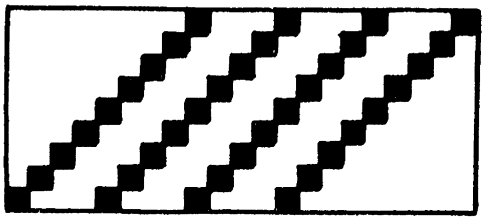

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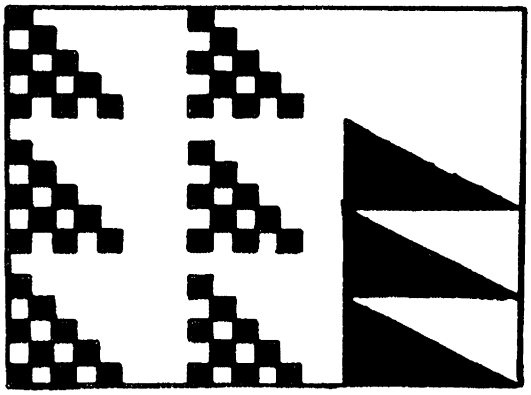

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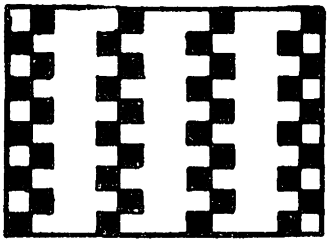

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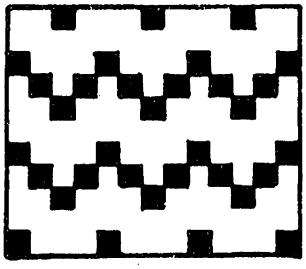

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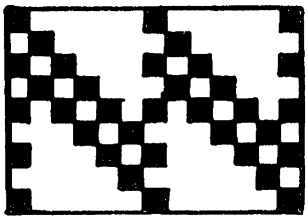

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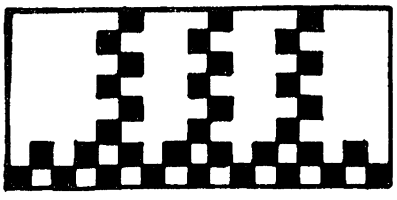

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Wicker Basketry Designs

Figure 1

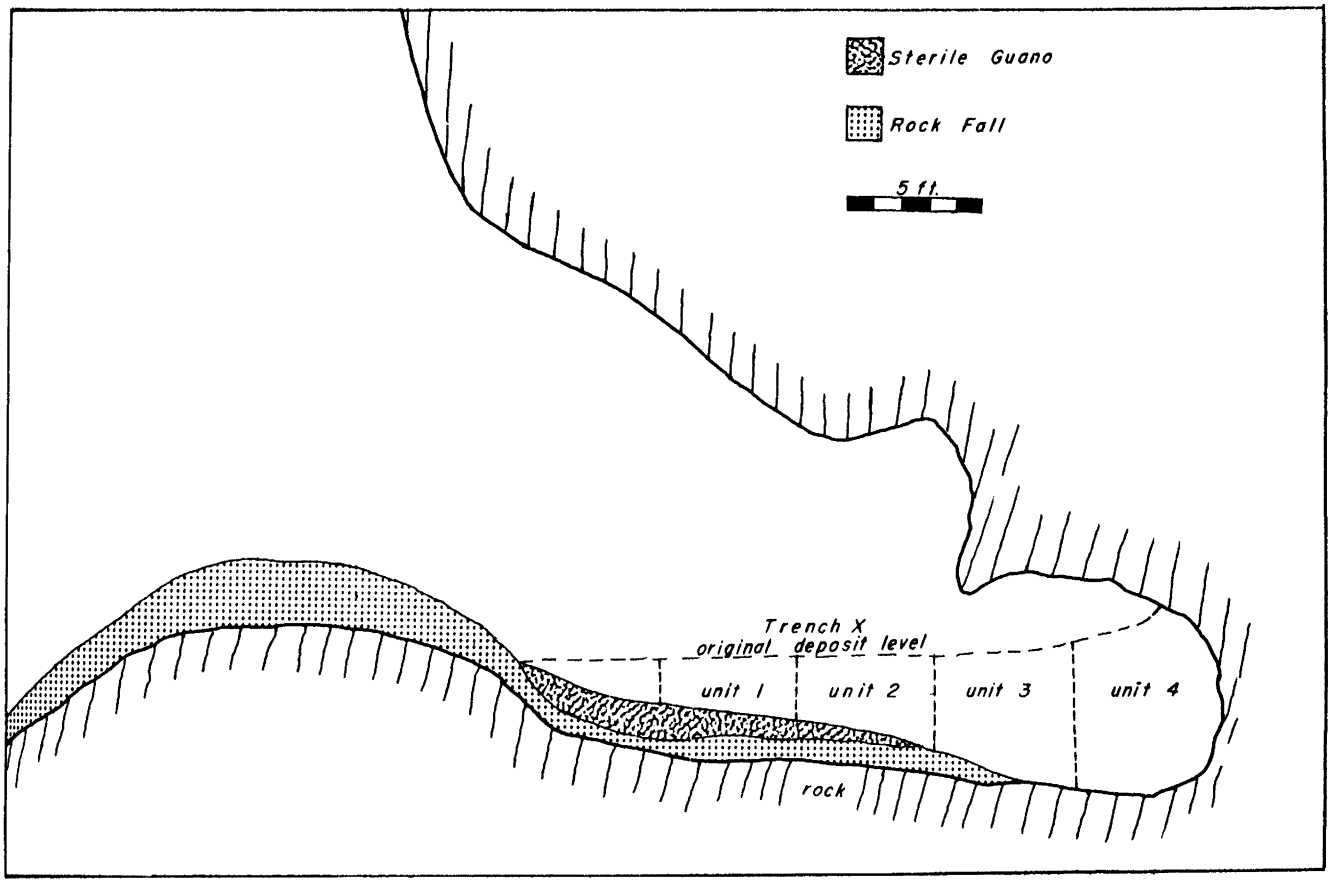

Figure 2a. Site 26-Pe-8, Cross Section

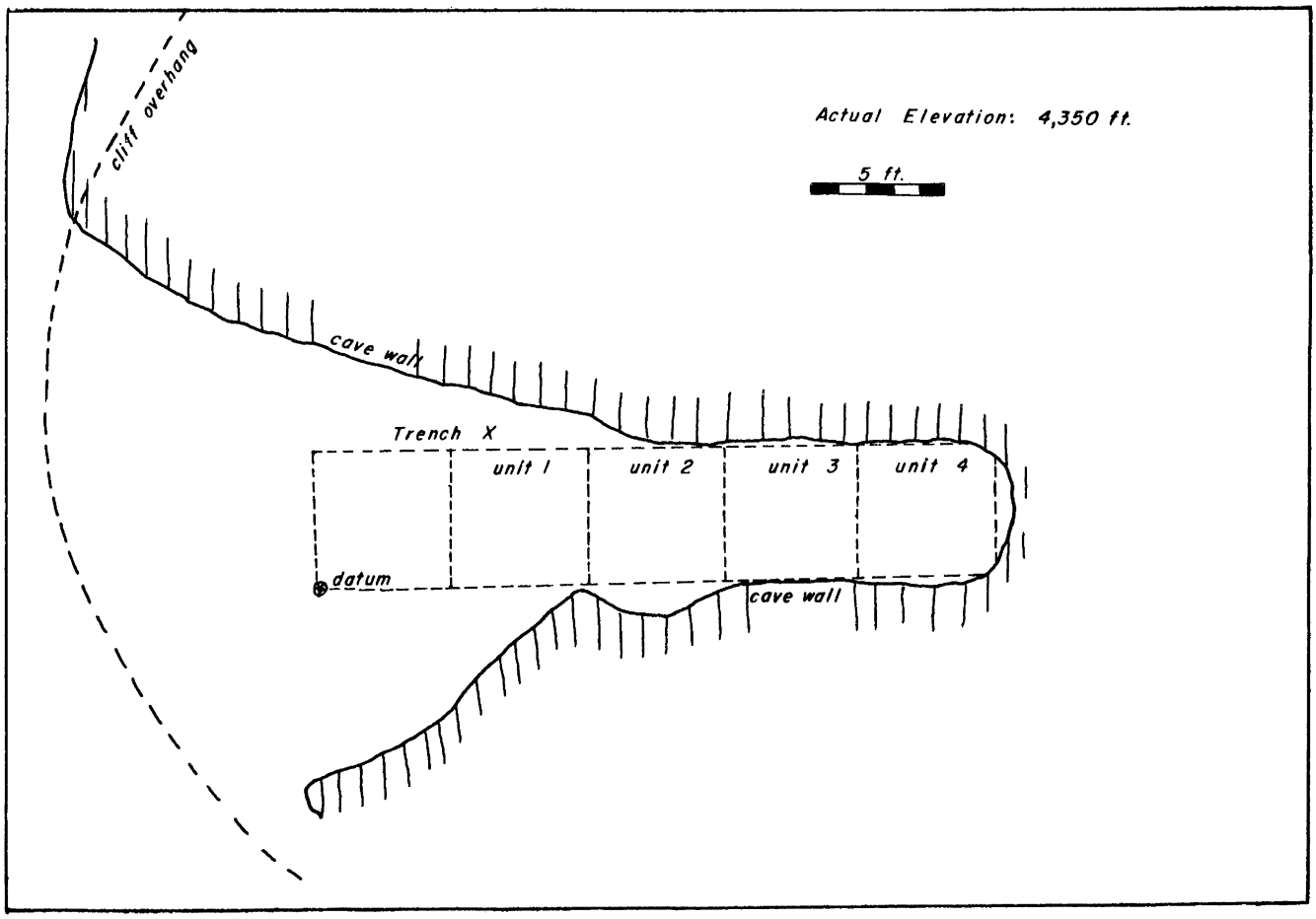

Figure 2b. Site 26-Pe-8, Plan

Explanation of Illustrations

Plate 1

a. Lovelock wicker basketry with layered weft, showing the apex. Notice the courses of heavy twining which characterize the start of these conical wicker burden baskets. UCMA 2-25749.

