

Six sherds have been modified. Three, all Tizon Brown, have been drilled, presumably to permit repair by crack-lacing (Plate IVa). Another of the same ware has been converted into a rude, unperforated disc by cutting and grinding its edges. This object, now broken, may have been a gaming piece. Two irregular sherds, one brown and one buff, have well-smoothed edges, such as might result from scraping pottery walls. The buff specimen is also drilled and appears to have been suspended from a cord (Plate IVb).

Conspicuously scarce in the excavations were seed-grinding implements with only four broken handstones and a small section of a mealing slab recovered. The former are unshaped, oval cobbles, two of fine-grained sandstone and the others of granite, which exhibit wear on only one surface. Two of the fragments are fire-cracked and a third, badly deteriorated, may also have found its way into a campfire. The portions found are too small to give meaningful measurements but they appear to be pieces from handstones of a size which could have been conveniently grasped in one hand. The lone milling stone fragment is a thick (5.3 cm.) piece of granite with a shallow depression ground into one surface. Apparently it was a natural slab modified only by use as the one remaining original edge shows no attempt at shaping.

Probably used as polishing stones are four oval pebbles of a hard, fine-grained sandstone. Their distinguishing feature is the gloss which they have taken on as a result of long service. Three have a single highly-polished wear surface, while both faces are worn smooth on the remaining specimen. Stones such as these are generally thought to have been used in rubbing and polishing walls of pottery vessels. They could have served equally well in finishing objects of wood, bone or shell. The largest polishing stone is 5.5 cm. long; the smallest is 3.9 cm. in length.

Small chipped stone articles were relatively abundant in the deposit. That much of their finishing was done at the site is demonstrated by the

quantity of waste flakes unearthed, and their occurrence by six-inch levels is tabulated below (Table 2). Quartz, the predominant chipping waste, is mostly of a white, grainy variety, poorly suited for flaking; a small percentage is a fine-textured, clear quartz, much more amenable to controlled working. The chert, jasper, chalcedony and obsidian are all of good quality. Fragments of the coarser-grained stones such as porphyry, quartzite and felsite, are mostly scrap, produced during the manufacture of rough service tools, or represent spalls broken off while they were being used. There are local supplies of all the lithic materials except obsidian. The latter was imported, presumably from the nearest known source, Obsidian Butte on the shores of the Salton Sea.

	<u>Surf.</u>	<u>0-6"</u>	<u>6-12</u>	<u>12-18</u>	<u>18-24</u>	<u>Totals</u>
Quartz	5	63	63	20	32	183
Porphyry	5	58	46	17	22	148
Quartzite	4	33	39	16	17	109
Chert	-	23	33	19	17	92
Obsidian	3	11	8	9	-	31
Jasper	-	7	5	3	-	15
Chalcedony	-	6	6	4	2	18
Felsite	-	<u>1</u>	<u>1</u>	<u>1</u>	-	<u>3</u>
	17	202	201	89	90	599

Table 2: Depth Distribution of Waste Flakes at BW 9.

Projectile points constitute the largest category of chipped artifacts. As a group they are poorly fashioned, and some may well be rejects. Of the thirteen specimens recovered, eight retain enough of their characteristic shape to be classified. Five different forms are present.

1. Triangular, straight base
(2 points; 1 quartz, 1 chert)
(Figure 1a)



Figure 1a

2. Triangular, concave base
(1 point; chert)
(Figure 1b)



Figure 1b

3. Triangular, straight base, side notched
(2 points; 1 quartz, 1 obsidian)
(Figure 1c)



Figure 1c

4. Triangular, concave base, side notched
(2 points; 1 jasper, 1 chalcedony)
(Figure 1d)



Figure 1d

5. Leaf-shaped, rounded base
(1 point; quartz)
(Figure 1e)



Figure 1e

The remaining specimens, 3 quartz and 2 chert, are only tips so it is impossible to state their original form.

The missile points are all of the "small" variety, undoubtedly used to tip arrows. They range in length from 1.8 to 2.3 cm., in width from 9 mm. to 1.7 cm., and in thickness from 3 to 7 mm. Average dimensions are: length 2.0 cm., width 1.3 cm., thickness 4.5 mm.

A nearly complete leaf-shaped blade with a broad rounded base was found (Figure 1f). Fashioned from a grainy, yellowish brown jasper, it has broad percussion flake scars on both surfaces and carefully retouched borders.

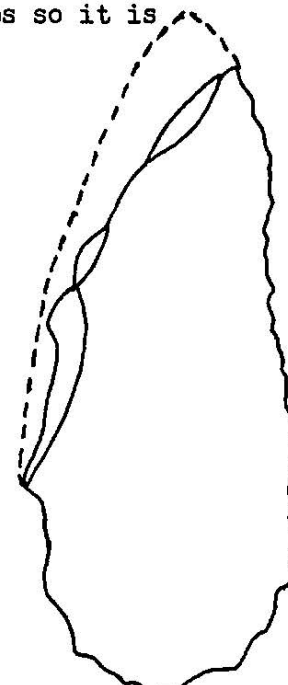


Figure 1f

The artifact has a projected length of 9.5 cm., a maximum breadth of 3.7 cm., and is 1.3 cm. thick. Two convex butt ends, both of quartz, seem to be from similar leaf-shaped blades. The only other example of this class of artifact is a central section of a well-made chert blade.

Simplest of all the smaller chipped stone tools are flake scrapers. The five unearthed are of the unifacially-retouched, single-edged variety. There is no uniformity of size or shape among them. Apparently when the need for a scraping tool arose, whatever flake happened to be close at hand was picked up and sharpened. Two of the scrapers are chert, two are made from porphyry flakes, and one is of quartz. The largest example measures 4.7 x 4.0 cm. and is 1.3 cm. thick; the smallest one is 2.1 cm. long, 1.5 cm. wide and 6 mm. thick.

Ordinary cobble hammerstones were not as plentiful as might have been expected as only three examples, two whole and one broken, were obtained (Plate IVe,f). All three are irregular quartzite cobbles, battered and pitted at one end. The larger of the two complete examples has the following dimensions: length 7.9 cm., width 6.1 cm., thickness 4.4 cm. The other whole hammer measures 5.1 x 4.4 cm., and is 3.7 cm. thick. Classed as a "pecking stone", on the assumption that it served in the shaping of small chipped stone articles, is a waterworn, oval quartzite pebble, with a single abraded edge. It is 3.6 cm. long, 2.7 cm. wide, and 2.3 cm. thick.

A small group of rough, percussion-flaked artifacts made from porphyry cobbles was obtained. Included are two hammers, one entire and the other fragmentary, with large flakes struck off to produce rough, faceted surfaces. The complete flaked-core hammer (Plate IVg) is 4.7 cm. long, 4.6 cm. wide, and 4.4 cm. thick. Two choppers have irregular working edges formed by rough primary flaking. The working edge on the first has been flaked from both

surfaces (Plate IVh). The tool measures 8.4 x 7.2 cm. and is 4.5 cm. thick. All that remains of a second chopper is a small section of its unifacially chipped border. A cobble with flat base and large flakes removed from all of its surfaces is classed as a scraper plane, though it could have functioned as a chopper equally well. The specimen (Plate IVi) is 7.9 cm. long, 7.8 cm. wide and 5.4 cm. thick. A second, smaller plane is also flat-based, but its upper side is incompletely finished and some original rock surface remains (Plate IVj). Its dimensions are: length 5.2 cm., width 4.1 cm., thickness 2.6 cm.

The only other stone item unearthed is a triangular sandstone pebble with a short projection at its apex. As it bears no signs of modification, the stone probably was picked up because of its unusual form and kept as a curio or charm. It is 10.9 cm. long, 4.1 cm. wide, and 1.8 cm. thick.

Shell articles, all fragmentary, comprise two pendants and a bead. One of the former is fashioned from a piece of the large shell of the Forty-ribbed Cockle (Plate IVk). Perhaps originally oblong in outline, it is biconically drilled near one end and has serrated borders. The upper section of a small abalone shell pendant has two perforations (Plate IVl). The broken shell bead consists of a portion of a highly polished limpet ring (Plate IVm). In addition to these three artifacts, the deposit yielded two scraps of sea shells. The first is an edge piece of a Black Abalone valve; the other is part of the hinge section of a pecten. It appears that an attempt had been made to drill the latter (Plate IVn). Marine shell is, of course, an intrusive material and the species represented are native to the Pacific Coast of Southern California.

Features

Three ill-defined hearths were encountered during the digging. The first consisted of an ash lens, 16.2 cm. in diameter and 8 cm. thick,

containing flecks of charcoal and a few pieces of fire-cracked stone. A second comprised an amorphous cluster of rock, charcoal and ash. The third feature, made up of an irregular, curving row of sixteen fair-sized cobbles, exposed in the side wall of one of the excavation units, was not investigated. It may have been the edge of a mescal roasting pit rather than a hearth. Numerous burned rocks scattered through the refuse provided ample evidences of other campfires.

An interesting concentration of fine-grained, yellowish clay containing mica was uncovered. The patch measured 13 x 8 cm. and was 8 cm. thick. Obviously the material had been carried in for some purpose. It may have been potter's clay which was never used.

