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## AN APPRAISAL OF THE ARCHAEOLOGICAL RESOURCES OF YOSEMITE NATIONAL PARK

By James A. Bennyhoff

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The University of California Archaeological Survey
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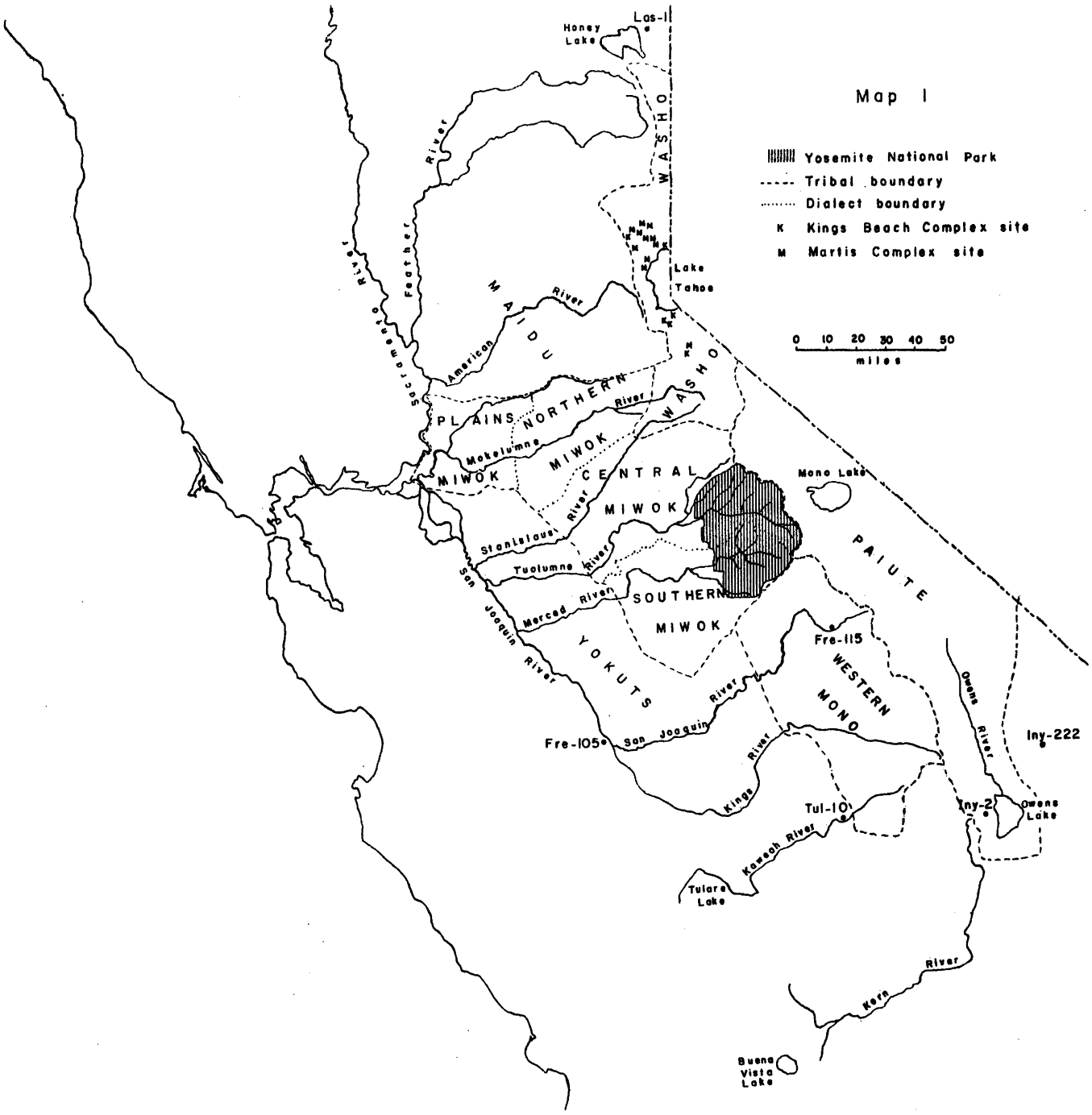
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Yosemite National Park
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miles
Las-1
Honey Lake
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American River
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Mokelumne River
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Mono Lake
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Iny-222
Fre-105
San Joaquin River
Kings River
Tul-101
Iny-2
Owens Lake
Kaweah River
Tulare Lake
Kern River
Buena Vista Lake

