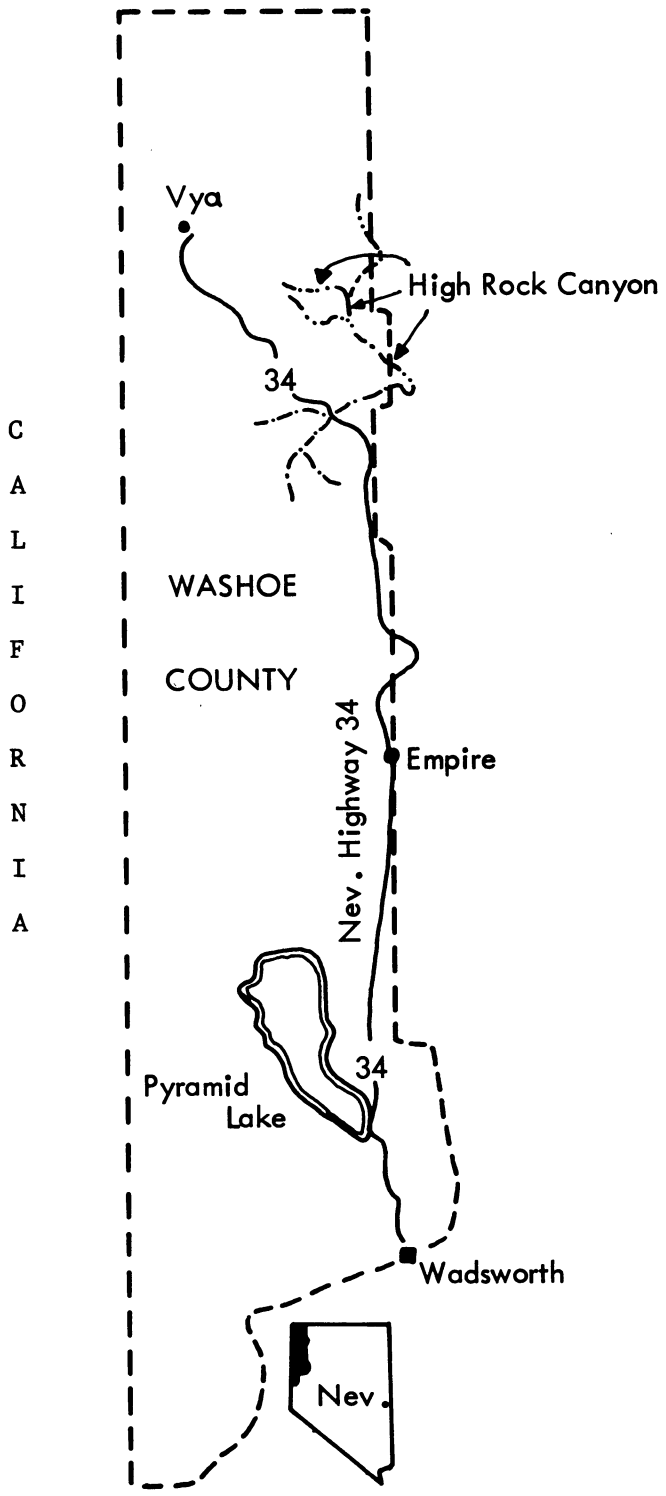
I. AN ANALYSIS OF A SURFACE COLLECTION FROM HIGH ROCK CANYON SITE 26-WA-177, NEVADA

Sonia Ragir and Jane Lancaster



WASHOE COUNTY, NEVADA, SHOWING THE LOCATION OF HIGH ROCK CANYON.

MAP 1

INTRODUCTION

The general area involved in this study lies in the northern half of Washo County, the northwesternmost county of Nevada and contiguous to California (map 1). This High Rock Canyon site was first reported by Dr. Robert E. Connick, Dean of the College of Chemistry, University of California, Berkeley, who visited the area for several days during 1961, primarily in search of petroglyphs. Though he failed to find the petroglyphs, Dr. Connick did observe an extensive obsidian workshop area which he reported to the University of California Archaeological Research Facility, providing a small series of cores from the site. On the basis of this report, the site was checked by Dr. R. F. Heizer in August, 1962, and a large collection of surface materials was made.

The High Rock Canyon site is accessible only by an incredibly poor desert road which leaves Nevada State Highway 34 at a point 13.3 miles north of the town of Woods. Two miles out of Woods along this road lies Nellie Spring, around which there is found some workshop refuse, and a little more than two miles farther on one comes to Indian Spring. We first observed workshop refuse about four miles north of Indian Spring and it continued to be evident for a distance of nine miles. The area providing the most abundant workshop refuse lies along High Rock Creek, on the terraces north and south of the creek below the Parker Ranch House which is located not far below the point where the narrow canyon, through which the stream flows, widens to become a small valley perhaps six hundred feet in width. Workshop debris is distributed along the banks of High Rock Creek as it pursues its southeasterly course, flowing, some dozen miles below Parker Ranch, into the narrow, sheer-walled High Rock Canyon so graphically described over one hundred years ago by Alonzo Delano in his Across the Plains and Among the Diggings, and by J. Goldsborough Bruff in his journal published under the title of Gold Rush.

Since the purpose of the brief 1962 visit was aimed primarily at noting the nature and extent of the workshop area, systematic collecting was not attempted. Because of the condition of the roads as well as the limitation of time, it was not possible to define either the area covered by the obsidian boulders or the general extent of aboriginal utilization of the obsidian. Most of the pieces described in this report were picked up along the creek—a permanent stream in this extremely dry region—below the ranch for a distance of about one and one-half miles. No evidence of house remains or rock circles was noted.

The larger workshop is of undetermined extent; it includes at least

the greater part of Township 41 North, Range 22 East, and Township 42 North, Range 22 East—roughly one hundred square miles. The obsidian occurs in the form of subspheroid nodules eroding from the surface which varies from gravels to alluvial silts. The depth of obsidian bearing deposits is unknown. Throughout the two townships mentioned the road passes through extensive workshop areas, but there are also some sections where workshop refuse is very scarce or entirely lacking. Map 2 shows the sections in which an abundance of broken obsidian cobbles and debitage were noted. In some cases the profusion of obsidian cobbles may have encouraged aboriginal exploitation, but there are also extensive areas which show little or no workship debris. While no answer can be given, it would appear that there must be specific reasons, such as the availability of water or some economic factor, which encouraged repeated and intensive utilization of obsidian in more or less restricted spots.

The main area of collecting was along the creek. The suggestion may be made (but there is no evidence to support it) that the definable areas of concentrated, obsidian-working activity represent traditional spots where particular groups were accustomed to visit. Only careful collection and comparison of materials from a series of workshop areas would illuminate this problem.

TERMINOLOGY AND CLASSIFICATION

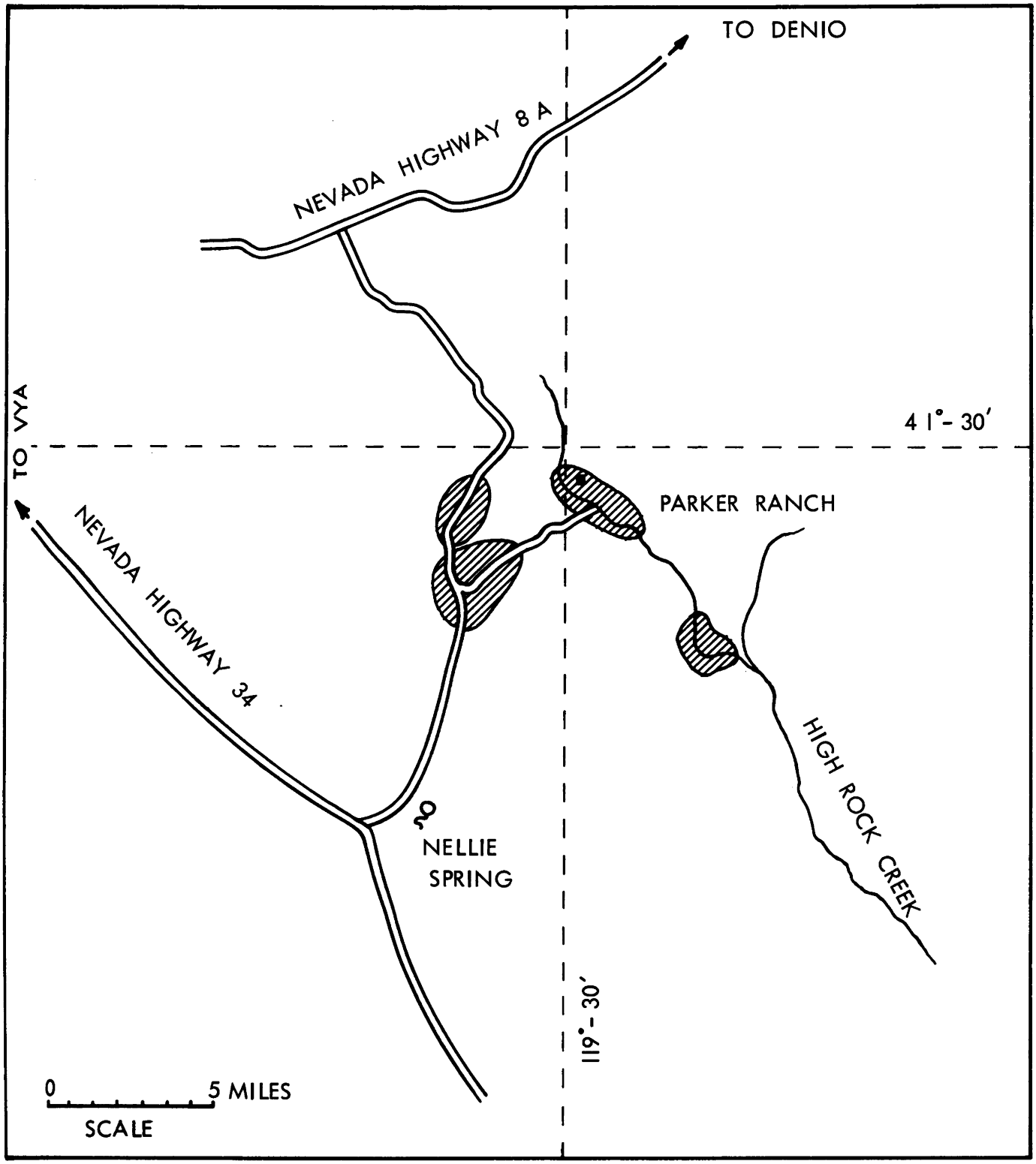
This paper is an exercise in technique for the analysis of an artifact collection and one type of interpretation to which such an analysis may lead. The typology and technical terms, and the general definitions of measurement used in this paper, are set out below.