Food Remains

Food refuse consisted of 133 scraps of mammal bone. The pieces, a high percentage charred, are too small to permit species identification, but the majority are fragments of bones of large mammals. A few are slivers from smaller species. The frequency of bone was nearly the same in the three upper six-inch levels of the midden but declined greatly in the 18 - 24 inch layer as shown below:

0 - 6 inches	42	bone scraps
6 - 12 "	41	
12 - 18 "	42	
18 - 24 "	8	
Total	133	" "

Conclusions

On the whole, the artifacts from the BW 9 excavations duplicate those picked up earlier from the ground. Except for a few shell objects which have no counterparts in the surface collection, the test-digging did not produce a

wider range of cultural items. There are noticeable differences in the frequency of occurrence of some major classes of items but these appear to have no archaeological significance. Whereas potsherds constitute 92.8 percent of the excavated materials, they make up only 81.2 percent of the surface lot. This variance can be satisfactorily accounted for by the nature of the two samples. While only larger sherds, unusual pieces and rims were gathered from the ground, all examples turned up by the digging were saved and counted. Projectile points from the exploratory pits outnumber surface specimens two to one but the comparative scarcity of the latter can be attributed to the efforts of relic hunters who have been extremely active in the district over the years. Such individuals assiduously search for arrowheads so it is not surprising that few articles of this kind have been left for the archaeologist. In contrast to sherds and points, seed-grinding implements occurred more plentifully on the surface than beneath it. But again there is an obvious explanation. These artifacts were used and subsequently abandoned in and around the boulder formations located on the fringes of the site, from whence came nearly all the specimens, rather than in the camping area proper.

The digging verified the assumption, arrived at from an analysis of surface finds, that BW 9 represents a late aboriginal settlement. All of the artifacts unearthed are forms employed by recent Indians of this region. No objects suggestive of an earlier occupation were turned up.

Thus it is apparent that the evidence furnished by the initial surface examination of BW 9 was sufficient to provide for an accurate determination of the site's contents and its correct placement in time. These findings are of some interest from the point of view of archaeological field procedures in desert regions for they demonstrate that conclusions based upon

material remains which have survived on the surface of relatively shallow sites, such as BW 9, are generally valid and do away with the necessity of digging test-holes, a practice costly in time and labor. They do not mean, of course, that the same will hold true for all sites, even in this same general region. Exploratory scientific excavations will continue to be essential in investigations of rock-shelters or open camps where prolonged or recurrent occupation has led to the accumulation of deep and possibly stratified deposits of debris, either to determine what cultural manifestations are represented or to ascertain whether a particular site will repay full-scale excavation. In short, test-digging remains as an invaluable adjunct to field survey but needs to be resorted to as a check and guide only where the situation demands.

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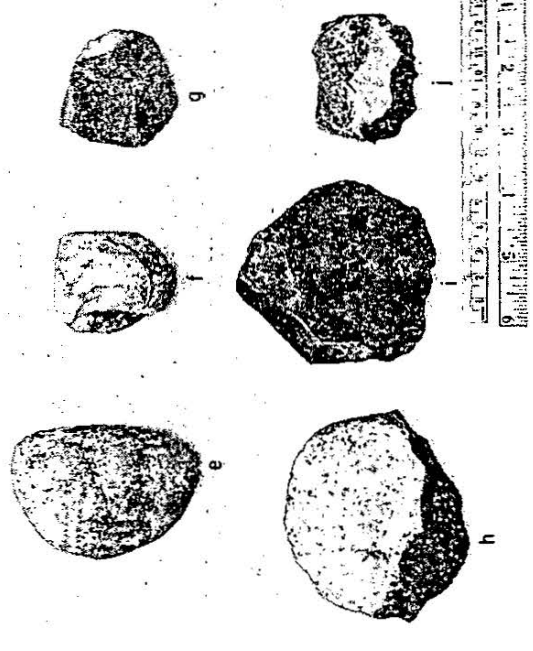
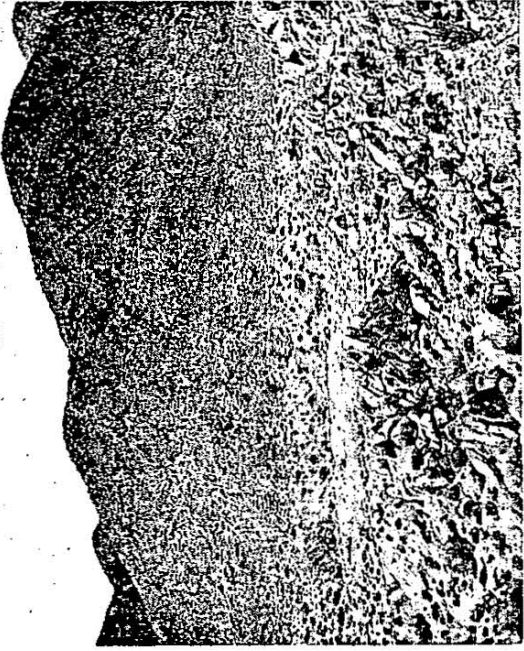
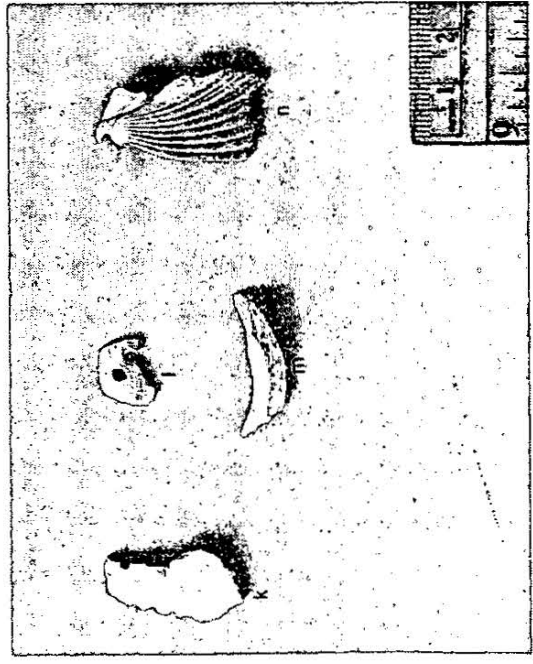
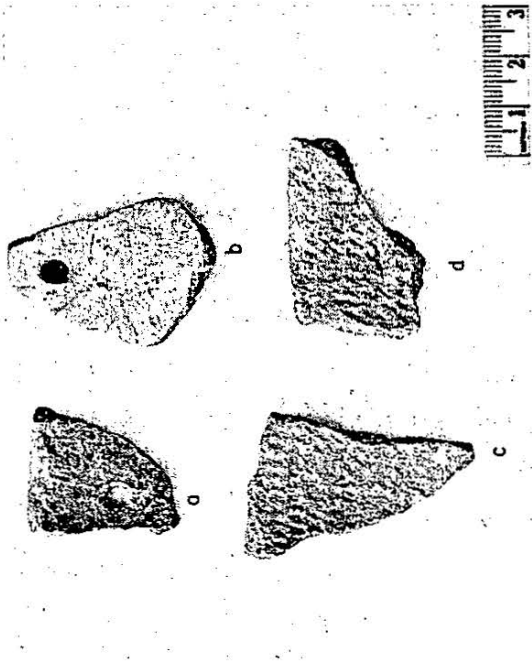


Plate 4

IV

Additional Excavations
at the
Indian Hill Rockshelter
Anza-Borrego Desert State Park
California

by

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Table of Contents

Introduction	1
Excavation Procedure	2
Archaeological Deposit	3
Artifacts	3
Pottery	3
Ground Stone Objects	6
Rough Stone Tools	8
Flaked Stone Objects	10
Bone Objects	16
Shell Objects	17
Perishable Objects	18
Pigment	18
Fireplaces	19
Food Remains	19
Human Skeletal Remains	20
Conclusions	20
Bibliography	24

Table 1:
Depth Distribution of Artifacts from
Indian Hill Rockshelter (April 1961)

Table 2:
Occurrence of Chipping Waste by 6-inch
levels in Pit F8 - page 11

List of Illustrations

- Plate V a - Indian Hill Rockshelter
 b - View of trench looking into shelter
 c - Milling Stone showing double-basined side
 d - Milling stone reverse side, single basin
- Figure 1: Diagram of Indian Hill Rockshelter (IH 5)
2: Indian Hill Rockshelter Soil Profile
 (North wall)
3: Indian Hill Rockshelter Milling Stone
4: Indian Hill Rockshelter Scraper Planes
5: Indian Hill Rockshelter Projectile Points
 (Large points a-f; small points g-l)
6: Indian Hill Rockshelter Knife Blades

Additional Excavations
at the
Indian Hill Rockshelter
Anza-Borrego Desert State Park

Although Anza-Borrego Desert State Park has recently been the scene of considerable archaeological activity, comparatively little has been learned regarding prehistoric cultural sequence. The vast majority of sites discovered during reconnaissances in the northern (Meighan 1959) and southern (Wallace and Taylor 1958, 1960a) sections of the Park have seen habitation only during the last aboriginal period. For others, haphazard digging by local collectors has destroyed any stratigraphic relationships that once may have existed.

It was with the hope of obtaining cultural superimposition that a large rock-shelter at Indian Hill in the southwestern part of Anza-Borrego was selected for excavation (Plate Va). The shelter seemed ideal for this purpose. Not only was it fairly roomy (measuring 55 feet across its mouth and over 25 feet front to back), and obviously containing a deep accumulation of habitational refuse, but it has suffered only superficial vandalism. True, when first visited, it had been dug into here and there but its extent and thickness argued against a wholesale destruction of its contents.