b. Layered weft Lovelock wicker basketry. In the lower left corner of this piece may be seen a portion where a hole has been mended by darning several courses of twining across it. UCMA 2-25805.

c. Large fragment of layered weft Lovelock wicker basketry. Note the pennant-shaped decorations. These are the same as those shown in Fig. 1, second from top, right. UCMA 2-25735.

d. Obsidian projectile point. UCMA 2-25842.

e. Openwork stiff twined basketry fragment. UCMA 2-25755.

f. Hardwood peg (for ring and pin game?). UCMA 2-25858

g. Catlow twined basketry fragment. Notice the 2-ply twisted warp protruding at lower center near the "g". UCMA 2-25795.

h. Leather thong wrapped with porcupine quill. UCMA 2-25796.

i,j. These two specimens show the difference between layered weft wicker (left) and side-by-side weft wicker (right). Note dark banding on the piece shown in Fig. j. This is the only kind of decoration possible in side-by-side weft wicker. UCMA 2-25876 (i), UCMA 2-25823 (j).

k. Layered weft wicker fragment showing selvage. Note warps gathered into pairs by two rows of coarse twining, each pair then serving as a warp and woven among other pairs until the edge is reached. Here the pairs turn back diagonally and become wefts, to be woven among the other pairs. UCMA 2-25745.

Figure 1

Wicker basketry designs.

Figure 2

a. Cross-sectional drawing of site.

b. Plan view of site (cave faces approximately west).

The Surface Archaeology of Site 26-Pe-5, Pershing County, Nevada*

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During the course of a resurvey of archaeological sites in the Humboldt Valley in 1950, a large collection of lithic artifacts was taken from a spot which later proved to be the site designated as site 5 by Loud (Loud and Harrington, 1929). The site was renamed 26-Pe-5 in 1950, following the method for site designation of the University of California Archaeological Survey. In this paper it will henceforth be referred to simply as Pe-5.

The site is located east and northeast of site 26-Pe-4, on a low barren playa near the toe of an alluvial fan extending from the hills of the eastern side of the Humboldt Valley. So far as is known, it is a surface site, there being found during the surface collecting no evidence of burials. In August, 1954, several hours were spent testing the site area with post-hole pits. No subsurface midden, artifacts, or burials were noted. The area of surface refuse forms a long rectangle, running about 500 yards from east to west and about 100 yards from north to south. Being on part of an alluvial fan, there is a slight slope from north to south; the elevation is from 3905 to 3900 feet. It is apparent that the southern edge of the site, i.e., the lakeward slope of the alluvial hump, has been wave-washed at some time of high water of the Humboldt Lake.

The site is distinguishable from the surrounding area by the presence of a concentration of rocks: flakes and pebbles or cobbles (see Pl. 1). A large number of the pebbles have flakes taken off them, i.e., they appear to be unfinished tools or cores from which flake tools were made. There seemed at first the possibility that these rocks might have been broken by wave or wind action. When, however, there was found an almost equal number of similar rocks, which had unquestioned chipped edges on them, the site took on the aspect of a bona-fide implement-making site. In addition, the cores and large flake tools of basalt and rhyolite were not the only implements found. There were numerous obsidian projectile points and fragments, and the evidence of at least some of them being made on the spot is patent. Loud describes the site as "a low-lying patch of obsidian refuse, the remains of implement making" (ibid., p. 130).

The age of the site is not exactly known. Further investigation based on geology, climatology, or artifact typology might reveal a rough date or make possible the placement of the site in the local cultural sequence. In

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any case, if exact age is not expectably determinable, a knowledge of the relationship of the culture represented here with others is. The most fruitful approach to this is in comparison of the artifacts found at Pe-5 with those found at sites about which more is known, such as Lovelock Cave, for example.

At this point a word should be said about the meaningful quality of the present series of classifications. It is not claimed that some of the subtypes, for example, of choppers and scrapers, represent real cultural differences, i.e., of manufacturing methods, motor habits, or use of the finished objects (Drucker, 1943, p. 35). The surface nature of the site deposit, its small extent, and the virtual absence of published data for other sites in the region do not allow any valid conjectures concerning distribution, either vertical or horizontal. Consequently, the setting up of subtypes on the basis of distinction in shape, as exemplified by the sub-classification of choppers, is meant to be largely a descriptive device, leaving open the possibility that each of the subtypes does in fact represent a real cultural difference. In the case of sinkers, on the other hand, the differences in shape were thought to have such little diagnostic value that specimens of various shapes have been categorized as "groups."

It is believed that, except for the projectile points, the specimens collected and described here represent a fair sampling of a site which has been previously little disturbed by Caucasians. Evidently projectile points have been collected by others over a period of years since Loud first named the site. Presumably the other types of implements, being relatively crude, have not been collected intensively or at all. Whatever the true situation is, the most that can be said at the moment is that the site is one of former implement making.

The vast majority of the specimens are of chipped stone. Although grinding is shown on some of the tools, no specimens positively identified as mortars or metates were found at the site. The reason for this is not known, although the large size of the sample and the care taken in gathering it in 1950 almost eliminates the possibility that fragments of such specimens were overlooked during the field collecting.

The artifacts here described are of the following kind and number:

Cores	254	Scrapers	139
Hammerstones	62	Planes	84
Choppers	58	Projectile points	236
Sinkers	132	Miscellaneous	28

Cores

Throughout this paper the term core, when used as a noun, designates nodular stones with a high silica content which exhibit signs of surface flake removal. Cores are either uncompleted tools, such as choppers or hammerstones, or pieces of stone from which flakes were obtained deliberately--these flakes were then further fashioned into tools such as scrapers or projectile points. It follows from this that a core tool is an artifact, the function or use of which is inferred by the observer according to certain broad criteria, such as the extent of chipping on the surface or the size of the chips produced. Cores, then, are pieces of stone of varying sizes, which usually are but slightly modified from their original pebble or cobble character.

If the above definition has validity, it is now necessary to distinguish between cores and hammerstones, which are probably the simplest of stone artifacts. Here the difference is seen by us to be the difference between flaking-off and battering. The battered hammerstones are distinct and what flaking there is on them seems to be fortuitous, although it is possible in some cases that exhausted cores or perhaps choppers were subsequently used as hammerstones, hence acquired battered edges.

The number of cores is second only to the number of projectile point fragments collected at the site. The specimens have been divided into two groups, rhyolite and basalt; there are 72 specimens in the former group, 178 in the latter. Chert, of which but 4 specimens were recovered, was apparently not at all an important core material at Pe-5, and was, in our sample at least, found to be used only occasionally, even for projectile points.

The character of the flaking on the cores suggests that rhyolite, with its uneven fracture quality, was used in the production of cores which did not require, indeed could not take, retouching, in order to be used ultimately as refined tools. On the other hand, when one looks at some of the smaller core or flake implements found at this site, such as scrapers or projectile points, it is noticed that rhyolite was used hardly at all, while basalt was used frequently, even vying with obsidian as a material for manufacture of projectile points.

It is clear that both materials, rhyolite and basalt, were readily available to the inhabitants of Pe-5, and that basalt core tools are more refined and show better controlled flaking patterns than like tools of rhyolite. Basalt, besides being used predominantly for the simplest tools, such as hammerstones and choppers, was preferred for a greater number of types of stone implements. Basalt and rhyolite cores do not reveal any great differences in shape--they are all "subspherical"--and both could be made into similar, relatively unrefined tools. Unless some not easily apprehended function may yet be assigned to cores as described here, we must assume that they were but incidental, i.e., represented a beginning stage in the manufacture of other tools.

Table 1

Size and Weight Data on Cores**

Type	Size of specimen	Museum Number	Weight (grms)	Length (mm)	Width (mm)	Thickness (mm)
Basalt	Average	2-27557*	297	75	58	54
	Large	2-28165	666	100	85	71
	Small	2-28378	50	50	40	28
Rhyolite	Average	2-28446*	401	87	61	76
	Large	2-28366	983	111	91	81
	Small	2-27606	96	69	62	27

*Illustrated (Fig. 1a, b).
**Specimen numbers are University of California Museum of Anthropology (UCMA) numbers.

Hammerstones

Hammerstones, as mentioned above, are probably the simplest of stone artifacts found at this site. They are characterized by battering or percussive abrasion on the edges. Where flaking accompanies the battered edges, it is assumed that it has occurred by chance, or that the specimen was flaked initially to be used as a chopper or scraper, but was either not used as such or was so used and subsequently discarded. Materials are basalt and rhyolite; the majority of the specimens are of basalt. On the basis of shape, three types have been distinguished, as follows:

Type a - Large battered cobbles (31 specimens). Twenty-two are of basalt, twelve of rhyolite. This type is subspherical in shape; some specimens have roughly flattened "sides," almost rectangular facets, which are chipped and battered along their edges. This is obviously a wearing away from constant use, since there is a vestige of an original surface on only two of these specimens. The latter parallel fairly closely the "core hammerstones" described in the Topanga culture (Treganza and Malamud, 1950).