Measurements

Length: The length of an artifact is the length of the narrowest rectangle into which the specimen can be fitted when the striking platform is oriented along the base line.

Breadth: The breadth of an artifact is the breadth of this rectangle.

Thickness: Unless otherwise stated, the thickness is the maximum measurement at right angles to the plane from which length and breadth are measured.



MAP 2

High Rock Canyon site area showing obsidian workshop areas

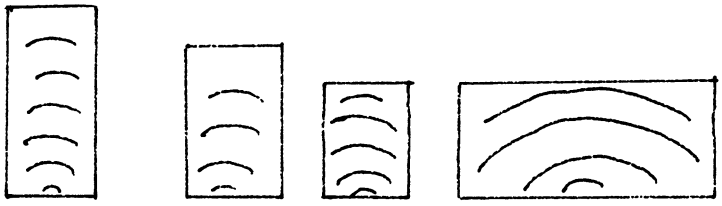
Technical Terms

Blade: A blade has a length-breadth ratio of 5:2 or more. Blades are always end struck.

Flake: The length-breadth ratio of a flake lies between 5:2 and 5:5.

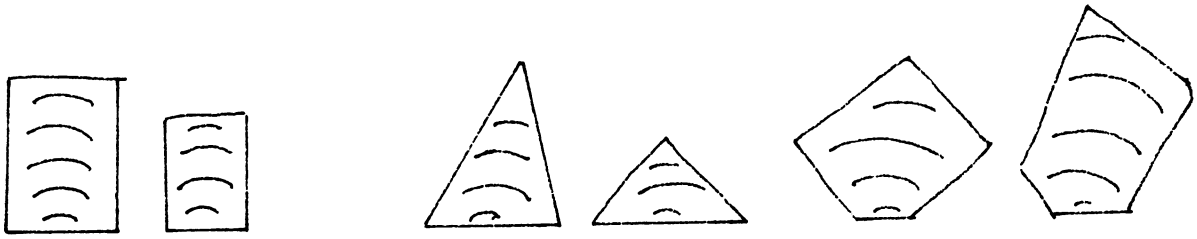
Flakes have been divided into the following caregories according to the manner in which they were struck from the core:

a. End flakes: striking platform on one of the shorter sides
b. Side flakes: those with breadth greater than length



Blade Long End Flake Short Side Flake

Flakes and flake tools have been classified as subrectangular, subtriangular, and irregular.



Subrectangular Subtriangular Irregular

Points and blanks: The essential characteristics of these tools are:

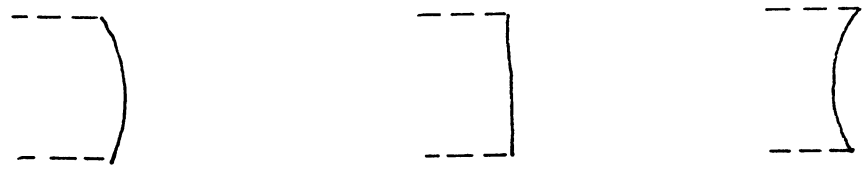
a. Relatively thin section
b. Careful secondary retouch over one or both faces
c. Edges are straight and regular in both planes (i.e. the face of the flake and edge profile)
d. Ends may be rounded, pointed, or subrectangular

Roughouts:

a. Medium to thick, irregular section
b. Rough primary and secondary retouch on one or both sides
c. Edges are irregular in both plan and edge profile
d. Ends may be rounded, pointed, or subrectangular

Cores: These are classified later in this paper according to the type of flake removed and the technique of removal.

Working edges are classified as:



Convex Straight Concave

Cross sections are described as:

Lenticular Biconvex Plano-convex

CLASSIFICATION OF THE ASSEMBLAGE

The 537 specimens in the assemblage collected at High Rock Canyon are classified according to categories suggested by Clark (1963:45-52). The total collection is divided into two parts: shaped tools, the final form of which depends on intentional shaping for use; and waste materials, the by-products of the process of manufacturing. In some instances these waste materials appear to have been used casually and informally, and in these cases they are secondarily classified as utilized.

Shaped Tools

The shaped tools, 32.8 per cent of the total assemblage, are divided into the following four categories:

Points: Fourteen specimens, mostly broken fragments. Bifacially trimmed from the edges, pointed at one end, thin in cross section relative

to length pressure-flaked over the entire surface, and, in one instance (Pl. VI, 30), fresh and unabraded.

Choppers: The nine specimens are characterized by a bifacially trimmed, serrated or irregular chopping edge made on an obsidian pebble or cobble. Somewhat abraded on the chopping edge. Probably used.

Scrapers: 23 specimens. Implements with a scraping edge usually developed by unifacial trimming from a flat surface, made on a flake or pebble of obsidian. Scrapers are found in a variety of forms, including side scrapers made on thick flakes, denticulated scrapers (i.e. notched scraping edge), and round side scrapers (Pl. III, 12-14). In addition to these flake scrapers there are nine examples of cores which show signs of utilization as scrapers; of these seven were made on pyramidal blade cores, the scraping edge being formed by the intersection of the ventral surface and the blade scars (Pl. II, 7, 8). The high proportion of blade cores showing utilization as scrapers may indicate a formal tool category; however, for this particular analysis they are classed as waste with utilization noted.

Roughouts and Blanks: 129 specimens. The largest category of shaped tools (73.3 per cent), and nearly a quarter of the total assemblage, is composed of roughouts and blanks. This group includes broken or unfinished specimens which represent different stages in the manufacture of a flake or core into an oval pointed at either end and lenticular in cross section. Roughouts are crudely shaped specimens which are not pressure-flaked, while blanks are bifacially pressure-flaked and appear relatively finished. There are 68 specimens classified as roughouts; of these 30 are unfinished, whole roughouts and 38 are broken fragments. Often the unfinished roughouts show signs of unsuccessful attempts to reshape or reduce their thickness, which probably accounts for their abandonment (Pls. IV, 19; V, 22). Of the 61 specimens classified as blanks all are broken fragments. The final form of the blanks, then, is uncertain. Many broken tips were collected which indicate that one end at least was likely to be pointed (Pl. VI, 31, 32). Squared and U-shaped butt ends were lenticular in cross section, and the width varied from 3-5 cm. The length of the finished blank cannot be directly determined since all of the nearly finished pieces were broken. The width would lead to an expectation of a fairly long blank; however the unbroken roughouts are usually only 4-6 cm. in width and range from 7-12 cm. in length, with an average of about 9 cm. All specimens in this category were fresh and unabraded, indicating that they had been broken during manufacture rather than by use.

Waste

Waste constitutes the remaining two-thirds of the assemblage. It is subdivided into three major groups: cores, waste flakes, and chips and chunks. A total of 14.7 per cent of the waste shows possible utilization.

Cores: 78 specimens. Cores constituted 11.5 per cent of the total assemblage and 21.6 per cent of the waste. All of the cores are black obsidian with the exception of one of greenish-brown chert. Half of the cores show signs of possible utilization as either scrapers (Pl. II, 7, 8) or choppers (Pls. III, 16; IV, 17; V, 21). A full description of core forms is presented below. Cores are subdivided into five groups: blade cores (12 specimens); and four types of pebble cores (66 specimens): split cobble, protobiconical, multidirectional, and formless.

Waste flakes: 99 specimens. Waste flakes were 23.1 per cent of the total sample and 34.3 per cent of the waste. Most are obsidian, but there are 20 specimens of chert. Of the flakes with striking platforms present, 62 specimens had a plain platform and 21 were simply faceted. The average length-breadth ratio of the measurable flakes was 6:5. The evidence from the form of the flakes and the striking platforms indicates that they were struck from simple, unprepared cores, except for six parallel-sided blades which seem to have been struck from prepared cores. Twenty-five flakes show possible utilization, the rest are fresh and unabraded.

Chips and chunks: 159 specimens. The remaining 29.6 per cent of the assemblage and 44.1 per cent of the waste were either flake fragments or chunks. Only ten specimens show possible utilization. A slightly higher proportion of basalt chunks and a number of small chips of white chert are present in this group, but the greater proportion in both bulk and number is obsidian. A more detailed breakdown of both tools and waste, including raw material used, is presented in Table 3.

ANALYSIS OF ASSEMBLAGE COMPOSITION

The particular classes of artifacts collected in High Rock Canyon as well as the relative importance of various classes indicate that the major activity in the area was the working of cores into roughouts and blanks (see Table 3) with a blade industry only suggested. Within the category of shaped tools, roughouts and blanks compose 74 per cent of the specimens (see Fig. 1). Roughouts are represented in all stages of

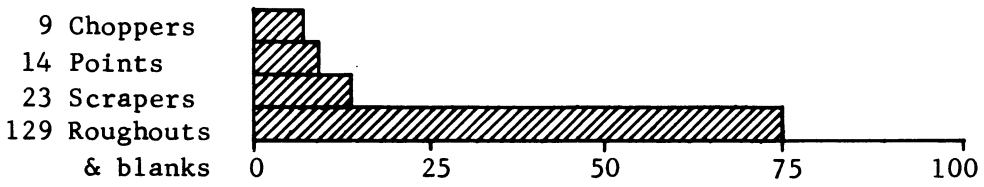


Fig. 1. Percentages of major types of shaped tools from High Rock Canyon.