The first excavation, undertaken on May 3rd and 4th, 1958, by seven members of the Archaeological Research Associates organization, consisted of an exploratory operation, designed to ascertain the nature and depth of the archaeological deposit. Three five by five foot test pits were dug. From this investigation, it was determined that the midden outside as well as inside the shelter extended downward for nearly six feet. An analysis of the more than 400 artifacts obtained and their depth distribution suggested that the shelter had experienced two distinct occupations (Wallace and Taylor 1960b).

On the strength of the results obtained from this preliminary testing, a more thorough excavation was deemed desirable and funds were appropriated for this purpose by the California State Division of Beaches and Parks. The objective of this second investigation was to obtain a larger sampling and to check inferences based on the earlier dig. Excavation began on April 5th and was completed on April 10th, 1961. Digging personnel consisted of George Kritzman, Edith Taylor Wallace and William Wallace, assisted for one day by Robert J. Fitzwater.

Excavation Procedure

Work was initiated by locating the two permanent datum points previously set up. Next a trench, divided into five foot squares, was staked out along the same line as the three initial test pits. This gave the trench an east-west orientation, tangent to the shelter's mouth. The plan was to make a stratigraphic cut from outside the overhang inwards so as to provide a soil profile and to determine the relationship of the deposit in front of the shelter to that lying within it. Four five by five foot squares were excavated, including one previously carried only to a depth of 30 inches. The area excavated lay north of the center of the shelter (Fig. 1).

All digging was done with trowels. As no natural layers were detected, the midden was removed in uniform six-inch levels. After being loosened and examined, the soil was sieved through a one-quarter inch mesh screen. The aim throughout was to maintain a careful vertical control. This was not easy to achieve because the work was carried on under rather adverse conditions. Especially troublesome was the almost constant wind which swirled dust about, making visibility poor and eroded small articles out of the trench walls. The soil, quite loose in some spots, often slumped down thus making it difficult to maintain straight side-walls in the excavation units.

Archaeological Deposit

As revealed by the digging, the culture-bearing deposit (Fig. 2) consisted largely of an unconsolidated dusty soil, presumed to have been deposited in large part by wind. Incorporated in it were charcoal, ash, artifacts and other habitational debris. Fallen rocks, large and small, weathered from the shelter's roof and overhanging lip, were thickly interspersed. A loose disturbed area, apparently a relic-hunter's pit, since filled in, and remains of a recent fire containing bits of charred newspaper, were encountered during the work. There were many traces of the activities of burrowing rodents.

In the excavated section, the midden measured approximately 62 inches at its deepest point; the average was only slightly less. No well-defined strata were distinguishable by contrasts in soil color, texture, or hardness, though the upper six or so inches of soil was considerably drier and more powdery than the remainder. The deposit rested upon an uneven surface of compacted, coarse-grained sand, yellow in color and apparently formed by the disintegration of granite boulders (Plate Vb).

Artifacts

The shelter's yield in artifacts, totaling 665, consisted primarily of pieces of pottery and whole and broken stone tools. A handful of bone and shell items, a single object fashioned from plant fiber, make up the remainder of the collection. The various articles recovered during the April 1961 digging are listed in Table 1 according to level.

Pottery. Pottery of a simple but satisfactory kind is represented by 438 sherds, many of which are quite tiny. In essential constructional details the fragments are alike. Their temper consists of sand containing a liberal

admixture of quartz and mica particles. Vessels from which they came were built up by coiling and their walls thinned with paddle and anvil. Anvil marks are frequently visible on the inner surfaces of larger pieces. Recognizable forms are round-based jars with straight or outcurved rims. The sherds, except for one basketry-impressed example, are plain. They do, however, vary in surface color and, to a lesser extent, in finish. On the basis of these differences they are divisible into a dark-surfaced and rough Tizon Brown Ware (Euler and Dobyms 1958, Ware 15) of the Palomar type (Meighan 1959, pp. 36-38) and a lighter-colored, smoother-finished Lower Colorado Buff Ware of the Topoc type (Schroeder 1958, Ware 16, type 18). Within each category there exists a considerable range of surface color. Tizon Brown Ware predominates, accounting for almost 93 percent of the ceramic materials.

Meriting special comment are two coarse-textured sherds. Joined together they form approximately one-third of a pot and allow for a reconstruction of its size and shape. The vessel is a globular, miniature jar with an uneven, slightly outcurved rim. It stands only 6 cm. high and has a maximum diameter of 5.5 cm. The overall crudity of the specimen and its small size suggests that it was fashioned by a novice, perhaps a young girl learning the potter's craft.

A Tizon Brown sherd has rounded, worked edges; it appears to be a section of a pottery disc. The fragment is quite flat and thin (5 mm. thick) and originally it had a diameter of about 1.8 cm.

Pottery occurred in quantity only within the upper portion of the habitation refuse, 96 percent of the sherds coming from above 24 inches. Deeper levels of the midden contained only stray fragments. The latter could easily have been carried downward by human or rodent activity, or have been wind-eroded from a higher level during the course of the digging.

	Pottery	Mills	Manos	?Pestles	Disc	Pendant	Hammers	Choppers	Scraper Planes	Large Points	Small Points	Blades	Flake Scrapers	Core Scrapers	Perforator	Bone	Shell	Cordage	TOTALS
0 - 6	228	1	2				3	2			10	1	9		1			1	258
6 - 12	105		2	1			2				11		2						123
12 - 18	57	2	4			1	3	1		1	2	2	5			1			79
18 - 24	30	1	5				2	1		4	3	1	8			1	1		57
24 - 30	8	3	4				2			7	3	1	10			1	2		41
30 - 36	6		4		1			1		4	1	3	3				1		24
36 - 42	1	6	1				2	1	3	3		2	4	1		1	2		27
42 - 48	1		5				4		2	2	1	6	2						23
48 - 54			2						3	3	1	4	1						14
54 - 60	<u>2</u>	<u>1</u>	<u>2</u>	<u>1</u>	-	-	-	<u>1</u>	-	<u>2</u>	-	<u>7</u>	-	<u>1</u>	-	<u>2</u>	-	-	<u>19</u>
Totals	438	14	31	2	1	1	18	7	8	26	32	27	44	2	1	6	6	1	665

Table 1: Depth Distribution of Artifacts from Indian Hill Rockshelter
(April 1961 Excavation)

<u>Depths</u>	<u>Brown Ware</u>	<u>Buff Ware</u>	<u>Totals</u>
0 - 6	215	13	228
6 - 12	94	11	105
12 - 18	54	3	57
18 - 24	28	2	30
24 - 30	7	1	8
30 - 36	5	1	6
36 - 42	1	0	1
42 - 48	1	0	1
48 - 54	0	0	0
54 - 60	2	0	2
	<u>407</u>	<u>31</u>	<u>438</u>

Ground Stone Objects. Prominent among the stone artifacts are seed-grinding implements. Milling stones total 14, only one of which is complete. They consist of thick (average 6.5 cm.) rectangular or vaguely oval slabs used in their original condition without any dressing. All are of the "basined" variety with shallow, elliptical depressions worn into the center of one or both surfaces. It is assumed that these basins, which show varying degrees of smoothness, resulted from a rotary grinding motion. Materials of which the milling stones are composed are: granite (8), sandstone conglomerate (4), and sandstone (2). Three of the fragmentary specimens have heavily battered edges, evidently from employment as hammers.

A striking feature of the unbroken mill is its massiveness. It measures 60.8 x 44.2 cm. and is 12 cm. thick. Needless to say it is not easily transportable. The specimen is unusual in having two well-worn oval depressions, 5.0 and 3.8 cm. deep, on one surface (Plate Vc), and a shallower (1.3 cm.) basin on its reverse side (Plate Vd; Fig. 3). One fragmentary milling stone also has adjoining basins on one face.

Handstones employed in conjunction with the milling stones number 31, nine of which are complete. Two variant forms occur: specimens worn flat on one side only, and those with two grinding faces. The prevailing type is the former with 16 examples, as compared with only 7 bifacials; the

remaining 8 are small, fire-damaged pieces which cannot be placed with certainty in either category. Most of the handstones consist of oval or angular cobbles employed in their natural form but five bifacials show deliberate shaping. A complete muller, carefully finished, has parallel sides and rounded ends; a fragment appears to be part of similar specimen. Another shaped type, represented by one entire and two broken handstones, is more nearly oval. The ends of four mullers exhibit scars from use in pounding. One of the latter has opposing pits pecked into its grinding surfaces to serve as finger grips. A substantial proportion (77 percent) are discolored and cracked by heat. Of the 31 handstones, 14 are granite, 8 are sandstone, 7 are sandstone conglomerate and 2 are quartzite. All of them, unifaces and bifaces alike, are medium-sized and easily grasped in one hand. Lengths range from 6.8 to 11.3 cm.; widths are from 5.7 to 10.5 cm. In thickness the handstones vary from 3.1 to 6.3 cm.

Milling stones and mullers occurred throughout the deposit. They showed no significant clustering at any level, being fairly evenly distributed from the top to the bottom of the midden.