Type b - Smooth cobbles or pebbles (10 specimens). Nine of the specimens are of basalt, one is of rhyolite similar in size to the average basalt specimens. These are of elongated ovoid to pear shapes. The rhyolite specimen is subspherical, with one surface showing possible rubbing. All the specimens are smooth, and show definite pecking marks at either end.

Only one is a complete pebble (No. 2-28320). Another (No. 2-28310) has a smooth cut or break across the short diameter; the smoothness might have been produced by grinding. Specimen No. 2-28320 is much larger than the others of this group (ca. 90x70x50 mm.) and was perhaps also used as a mano; in addition it has fairly heavy pecking marks at one end. One broad face of the specimen is ground down, and has definite lateral shoulders which, however, are more pronounced at one end than the other.

Type c - Ovoid flat hammerstones (18 specimens). All are of basalt, six of the specimens have one end thicker than the other so that they resemble ovoid wedges. An unusual characteristic of this subtype is that perpendicular flakes have been removed from the thicker end, which is heavily battered. Battering on the lateral edges is slighter, and there is only light battering on the opposite, or thinner ends of the specimens. The effect is that of greatly worn-down choppers or scrapers. The remainder of the specimens have uniform battering on all the edges.

Table 2

Size and Weight Data on Hammerstones

Type	Size of specimen	Museum Number	Weight (grms)	Length (mm)	Width (mm)	Thickness (mm)
a (Basalt)	Average	2-28322*	383	76	74	61
	Large	2-28065	1243	112	102	90
	Small	2-27633	217	85	67	33
a (Rhyolite)	Average	2-27645*	306	83	71	53
b (Basalt)	Average	2-28310*	184	81	53	30
	Large	2-28320	883	115	98	67
	Small	2-28321	56	65	28	22
c (Basalt)	Average	2-28315*	149	77	48	30
	Large	2-28316	295	86	78	46
	Small	2-28359	48	52	43	20

*Illustrated (Fig. 1c-f).

Choppers

These are mostly core-like tools which obviously did not have much care expended on their manufacture. Most of the specimens show bi-facial chipping, with the cutting edges roughly scalloped. A few are uni-faced; they might actually have been used as large scrapers or planes. Choppers were made from basalt, rhyolite, and andesite. Three types are distinguishable on the basis of outline and shape; one other type is set apart because all the specimens are of the same material and all are rough and irregular in shape.

Type a (13 specimens). These are the rough and irregular type just mentioned. They are all of rhyolite, which seems to be the kind of material least adapted for choppers. Except for the one rough cutting edge, the specimens are not easy to distinguish from what have been defined above simply as cores.

Type b (6 specimens). Fragments of smooth, flat, ovoid cobbles, all of basalt, which were originally about 100x130x40 mm. in size. Two of the specimens represent about one-half of such a cobble, probably split intentionally, across the short diameter. A rough cutting edge was thus produced at the break. The other specimens have the same type of edge, i.e., that produced from a split across the short diameter, but the fraction of the original cobble evidently is smaller, thus producing on some a longer cutting edge. All but one of the specimens show pecking on the rounded end. None of these show any abrasion that would indicate use as a mano, however; three specimens show spots where some sort of polishing or rubbing has taken place on the original curved surfaces. The contour of the natural surface has not been modified, i.e., shouldered, by the process. It is questionable whether the stone was originally used for hammering or pecking and then cracked from use, or whether it was cracked in order to produce the rough chopping edge. In any case, the cutting edges show little evidence of use, for example in the form of use-retouching. One specimen (No. 2-27767) has only one original surface still intact, and the shape approaches that of Type d, a semi-circular wedge type.

Type c (7 specimens). These are of basalt, circular in outline, and bi-faced. This type has a cutting edge most of the way or completely around its periphery.

Type d (32 specimens). These are all of basalt. They form the largest group of choppers, and can be described as a roughly semi-circular wedge-shaped type. In most of the specimens there is a thick, flattish edge at the back, and the semi-circular edge is the chipped cutting surface. They are divided about evenly as to number, some having bi-facial chipping, the rest being uni-faced, with fairly steep-angled chipping. The latter subtype resembles a large plane or scraper.

Table 3

Size and Weight Data on Choppers

Type	Size of Specimen	Museum Number	Weight (grms)	Length (mm)	Width (mm)	Thickness (mm)
a (Rhyolite)	Average	2-28108	313	90	65	45
	Large	2-27798	906	125	90	60
	Small	2-27802*	102	77	50	25
b (Basalt)	Average	2-27767*	257	100	60	28
	Large	2-27693	624	110	95	33
c (Basalt)	Average	2-28093*	255	75	60	40
	Large	2-27677	384	100	75	35
	Small	2-27694	53	50	45	15
d (Basalt)	Average	2-27681*	278	100	65	25
	Large	2-28109	455	95	70	45
	Small	2-28087	66	50	45	15

*Illustrated (Fig. 1g, h; 2a, b).

Sinkers

It is difficult to determine the exact use of these artifacts in the fishing economy of the people who made them. They might have been used on nets or on individual drop-lines. In three caves on the east side of Humboldt Valley, i.e., Lovelock, Humboldt, and Ocala Caves, nets have been recovered, and in both Lovelock and Humboldt Caves bone-barbed fishhooks set on fishing line have been found (Loud and Harrington, op. cit., pp. 41, 89; Heizer and Krieger, 1956, pp. 19, 62). Sinkers were not in any case found associated with either nets or fish lines, and the only specimens which could possibly have been used as sinkers, perforated stones found in Lovelock Cave (Loud and Harrington, op. cit., p. 107), could easily have had some other function, e.g., they might merely have been decorative stones. The latter specimens also were not found associated with any fishing equipment.

Comparison of fishing gear from Pe-5 and Humboldt Valley caves shows but one possible common occurrence, i.e., the "ice pick" fragments of Pe-5 (see p. 43) and the complete "ice pick" specimen reported by Loud (op. cit., p. 146) from Lovelock Cave. Thus the entire range of cave specimens offers no particular clue to the function of the sinkers at Pe-5.

The relative lightness of the Pe-5 specimens might indicate that they were more adaptable to drop lines rather than nets. Also, it is obvious that if the site were a winter fishing village, for example, the sinkers could only have been used on drop lines. Presumably they could not have been used in winter on large fishing nets and also would not be used on small dip nets (or seed beaters, for example--cf. Stewart, 1941, p. 425) to scoop fish through holes in the ice.

From the variety of shapes and materials of the specimens, it is seen that there were no preferred or ideal types. Almost any rather small, thinnish pebble could be used; the chief feature found on all the specimens is chipped notches on opposite edges at the point of shortest diameter, with some rubbing in the notches thus produced, perhaps to prevent cutting the cord which was tied around the sinkers. Although the wear from rubbing in the notches on some of the specimens is quite marked, no specimens show grooving all the way around, such as that on a specimen from Humboldt Valley illustrated in Loud and Harrington (op. cit., Pl. 64). One of the cobble scrapers, however, which might have been used also as a sinker, showed a distinct semi-circular groove across one end.

Sinkers were made from basalt, slate, shale, scoria, and other tufaceous fragments. Four categories, determined according to shape, are listed below. Only Group III includes sinkers which apparently were made from water-worn pebbles. The other groups contain specimens made from rough fragments, mostly of basalt.

I. Asymmetrical, with straight sides (41 specimens).
II. Symmetrical, smooth rectangular (24 specimens).
III. Smooth ovoid or leaf-shaped (33 specimens).
IV. General irregular shapes (34 specimens).

It is to be noted that there is not a large range of sizes among the sinkers. Only one specimen, with a weight of 305 grams, exceeds the general average weight for all the specimens of about 50 grams.

Table 4

Size and Weight Data on Sinkers
Except for one large sinker in Group III, only the weight and dimensions of average sized specimens are given.

Group	Museum Number	Weight (grms)	Length (mm)	Width (mm)	Thickness (mm)
I	2-28331	63	52	48	10
	2-27812	29	58	50	4
II	2-27627	52	48	42	15
	2-28332*	23	51	32	4
III	2-27778	23	55	35	4
(largest)	2-28326	305	110	68	20
IV	2-28343	43	70	35	10
	2-27816	41	50	30	10

*Illustrated (Fig. 2d).

Scrapers

Scrapers are distinguished from choppers in having consistently unifaced chipping, and in being generally smaller than choppers. They are also to be distinguished from planes by the fact that they have a lower angle to the trimmed edge than have the latter, and a bottom surface which is rather more concave or convex than the almost flat lower surface of a plane.

Scrapers exhibit a wide range of shapes and types. The shapes extend from leaf-shaped or long-rectangular to square or circular (discoidal). Except for two related types of tools, as indicated below (knives and "anvils"), most of the scrapers can best be described on the basis of chipping or trimming of the edges, as follows:

1. Side scrapers

a With trimming on one edge (straight).
b With trimming on a continuous semi-circular edge.
c With two separate edges trimmed.
d With trimming on three edges.