# An Appraisal of the Archaeological Resources of Yosemite National Park

by

James A. Bennyhoff
Archaeologist,
University of California Archaeological Survey

Submitted to the Director of the National Park Service in satisfaction of Article Id of Memorandum of Agreement No. 14-10-0100-251 between the National Park Service and the University of California under terms of which the data reported herein were collected in July, 1952 and August, 1954.

# PREFACE

By Robert F. Heizer[1]

The report by James Bennyhoff which follows contains the information recovered and his conclusions concerning the cultural significance of the data derived from three site reconnaissance and excavation sessions in Yosemite National Park.

The program of survey and test excavation was carried out under a contract between the University of California and the National Park Service. The Archaeological Survey for some time prior to the proposal by the Park Service, had been studying the interesting problem of the nature of and evidences for Indian occupation of the Sierra Nevada area, and the Yosemite Park survey offered an opportunity to pursue this problem.

The initial field survey was carried out from July 1 - 30, 1952 by Mr. Bennyhoff who was aided by R. H. Brooks and L. Fisher, students at the University of California.

The second session was financed entirely by the Archaeological Survey, and entailed the test excavation of three sites (Mrp-97, -105,-106) between September 2 - 14, 1953 by Mr. Bennyhoff whose crew was composed of his wife, P. J. Pelto and B. Barron.

The third session which involved both reconnaissance and test excavation (Mrp-9), was carried out between June 17 and July 6, 1954 with Mr. Gordon Grosscup in charge. His assistants were E. R. Prince and R. T. Anderson, students at the University.

The 1952 work was reported by Bennyhoff in a manuscript ("An Archaeological Survey of Selected Areas of Yosemite National Park") submitted to the NPS (unpublished). The major results were published in brief summaries (Bennyhoff, 1953, Hartesveldt, 1953). The 1953 test excavations were reported to the NPS by Bennyhoff in a manuscript (unpublished) "Preliminary Report on Archaeological Excavations in Yosemite National Park, September 1953." The 1954 survey was reported by Grosscup to the NPS in a manuscript (unpublished) "An Archaeological Survey of Yosemite National Park, 1954."

The present report illustrates very well that results can be obtained from surface survey when it is combined with limited site testing, previously collected materials, and ethnographic-historical records.

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[1] Director, University of California Archaeological Survey.

University of California Archaeological Survey

Department of Anthropology

Berkeley 4, California

December 29, 1954

Refer to L 7423-H

Mr. Herbert Maier
Assistant Regional Director
National Park Service
180 New Montgomery Street
San Francisco, California

Dear Mr. Maier:

Please find enclosed, in satisfaction of Article I, Item (d), three copies of the report of Mr. Gordon Grosscup, who conducted archaeological surveys in the summer of 1954 in Yosemite National Park, under terms of the Memorandum of Agreement No. 14-10-0100-251 between the National Park Service and the University of California.

As stipulated in Article I, Item (f) a duplicate set of site survey sheets is submitted. With reference to the final sentence in Article I, Item (d) please be advised that the final detailed report is still in the process of preparation, the date of its conclusion being at the moment indefinite.

Very sincerely yours,

Robert F. Heizer
Director

cc. J. H. Corley

United States
Department of the Interior
National Park Service
Region Four
180 New Montgomery Street
San Francisco 5, California

January 18, 1955

Dr. Robert Gordon Sproul
President, University of California
Berkeley 4, California

Dear Dr. Sproul:

It gives us great pleasure to acknowledge receipt of, and to accept, Mr. Gordon L. Grosscup's report, "The Archeological Survey of Yosemite National Park: 1954," which was submitted by Dr. Robert F. Heizer, Director, California Archaeological Survey, in partial fulfillment of contract No. 14-10-0100-251 between the University of California and the National Park Service for the continuation of archeological surveys in Yosemite National Park.