In the collection are two sandstone cobbles, both fire-damaged, which could have functioned as pestles for pulverizing plant foods, though it is by no means certain that they were utilized in this fashion. The largest is an elongate stone, more or less oval in outline, 23.3 cm. long, 12.5 cm. wide, and 6.6 cm. thick. Both ends are abraded and flattened, suggesting use in a shallow stone mortar. A smoothed area on one surface indicates that this cobble may have served for grinding as well as crushing. The second specimen is incomplete. Apparently it was once a wedge-shaped cobble, much less bulky than the first example. Its remaining end is also flat.

No mortars or fragments thereof were recovered though there are six grinding holes worn into boulders at the south end of the overhang.

An outstanding ground stone artifact comprises about one-fourth of a sandstone disc. Considerable care was employed in its manufacture. The upper and lower surfaces of this artifact are ground flat and smooth as is its encircling edges. In the center of the disc is a large (6.5 cm.) biconically drilled hole. The object has a reconstructed diameter of around 15 cm., and is 3.5 cm. thick. Its use is unknown.

A thin piece of orangish-red rhyolite with cut and ground edges seems to have been intended for a pendant. It has a trapezoidal form with one corner broken away. Apparently it was damaged during manufacture, perhaps while being drilled, and then discarded. The object is 2.7 cm. long, 1.9 cm. wide, and 4 mm. thick. Depth Distribution of IH 5 Ground Stone Artifacts:

Depths	Milling stones	- Manos -			? Pestles	Disc	? Pendant	Totals
		Uniface	Biface	Frags				
0--60	1	1		1			3	
6-12		1	1		1		3	
12-18	2	1	3			1	7	
18-24	1	2	1	2			6	
24-30	3	2	1	1			7	
30-36		2	1	1		1	5	
36-42	6*			1			7	
42-48		3		2			5	
48-54		2					2	
54-60	<u>1</u>	<u>2</u>	-	-	<u>1</u>	-	<u>4</u>	
	14	16	7	8	2	1	49	

* One complete milling stone found at 40 inches.

Rough Stone Tools. Well represented are rough stone tools designed for use in such tasks as pounding and chopping. A varied assortment of hammer-stones includes both unshaped and intentionally fashioned specimens. The former are natural cobbles, angular in form, either picked up at random or chosen for their convenient size and shape. On one or more edges they carry

the characteristic pitting resulting from pounding. Though variable in dimensions, they are all of a size which fits snugly in the hand. They range in length from 4.9 to 11.3 cm., averaging 8.8 cm.; and in breadth from 3.9 to 7.8 cm., averaging 6.7 cm. Thicknesses are from 2.8 to 6.3 cm. with an average of around 5 cm. Of the 12 cobble hammers, ten are quartzite and two are quartz.

The six purposefully-shaped hammers, formed by trimming down cobbles or irregular nodules by the percussion method, have jagged flake scars on all surfaces. Taken as a group they show a tendency towards a spherical shape. These tools are mostly made of porphyry (5), a tough stone well-suited for hammering. Only one is fabricated from another material--felsite. Their dimensions are: length 6 to 7.7 cm., average 6.8; width 5.2 to 6.9 cm., average 6.1; thickness 3.6 - 6.8 cm., 4.6 cm. average.

A group of six rough implements, none of which is whole, are designed for chopping. Like the shaped hammers, they were formed by percussion flaking from cobbles or nodules. They have been dressed over their entire upper and lower surfaces so as to give a circular or oval form. Five of the specimens are made of porphyry, and one is felsite. None is complete enough to provide meaningful measurements but all appear to be parts of tools with dimensions not too different from those of the hammers.

A seventh chopper is unusual in being nothing more than a flat, oval cobble of hard-textured sandstone with four large flakes struck off from one end to produce a dull edge. This tool is considerably larger than the other choppers, measuring 13 by 9.3 cm. It is quite thin, however, being only 3 cm. thick.

Similar in manufacture and outline to chopping tools but with smooth, flat bases are eight scraper planes. Five of these tools are characterized

by a high, ridged upper surface (Fig. 4 a, b); the others are flatter (Fig. 4 c, d). The intersection of the trimmed top and flat base forms a working edge; two specimens are further sharpened by the removal of tiny flakes. Porphyry is again the commonest material, accounting for six of the planes; one of the remaining two is of felsite and the other is of quartz. None of the specimens is particularly large. Lengths vary from 4.7 - 10.1 cm., averaging 6.8; widths range from 3.9 - 7.3 cm., averaging 5.7 cm.; thickness, 2.2 - 5.5 cm., averaging 3.9 cm. The use of these tools has long been a subject of speculation. It has been conjectured that they may have been devised for preparing the soft parts of plants for food, hence the frequent reference to them as "pulping planes." Another suggestion is that they were employed in fleshing animal skins.

Of the rough stone tools, only scraper planes were restricted to one part of the midden. They clustered in the deeper levels, none being recovered above 36 inches. Hammers -- cobble and shaped, and choppers occurred at all levels.

Depth Distribution of IH 5 Rough Stone Tools:

Depths	Hammerstones		Choppers	Scraper Planes	Totals
	Cobble	Shaped			
0- 6	2	1	2		5
6-12	2				2
12-18	1	2	1		4
18-24	2		1		3
24-30	2				2
30-36			1		1
36-42		2	1	3	6
42-48	3	1		2	6
48-54				3	3
54-60			1		1
	12	6	7	8	33

Flaked Stone Objects. Smaller chipped artifacts -- projectile points, blades and scrapers -- were fairly abundant in the refuse deposit. A wide

variety of materials was used in their manufacture. Predominantly employed was quartz, opaque white and clear, which accounts for approximately 52.2 percent of the chipped objects. Next in abundance is porphyry (14.5 percent). Less freely utilized materials include chert (7.2 percent), obsidian (7.2 percent), jasper (5.6 percent), chalcedony (5.6 percent,) felsite (4.8 percent), quartzite (1.9 percent), and hard sandstone (.8 percent). Except for obsidian all of these stones are available locally. An analysis of chipping waste from one excavation square showed similar percentages (Table 2). It also demonstrated that a shift in preference occurred with finer-grained materials -- chert, jasper, chalcedony, and obsidian -- becoming more plentiful in the higher levels of the midden. The greater proportion of porphyry flakes and other fragments in this sample results from the employment of this material in fashioning rough stone tools as well as smaller chipped items.

<u>Depths</u>	<u>Quartz</u>	<u>Por- phyry</u>	<u>Chert</u>	<u>Jasper</u>	<u>Obsid- ian</u>	<u>Chalced- ony</u>	<u>Quart- zite</u>	<u>Totals</u>
0- 6	175	79	33	29	8	9	0	333
6-12	151	79	20	24	11	23	0	308
12-18	81	18	6	5	6	4	1	121
18-24	183	71	2	12	9	3	1	281
24-30	181	102	12	11	2	0	2	310
30-36	194	132	12	7	7	2	2	356
36-42	221	111	11	6	2	1	4	356
42-48	110	75	14	1	2	1	3	206
48-54	155	78	9	1	3	1	9	256
54-60	<u>153</u>	<u>102</u>	<u>7</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>9</u>	<u>274</u>
	1604	847	126	97	52	44	31	2801
%	57.3	30.1	4.5	3.5	2.0	1.5	1.1	100%

Table 2: Occurrence of Chipping Waste
by 6-inch levels in Pit F8.

The most distinctive flaked stone artifacts are the projectile points. They fall into two major categories -- "large" and "small" -- on the basis of size and weight. The 26 specimens placed in the first group, while not

massive, are large enough to indicate that they were probably intended for hafting as dart points. Three distinguishable varieties are present:

1. The form of greatest frequency is the thick leaf-shaped point with rounded base (Fig. 5 a - c). There are ten of these, three complete. Two specimens differ from the others in having pronounced serrated borders. The base of one point still retains some of the pitch which once helped hold it fast to a shaft. Eight of the leaf-shaped missile tips are fashioned from quartz; one is made of jasper; the other is of porphyry. The largest example measures 4.8 by 2.5 cm. and is 1.2 cm. thick; the smallest has dimensions of 3.5 x 1.8 cm. and is 1.0 thick, and weighs 5.42 grams.

2. The second most abundant class is made up of six specimens, two of which are undamaged (Fig. 5 d-e). This form is characterized by deep, broad corner notches which, combined with a basal indentation, produce "ears". The points have straight or slightly convex edges, giving the blade either a triangular or lanceolate outline. In normal cross section they are lenticular. Materials used in their manufacture are quartz (2), chert (1), felsite (1), jasper (1), porphyry (1). The larger of the two entire specimens has the following dimensions: length 4.0 cm.; width 3.6 cm.; thickness 7 mm. It weighs 7.02 gr. The second measures 3.4 x 2.1 cm., and is 5 mm. thick. It is much lighter, weighing 3.23 grams.

3. Of particular interest because it is quite different from any of the other forms is a beautifully made missile point with a flaring concave base and side notches. Additional notches along its straight edges provide large, square-ended barbs (Fig. 5f). This is an unusually well-made specimen, symmetrical and carefully chipped from a piece of banded chalcedony. It is 4.8 cm. long, 2.1 cm. wide and 6 mm. thick; and weighs 5.64 grams. A basal fragment appears to be from a similar though less symmetrical point.