2. End scrapers

With trimming on one end.

3. Discoidal scrapers

With chipping all around.

4. Related tool types

Knives.
Cobble scrapers or anvils.

General description of types:

1. Side scrapers

Subtype a (45 specimens). This is numerically the largest and most simple group of scrapers. Most of the specimens are of basalt; apparently any flake of this material, whether struck off accidentally or otherwise, might have been secondarily chipped for use as a scraper if it happened to be large enough for the purpose at hand. Thus the shapes are irregular in outline, and the thickness varies. Although the latter factor would suggest a further extracting from this group of thick and thin flake types, this was not thought feasible in view of the seemingly accidental character of many of the flakes.

Subtype b (21 specimens). Material is predominantly basalt, with a few rhyolite specimens. This type has the most clearly defined shape of any of the side scrapers. However, only six of the specimens seem deliberately fashioned to this shape. The others appear to be accidental flakes with the chipping on the original thin edge. All the specimens are roughly semi-circular in plan with wedge long-sections; secondary chipping is on the semi-circular thin edge while the opposite, or thick edge, is a fairly straight plane, perpendicular to the broad surfaces. Some of the latter are convex, obviously resulting from percussion flaking and often having a well-defined bulb of percussion, indicating that these specimens were flakes struck from a core. The opposite broad surfaces of such specimens usually show only rough primary flaking.

Subtype c (12 specimens). These are usually rectangular pieces with the trimming on two opposite edges, parallel to the long axis. The flakes,

or original pieces of stone (basalt), seem to have been consciously selected for the manufacture of this type of tool. The thicknesses of the specimens do not vary so much as in subtype a.

Subtype d (12 specimens). This type is closely related to subtype c in shape, thickness, and material. The chief difference between the two is in the extent of the trimming: in subtype d the two side edges are chipped approximately at right angles to the end or "short" edge, hence this type is really a combination side- and end-scraper.

2. End scrapers (3 specimens)

This type is similar to subtype a of the side scrapers, the only difference being in its having the trimmed edge parallel to the short axis instead of the long axis of the specimen. Since this type is numerically insignificant, it will not further be considered.

3. Discoidal scrapers (17 specimens)

These are circular or ovate discs, all being trimmed completely around the periphery. A few, however, have quite irregular chipping on some sections of the edge. The specimens are modified natural or man-made flakes, chiefly of basalt. In cross-section they are roughly lenticular, except that in some specimens one surface is flat rather than curving.

4. Related tool types

Knives (37 specimens). These are all thin, long, sub-rectangular, i.e., tabular, fragments of basalt. Some have secondary chipping on both of the long edges; others have flaking on one long edge only. While most of the specimens are natural tabular flakes, some of them have rough chipping on the flat surfaces.

Cobble scrapers or anvils (9 specimens). This group might also be connected with the cobble tools (subtype b) of the chopper group. The specimens are vari-sized fragments of basalt or rhyolite cobbles, which have been split longitudinally and/or laterally, leaving one smooth face of the original cobble, and one rough face.

The specimens are circular or ovate in plan, generally thin, with rough secondary chipping, or in some cases battering, around parts of the edges. The rest of the unretouched edge is sharp enough, probably, to have been useful for scraping purposes.

Four of the specimens show light abrading on the smooth cobble surface, as if they were used for rubbing or polishing of some sort, though mostly they do not have any definite form, like manos, for example. (Specimen No. 2-27673 shows the most abrasion, and even shoulders are barely discernible in this specimen.)

Specimen No. 2-28146, the largest of this type, apparently retains the original surface of the ovate cobble. It shows evidence of pecking on one end (cf. pecking on ends of cobble chopper [subtype b]) and has a slight depression on its smooth upper surface which could indicate use as an anvil.

Another specimen, No. 2-27768, also shows a pecked, anvil-like surface. In addition, it has a smooth fracture through what was the short diameter of a cobble. On this surface is a semi-circular groove which at first glance looks like part of a drilled hole. On closer inspection, however, it appears to be not a hole but rather a worn spot resulting from use of the stone as a sinker. The edge at the opposite end of the specimen has a corresponding but less well-defined nicking.

Table 5

Size and Weight Data on Scrapers

Size of specimen (gross)	Weight (grms)	Length (mm)	Width (mm)	Thickness (mm)
Largest specimen: cobble scraper	370	125	76	35
Smallest specimen: side scraper	17	37	33	7
Average specimens:				
one side chipped	108	65	51	20
semi-circular edge	121	115	60	15
two edges chipped	121	72	68	13
three edges chipped	83	76	46	21
discoidal	88	65	64	12
knife	68	95	49	9
cobble scraper	220	100	70	18

Illustrated specimens (Fig. 2g-j; 3a-c).

Planes

Specimens of this type have previously been called scraper-planes or pulping-planes (Rogers, 1929, p. 50). Planes, in contradistinction to ordinary scrapers, are generally core-tools, i.e., there are not many planes in the collection which were made from flakes. Other factors on which planes have been distinguished are:

(1) Flat under-surfaces or "bottoms"--either a cleavage plane or a percussion flaked surface.

(2) Uni-facial secondary chipping on working edge at a very steep angle to under-surface.

(3) Thick or high in cross-section--the tools thus could be easily gripped for use in a push or pull motion. The thickness or height varies from quite low (ca. 20 mm.) to an average height equal to or somewhat less than the short horizontal diameter. A few specimens (four) are extremely "tall"--two or three times the latter diameter.

Materials used were basalt, rhyolite, and chert (only one specimen, similar to one of finely chipped basalt). The rhyolite specimens again are much rougher and more irregular in shape than are the others. However, in all the specimens, regardless of material, there is a great variation in shape, although nearly all may be called somewhat elongated forms. One recognizable group, which is entirely of basalt, shows a regular oyster shape, i.e., the specimens have bottom surfaces which are ovoid in outline, and a low, regular convexity above the cutting edge.

Because of these irregular shapes, it seemed desirable to establish two types of planes, types based on the amount of trimming on the edges. The types, both of which show uni-facial chipping, are as follows:

Type a (41 basalt, 20 rhyolite, 3 andesite specimens). With trimming on one, or occasionally two, straight edges (long diameter of the specimen).

Type b (33 basalt, 1 chert, 11 rhyolite specimens). With trimming on an edge, extending completely around the periphery. In this type is the oyster-shaped group mentioned above, which is further characterized by a fairly regular chipping of "shaping" on the convex upper surface.

Table 6

Size and Weight Data on Planes

Type	Size of specimen	Museum Number	Weight (grms)	Length (mm)	Width (mm)	Thickness (mm)
a (Basalt)	Average	2-27704	184	110	58	32
	Large	2-28287	551	127	80	45
	Small	2-27714	44	65	32	21
a (Rhyolite)	Average	2-27733*	177	70	54	40
	Large	2-28067	792	110	96	50
	Small	2-27735	38	65	35	30
b (Basalt)	Average	2-27732*	121	70	55	30
	Large	2-27543	539	128	70	48
	Small	2-27701	48	52	36	25
b (Rhyolite)	Average	2-28027	153	70	55	33

*Illustrated (Fig. 3d, g).

Projectile Points

It is to be expected that the present collection of points does not represent quite a fair sampling of the site for any given time. Unquestionably, collectors have visited the site at times when many of the artifacts were not covered by sand. During such collecting the cruder artifacts, such as scrapers, described in the preceding sections, probably were overlooked, while the coveted points were taken freely. Loud, as mentioned above, describes the site as a "low-lying patch of obsidian refuse." This implies that he neglected to notice the basalt artifacts. In addition, he found only a very small number of obsidian artifacts here. This must mean that either he did not spend much time at the site, or that he visited it at a time when wind-blown sand had obscured the smaller pieces. In any case, assuming that the area has previously been well-hunted, the rather large number of projectile points or fragments recovered in 1950 indicates either that there was a long occupation here, a fairly well-peopled camp, or that the site was a manufacturing center. Combinations of these are of course possible, but the latter supposition is probably closer to the truth than the others.

There is a wide range of types in the points found; the classification used* is applicable only to about one-half of the specimens recovered, which are either complete specimens or identifiable bases. The remainder are mid-sections or tips. Wherever there were only minute or minor variations from the established classification, it was felt to be sufficient to use the established types as criteria rather than to set up new ones. In only one case was it found necessary to depart from the classification, and this concerned a specimen which might have been manufactured accidentally. In descriptive terms, only one type will be considered here. This is the type SCa3, which contains more specimens than any of the other types--it falls in the class which has characteristic corner notches and a concave (based) or "split" stem (Fig. 41, m).

Of 52 specimens falling into the SCa3 category, 33 are extremely small in size, i.e., their average calculated weight is less than .5 grams. Specimens exceeding this weight, and extending to a maximum weight of 7.4 grams, are comparable in type and size to points from Lovelock Cave (Loud and Harrington, op. cit., Pl. 56) and Humboldt Cave (Heizer and Krieger, op. cit., Pl. 14). At the latter cave, the points recovered in greatest quantity, of type SCb2, differ from the SCa3 points of Pe-5 only in that they are tanged, while the SCa3 points are not.

Comparison of the assemblage of small projectile points with collections from other sites in the Humboldt Valley has not yet been made in detail. It is known, however, that in the collections of the University of California Museum of Anthropology, from the surface of site 26-Ch-15, are numbers of small projectile points. The latter site is but a few miles southwest of Pe-5, in the now dry bed of Humboldt Lake. The predominant type of point found here is the NBa2 type (following the classification used in this paper), also designated as "desert side-notched" by Baumhoff (1957, p. 10). This is usually a small type of point, comparable in size to the SCa3 points of site Pe-5.