This report marks the completion of a three-year cooperative program by the California Archaeological Survey and the National Park Service for the survey of archeological sites in Yosemite. The first season's work, in 1952, was conducted under the leadership of Mr. James A. Bennyhoff of the Survey and was partially financed by a contract between the University of California and the National Park Service. Additional field work performed under Mr. Bennyhoff's direction during the late summer of 1953 was initiated and supported by the University. The work of the 1954 season was conducted by a Survey party under Mr. Gordon L. Grosscup, again as the result of a National Park Service contract.

This cooperative program has significantly expanded knowledge of the occupation of the Yosemite region by aboriginal peoples. In addition to its general scientific value, this knowledge will be useful to this Service in planning the future development, protection, and interpretation of Yosemite National Park.

We wish to take this opportunity to express to the University of California and to the California Archaeological Survey our appreciation for their splendid cooperation and assistance in this program.

Sincerely yours,

Lawrence C. Merriam
Regional Director

Copy to: Dr. Robert F. Heizer
Mr. James H. Corley

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# ILLUSTRATIONS AND TABLES

# INTRODUCTION

This report summarizes a survey of archaeological sites found in selected areas of Yosemite National Park and is the result of a joint project of the University of California Archaeological Survey and the National Park Service. The purpose of the survey was to map the location and record all evidence found of aboriginal occupation in the Park area, such as village and camp sites, rock shelters, pictographs, and their associated artifacts. It was felt that the greatest attention should be given to the most accessible regions which are in danger of alteration by the ever expanding tourist activity. As this was the first extensive archaeological survey in California to cover such a wide range in altitude, from 1600 to 11,000 feet above sea level, it was also desired to obtain information on the settlement patterns in the varying life zones. Some out-of-the-way areas were included in the hopes that sites could be found which had not been previously surface collected. Special attention was given to possible trails and trade routes. Limited test excavations were made in four sites in the hope of revealing a stratigraphic sequence of cultures and to determine the depth and nature of the deposit of certain sites in this region.

There has long been interest in the evidence of former Indian occupation to be found within the Park boundaries. Travelers and students of diverse natural sciences have frequently commented on the mortar rocks and concentrations of obsidian to be found widely distributed in the Park. Occasional reports have been published on the more noteworthy remains, among which are those of Beatty, 1933b; Caywood; Douglass; Garrison; Harnden; Johnston; McLellan, 1952; Presnall 1930a, b; Smith; and Tripp. Specimens have been collected and catalogued in the Yosemite Museum, and provide an important sample of aboriginal productions from the region. However, it remained for Mr. R. McIntyre (Assistant Park Naturalist, 1948-1950) to take the first steps in the systematic recording of archaeological sites. His map in the Yosemite Museum was of great aid as a guide to profitable areas to survey and to the location of specific sites.

The Yosemite Valley has been the subject of a particularly rich group of historical accounts, and ethnographic detail is unusually abundant for such a high region of the Sierras. It is the only known Sierran valley with an extensive list of historic villages which can be located with some accuracy.

To Dr. A. Neasham and Mr. L. Caywood of the National Park Service goes the credit for proposing that the survey be carried out; both have made useful comments on the problems involved in the survey and in selecting the areas to be dealt with. The Yosemite Park Staff cooperated to the fullest extent, placing all needed facilities at our disposal, and supplying friendly guidance and information at all times. I wish to express my gratitude to Dr. C. P. Russell, former Yosemite National Park Superintendent, for his interest and stimulating suggestions on historical problems. Mr. J. C. Preston, the present Superintendent, gave wholehearted support to the project. Mr. D. E. McHenry gave valuable advice on possible sites and problems. Mr. H. L. Bill made all necessary preparations to facilitate our

work and arranged for camping facilities. To Mr. N. B. Herkenham I owe special thanks for the time he gave to getting the survey under way and for orientation in the Museum and Library. Mr. R. McIntyre provided information on the location of sites and joined the survey crew on two trips. Mr. O. L. Wallis provided numerous site tips and participated in the survey of Little Yosemite Valley. For their helpful hints on the location of sites I am indebted to Mr. K. Ashley, Mr. W. W. Bryant, Mr. H. During Mr. M. B. Evans, Mr. D. H. Hubbard, Mr. O. S. Johnson, Dr. C. Sharsmith, and Mr. A. Waldo. To the many individuals who gave their aid, members of the Administrative, Museum, and Library Staffs and the Field School, I extend my sincere thanks. The extensive bibliography and many pertinent suggestions provided by Dr. R. F. Heizer of the University of California Anthropology Department were invaluable in the preparation of this report. To my associates in this survey and excavation project I express my deepest appreciation for the long hours and weary miles endured without complaint.