In addition to the classifiable specimens there are eight fragments of heavier missile points which lack diagnostic parts. These consist of five small edge pieces, two tips and one central section. Seven are quartz, one is obsidian.

Depth Distribution of IH 5 Large Missile Points:

Depths	Lanceolate Base Rd.	"Eared" Corner-Notched Concave Base	Serrated Side-Notched Concave Base	Fragments	Totals
0- 6					0
6-12					0
12-18	1				1
18-24	1	2		1	4
24-30	3		2	2	7
30-36	2			2	4
36-42	1	2			3
42-48				2	2
48-54	1	1		1	3
54-60	1	1			2
	<u>10</u>	<u>6</u>	<u>2</u>	<u>8</u>	<u>26</u>

Small light-weight projectile points show increased technical skill over their larger counterparts, being of exact outline and exhibiting fine pressure-flaking on all surfaces. They are also more numerous than the heavier points, numbering 32 in all. Although these points exhibit a variety of forms, the vast majority are triangular in outline. They can be differentiated into three groups on the basis of basal shape.

1. Straight base - 5 points (Fig. 5g)
2. Concave base - 11 (Fig. 5h-i)
3. Concave base, side-notched - 7 (Fig. 5j-k)

All of these triangular points tend to be elongate and slender. The two extremes of length are 1.6 to 2.8 cm.; breadths (at base) vary from 1.2 to 1.8 cm. They are uniformly thin with thicknesses of 2.5 to 6 mm., and weigh only .5 to 1.4 gram. They are manufactured chiefly from quartz (13); other materials used include chert (4), obsidian (4), chalcedony (1) and jasper (1).

One interesting specimen, also having a triangular blade, is distinguished from the other small points by its corner notches and long, parallel-sided stem (Fig. 5 1). The base of the stem is straight. This point, of chalcedony, is 2.9 cm. long, 1.7 cm. wide, and 4 mm. thick. It weighs 1.15 gram. A single broken point has a lanceolate form, rounded at the base. Made of jasper, its measurable dimensions are: width 1.4 cm.; thickness 6 mm. Completing the group of small missile points are seven unclassifiable pieces -- six tips and a central section. Borders of one of the latter are deeply and irregularly serrated, giving a wavy effect. Three of these fragments are made of quartz, three of obsidian and one is of chert.

Depth Distribution of IH 5 Small Missile Points:

Depths	. . Triangular outline, bases . .				Lanceo- late	Frag.	Totals
	Straight	Concave	Concave & Side-Notch	Corner Notch			
0- 6	3	5	1			1	10
6-12	4		5		1	1	11
12-18						2	2
18-24		1		1		1	3
24-30	1		1			1	3
30-36		1					1
36-42							0
42-48						1	1
48-54	1						1
54-60							0
	5	11	7	1	1	7	32

All of the ten classifiable blades, assumed to have been knives, have a lanceolate outline and rounded bases (Fig. 6). They show large percussion scars on both surfaces but their edges have been carefully pressure-flaked. One specimen has an edge which is more sharply convex than the other producing an impression of a curved blade (Fig. 6c). Apart from a large, coarsely chipped specimen, apparently unfinished, the knives are of medium size and relatively flat and thin. Their lengths are fairly uniform, ranging

from 6 to 6.8 cm.; in greatest blade breadth they vary from 3 to 4.2 cm; and in thickness are 9 mm. to 2 cm. The preferred or perhaps most easily available material for their manufacture was quartz (7). There are also blades made from porphyry (2) and jasper (1). Seventeen fragments, eight edge pieces, five tips and four central sections, appear to be from blades of similar form and size. Fourteen of these are quartz, two are porphyry and one is quartzite.

Scrapers, the most abundant class of chipped objects, constitute a miscellaneous lot of crude and shapeless tools. They are simple flakes unaltered except for a scraping or cutting edge formed along one side by secondary chipping. The usual form has a convex working edge; on a few parallel-sided flakes it is nearly straight. There are 44 of these scrapers. A wide variety of materials is represented: quartz (13), porphyry (12), chert (4), chalcedony (4), felsite (4), obsidian (4), jasper (2), hard-textured sandstone (1). There is considerable range in their size, 1.6 - 7.5 in length, 1.1 - 5.7 cm. in breadth, 3 mm. - 2.5 cm. in thickness. Average dimensions are 4.0 x 2.9 cm. and 1.1 cm. thick. Two additional scrapers, fabricated from small cores, can be distinguished from the others by their high-angle scraping edges. The largest, of quartzite, measures 4.1 x 3.5 cm. and is 2.5 cm. thick. The smallest has dimensions of 3.1 x 2.6 cm., is 1.5 cm. thick and is made of felsite. The haphazard nature and frequency of the scraping tools suggests that they were quickly fashioned for a particular task and cast away when it was completed.

An elongated oval quartz flake with a short point at one end is the sole example of a stone perforating tool. No effort at trimming the flake beyond forming its drill-like tip was made. The specimen is 2.3 cm. long, 1.3 cm. wide, 5 mm. thick.

Among the chipped implements, only the projectile points showed notable stratigraphical separation. Heavier projectile points, whole and broken, were restricted to the lower portions of the deposit with none unearthed above the 12-18 inch level. In contrast, small, light-weight missile tips were pretty much limited to the upper 24 inches of the refuse. The few examples recovered below this depth could have been displaced by rodent or human disturbance from their original position higher up in the midden. Knife blades while not confined to any portion of the deposit showed an appreciable increase in its deeper levels (below 30 inches). Flake scrapers had their heaviest concentration above 30 inches, from whence came 34 of the 44 specimens (77.2 percent). The two core scrapers were obtained from below 36 inches. The latter are probably too amorphous in nature and too few in number for the restricted vertical distribution to have any real significance.

Depth Distribution of IH 5 Chipped Stone Tools:

Depths	- Points -		Scrapers				Totals	
	Large	Small	Blades & Frags	Flake	Core	Perforator		
0- 6	0	10		1	9		1	21
6-12	0	11		0	2			13
12-18	1	2	1	1	5			10
18-24	4	3		1	8			16
24-30	7	3		1	10			21
30-36	4	1		3	3			11
36-42	3	0		2	4	1		10
42-48	2	1	3	3	2			11
48-54	3	1	3	1	1			9
54-60	2	0	3	4	0	1		10
	26	32	10	17	44	2	1	132

Bone Objects. Bone artifacts are surprisingly rare with only six examples present. This limited use of bone cannot be attributed to its scarcity for enough animal remains were present in the refuse to have supplied the necessary raw material for fashioning a broad range of tools and other articles. Five of the six specimens are parts of awls, four tips and

one central section. All have been made from mammal long-bones, split lengthwise and carefully tapered. Three of the tips have a flattened oval cross section; the fourth awl, remarkable for its exceedingly sharp point and high polish, is nearly circular. They range in thickness from 4 to 8 mm.

The only other worked bone item is a short length of rabbit bone with one end cut square and the other broken away. The piece is not polished or otherwise modified. This may be scrap resulting from the fabrication of a bone bead or tube.

Bonework was fairly evenly distributed through the occupational refuse. Awl fragments were distributed from the 12 - 18 inch to the 54 - 60 inch levels. The cut rabbit bone came from the latter level.

Shell Objects. Among the six shell objects are two Purple Olive shells converted into beads by grinding off their spires. On a third specimen the spire has been cut or broken away. The beads are all quite small, having lengths of 1 - 1.3 cm., and diameters of 7 mm. The basal portion of a fourth olive shell is assumedly a remnant of another bead.

The other two shell artifacts consist of a fragmentary pendant and a bead fashioned from abalone shell. The remaining portion of the pendant has a curved edge near which are two holes, drilled from one side. Its original form cannot be ascertained. The abalone bead is flat and circular with a diameter of 8 mm. Its slightly off-center perforation has been bored from one side.

In addition to finished products there are 15 shell scraps, probably wastage resulting from the manufacture of ornaments. Represented are the following species:

Abalone (Haliotis sp) - 3
 California Anodon (Anodonta californiensis) - 4
 California Horn Shell (Cerithidea californica) - 1
 California Mussel (Mytilus californicus) - 1
 Chestnut Cowry (Zonaria spadicea) - 1
 Cockle (Cardium sp.) - 2
 Forty-ribbed Cockle (Trachycardium quadragenarium) - 1
 Glycymeris (Glycymeris maculata) - 1

Except for the Glycymeris, a Gulf of California species, all of these shellfish are native to the coast of southern California. One small piece of shell, perhaps fresh-water mussel, could not be definitely identified.

All of the shell artifacts came from rather deep in the midden. The four olive beads were obtained below 24 inches as was the circular abalone bead. The fragmentary pendant was turned up in the 18-24 inch level. Shell scraps occurred in each six-inch level down to 48-54 inches.

Perishable Objects. Articles made of perishable organic materials were virtually non-existent. The only representative is a 13.5 cm. length of cord made by twisting ("Z-twist") two one-ply strands together. The piece measures slightly less than 2.5 mm. in diameter and has 10 twists per 10 cm. It resembles modern hemp twine in appearance and is probably made of yucca or agave fiber. The cordage is not knotted.

Although no actual basketry was recovered, its presence is demonstrated by an impression on the interior surface of a potsherd from the 0 - 6 inch level. The basket-work, clearly visible, was produced by the coiling technique. It has non-interlocking stitches.