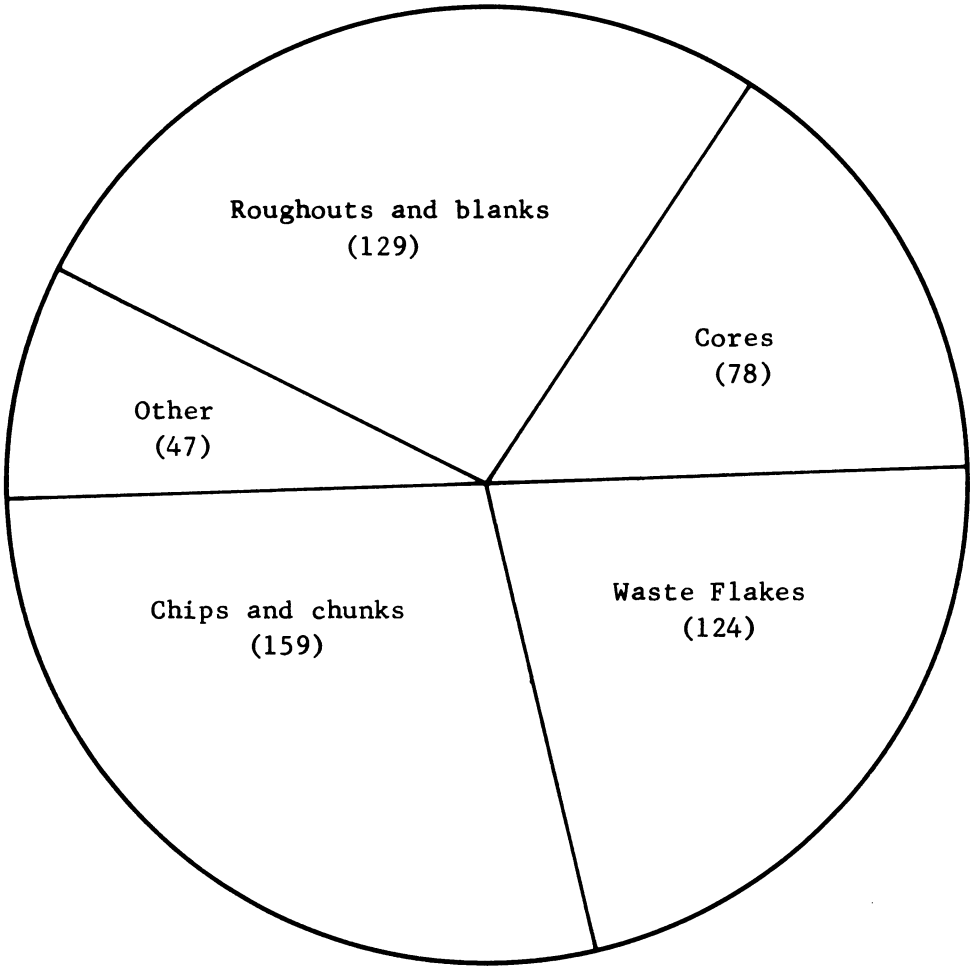


Fig. 2. Major groups of shaped tools and waste products.

manufacture. The final stage, the manufacture of blanks, is represented only by broken fragments. The proportion of roughouts and blanks is high even when viewing the assemblage as a whole (see Fig. 2) although this may reflect a bias in collecting. The relatively high frequency of cores—nearly 15 per cent of the total—indicated that the manufacturing process began in High Rock Canyon with the initial flaking of the cores for the subsequent manufacture of blanks.

Raw Material

Almost all of the artifacts collected are of some variety of obsidian. One kind is a fine, very homogeneous black obsidian which makes up the bulk of the assemblage. This material comes from a local supply of obsidian cobbles. The cores are unmistakably pebbles or cobbles with a thick cortex and smooth surface with much evidence of incipient conchoidal fracture. There are also 20 examples of roughouts or flakes made of a hard, gray, basalt-like obsidian. However no cores of this variety were collected. Besides the great preponderance of obsidian as raw material, there is a small incidence (43 specimens) of greenish-brown and of whitish chert specimens. The chert specimens—which are all roughouts, waste flakes, or chips, except for one core—constitute about eight per cent of the total assemblage. This chert was not available in or near High Rock Canyon and must have been brought into the area. Knowledge of the sources of this intrusive material might give interesting information about the number of groups which utilized the workshop and the localities from which they came. The only other nonobsidian specimens were basalt chips and chunks. Two of the chunks may have been used as hammerstones since their surfaces were heavily battered (Pl. I, 4). Of the total assemblage, over 88 per cent of the specimens and all but one of the 78 cores were of the local glassy black obsidian.

The Manufacture of Blanks

After an appropriate obsidian cobble was selected (with an average length of 9 cm.), it was apparently split open by a blow from a stone hammer or by hurling it at a stationary stone. Many of the cores show signs of battering on the cortex at the point where the cobble was originally broken, which makes the use of a hammerstone the most likely method of initial fracture. The scar from this break was then used as a striking platform for the removal of large, thickish flakes. Cores from this stage of working have deep negative bulbs of percussion and large, deep flake scars (some with prominent concentric rings) which, taken together, indicate that the flakes were removed by either hammerstone or direct-anvil techniques. The removal of such flakes might continue until

very little was left of the original cobble. At the beginning of this process, flakes were struck from opposite faces but at the same end of the pebble, resulting in a core which was protobiconical in form (Pls. III, 15, 16; IV, 17). In the next step the core was turned upside down and flakes were struck from both faces at the opposite end. These cores, which had flakes removed from both ends and both faces, have been identified here as multidirectional cores (Pl. IV, 18, 20). Continued flaking reduced cores to shapeless lumps or formless cores. Usually, however, the core was further reduced to a bifacial roughout (Pl. V, 21).

A comparison of the average measurements of the different types of cores, as presented in Table 2, supports this general sequence of reduction. The core measurements show some reduction in the average length from 9.1 cm. in the split-pebble to 6.8 cm. in the formless cores. The shorter average length of the protobiconical cores in comparison to the multidirectional ones is due to the fact that a cobble which is short in the beginning would not be turned in the hand but would have been flaked at only one end. The cores also show some decrease in average thickness. Many of the multidirectional cores had little or no cortex left and must have been reduced from considerably thicker cobbles. The unusual average thickness of 4.1 cm. in the formless cores compared to their short average length of 6.8 cm. accounts for their discard, since reduction to a roughout would have been too difficult. There is no change in the average length-breadth ratio between cores showing various degrees of work which would be expected if the cores were specialized. Actual core size appears to be correlated mainly to the size and shape of the original obsidian cobble, except in the case of blade cores (discussed below).

After the initial flaking of the core, the actual manufacture of blanks followed one of three courses: first, they could be made from thick flakes struck from the outside of the cobble (Pls. V, 22; VI, 26); second, from somewhat thinner inside flakes (Pl. VI, 27); or, finally, they could be made from the core itself (Pls. IV, 20; V, 21, 23). However, the end products were essentially the same. The roughouts were all foliate or lanceolate in outline, lenticular in cross section, and varied from 3-5 cm. in width. Roughouts made from flakes struck from the sides of cores, and especially from the cores themselves, tended to be relatively thicker in cross section than those made on thin flakes, but otherwise no consistent differences were noted.

In initial shaping and reduction of the piece of obsidian, the flake or core was usually reduced to a rough oblong, somewhat pointed at either end and lenticular in cross section (Pl. V, 21, 22). Specimens

from this stage of reduction have flake scars around the total circumference—on one face if made on a thin flake or both faces if a core or thickish flake were used. If a very thin flake was used, this stage could be dispensed with altogether. The flake scars are typical of hammerstone technique, large, deep impressions with deep negative bulbs of percussion. There is some suggestion—the appearance of small hinge fractures on the body of the thicker roughouts—that this stage of shaping of the much harder chert cores was done by controlled anvil technique rather than by hammerstone (Pls. V, 21; VII, 35). A second set of flake scars is often superimposed on the larger scars made in the initial shaping. This second set of scars is also struck from about the circumference of the core or flake. They resulted from the removal of smaller flakes, shallow and flaring in form with negligible striking platforms. The scars show small but distinct negative bulbs of percussion and wavy but not prominent concentric rings (Pls. V, 23-25; VI, 26). In the laboratory the authors have produced similar scars by striking obsidian with a cylindrical hammer made of some comparatively soft material such as bone, antler, or wood, which suggests that the High Rock Canyon roughouts were secondarily flaked by cylinder-hammer technique.

The final step in manufacture was further secondary retouch of both faces by pressure flaking from the margins of the blank (Pl. VI, 27, 28). This process left a series of long, narrow, parallel flake scars running from the margins toward the center of the piece. The scars are very shallow, with small, closely spaced but visible concentric rings with no obvious bulbs of percussion. Flakes removed in this manner are small and scale-like and no examples were found in the collection; such minute obsidian flakes shatter as they are removed. This technique produces fine symmetrical points (Pl. VI, 30) and blanks (Pl. VI, 29, 31-33). On finished pieces and blanks the pressure flaking covers the entire surface of both faces, completely obliterating any remains of scars from the initial flaking and shaping of the roughout.

The Blade Industry

Blades and blade cores, a small but significant part of the collection, form an industry distinct from the manufacture of roughouts and blanks. Twelve obsidian blade cores and six flake blades were collected. Two varieties of blade cores are represented. One type is a simple split-pebble core from which flake blades have been removed (Pl. II, 10). The blades from such cores are large, ranging from 7-10 cm. in length as the flake scars and the one complete blade indicate (Pl. II, 11). The few flakes in the collection have negligible striking

platforms, small but prominent bulbs of percussion, and a long, narrow form which together are indicative of a punch technique. It is possible that these longer flakes may have been used for knives.