The desert side-notched points are conspicuously absent from the Pe-5 collection. This is significant in that evidence from other sites in or near the edge of the western Great Basin indicates that this type of point was manufactured in late prehistoric times and its use frequently extends to the full historic period (ibid., p. 31; Heizer and Elsasser, 1953, p. 20). It is, of course, not positive that the desert side-notched point type from the surface of 26-Ch-15 falls into the late prehistoric or protohistoric period. Its association, however, at 26-Ch-15 with bead types definitely of protohistoric times (Bennyhoff and Heizer, 1958, p. 72) is meaningful. The suggestion thus is made that while 26-Ch-15 was occupied by the Northern Paiute in the protohistoric period, as evidenced by

*The form classification is based upon that of Thomas Wilson, 1899, Part II, pp. 811-988; employed by Gifford and Schenck, 1926, pp. 80-81; Schenck and Dawson, 1929, pp. 370-371; Strong, 1935, pp. 88-89; Cressman, 1936, p. 31.

the presence both of the bead types and the desert side-notched points, site Pe-5, where no definite time-marking specimens were found, was by this time completely abandoned.

As can be seen from Table 9, following, a majority of the points are of obsidian. These show the most refined pressure flaking techniques, even points less than 15 mm. long being well-chipped. It is not known exactly why such extremely small points had so much care expended upon them. The basalt points of course do not show such refinement--this is undoubtedly due to the refractory nature of the material. Since other materials besides obsidian and basalt were not at all frequently used, a listing of this material will not be made. Some of the specimens of these various materials show rather refined pressure flaking; others are crude fragments.

In Table 8, where dimensions of the specimens are listed, it will be noted that thickness is not included. This is rather a constant factor, the thickness varying proportionately to the other measurements, from about 3 to 9 mm. An exception to this is in the category "drills." These are included with projectile points on the basis of their being round or ovoid in cross-section.

Table 7

Size, Weight, and Material Data on Projectile Points
(Types showing a range of size and weight)

Type of point	Size range (mm)				Weight range (grms)			Fig. reference to illustration
	Small		Large					
	Length	Width	Length	Width	Small	Average	Large	
NAb1 (8)*	25	14	70	38	1.4	8.4	15.0	4a
NAb3 (17)	25	13	40	20	1.3	3.7	7.9	4c
NBa (5)	15	10	45	25	.5	3.2	9.4	4d
SAa (5)	15	10	38	19	.2	1.6	4.1	4f
SBa (6)	15	9	45	30	.2	2.7	7.7	4g
SBa' (3)	17	13	28	20	.8	1.8	3.6	4h
SCa2 (12)	15	12	35	20	.4	2.6	3.0	4k
SCa3 (52)	12	6	40	30	.1	1.4	7.4	4l, m
SCb3 (8)	22	18	38	22	1.2	3.0	3.5	4p

*Figures in parentheses indicate number of points recovered.

Table 8

(Types Represented by Individual or Fragmentary Specimens Only)

Type of specimen	Size (mm) Length	Width	Condition	Fig. reference to illustration
NAb2	35	20	Complete	4b
NBb1	30	15	Fragment	4e
SBb	34	25	Fragment	4i
SCa1	28	20	Fragment	4j
SCb1	17	16	Complete	4n
SCb2	24	22	Fragment	4o
Special point	36	20	Fragment	4r
Drill	55	18	Complete	4q

Table 9

Number of various types of projectile points collected, materials, and percentages of total material used.

Type	Number collected	Obsidian	Percent of total	Basalt	Percent of total	Other (volcanic) materials	Percent of total
NAb1	8	3	37	5	63		
NAb2	1			1	100		
NAb3	17	11	65	4	23	2	12
NBa	5	2	40	2	40	1	20
NBa1	1	1	100				
NBb1	1	1	100				
SAa	5	2	40	3	60		
SBa	6	4	67	2	33		
SBa'	3	3	100				
SBb	2	1	50	1	50		
SCa1	1			1	100		
SCa2	12	8	67	4	33		
SCa3	52	40	76	4	8	8	16
SCb1	1	1	100				
SCb2	2	1	50			1	50
SCb3	8	5	63	1	12	2	25
Special	2	2	100				
Rejects	103	67	66	31	30	5	4
Drill	7	1	14	5	72	1	14
Total	237	153	65.0	64	27.0	20	8.0

Miscellaneous Artifacts

In this category are specimens which were not found in such number at the site as to be supposed to be objects of common use, or objects which were manufactured in the immediate area. Further, all of the specimens are characterized by definite evidence of their having been subjected to grinding, pecking, or rubbing processes. It will be noted in the preceding sections that chipping has been the process overwhelmingly in evidence on the specimens--on only a few has there been any grinding or rubbing, and here the actual purpose has been questionable.

Five groups of artifacts were found--four are recognizable as containing types of implements which seem to have been used at one time or another by the early inhabitants of the Humboldt Valley. These are: (1) "ice picks," (2) manos, (3) hullers, (4) rubbing stones. One group has but one representative specimen; at present this can be designated only as a chipped, pointed slate object. Detailed descriptions of these groups follow.

(1) "Ice picks" (16 specimens)

These are all of granite or rhyolite, and are all fragmentary, apparently representing pieces no larger than one-quarter of their original complete size. The original size can be inferred from comparisons of Pe-5 fragments with some complete specimens, obviously of similar type, described by Loud as "ice picks," found in other Humboldt Valley sites.

The only direct local ethnographic evidence for the use of the specimens as ice picks was supplied to Loud (Loud and Harrington, op. cit., p. 156) and Stewart (1941, pp. 363, 425) by the same informant (Gilbert Natchez). Stewart reports (op. cit., p. 425), "Informant's mother told him that the old timers tied a sharp rock onto a stick to use to break the ice. He thought it similar to the one from Lovelock Cave. AL [Annie Lowry] denied ever hearing of such an instrument being used. Ice was broken with any big stick." The practice of fishing through holes in the ice, however, was fairly well-known in the western Great Basin or near its western edge, in California. It is mentioned by Bruff (Read and Gaines [ed.], p. 279), for example, for Little Goose Lake (Feather Lake) in Atsugewi territory; noted by Voegelin (1942, p. 56) for the Klamath, Modoc, E. Achomawi, and Atsugewi, and by Stewart (op. cit., p. 363) for a whole series of Northern Paiute bands besides the Lower Humboldt River group to which Gilbert Natchez belonged.

Loud's specimens are in the form of a pestle with two sharp points, and with "longitudinal and encircling grooves for the purpose of attaching handles" (Loud and Harrington, op. cit., p. 146). The specimens now under consideration all exhibit rather smooth surfaces which have either been pecked evenly all over or have this appearance only because of the coarse nature of the stone. Eight specimens are end fragments, showing the clearly

defined, smooth, possibly ground, sharp point of Loud's ice pick. The remainder are medial fragments, i.e., both ends have obviously been broken off of them. None of the specimens, pointed or otherwise, are large enough to indicate that the original artifact actually had points at both ends.

The longitudinal grooving on 4 of the pointed fragments is about 20 mm. wide, 5 mm. deep. Four of the center fragments also show traces of similar grooving. The ungrooved specimens, which have outer surfaces exactly like those of the grooved ones, could represent, of course, the non-hafted ends of the tools. Three of the center fragments have an encircling groove, of about the same width and depth as the longitudinal groove described above. None of the specimens, unfortunately, have both types of groove.

In cross-section, all but one specimen is elliptical rather than round. The one exceptional piece, which could be a pestle fragment, also does not show the grooving. It has a truncated cone shape, i.e., both ends are broken, but it shows the typical pecked surface of the "picks."

As stated above, none of the fragments are larger than about one-quarter of Loud's more complete specimen, which is ca. 33 cm. in length, with a diameter at the central point of about 12 cm. The linear and weight measurements in our specimens can thus be used, but with little accuracy, in estimating the size of the originals.

(2) Manos (2 specimens)

Two fairly regularly shaped ovoid cobbles, each with one end battered. One (No. 2-27756) is of granitic dark grey rock; the other is of a whitish rhyolite material. On both specimens upper surfaces are roughly crystalline, with the opposite surfaces showing well-rubbed surfaces over evidences of pecking.

(3) Hullers (2 specimens)

Two light fragments, of scoria, which have the shape of wedges or pieces of pie. One surface, probably the top, is rubbed down to a very slight, though even, concavity. The opposite surface shows less rubbing, but there is still definite evidence of use. The three vertical "sides" are relatively straight, and show no evidence of wear. The tip of the "wedge" is broken off on one of the specimens.

(4) Rubbing stones (7 specimens)

Six are of basalt, one of some unidentified large crystalline rock; all are fragments, and have evidences of use both as rubbing and pecking stones, i.e., they are stones which had general use rather than the specific use, for example, to which a mano might be put. Two are the sort of small, flat, ovoid cobble flakes described in the sections on choppers,

hammerstones, and scrapers. They have rubbing and scratch marks in the center and pecking marks at their ends. One has an angular edge on its facing shoulders, resulting, apparently, from alternate rubbing on both sides. In addition, there are deep peck marks such as might be produced by use of the specimen as an anvil. Another specimen shows heavy rubbing wear and scratches on all surfaces, and has besides a shallow hole or depression about 8 mm. in diameter and 12 mm. deep ground in one flat surface.