Pigment. Four bits of bright red hematite were interspersed through the debris. The largest piece weighed two grams; the smallest a mere .15 gram. A tiny stone slab, stained with red was picked up from the back dirt of a relic-hunter's pit. Obviously a quantity of pigment had been ground upon it. The iron oxide, presumably provided a source of body and face paint; it could

also have served for making pictographs, a set of which adorn the ceiling and walls of a nearby rock-shelter. The source of this substance is not known.

Depth Distribution of Miscellaneous Items from IH 5:

<u>Depths</u>	<u>Bone</u>	<u>Shell</u>	<u>Cordage</u>	<u>Pigment</u>	<u>Totals</u>
0- 6			1	1	2
6-12					0
12-18	1				1
18-24	1	1*		1	3
24-30	1	2			3
30-36		1			1
36-42	1	2**			3
42-48				1	1
48-54				1	1
54-60	2***				2
	6	6	1	4	17

(*Shell pendant, **Shell disc; ***?Bone bead).

Fireplaces

Remains of many campfires were encountered during the excavation. An especially heavy concentration of fire remains was exposed just within the shelter. Clearly recognizable were no less than ten superimposed layers of charcoal, separated from one another by thin bands of soil. Apparently it was here, barely beneath the overhang that successive generations of the shelter's inhabitants chose to light their fires. They built their camp fires directly on the ground, not in pits, and did not enclose them with rocks.

Food Remains

From the occupational debris came 4,039 mammal bones, 10.5 percent calcined. Most are fragments, bones split open to facilitate extraction of their marrow. Those from the deeper levels are coated with a calcareous substance.

To judge from a superficial examination of the remains, only a small range of animals is represented. The predominant number comprise bones of jack rabbits. Pack rats and bighorn sheep are also represented. Bird bones are surprisingly scarce, there being only one readily recognizable example. Of special interest are four fair-sized fish vertebrae.

Although there is every reason to believe from the nature of their equipment that the shelter's former residents relied heavily upon wild plant foods for their livelihood, digging produced only one sample of undoubted plant food. It is a pine-nut shell, half chewed away by rodents. Other vegetal remains were uncovered -- seeds, cactus spines, leaves, twigs and the like -- but these had obviously been carried in by rodents or blown into the shelter by strong gusts of wind. All had a fresh appearance and were found on or near the surface.

Human Skeletal Remains

No articulated burials or cremations were unearthed. The only human skeletal material consists of the remains of a child, less than a year old. These bones were found scattered through the debris at depths ranging from 30 - 36 to 54 - 60 inches. They comprise thin skull fragments (58), and the anterior segment of a sternum; also present are four teeth -- two incisors and two molars.

Conclusions

The recently completed excavations at the Indian Hill rock-shelter have, in general, confirmed conclusions reached from preliminary digging completed three years earlier (Wallace and Taylor 1960b, pp. 78-80). Stratigraphic analysis of the artifacts obtained during the April 1961

excavations again clearly showed that some classes of objects tended to cluster in either the lower or upper portion of the midden, thus demonstrating once more that certain cultural changes had taken place during the time span represented by its accumulation. On the basis of these changes it is possible to state anew, and this time more firmly, that the shelter witnessed at least two distinct phases of occupation, each characterized by a somewhat different artifact assemblage. It is by no means certain where the exact line of demarcation between the two manifestations occurs in the refuse but it seems to fall at around 24 inches.

The most diagnostic articles assignable to the deepest and therefore earliest assemblage are lanceolate and corner-notched stone projectile points of a size and weight which classifies them as dart tips rather than arrowheads, and scraper planes. Other items occurring in some numbers include leaf-shaped knife blades, Flake scrapers, cobble and flaked core hammers, choppers, milling stones and handstones. Minor items are Olivella shell beads and bone awls.

The material equipment left behind by these earliest inhabitants reflects an economy based primarily upon collecting wild plant foods but in which hunting also played a part. To judge from the amount of living space available in the shelter, these early gatherers and hunters formed a small group, perhaps a few families at most. Apparently they did not reside permanently at Indian Hill but moved into the shelter and occupied it for a time when seasonal food supplies were available.

A comparison between artifacts belonging to this earliest assemblage and specimens from known archaeological complexes of the southern Californian desert region throws light upon the problem of its cultural and chronological position. The Indian Hill finds match very well those from ancient campsites

in Pinto Basin (Campbell and Campbell 1935) and other localities yielding similar artifacts (Rogers 1939, pp. 47-60; Harrington 1957). Up to now the Pinto complex has not been specifically identified in this section of the desert. Considerable controversy has arisen regarding the age of Pinto materials but the more or less accepted view today is that they date from the Little Pluvial, a time of increased precipitation extending from around 2500 B.C. until the beginning of the Christian era. As there is no real indication that the Indian Hill people lived under climatic or faunal conditions very different from those prevailing now, it can be supposed that the shelter's first occupation dates from near the end of the wet cycle, when the environment was beginning to assume its present condition.

Distinguishing artifacts of the second or later assemblage at Indian Hill are pottery and small, light-weight missile points. The latter imply introduction of the bow and arrow. Aside from heavier projectile tips, scraper planes and a few lesser items which are absent, the remainder of the tools and other equipment are much the same. Knife blades, however, are of less frequent occurrence whereas flake scrapers are more abundantly represented than in the earlier group of artifacts. Daily living habits of the shelter's final occupants did not change perceptibly. Like their predecessors they divided their time between gathering and hunting with the native flora supplying their major food resources. Similarly, they appear to have inhabited the site seasonally rather than perennially.

The upper-level materials are identical to those typically found on sites in Anza-Borrego occupied in late prehistoric and historic times (Meighan 1959; Wallace and Taylor 1958, 1960a). The basic artifacts -- pottery, arrowpoints, milling stones and handstones -- are also characteristic of recent encampments everywhere in the southern Californian desert,

sites attributed to ancestors of the present-day Yuman-and Shoshonean-speaking Indians. The start of this closing phase of aboriginal life is regularly placed at about 1000 A. D.

Although two phases of habitation can be distinguished, the entire sequence of events at the Indian Hill shelter is imperfectly known. If the presently accepted desert chronology (Bennyhoff 1958, Fig. 1) with its broad time limits has any validity, there is an unaccounted for gap of 1000 years between the end of the Pinto occupation and the time of the arrival of the shelter's later Indian residents. There are three possible explanations for this apparent hiatus:

1. It is conceivable, though highly unlikely, that Pinto culture, or something very much like it, persisted in this region until relatively recent times.

2. An intermediate assemblage, falling in time between the end of the Pinto occupation and the arrival of the ancestors of the Modern Indians, may exist at Indian Hill but has thus far gone undetected either because its artifacts are not sufficiently distinctive or because there are too few of them.

3. There may have been a long interim during which humans did not dwell in the shelter. Although this interpretation appears to be the most plausible, there is no band of sterile soil or other discontinuity to testify to a protracted occupational lapse. It seems reasonable to assume that in the course of ten centuries, a layer of soil, either wind-borne or resulting from weathering of the granite roof and walls of the shelter would have been deposited.

More cannot be said at this time concerning this perplexing problem. It can only be solved by further exploration of the shelter's midden. And if it is to be resolved satisfactorily it is essential that as much ground as possible be excavated in order that the finds be sufficiently numerous to constitute valid and incontrovertible proof.

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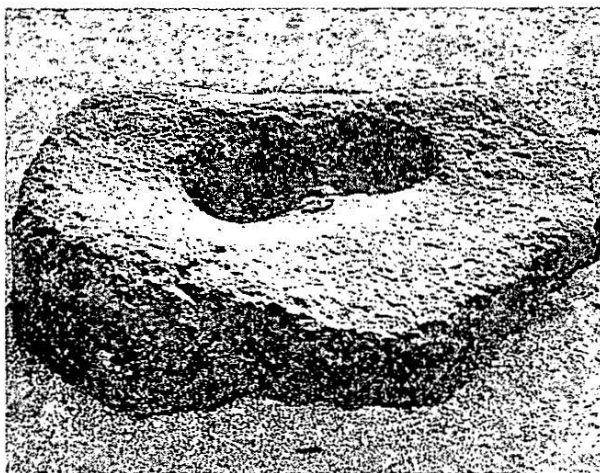
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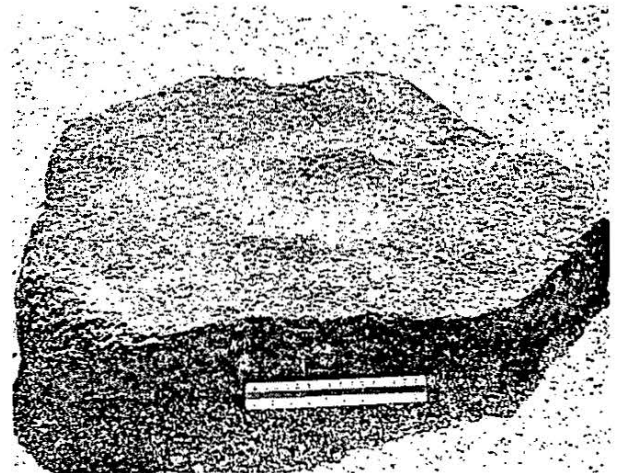
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b