The second form of blade core, of which there are nine specimens, represents the only specialized core in the collection. The cores approximate a pyramid in side-view, some being quite symmetric (Pl. II, 7, 8). These cores are by far the thickest of all the core types in the assemblage, averaging 4.9 cm. in thickness compared to an average length of 7.8 cm. The ventral surface of the core is formed by one or more flake scars and is approximately flat. Using this as a striking platform, small blades were struck all from one direction around the circumference of the core. The flake scars on these cores are very shallow, averaging 4.5 cm. in length and 1.5 cm. in width. One blade of this type made of basalt-like obsidian was collected (Pl. II, 9). Many of these blades are too small to be utilized successfully without hafting. They might have been mounted either singly or in a series to form the cutting edge of a bone or wooden knife.

CONCLUSION

The High Rock Canyon assemblage comes from a workshop site where the raw material—obsidian cobbles—was used for the manufacture of blanks and blades. The presence of a large number of cores, waste materials, and partially completed roughouts, and the absence of whole and finished blanks or blades, as well as the fresh and unabraded appearance of the specimens are indicative of this type of activity. Two distinct obsidian industries are present—the first for the manufacture of a generalized lanceolate blank roughly 5 cm. wide and 9 cm. long, and the second for the manufacture of blades. The punching of blades from obsidian cores in the latter industry was a specialized technique and yielded cores distinctive in form. The blades themselves were not retouched but were probably used for their cutting edges. Roughouts were made from unprepared pebble cores initially split and flaked by a stone hammer. The secondary flaking and shaping was by a soft cylinder hammer of bone, wood, or antler; and the final finishing, straightening of the edges and thinning, were accomplished by refined pressure flaking with a bone or antler fabricator. This final pressure flaking obscured all traces of the preceding manufacturing techniques. Therefore, it is only in such a workshop site, where all the steps in the working of an artifact are represented, that the details of manufacturing techniques can be fully reconstructed.

Several significant gaps were obvious in this collection. There were no (1) finished points, (2) unbroken blades, (3) unbroken blanks, and (4) not a significant number of utilized tools.

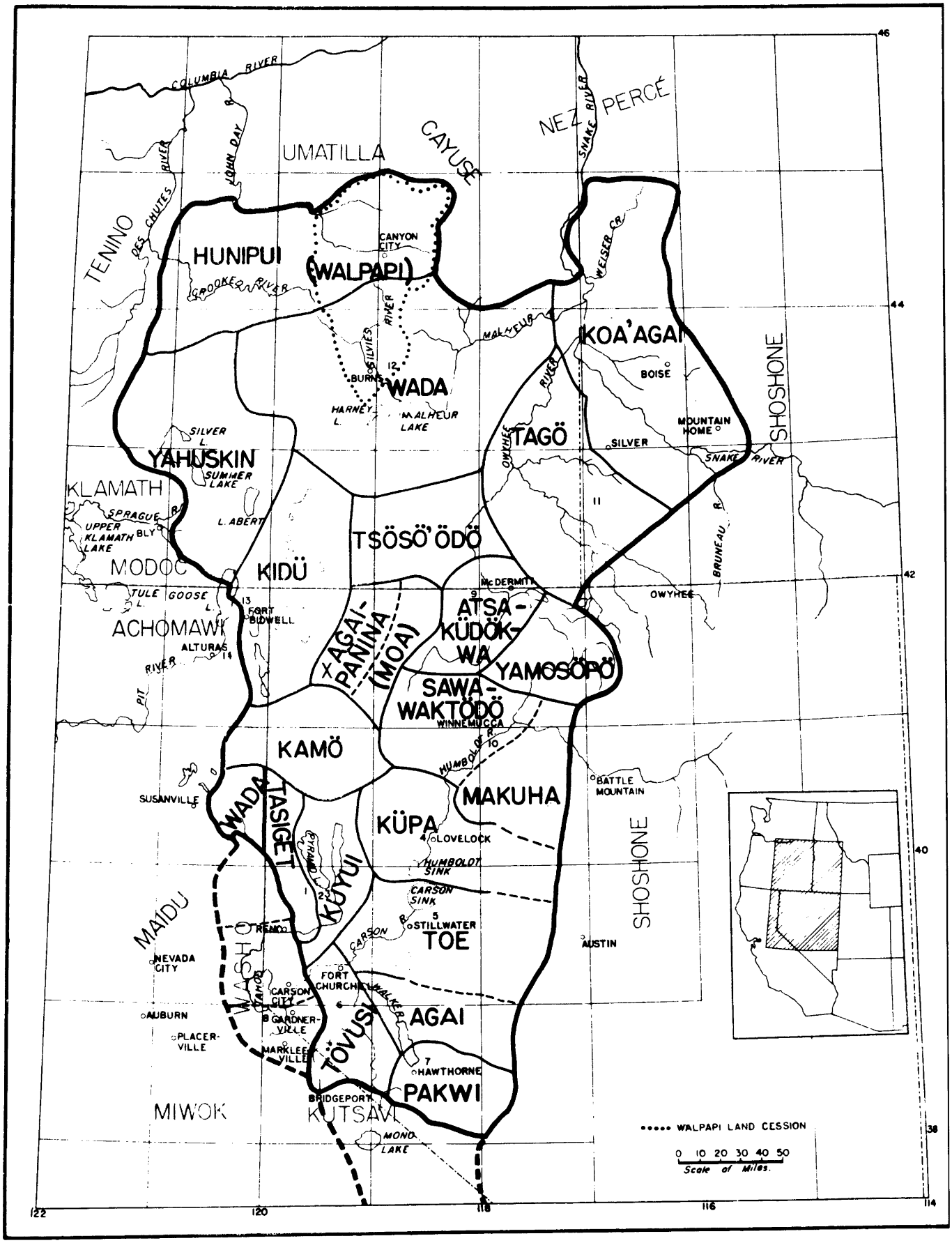
Two possible interpretations of the cultural activity may be postulated from this configuration. First, a single group may have manufactured generalized blanks and blades which they then traded with other tribes. However this type of group specialization of labor would probably require a longer habitation at the site than is indicated by the scanty representation of subsistence equipment. Some finished points, utilized blades, and a larger number of scrapers and choppers would be expected if hunting and gathering activities were carried on over the period necessary to manufacture a surplus for trade on the relatively large scale indicated by the sheer mass of waste covering the site. The small number of scrapers and choppers indicate some subsistence activity, perhaps the gathering and catching of small mammals or birds. The second and more likely type of utilization of the area is by task-specific bands from a number of different territories who may have come into the canyon periodically for a few days at a time to make blanks for their own use, carrying these away to be finished as the need arose.

Ethnohistorical accounts describe piles of rejects which could easily yield collections such as the one from High Rock Canyon which is within the Northern Paiute territory. Kelly (1932:141) reports:

> Chipped implements were largely obsidian. The stuff is scattered plentifully, and informants deny any particular source, saying that pieces were picked up 'just anywhere.' An enormous deposit occurs at the south end of Cowhead Lake. Quantities were evidently transported from here to camps on the north shore where piles of rejects may be seen, but these may antedate Paviotso occupancy.

O. C. Stewart (1939:126) places High Rock Canyon in the territory of the Agaipañina, a Northern Paiute group (Map 3), directly east of the groups described by Kelly (1932). The Northern Paiute in general are often mentioned regarding obsidian trade with neighboring California tribes—the Achomawi, Modoc, and Atsugewi. Blanks and finished arrowheads were major items of trade rather than the raw materials for their manufacture (Davis 1961:32).

It would be possible to do a chemical analysis of obsidian artifacts



Map 3. Northern Paiute Bands. (After Stewart 1939.)
X in Agaipañina group shows location of High Rock Canyon

found among these California tribes to determine the source of the obsidian and thus establish a definite link between the High Rock Canyon locality and known California groups or archaeological remains. From this information a time span during which the area was occupied as a workshop could be estimated and the hypothesis of intensive exploitation by small groups for trade with California tribes and other groups, perhaps to the east, could be substantiated. The archaeological evidence—low percentage of utilized tools and absence of finished points, blanks, or blades (either fragmental or whole) in the assemblage—supports the hypothesis that individual groups periodically exploited High Rock Canyon specifically for the manufacture of blanks and blades from obsidian cobbles. A larger, controlled sample of the total site area would yield more conclusive evidence on this question by verifying what would seem to be significant differences in the various tool categories.

TABLE 1

Detailed Breakdown of Tools and Waste from High Rock Canyon

Assemblage	Total Number	Percentage of Total Number
Shaped Tools		
Points	14	7.9
Roughouts and blanks	129	73.3
Scrapers	23	13.1
Choppers and picks	10	5.7
Total	176	100.0
Waste Products		
Cores	60	16.6
Utilized	18	5.0
Flakes	99	27.4
Utilized	25	6.9
Chips and chunks	149	41.3
Utilized	10	2.8
Total	361	100.00
TOTAL ASSEMBLAGE	537	
Tools		
Shaped	176	32.8
Utilized pieces	53	9.9
Total Tools	229	42.7
Waste		
Cores	60	11.2
Flakes	99	18.4
Chips and chunks	149	27.7
Total Waste	308	57.3
TOTAL NUMBER OF PIECES	537	100.0

TABLE 2

Comparison of Measurements of Four Types of Obsidian Cores from High Rock Canyon

Core Type	No.	Maximum Length in cms.	Minimum Length	Average Breadth	Length-breadth Ratio
Split-pebble	13	12.3	6.8	4.74	6:5
Protobiconical	18	14.6	5.4	4.25	6:4.5
Multidirectional	31	13.2	4.7	3.20	6:4.5
Formless	4	8.0	5.0	4.10	6:5
Blade Cores					
(1) Pyramidal	9	8.8	6.3	4.90	6:5.3
(2) Other	3	11.7	8.0	4.70	6:4.5

TABLE 3

Breakdown of Assemblage into Types of Raw Material

	No.	Obsidian	Chert	Basalt
Shaped Tools				
Projectile points: foliate	1	1		
hollow based	1	1		
broken frags.	12	9	3	
Scrapers, side: single	1	1		
double	1	1		
end	3	3		
end and side	7	7		
irregular	1	1		
core	9	9		
Choppers	9	9		
Pick	1	1		
Roughouts:				
On whole cores	18	15	3	
On frag. cores	13	13		
On whole flakes	12	12		
On frag. flakes	25	20	4	1
Blanks, bifacial, broken	61	57	4	
Utilized Pieces				
Cores	18*	18		
Flakes	25	15	3	7
Chips and chunks	10	8		2
Waste				
Cores, split cobble (single and double)	13	13		
Protobiconial	18	18		
Multidirectional (both faces)	31	30	1	
Flake-blade	12	12		
Formless	4	4		
Flakes: irregular	62	41	13	8
short quadrilateral	28	19	7	2
core trimming	3	3		
Flake blades and blades (long quadrilateral)	6	5		1

* Included in waste

BIBLIOGRAPHY

Bruff, J. Goldsborough
1949 Gold Rush: the Journals, Drawings, and other Papers of J. Goldsborough Bruff, Captain, Washington City and California Mining Association, April 2, 1849-July 20, 1851. Columbia University Press, New York.