## ETHNOGRAPHIC BACKGROUND

In aboriginal times the territory covered by this survey was occupied by the Penutian-speaking Central and Southern Miwok (Merriam, 1907, pp. 345-347; the Tuolumne and Mariposa Miwok dialects of Barrett, 1908, map 3). The boundary between these groups followed the crest of the watersheds of the Tuolumne and Merced Rivers, and thus is essentially the modern boundary between Tuolumne and Mariposa counties. Various Miwok groups surrounded the Yosemite region on the north and west, the Shoshonean-speaking Northfork Mono were neighbors to the south, while to the east, beyond the Sierran crest, lived the Shoshonean-speaking Paiute.[1]

Little information is recorded on the specific ethnic group or groups which occupied the area included in Yosemite National Park. The only tribelet firmly established in the ethnographic literature is the Awanichi, the inhabitants of Yosemite Valley and the Merced River down to the South Fork (Barrett, 1908, p. 343; Merriam, 1917, p. 202). This group is usually referred to as the Yosemite Indians in the historical accounts (Cole).

Two other groups, the Nutchu and Pohonichi, are referred to briefly. A Nutchu village is first mentioned in 1851 near the mouth of Bishop Creek on the South Fork of the Merced (Marvin). Powers (1873 p. 325) also placed them here on the basis of fieldwork done in 1871-72. The group signed a treaty with the Indian Commissioners in 1851, relinquishing their tribal lands (Comm. Ind. Aff., 1853, p. 74). In 1857 they were subject to the Fresno Reservation, but were living on the headwaters of the Chowchilla River (Lewis). Kroeber (1925, Pl. 37, No. 105) places the village of Nochu near Mariposa. The northern boundary of this group was probably the left bank of the South Fork, so it is doubtful if any of their villages are included within Park boundaries.

According to Bunnell (1911 , p. 203), the Pohonichi occupied the region of Pohono Meadows in summer, and claimed land as far south as the right bank of the South Fork of the Merced. Bunnell (Ibid., p. 54) first refers to a small band of this group camped on the "divide of the Merced" which has sometimes been interpreted as the Middle Fork; however, Bunnell (Ibid., p. 203) later refers specifically to the location of this band on the South Fork. The Pohonichi signed the same treaty as the Nutchu and in 1857 were living on the Fresno Reservation (Lewis). Powers (1873, p. 325) placed them on the north bank of the Fresno River. As this river represents the boundary line between the Southern Miwok and Yokuts tribes this placement probably reflects the fact that the generic term for Southern Miwok in the Foothill Yokuts dialects was Pohonichi (Barrett, 1908, p. 342). Powers therefore is not referring to the specific group with which Bunnell had frequent direct contact. There is some confusion because "Pohono" meant a peculiar kind of puffing wind to both the Southern Miwok and the adjacent Chowchilla Yokuts (Bunnell, 1911, p. 213). Barrett could find no informants who called themselves Pohonichi, so this term may be the name applied to the group by the Nutchu or Chowchilla. The frequent references to actual informants by Bunnell and the appearance of the group in the treaties leaves no doubt but that an actual group named Pohonichi did exist, living between the Awanichi and the Nutchu.

Very little is known of the Central Miwok who occupied the higher altitudes. Their usual designation is simply "Tuolumne Indians" because they lived on this river. No mountain group can be identified in the treaty lists. In 1857 there were over 100 "Wallalshimmes" or Tuolumne Indians still living (Lewis). Powers (1873, p. 325) obtained some information on the "Wallies" in 1871-72. He wrote of them as an extensive tribe occupying the Stanislaus and Tuolumne Rivers, and statements concerning the group indicate a Valley location. The term was expanded by the whites to include all Indians on the Tuolumne. The only village known is Hetchhetchi, placed in the valley which now bears this name (Kroeber, 1925, Pl. 37, No. 85).