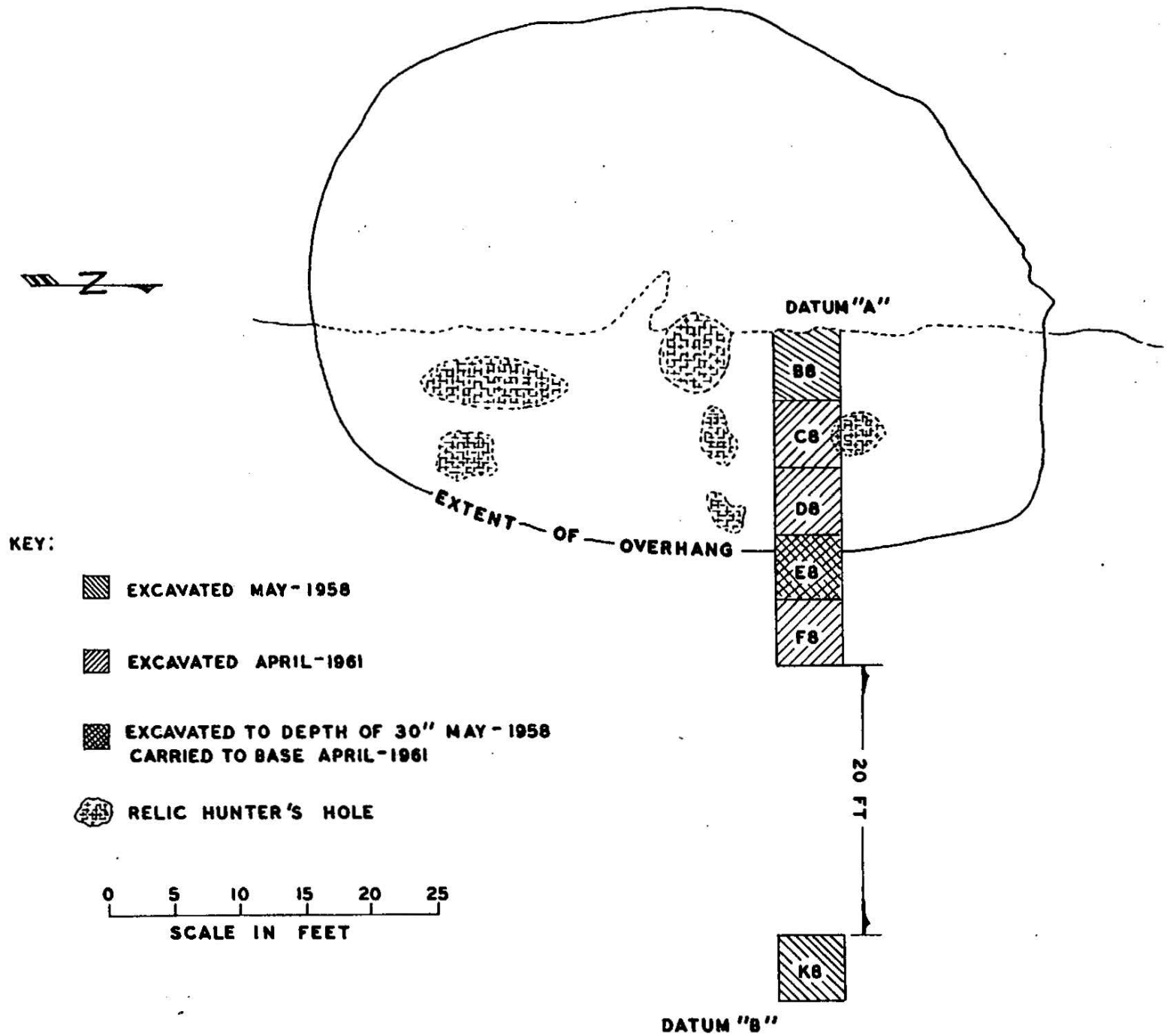
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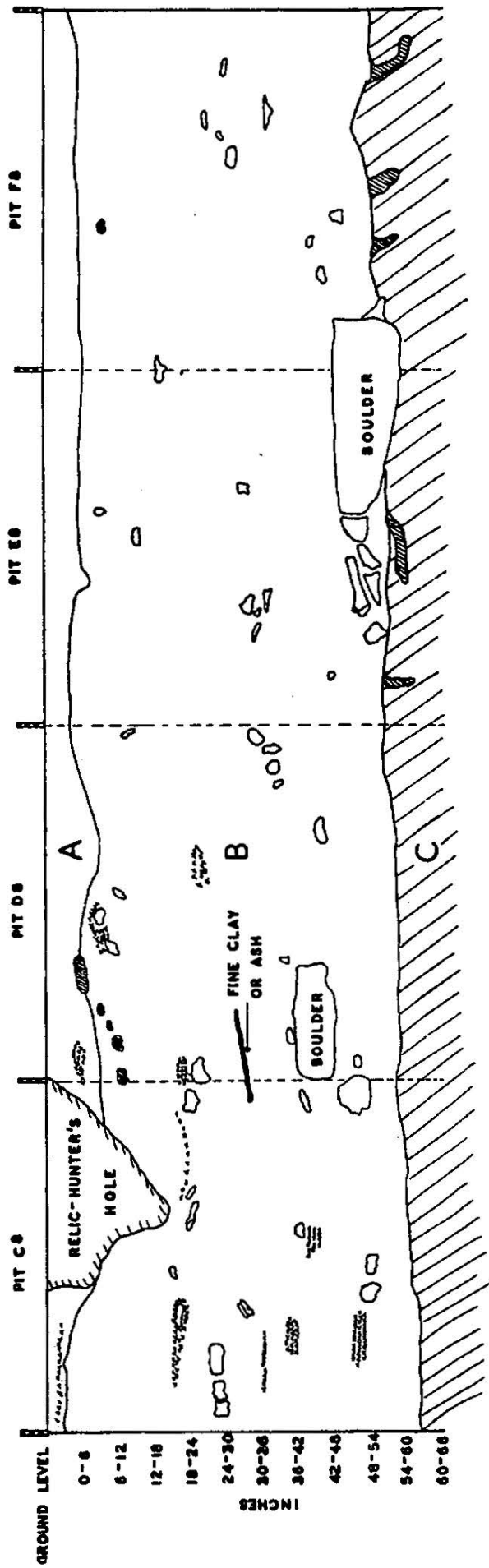


d

Plate 5

FIG.1 DIAGRAM OF INDIAN HILL ROCK SHELTER.

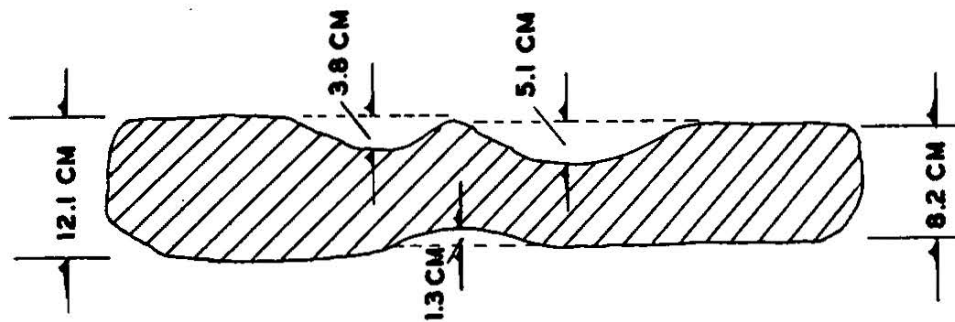
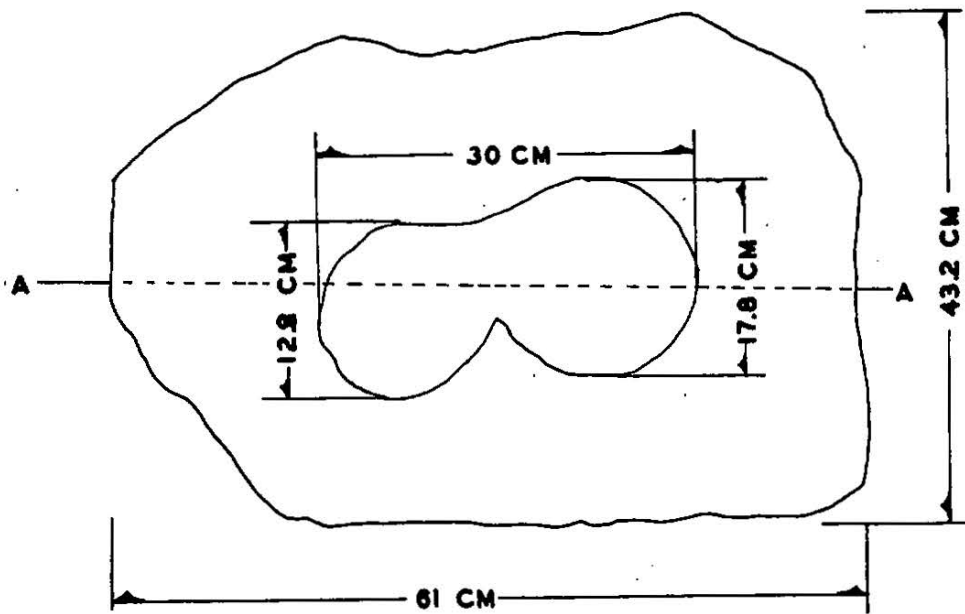




- KEY:
- CHARCOAL
 - RODENT HOLE
 - UNMODIFIED STONE
 - ZONE A LOOSE POWDERY TOP SOIL
 - ZONE B LOOSELY COMPACTED SOIL
 - ZONE C COMPACTED BASAL SOIL



FIG.2 INDIAN HILL ROCK SHELTER
SOIL PROFILE (NORTH WALL).