Clark, J. D.
1963 The Prehistoric Cultures of Northeast Angola. Diamanz, Publicacoes Culturair, No. 62. Lisboa.

Davis, J. T.
1961 Trade Routes and Economic Exchange Among the Indians of California. Reports of the Univ. of Calif. Arch. Survey, No. 54. Berkeley.

Delano, Alonzo
1936 Across the Plains and Among the Diggings. Reprint of original 1854 edition. Wilson-Erickson, Inc., New York.

Kelly, I. T.
1932 Ethnography of the Surprise Valley Paiute. Univ. of Calif. Publs. in Archaeol. and Ethnol., Vol. 31:67-210. Berkeley.

Stewart, O. C.
1939 Northern Paiute Bands. Univ. of Calif. Anthropological Records, Vol. 2:125-149. Berkeley.

PLATE I

[Unless otherwise indicated all specimens are actual size]

Specimen numbers are those of the Lowie Museum of Anthropology
University of California, Berkeley

1. Split-pebble core made on a flat elliptical cobble of obsidian. Three flakes have been removed from one edge of the long axis of the cobble. The cortex of the cobble shows signs of battering along the margin from which the flakes were removed. Fresh and unabraded. (2-34155)

2. Fist-sized obsidian split-pebble core from which one large flake has been struck, representing initial reduction in the working of a pebble core. Fresh but with some nibbling of the edges. (2-34156)

3. Split-pebble core of obsidian, the upper surface of which shows scars resulting from the removal of three flakes from along one margin of the long axis of the core. The flake scars have deep negative bulbs of percussion and prominent concentric rings. Fresh and unabraded. (2-34154)

4. Basalt cobble with large, rough flakes removed from both surfaces and the greater part of the circumference. Shows much battering which indicates its having been used as a hammerstone. (2-34158)

5. Large, thick flake from the center of an obsidian core, probably removed by bipolar flaking resulting from the splitting of an obsidian cobble by striking it with a hammerstone while resting the core on a stone anvil. The upper face shows three or more scars of flakes all struck from the left hand side, the lower face formed by one large flake scar removed from the right. (2-34138)

6. Quadrilateral flake of obsidian with a single faceted, large, inclined striking platform, prominent bulb of percussion, and noticeable bulbar scar. The specimen was probably struck by anvil or hammerstone technique. The ventral surface is a single primary flake scar. The dorsal surface shows the remains of three long flake scars all running the length of the flake. Fresh but with slightly abraded edges. (2-34162)

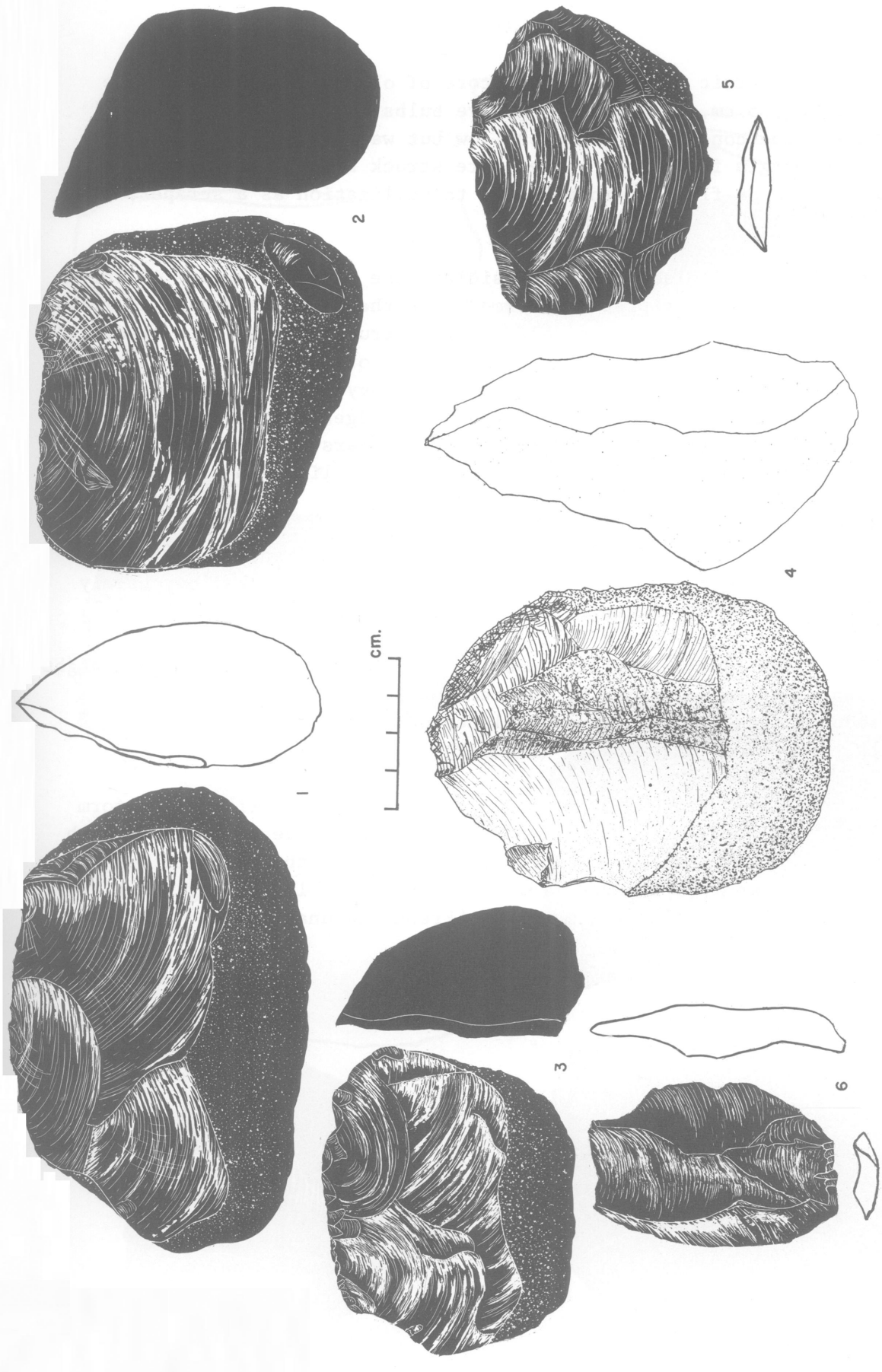


PLATE I

PLATE II

7. Asymmetric pyramidal blade core of obsidian with thin flake scars up to 5.5 cm. long. The negative bulbs of percussion are small but clear, the concentric rings shallow but wavy. The ventral surface along the margin from which blades were struck shows signs of either being trimmed or flaked, probably due to utilization as a scraper. Fresh. (2-34150)

8. Pyramidal blade core of obsidian, the ventral surface of which is a single flake scar probably formed when the core was separated from the pebble. From this surface blades were struck leaving thin blade scars up to 4.5 cm. long. The negative bulbs of percussion are small but clear, the concentric rings shallow and wavy. Blades were most likely removed by bone punch technique. The edges formed by the intersection of the ventral surface and the blade scars are serrated and show crushing and abrasion which may indicate utilization as a core scraper. Specimen fresh. (2-34149)

9. Diminutive blade of gray, basalt-like obsidian. Striking platform end is snapped off. Main flake surface shows shallow, barely perceptible, concentric rings. Fresh but abraded edges. (2-34169)

10. Blade core on obsidian cobble. A single, approximately straight striking platform is formed by the remains of two flake scars. From one side of this platform several blades up to 7 cm. long have been struck. Fresh and unabraded. (2-34152)

11. Obsidian blade 9.5 cm. long with negligible striking platform and small but noticeable bulb of percussion indicative of typical punch technique. Small flakes removed by utilization at the butt end suggest that the specimen was removed from a double-ended blade core. Nibbling but no retouch along lateral margins. Fresh and unabraded. (2-34165)