The general culture of the Southern Miwok has been outlined in some detail by Clark (1904), Kroeber (1921) and Hutchings (1886), while Barrett and Gifford provide an extensive treatment of the material culture of all Miwok. Of special pertinence is the account by Bunnell (1880, especially pages 79, 81) who describes certain aspects of Awanichi culture as it was functioning at the time of first white contact. Gordon-Cumming (pp. 133-136) provides an interesting account of Indian culture undergoing westernization in the 1880's.

Occupation of most of this area of intermediate and microthermal climate had to be seasonal because of the heavy snowfall during the winter months. Certain favorable areas up to 4000 feet elevation were occupied the year round though the winter population was considerably reduced. Each group had well defined territories for their exclusive use in hunting and gathering, but the higher elevations represented communal areas open to all groups, including Paiute and Washo Indians. Life was rather migratory, the families moving from place to place as

seasonal food became available. Hunting and gathering forays into the higher altitudes were frequent from spring to autumn; women accompanied the men on any large trip. Surpluses of food were dried and stored whenever possible. Bulbs, clover and other greens were important foods during the spring, after the monotony of dried foods eaten during the winter. Hunting and fishing were daily pursuits, while roots, berries, seeds, and varied insect foods were gathered during the summer. In the late summer when the rivers were low, quantities of trout were taken by means of fish poison and weirs at elevations below the high waterfalls. As fall approached an increasing number of crops had to be harvested--fruits, berries, seeds, and nuts, particularly the acorn and pinenuts. During the winter, hunting was the major activity to add some variety to the dried foods prepared the season before.

According to Clark (p. 25) the winter dwelling was of conical form with a pole framework covered by cedar or pine bark, while impermanent brush shelters were used in summer. None of the numerous accounts of these dwellings refers to the semi-subterranean house, but groups which wintered at lower elevations may have excavated the house interior to a depth of several feet. Excavated sweathouses were a common feature of most villages, and Kneeland (p. 52) provides a detailed description of the Southern Miwok form.

The bedrock mortar and cobble pestle were the usual grinding implements for the preparation of acorns and seeds. Some use was made of the metate and pestle-mano by the Central Miwok, but this practice was apparently quite recent (Barrett and Gifford, pp. 209-210).

The dead were cremated and the ashes buried, but it is not known whether this occurred within the village, at cemeteries, or at isolated spots. The last Indian cremation in the Yosemite Valley is described by Beatty, 1933a. The ashes of one chief were carried from Mono Lake to Hite Cove for burial (Russell, 1947, p. 48).

Ceremonial life was minimal, as most of the population was scattered in small family groups engaged in collecting a winter food supply. A festival was held near the end of the harvest season, when the scattered bands began to congregate to move to the winter residence. Merriam (1917, p. 205) refers to two historic ceremonial houses in Yosemite Valley. A large communal hunt was held preparatory to the feast and simple dances. Life was too close to the subsistence level to allow the cultural elaboration found among the groups inhabiting the Central Valley.

## HISTORICAL BACKGROUND

The Yosemite Valley is the only area of the Park for which historic and ethnographic accounts furnish some detail about the Indian inhabitants. Most of the accounts represent personal reminiscences with brief references to the aborigines. An able summary of the Mariposa Indian War

and the Indian treaties for the area is given by Russell (1951). A brief resume of the historic period is given below with emphasis on subjects pertinent to the late occupation of several areas in or near Yosemite Park, and a discussion of their contents follows.

Late 1700's or early 1800's: According to Chief Tenaya, disease swept through Yosemite Valley, and the Indian survivors fled. Some settled with the Mono Lake Paiute, including Tenaya's father who took a Paiute wife. The valley remained uninhabited for many years until Tenaya, upon the urging of surviving Miwok, returned to Yosemite as chief of a mixed group (Bunnell, 1911, p. 72).