CROSS SECTION THROUGH A-A

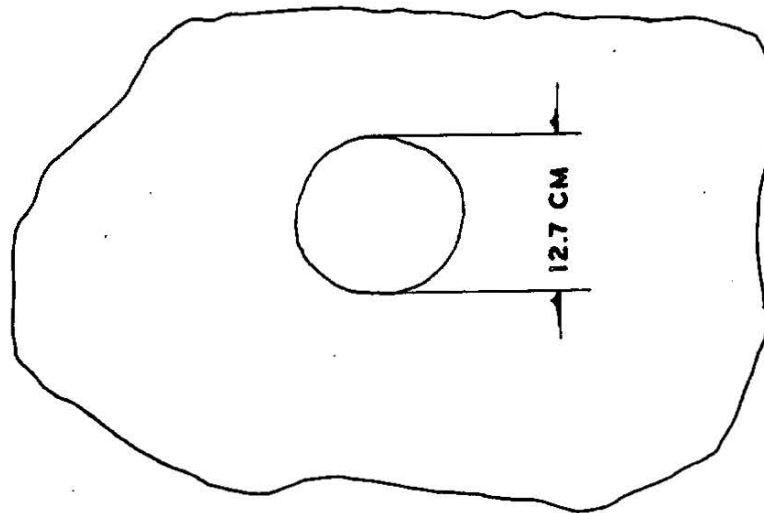
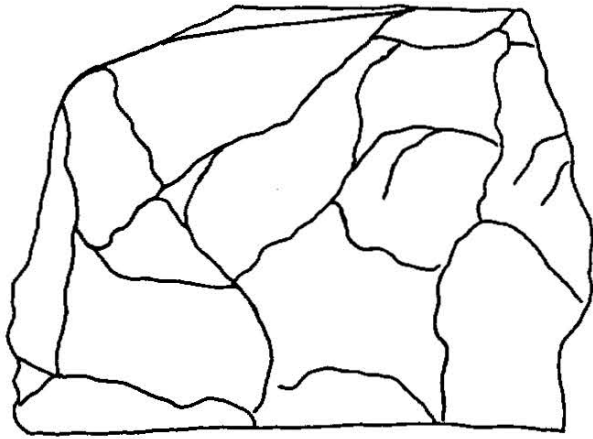
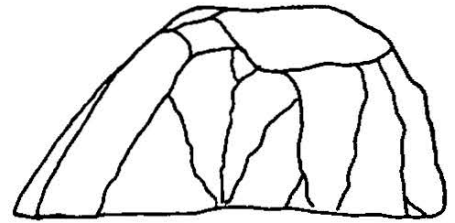


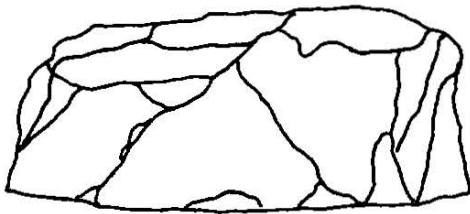
FIG.3 INDIAN HILL ROCK SHELTER MILLING STONE.



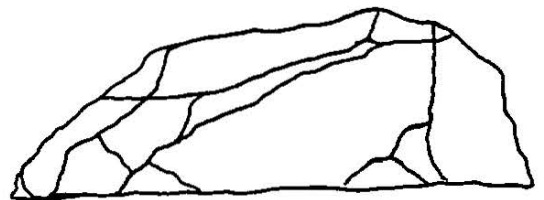
A



B



C



D

FIG. 4 INDIAN HILL ROCK SHELTER SCRAPER PLANES. 1:1

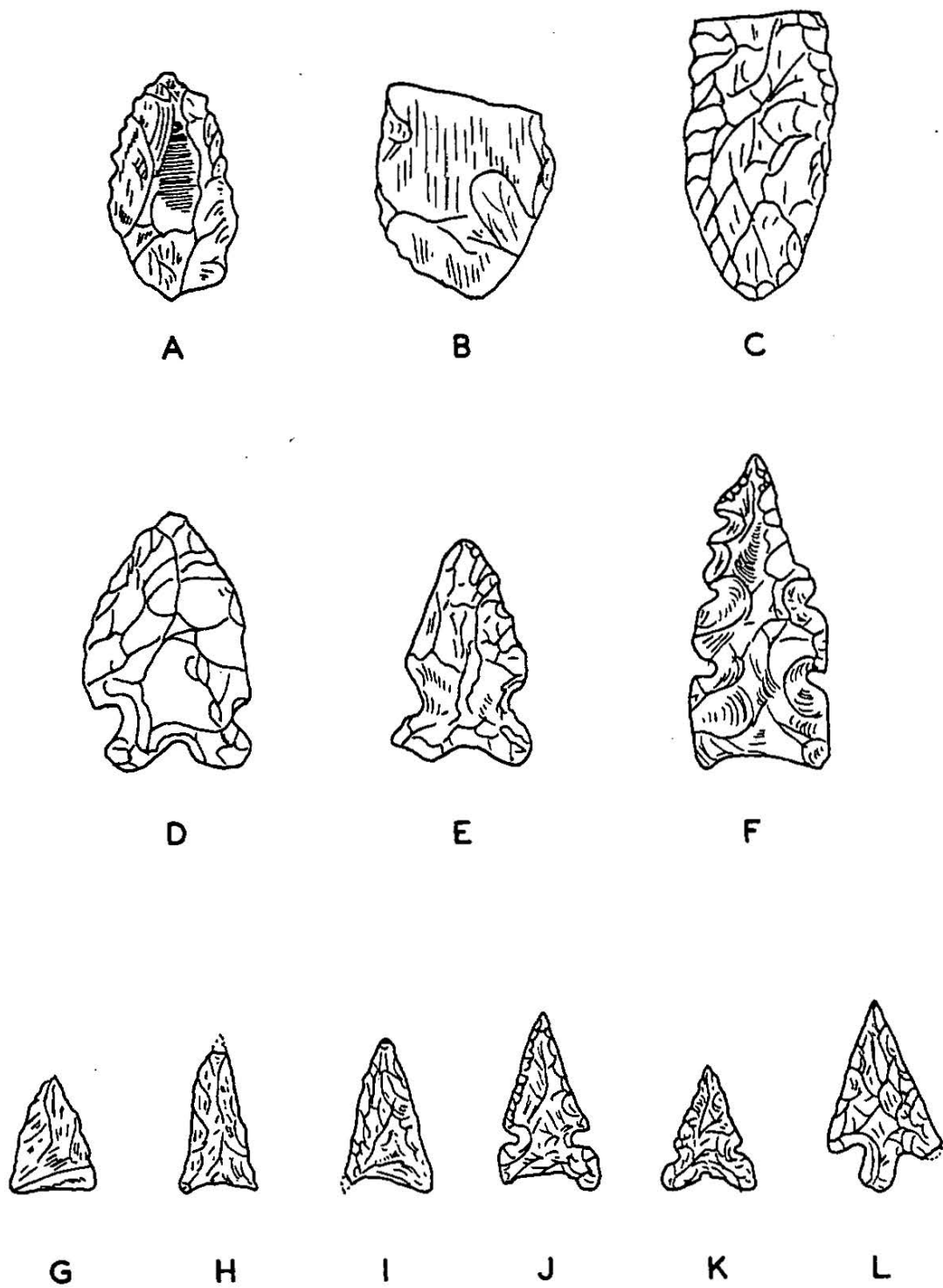
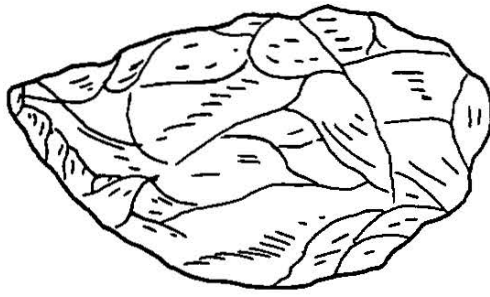
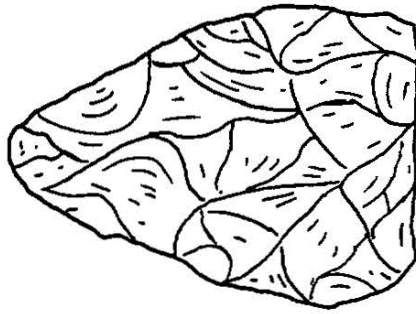


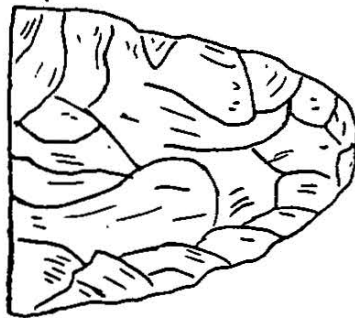
FIG. 5 INDIAN HILL ROCK SHELTER PROJECTILE POINTS. 1:1



C



B



A

FIG. 6 INDIAN HILL ROCK SHELTER KNIFE BLADES. 1:1