(5) Chipped, pointed slate object (1 specimen)

This is a fragment of a slender, knife-shaped, natural smooth pebble. One end is pointed by rough chipping; at the other end is shown the original smooth surface of the pebble. There is, in addition, evidence of rubbing on one flat surface, and a very small flattened area on the point, such as might be produced by drilling, although the stone is not hard enough to suppose such flattening would take long to come about.

Table 10

Additional Data on Miscellaneous Artifacts

Specimen	Museum Number	Weight (grms)	Length (mm)	Width (mm)	Thickness (mm)
Ice picks					
(a) with encircling groove	2-27753*	277	95	80	35
(b) with longitudinal groove	2-27742*	287	80	60	55
(c) with no groove	2-27749	388	110	65	45
Mano	2-27756	731	105	85	50
Rubbing stone	2-27478	346	130	40	40
Huller	2-27745	193	100	70	28
Chipped, pointed slate object	2-27746	16	70	15	7

*Illustrated (Fig. 3h, i).

Summary

Site Pe-5 appears beyond question to have been utilized as a workshop site. In support of this is the presence of great numbers of chipped stone artifacts in various stages of completion, concentrated in a limited area. At present there is no way of telling whether the site ever was characterized by a definite midden deposit--all artifacts in the collection here described were recovered from the surface.

The site is situated on a low rise about 400 yards south of the Humboldt River, above the floodplain of the river, but near the point where it entered Humboldt Lake in times of high water. (Loud and Harrington [op. cit., Pl. 1] locate the site quite close to the high water level of Humboldt Lake in flooded years.) It seems likely, therefore, that the site was occupied in aboriginal times at a season of the year when the lake level was close to the edge of the site, perhaps during winter or early spring when the level would be at its maximum. During the total span of occupation the surface of the site possibly was covered with water at times or at least its margins were washed sporadically with water from the lake. If the small number of water-worn artifacts collected in 1950 is an index of the extent of such covering or washing, then it must be assumed that these events were relatively infrequent. In any case, the present appearance of the surface of the site, with its close concentration of artifacts, suggests that forces of both wind and water, acting simultaneously or separately, have brought about, since the time of abandonment of the site, deflation of any midden deposit that was present at that time.

In addition to the site's function as a workshop area, it must have been intimately connected with the fishing industry in Humboldt Lake. This is attested by the recovery of a large number of notched specimens which almost certainly were used as sinkers, and of a few fragmentary artifacts which have been classified as "ice picks"--could these have been used to punch holes (for fishing) in ice-covered Humboldt Lake? Ethnographic evidence for such usage is not entirely convincing, even though fishing through holes in ice-covered lakes has been heavily documented for the western Great Basin.

Activities concomitant with fishing could also explain the presence of hammerstones (for shaping ice picks?) and scrapers and planes (fish cutting or scaling?). Mr. W. I. Follett, of the California Academy of Sciences, San Francisco, who has recently been conducting a study of fish remains from the Humboldt Valley, states (personal communication) that although he has not found any direct evidence that Humboldt Lake fish species were scaled, for example, by the occupants of Lovelock Cave, it is entirely reasonable to assume that the suckers and chubs known to have been living in Humboldt Lake at the time of aboriginal occupation in the region would have been scaled by the Indians before being eaten.

Most of the tools recovered could have been made and used at the site. The projectile points found suggest generally use as arrow points, rather than as atlatl dart points. So far as is known, they were not used in the fishing industry. A strong possibility is that the making of arrow points was a part-time but continuous occupation for the inhabitants of Humboldt Valley. If points were not used in winter, they might then have been manufactured in anticipation of the shooting of birds or mammals during the early spring. The predominance of the small, corner-notched, split-stem points and the lack of the desert side-notched type of projectile points perhaps indicate that the site was occupied at some time during the span of occupation of Humboldt and Lovelock Caves, and was not known or used by the Northern Paiute, who presumably occupied the nearby Humboldt lakebed site, 26-Ch-15, at certain times during the protohistoric period.

The total assemblage of artifacts recovered at Pe-5 does not at the moment suggest a well-defined chipping industry, i.e., no really distinctive types of tools have been recognized. Although many subtypes are described, the validity or invalidity of type classification will not be apparent until comparisons are made with other sites in a wider region. The projectile points, while classified according to a commonly used system, perhaps are an imperfect sample, since the site has assuredly been picked over in the past by other collectors, with their gleanings unrecorded. On the other hand, such comparisons as are allowed between the Pe-5 projectile point specimens and material from other sites in Humboldt Valley has led to the tentative conclusion as to time of occupation outlined above.

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UC-PAAE	University of California Publications in American Archaeology and Ethnology
UCAS-R	University of California Archaeological Survey-Reports

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Explanation of Plate

Plate 1

a. General view of site Pe-5, to southeast, showing litter of lithic workshop material

b. Close-up view of surface of site Pe-5. (Note chipped basalt blade or knife in situ near sign.)

Explanation of Figures

(All numbers are University of California Museum of Anthropology numbers.)

Figure 1

a. Basalt core, No. 2-27557.
b. Rhyolite core, No. 2-28446.
c. Hammerstone, Type b, No. 2-28310.
d. Hammerstone, Type a, No. 2-28322.
e. Hammerstone, Type a, No. 2-27645.
f. Hammerstone, Type c, No. 2-28315.
g. Chopper, Type a, No. 2-27802.
h. Chopper, Type b, No. 2-27767.

Figure 2

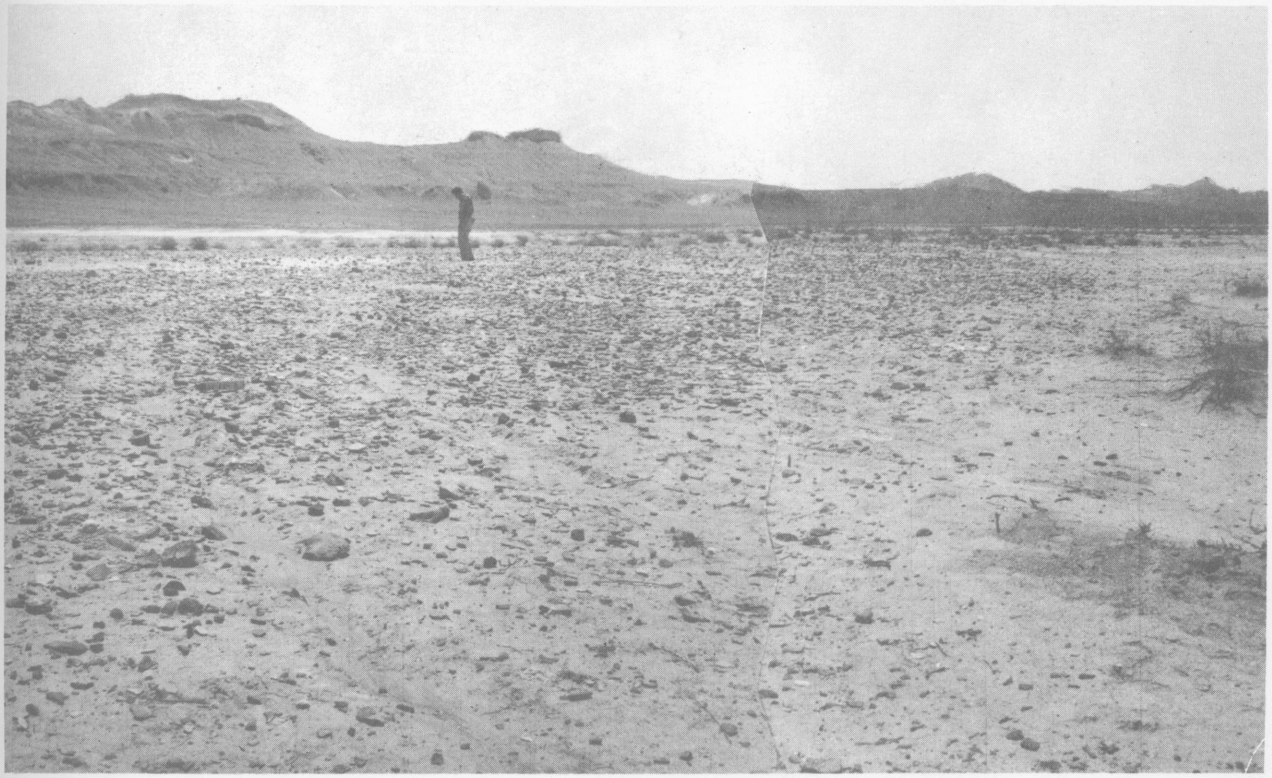
a. Chopper, Type c, No. 2-28093.
b. Chopper, Type d, No. 27681.
c. Sinker, Group I, No. 2-27817.
d. Sinker, Group II, No. 2-28332.
e. Sinker, Group III, No. 2-27763.
f. Sinker, Group IV, No. 2-28340.
g. Side scraper, subtype a, No. 2-27674.
h. Side scraper, subtype d, No. 2-28161.
i. Side scraper, subtype b, No. 2-27648.
j. Side scraper, subtype c, No. 2-28203.