This disease should have been the epidemic of 1833, which swept the Great Valley from the Upper Sacramento to the King's River with disastrous results (Cook, 1955), and caused the residents to move into the mountains for several years. As discussed by Cook (1943, pp. 13-25), there is little evidence for epidemics in the interior before 1830. However, as related by Bunnell, Tenaya implies that the Yosemite epidemic occurred before he was born. As he was an aged man in 1851, it is not possible to compress Tenaya's account into a mere 20 years. At present one cannot determine whether a pre-1833 epidemic is represented, whether Tenaya invented or confused the story, or whether Bunnell misunderstood him.

1850: Major Savage established a trading post in Awanichi territory and was promptly attacked by the "Yosemite." This group, along with the neighboring Pohonichi and Nutchu, is included with the dominant Yokuts groups as participants in the Mariposa uprising in December, when Savage's stores were destroyed by Indians (Bunnell, 1911, pp. 3, 10, 11, 14).

1851-1852: Three military expeditions were sent into Yosemite Valley to punish the raiders and to bring them back to reservation life. Each time the Awanichi escaped, or attempted to escape, eastward to the Mono Lake area. On the first expedition to the snowbound valley the food stored at more than seven villages was burned, while the second expedition captured a village of 35 inhabitants on the snow-covered shores of Lake Tenaya (the passes were still blocked by snow). The accounts imply that some Awanichi had escaped at an earlier time. Few Indians were actually killed. (Marvin; Bowling; Bunnell, 1911, pp. 54, 81-84, 228, 236; Hutchings, 1856, pp. 4-6).

On April 29, 1851, the Nutchu and Pohonichi signed the treaty giving up their tribal lands. The Awanichi never did. (Comm. Ind. Aff. pp. 74, 88).

1853, summer: Bunnell (1911, pp. 298-299) relates that Paiutes all but annihilated the Awanichi in retaliation for the latter's theft of horses from the Paiute. Maria Lebrado, a claimed descendant of Tenaya, denies that this occurred (Russell, 1947, p. 48).

June, 1855: Hutchings and the artist Ayres explored the Valley rather thoroughly but found it deserted; trails were unused and only a few empty granaries were noted (Hutchings, 1860, p. 78).

1856: 100 Pohonichis lived on the Fresno Reservation. 75 Nutchus lived on the headwaters of the Chowchilla; with them dwelt the remnants of the "Sosemity" tribe, formerly of the Valley (Lewis).

In reading the various accounts of the military expeditions into the Valley, one is surprised at the lack of agreement in the statements made by eyewitnesses.[2] Marvin reports the account of Lewis and Brooks within a month after the Mariposa Battalion returned from the first expedition. Their contact with Tenaya appears to have been minimal and there is only minor disagreement with Bunnell. Bunnell wrote his first report eight years later, but he kept a notebook, was certainly the most interested observer, had the greatest contact with Tenaya; and therefore has been considered the most reliable source. His later accounts merely elaborate the first report of 1859. Roane and Crenshaw, also eyewitnesses, state that Bunnell's first account is correct (Bunnell, 1859, p. 504). Though it appeared three years earlier than that of Bunnell, Hunt (as reported in Hutchings, 1856, pp. 4-6) has provided the poorest report which can be challenged from sources independent of Bunnell.

The above records indicate quite clearly that the information contained in them refers to a disrupted period, and may not reflect the aboriginal life of the Southern Miwok in all particulars. If Bunnell's record is accurate, Yosemite Valley was occupied by a mixed group for at least one generation before white penetration of the foothills. The Miwok group that re-entered the Valley following the epidemic was strongly mixed with Paiute physically and culturally, as discussed below. Bunnell (1911, pp. 60, 72, 298) repeatedly refers to the Yosemite band as being composed of renegades and refugees from other groups from both sides of the Sierras, including the Tuolumne Miwok and foothill groups. Mission raids had upset the foothill tribes and there probably was considerable movement of individuals during this period. Additional evidence of close contact with foothill groups is the report that the Awanichi, Pohonichi, and Nutchu participated in the attempt by the Chowchilla and their Yokuts neighbors to stop white penetration into their territory. Bunnell (1911, p. 86) refers to horse and mule bones in the camps when the Battalion first entered the Yosemite in 1851; if correct, this indicates the rapid acceptance of horseflesh as food as well as the Indian raiding pattern which produced conflict in the Great Valley since Mission times.