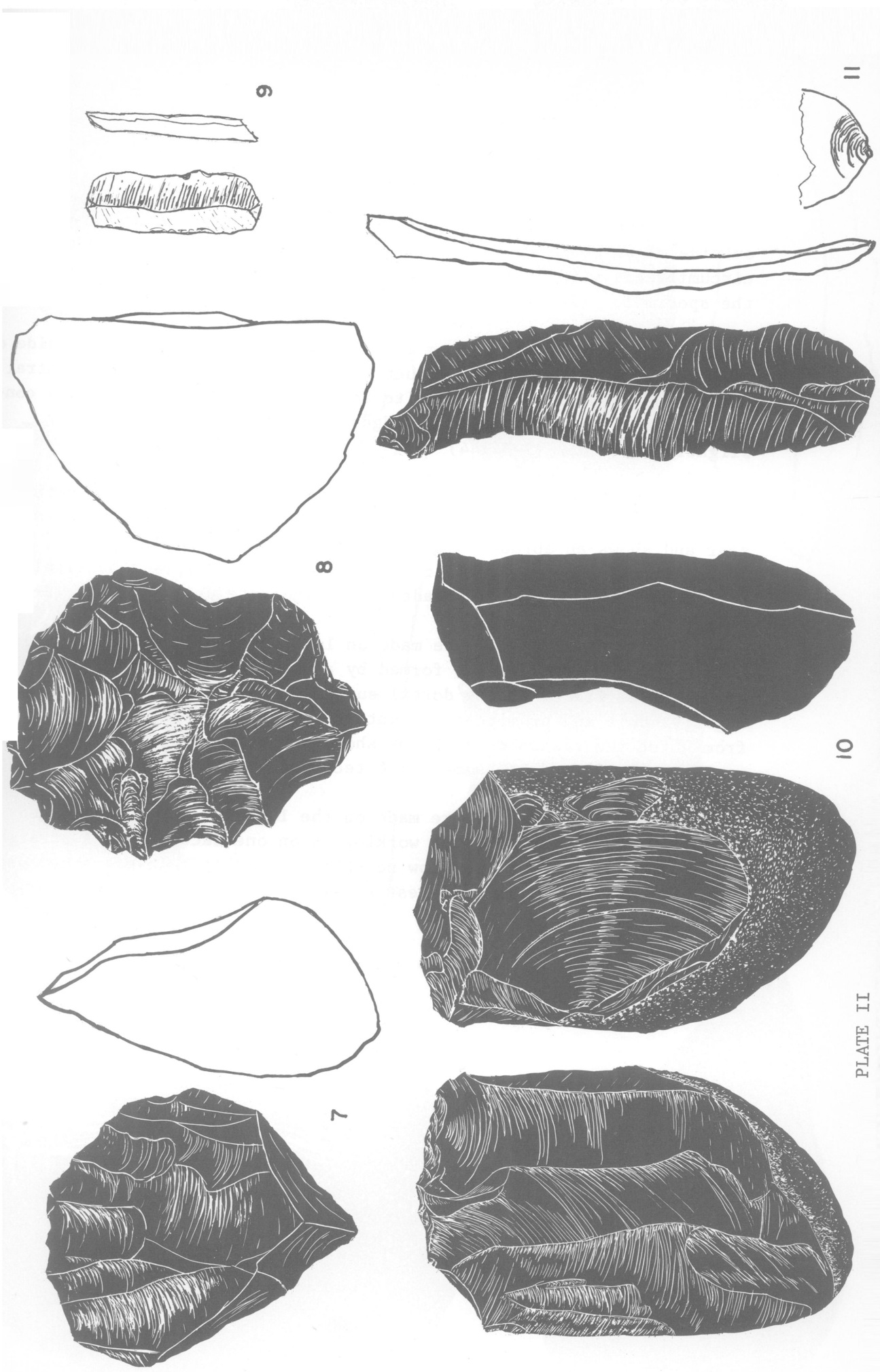


PLATE II

PLATE III

12. Short end or round scraper on a small flake struck from the outside of an obsidian cobble. There is steep retouch all around the circumference with fine pressure retouch on the upper rounded edge of the specimen. (2-34137)

13. Side scraper made on a thick flake struck from the outside of an obsidian cobble. Blunt retouch has been directed from the ventral face down the whole of one edge to form an irregular but slightly convex scraper. Somewhat battered edges indicate utilization. Very slightly abraded. (2-34144)

14. Denticulate end scraper formed on a flake struck from the side of an obsidian pebble. The ventral surface is formed by a primary flake scar and shows an abraded bulb of percussion. The dorsal surface shows steep retouch around the upper end of the flake to form a denticulated scraping edge. Fresh but abraded edges indicate utilization. (2-34142)

15. Protobiconical core made on long obsidian cobble. The platform on the ventral face is formed by a single flake scar from which were struck three flakes on the dorsal surface, the last showing a very deep negative bulb and prominent concentric rings in the flake scar. The edge from which the flakes were struck shows slight battering. The specimen was probably formed by hammerstone technique. Fresh and unabraded. (2-34153)

16. Protobiconical core made on the long axis of a fist-sized obsidian cobble. The initial working is on one face only. A straight striking platform shows shallow notchings. Small flake scars removed from the edge of one face suggest possible utilzation as a chopper. Fresh. (2-34157)

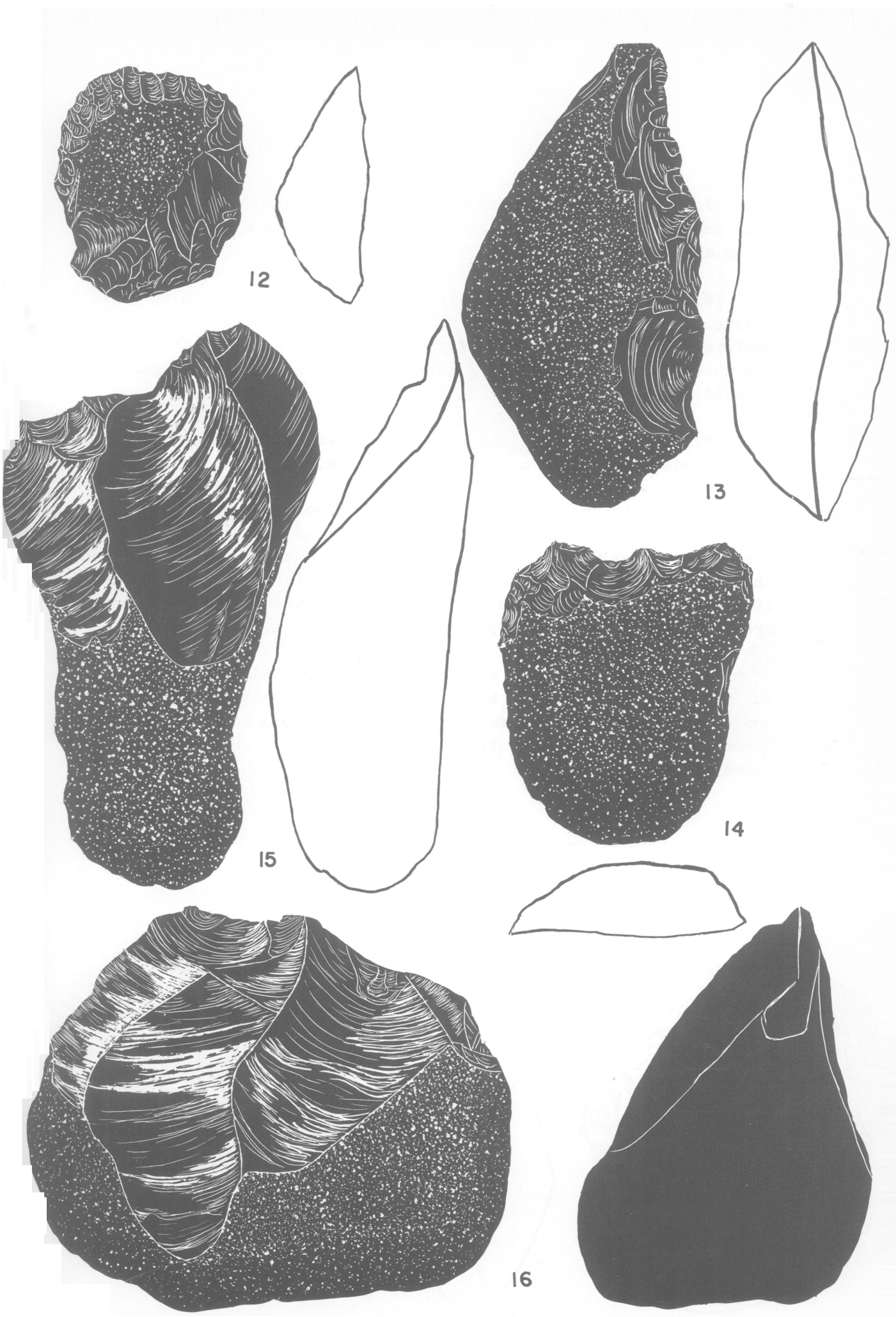


PLATE IV

17. Protobiconical core made from an obsidian cobble and worked from one end by alternate flaking. Utilization as a small chopper. Fresh and unabraded. (2-34135)

18. Oval, multidirectional, biconical core made from an obsidian cobble and worked by alternate flaking over both faces around the circumference. From one face a single large flake has been removed, giving the specimen the appearance of an asymmetric disc core. Slightly abraded edges. (2-34160)

19. Core trimming flake of obsidian removed from a core during the secondary reduction of core into a blank. Fresh and unabraded. (2-34171)

20a. Multidirectional core made from a small, flat obsidian pebble. A series of alternate flakes with deep negative bulbs and unpronounced concentric rings have been removed from both faces around the margin of the core. The small size of the pebble suggests that it represents the first step in the reduction of a pebble core directly into a blank. Fresh but abraded edges. (2-34151)

20b. Circular scraper on a medium sized outside basalt flake. The ventral side is formed by the single original flake face with an unprepared striking platform. There is relatively steep retouch all around the circumference. The retouch is even and the working edge symmetrical. Utilized.