Figure 3

a. Scraper, Discoidal type, No. 2-28119.
b. Scraper, Cobble type, No. 2-28123.
c. Knife, No. 2-27737.
d. Plane, Type a, No. 2-27733.
e. Plane, Type b, No. 2-28075.
f. Plane, Type b, No. 2-27732.
g. Plane, Type b, No. 2-28303.
h. Ice pick, with encircling groove, No. 2-27753.
i. Ice pick, with longitudinal groove, No. 2-27742.

Figure 4

a. Projectile point, Type NAb1, No. 2-27764.
b. Projectile point, Type NAb2, No. 2-27900.
c. Projectile point, Type NAb3, No. 2-27498.
d. Projectile point, Type NBa, No. 2-27949.
e. Projectile point, Type NBb1, No. 2-27933.
f. Projectile point, Type SAa, No. 2-27703.
g. Projectile point, Type SBa, No. 2-27966.
h. Projectile point, Type SBa', No. 2-27925.
i. Projectile point, Type SBb, No. 2-27729.
j. Projectile point, Type SCa1, No. 2-27788.
k. Projectile point, Type SCa2, No. 2-27720.
l. Projectile point, Type SCa3, No. 2-27910.
m. Projectile point, Type SCa3, No. 2-28045.
n. Projectile point, Type SCb1, No. 2-27493.
o. Projectile point, Type SCb2, No. 2-27539.
p. Projectile point, Type SCb3, No. 2-27918.
q. Drill, No. 2-27897.



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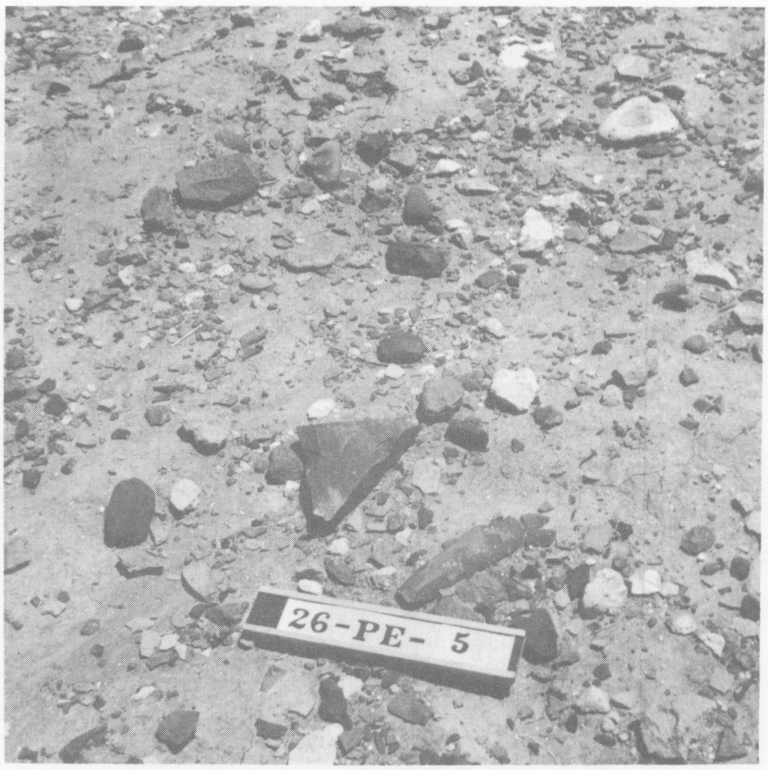