While there was thus frequent contact with the western groups, it appears to have been of a disorganized nature because of the conflict with the white gold seekers. The available sources indicate that a much closer relationship existed between the Awanichi and the Paiute to the east. The Yosemite inhabitants headed for Mono Lake whenever armed forces entered the Valley. The Awanichi did not follow their Southern Miwok neighbors in signing the Indian treaties. Intermarriage was frequent between the Awanichi and Paiute. Tenaya himself was of mixed

parentage, and Bunnell (1911, p. 297) refers to him as the "founder of the Paiute colony in Ah-wah-ne." Savage, who spoke five local Indian dialects, including the Nutchu variant ("R. W."; Marvin), could not readily understand Tenaya and it was his opinion that the chief spoke a Paiute dialect (Bunnell, 1911, p. 70). Nor could a Nutchu chief understand Tenaya so a Mission Indian had to be used as interpreter (Bunnell, 1859, p. 501). One must wonder how a Mission Indian learned Paiute, however. Tenaya must have been able to speak Miwok as well as Paiute, and it is probable that the Awani dialect was merely off-colored by Paiute loan words. Later ethnographers had no difficulty in classifying Awanichi as Southern Miwok. Southern and Central Miwok basketry differs from other Miwok textiles in that it shares a number of eastern forms with the Paiute. The quantity of obsidian found in the Yosemite area indicates that trade with the Mono Lake area existed for centuries. Another eastern penetration was the mano and metate, adopted by the Central Miwok in very late times (Barrett and Gifford, p. 210).

Later historical and ethnographic accounts are filled with references to Paiutes in the Sierras. Bunnell refers to them checking the acorn crop on the South Fork of the Merced (1880, p. 299) and wintering in Tuolumne Canyon (Ibid., p. 231). Paiute informants told Steward (1933, p. 329) that they hunted in Little Yosemite Valley in the summer, and wintered in Yosemite Valley when pinenuts were scarce (p. 257). Hoffman (p. 370) repeats a claim that Hetch Hetchy Valley was disputed territory between the Paiutes and Big Creek Miwok; after several fights, the Paiute won and in 1868 this eastern group was still gathering acorns in the valley every fall. Leidig remembered that in the late 19th century one group of Paiute from Mono Lake summered in Yosemite at the foot of Indian Canyon, while another band had their rancheria in the Camp 9 area. The aged Lucy Tellus told the author of her Paiute father working in Yosemite during the summer and returning to Mono Lake in winter. Chase (p. 76), Muir (1917, pp. 80-81), and Barrett and Gifford (p. 25) all refer to Paiute trips into Yosemite. It is probable that this contact was less in pre-white times. Maria Lebrado, a survivor of Tenaya's band, recalled only one annual visit of the Paiute to trade (Taylor, p. 4; Crowe, p. 59). Certainly the Paiute exploitation of the western Transition zone, notably Yosemite and Hetch Hetchy Valleys, with the summer settlement in Yosemite, could not have occurred until the dissemination of the Awanichi inhabitants following the white penetration of the foothills and Yosemite area. The conclusion which one must draw from the above data is that many camp sites in the High Sierra, and even some villages with mortar rocks in Yosemite and Hetch Hetchy may represent late Paiute occupation as well as Miwok.

The absence of Indians in Yosemite Valley in the summer of 1855, and the rarity of Awanichi from that time onward suggests that some disaster overtook the group. The account of a Paiute attack gains credence in view of the Hetch Hetchy conflict reported above, and the fact that it was not only a few Awanichi who resettled in Yosemite Valley at the end of the last century, but other Central and Southern Miwok as well.

The Yosemite Valley is noteworthy in having a group of references to historic villages, many of which can be located. The names and sources are given in Table 1; Merriam provided the longest list of villages and in the following discussion it will be convenient to make all references to the same village in terms of the number he assigned to it, prefixed by the letter M. Those villages reported by Powers which are not in the Merriam list are designated as P-1 and P-2. Leidig located a great many points of historical interest by number on a manuscript map in the Yosemite Library; his two numbered Indian villages become L-3 and L-4 herein. Two Paiute villages are not numbered by him but are shown on his map; one is the same as M-4, but the other is distinct and will be designated as L-X to avoid confusion with Leidig's other numbered spots.