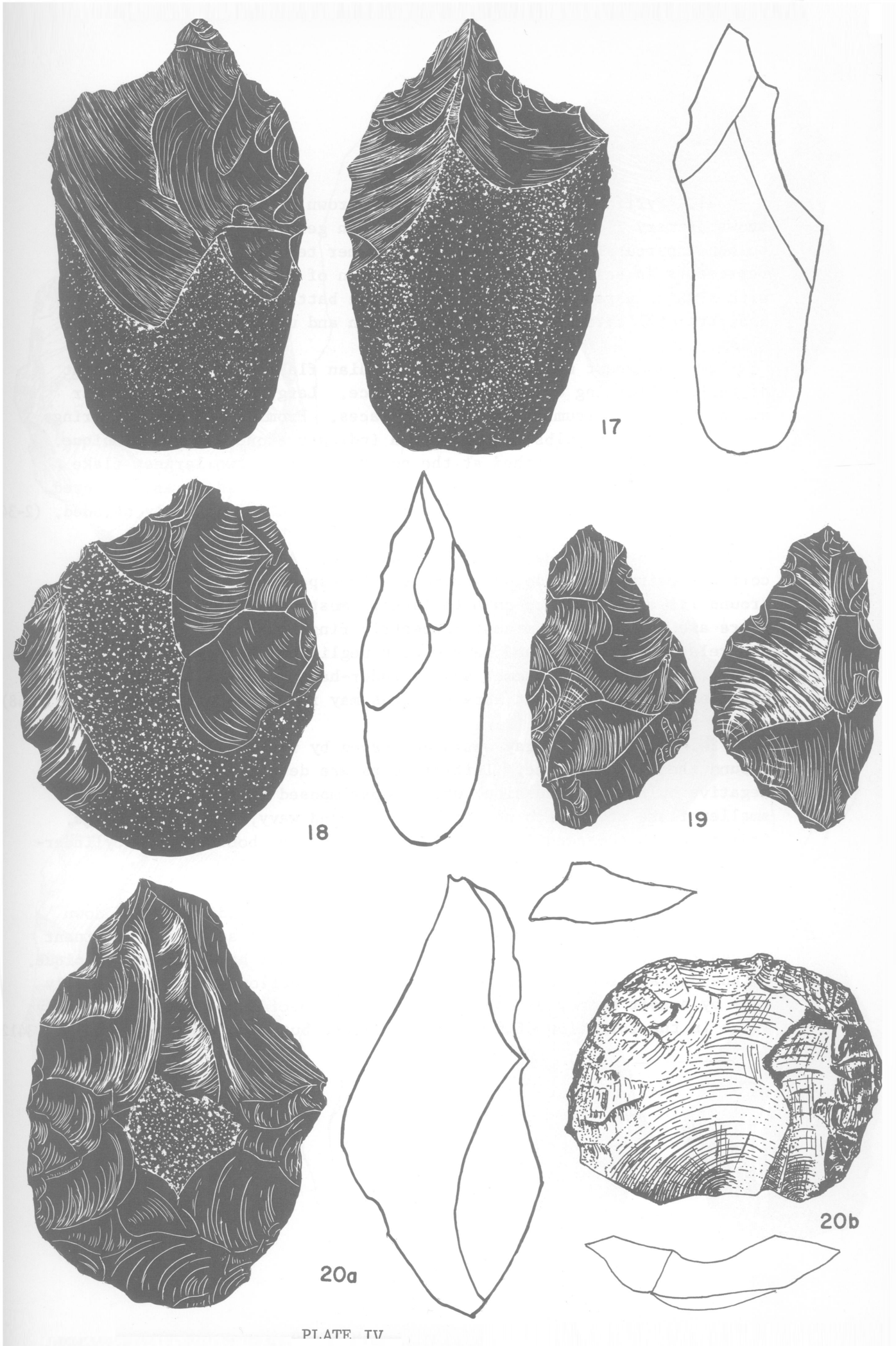


PLATE IV

PLATE V

21. Pyriform roughout of greenish-brown chert. The specimen shows primary flaking over both faces with generally deep negative bulbs of percussion typical of stone hammer technique. The specimen represents an early stage in the reduction of a core to a roughout with a thick parallelogram section. Some battering of the edges may indicate utilization as a chopper. Fresh and unabraded. (2-34159)

22. Roughout made on a large obsidian flake with a small amount of cortex remaining on the dorsal surface. Large flake scars appear all around the circumference on both faces. Prominent concentric rings and deep negative bulbs of percussion indicate stone hammer technique. The upper margin is notched at the point where the two largest flake scars on the dorsal and ventral surfaces meet. The edges are battered, probably in attempts to reduce thickness. Fresh but slightly abraded. (2-34172)

23. Roughout made on an obsidian core. A small amount of the cortex remains on the dorsal surface. The specimen is worked all around its circumference on both faces. Most of the earliest flake scars are deep with prominent concentric rings while the later ones are relatively shallow and narrow with negligible bulbs of percussion suggesting that stone hammer and cylinder-hammer techniques were used consecutively. Fresh but abraded edges may indicate utilization. (2-34148)

24. Roughout of gray obsidian shaped by retouch on both faces around the circumference. Initial scars are deep with prominent negative bulbs of percussion, while superimposed on these scars are smaller flake scars with negligible bulbs and wavy, concentric rings, indicating the consecutive use of hammerstone and bone or wood cylinder-hammer. Fresh but slightly abraded edges. (2-34131)

25. Pointed, bifacially worked roughout of obsidian worked down from pebble core or thick flake, with deep negative scars and prominent concentric rings on the ventral side indicative of hammerstone technique. On the dorsal side the scars are smaller and shallower and are probably made by a soft hammer of bone or wood. The specimen represents an early stage in the formation of a roughout. Fresh but with abraded edges. (2-34125)

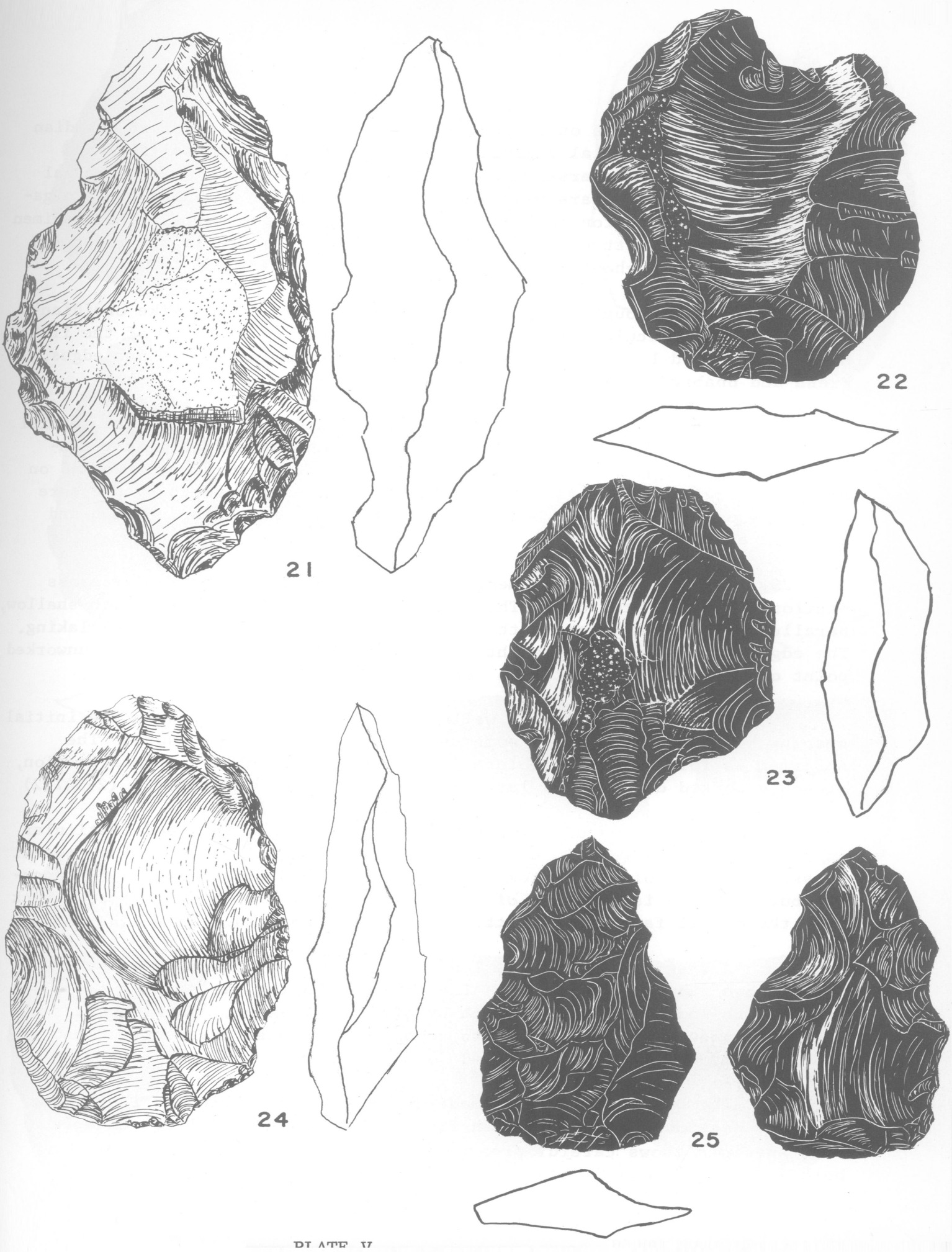


PLATE V

PLATE VI

26. Roughout made on a flake struck from the outside of an obsidian cobble. There is partial removal of the cortex on the dorsal face and primary flaking by hammerstone and soft hammer techniques on the ventral face. Shallow flake scars with wavy concentric rings and noticeable negative bulbs of percussion occur over the larger, cruder scars. The specimen is trimmed at the butt end and represents an early stage in the reduction of a flake to a roughout. Fresh and unabraded. (2-34139)

27. Foliate roughout made on a flake of gray, basalt-like obsidian with a thin, lenticular cross section. The striking platform of the flake has been removed by pressure-flaked secondary trimming along both edges. Fresh and unabraded. (2-34123)

28. Pyriform shaped roughout made on an obsidian flake. The initial shaping shows the deep, negative bulbs of percussion and prominent concentric rings of hammerstone technique. The ventral surface is worked on only one margin. The dorsal surface shows secondary retouch by pressure along the upper margins on both sides to form a pointed end. Fresh and somewhat abraded. (2-34132)

29. Obsidian point fragment showing a very thin, lenticular cross section and a foliate form. The specimen is bifacially worked with shallow, parallel flake scars along both edges typical of refined pressure-flaking. The edges converge to a straight end which may represent an as yet unworked point or possibly the butt end. Fresh and unabraded. (2-34133)

30. The pointed end of a well-made obsidian blank showing the initial shaping by a soft hammer and some secondary retouch by pressure. The specimen is foliate or lanceolate in form and lenticular in cross section, probably worked down from a large flake. Fresh and unabraded. (2-34122)