b

Plate I

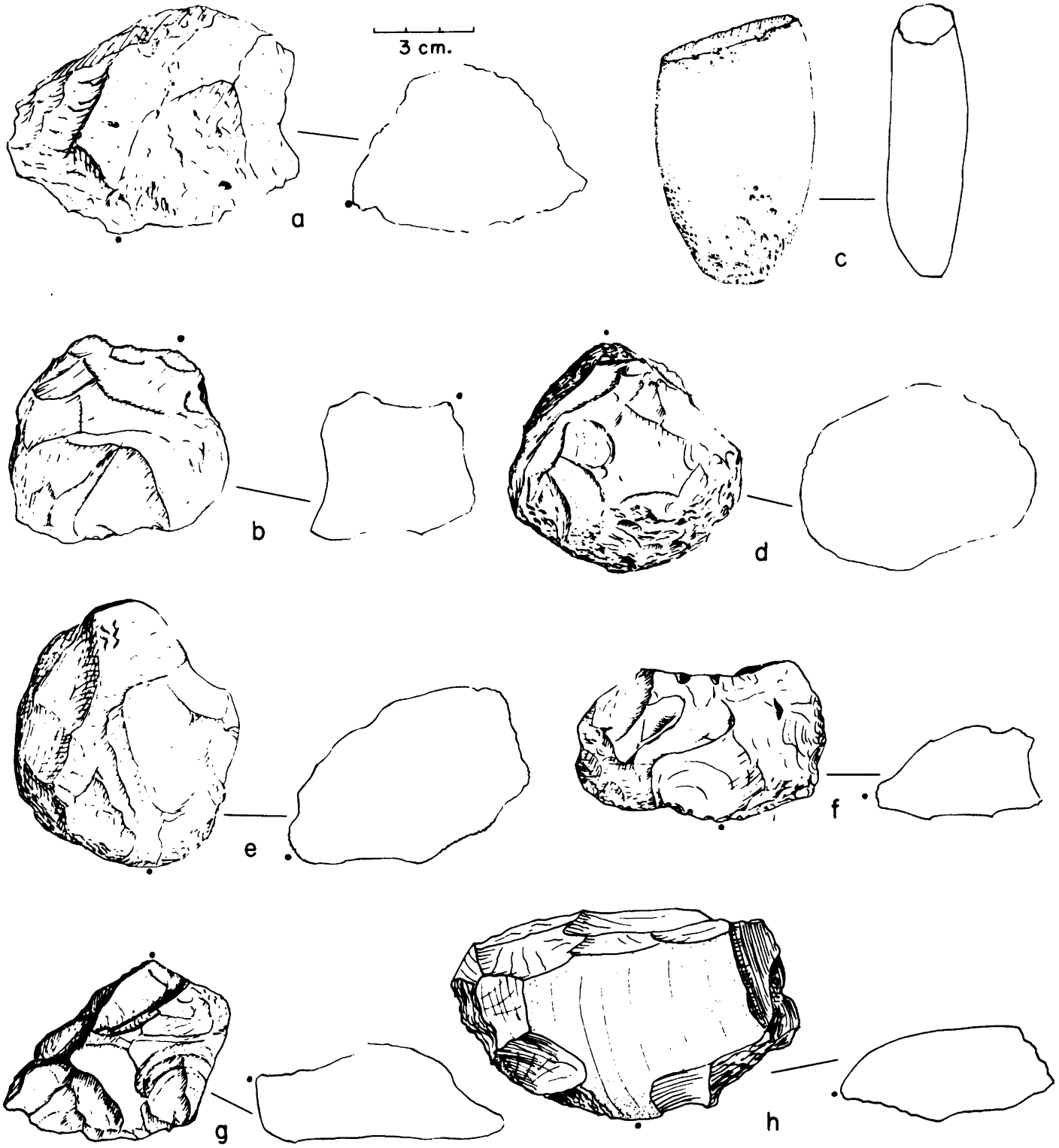

Figure I

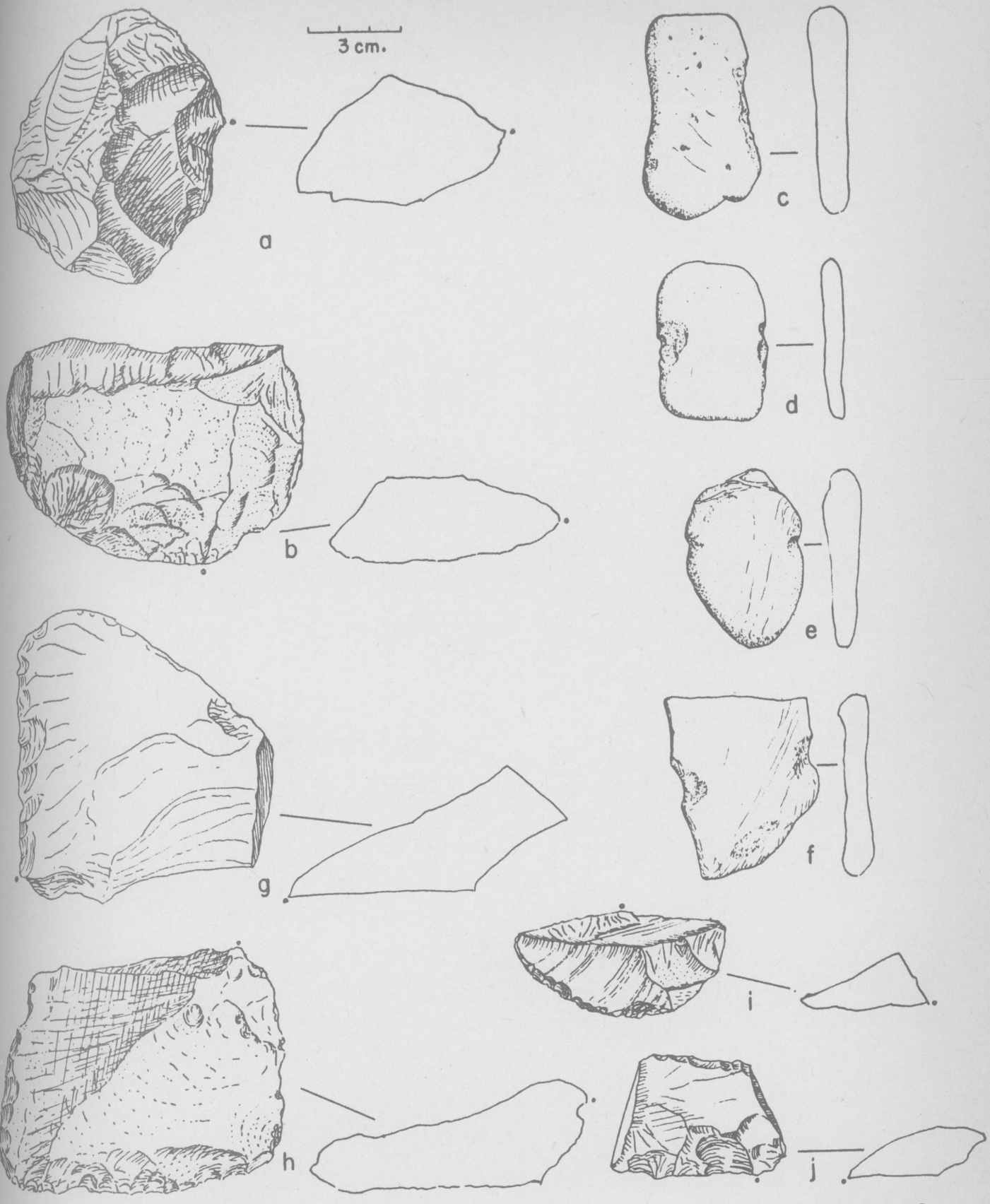

Figure 2

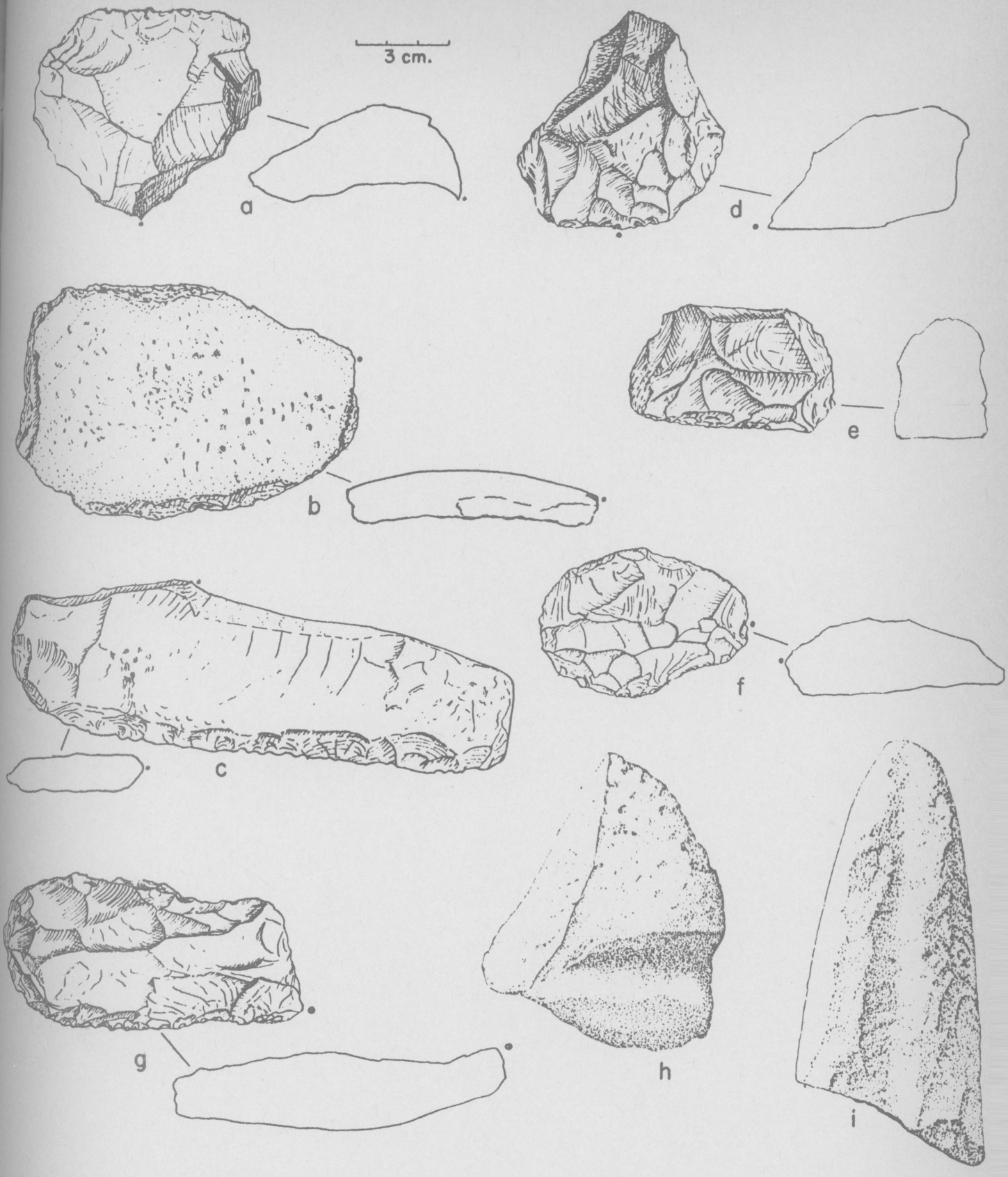

Figure 3

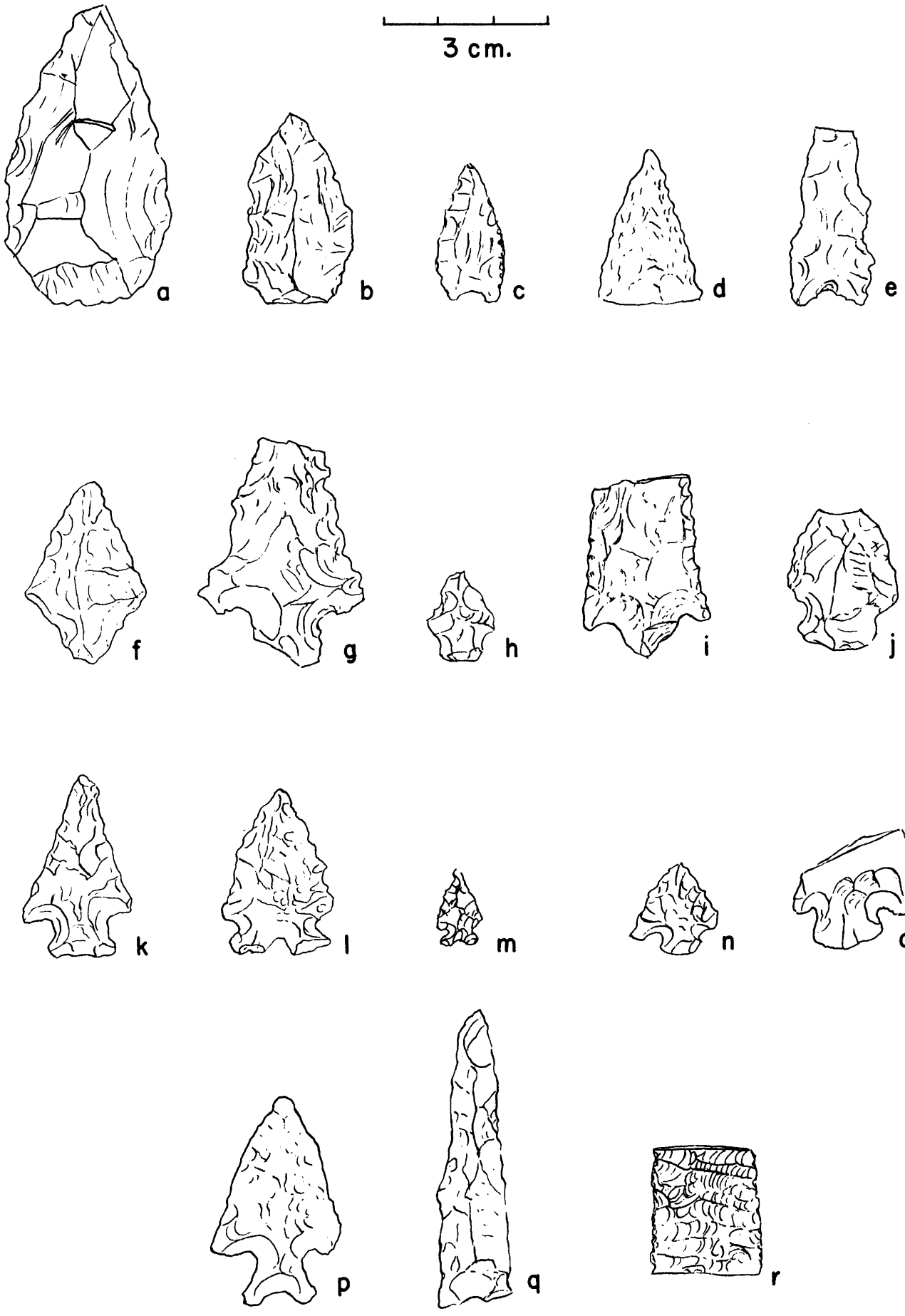

Figure 4