31. The butt end of a well-made obsidian blank, thin and lenticular in cross section, probably worked down from a large flake, showing careful pressure flaking of the bottom and sides of both faces to form a rectangular butt. There is evidence of a possible thinning or fluting scar struck from the dorsal face of the butt. Fresh and unabraded. (2-34124)

32. A fragment of a large lanceolate blank of obsidian, probably worked down from a large flake. The primary shaping was done by soft hammer with some secondary retouch by pressure flaking. There appears to have been unsuccessful attempts to reshape the broken fragment. Fresh and slightly unabraded. (2-34134)

33. The butt end of a well-made obsidian blank, thin and lenticular in cross section, probably broken from a lanceolate or foliate example. This specimen shows careful pressure-flaking of the bottom and sides of both faces to form a U-shaped butt. (2-34130)

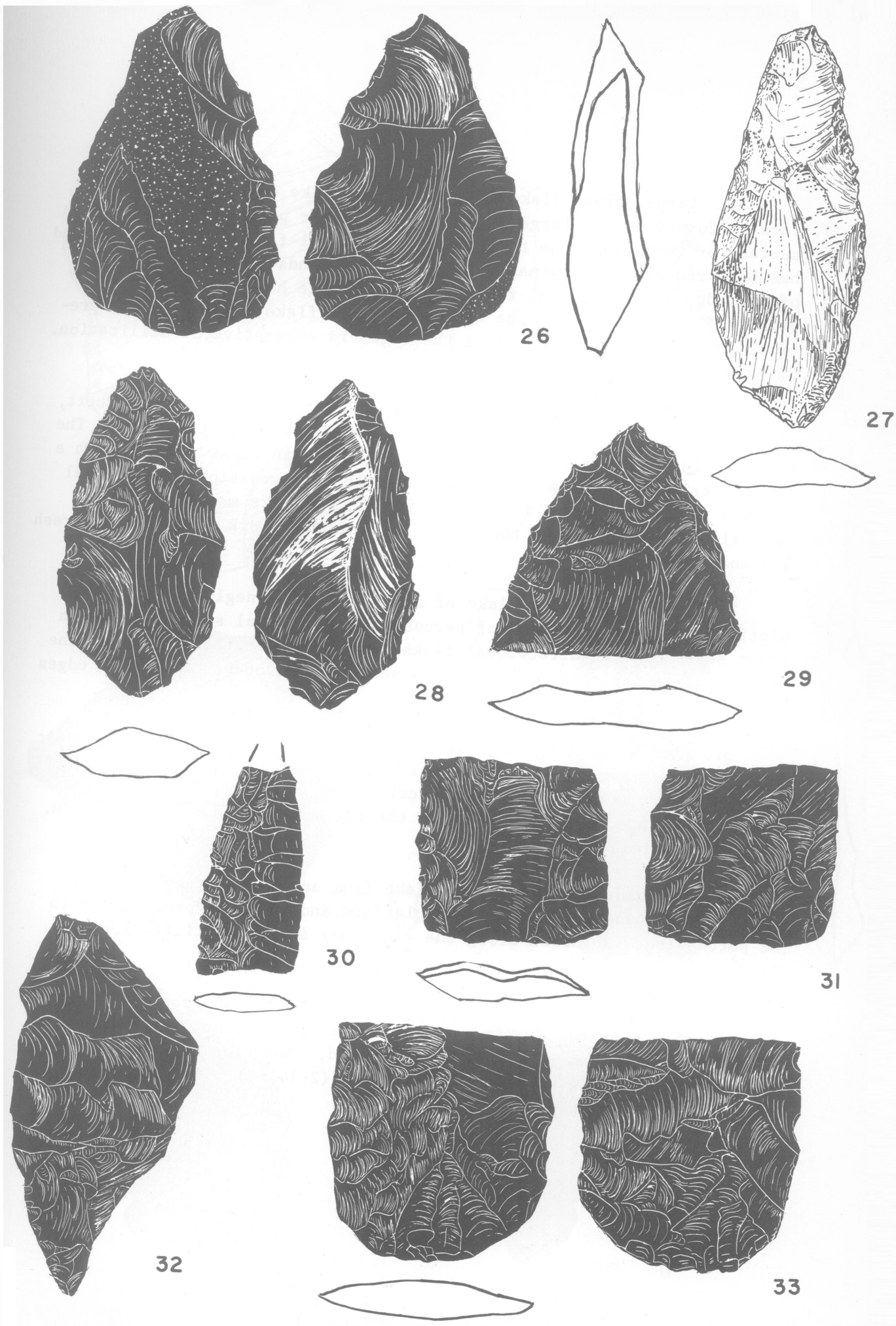


PLATE VII

34. Large, broad flake of gray, basalt-like obsidian. The under face is formed by one large scar, possibly either part of the main flake surface or resulting from the removal by thermal fracture. The butt end has been reduced by marginal retouch which extends also down the whole of one edge of the ventral face. The upper face has multidirectional primary flaking and gives the appearance of a flake removed from a prepared core. Some nibbling along the edges is suggestive of utilization. Slightly abraded. (2-34143)

35. Roughly triangular side-struck flake of greenish-brown chert, the size and shape being suggestive of controlled anvil technique. The ventral side is formed by the single original main flake surface with a simple striking platform and prominent bulb of percussion. The dorsal surface is formed by the remains of four flake scars made before the removal of the flake from the core. No secondary work is evident. Fresh and unabraded. (2-34170)

36. A broad, inside flake of obsidian with a negligible striking platform and prominent bulb of percussion, the dorsal surface of which shows scars of multidirectional flakes struck before the removal of the specimen from the core. There is no secondary retouch. Fresh but edges abraded. (2-34168)

37. Irregular long flake of obsidian. The bulb and striking platform have been removed by subsequent retrimming. The scars on the upper face have been struck from two directions and are flat with prominent concentric rings. Some nibbling of the edges may indicate utilization. Fresh. (2-34141)

38. A quadrilateral inside flake from an obsidian pebble core showing a pseudo-faceted striking platform and somewhat prominent bulb of percussion. Abrasion along the edges may indicate utilization. Fresh. (2-34163)

39. A small inside flake struck from an obsidian pebble core with a negligible striking platform, flat bulb of percussion, and a small amount of cortex remaining at the upper end. Abrasion along lateral margins may indicate utilization. Fresh. (2-34164)

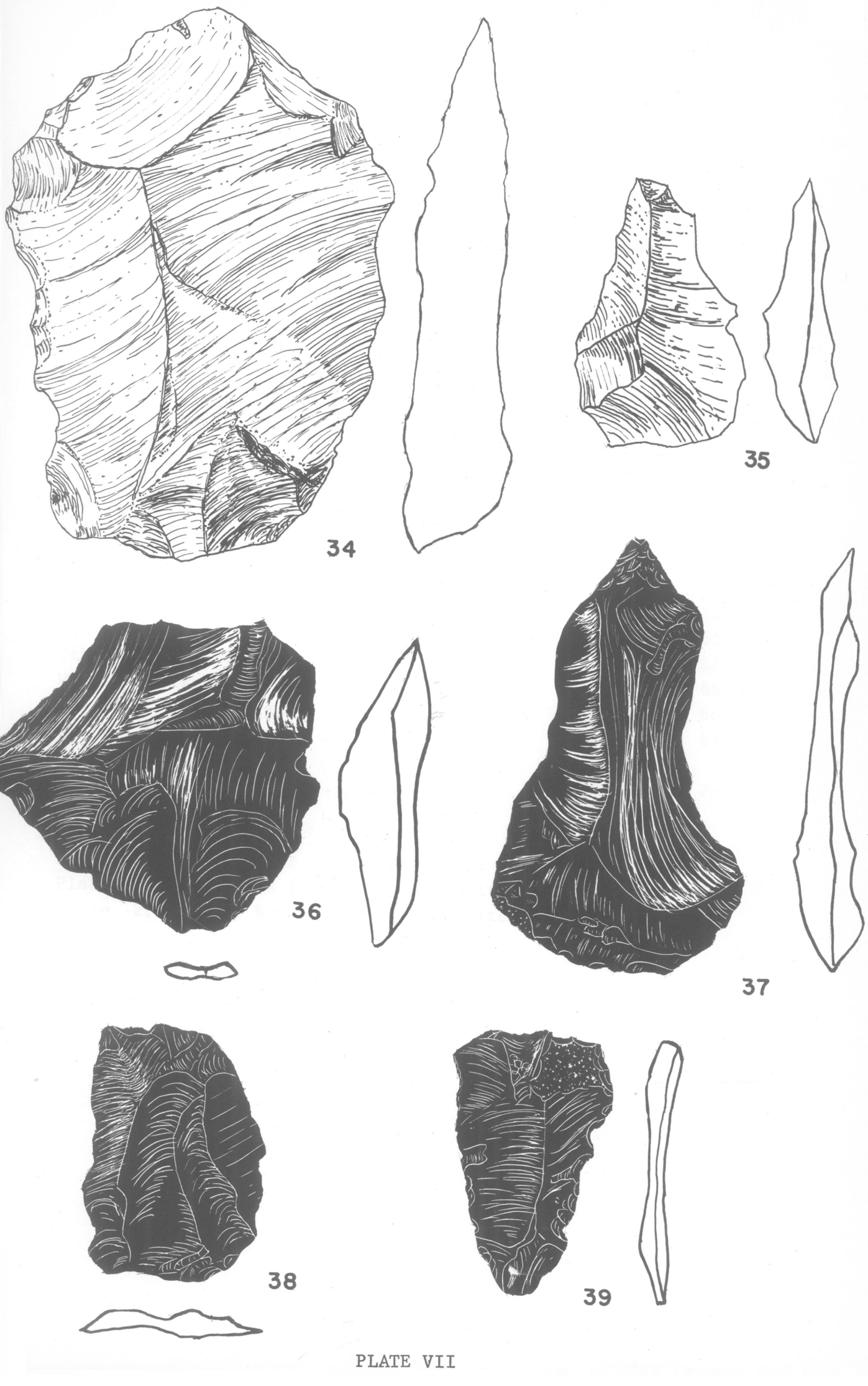


PLATE VII