In 1880, Bunnell published his map of the activities of the first expedition into the Valley in 1851. He plots five villages and a group of sweathouses, all of which are near one or more of Merriam's sites (see Table 1). In addition he refers to one village a short distance above Cathedral Rocks (1911, p. 84), and "other groups" of huts which are not enumerated. His plotting of the route taken by the whole group and his detailed account of the Merced River crossing indicates with some certainty that a large number of Merriam's sites (M-4, 5, 8, 9, 10, 12, 26, 27, 31) were not then occupied. M-4 and M-5 are of particular interest because they are the second and third largest sites in the Valley; the Battalion Camp 2 is placed between these two sites on Bunnell's map. The first entrance of the Valley was made in March, while snow still covered the ground, so the small list of villages is not comparable to the other sources which record summer villages also.

Powers (1877, p. 365) collected his village list in 1871-1872 from an Awanichi. His informant stated that there were only nine historic villages. The seven on the north side of the Valley were distributed between M-2 and M-7, but two of the sites were not obtained by Merriam (P-1, P-2). Only two villages were occupied in the late period on the south side, M-26 and M-30. Powers states that other villages existed down to Bridalveil Creek, but were destroyed in wars before the whites came.

In 1878-1879, the Wheeler Survey placed only M-10 on the map. Hutchings (1886, p. 421) states that less than 20 Indians then resided in the Valley.

Merriam obtained 36 names in the early 1900's, of which six were occupied as late as 1898 (M-1, 4, 6, 9, 28, 29). The inhabitants of M-6 were forced to move in 1907, and only M-4 was occupied in 1910. More recently the Indians of M-4 were moved to modern houses near Yosemite Lodge.

In 1933, Leidig remembered two <u>main</u> villages of the Miwok. L-3 was the summer encampment of Indians from Coulterville, Bull Creek and Tuolumne (the first two are in Southern Miwok territory south of the Awanichi claim, and the last represents Central Miwok territory). Muir

(1920, p. 81) also refers to a village which wintered at Bull Creek. L-4 was the summer village of Indians from Bear Creek, Mariposa, and Fresno Flat (southernmost Southern Miwok and possibly Yokuts). L-X was the summer village of one Paiute band, while another Mono Lake group occupied M-4. Leidig's information probably applies to the 1870-1900 period.

In 1952 Lucy Tellus informed the author of the yearly moves to and from Mono Lake which she made with her father; she remembered camping at a variety of places each summer but could not recall more than M-4, M-6, and M-10. She earlier had reported M-2 also (Ross, p. 67).

It appears significant that nine villages are the maximum number of contemporaneous settlements reported by any author in the historic period. The variation in the above accounts is considerable in view of the limited time range. It would appear from Lucy Tellus that settlements were impermanent and several were occupied in succession by the same family each summer. Powers' statement that M-7 is the westernmost village in the Valley since white contact does not agree with Bunnell's 1851 visit to M-15. Nor does this 1851 occupation of M-15 agree with Merriam's statement that the village was occupied only in the summer.

Little can be done with the size of the aboriginal population. If the Valley was swept by an epidemic as claimed by Tenaya, it is doubtful whether the Indian population of such a Sierran region would have restored itself by 1851. In March of this year the Mariposa Battalion first met 72 Awanichis on their way to reservation life. Pohonichi informants claimed there were about 200 Awanichi, to which Tenaya responded that many members of his group had come from adjacent tribes and preferred to return to them rather than to live on a reservation (Bunnell, 1911, p. 60). Only 35 members of this Awanichi group remained when the village was captured at Tenaya Lake in May (Ibid., p. 236). Hutchings gives a wrong overestimate of Valley inhabitants at first contact (see endnote 2). Powers (1877, p. 365), who is noted for his reports of large populations estimates that his nine historic villages must have contained 450 inhabitants at one time. Lewis reports a total of only 75 Nutchu and Awanichi combined in 1856, living outside the Valley. The 200 estimate of the Pohonichi chief is perhaps closest for the disrupted period just prior to white contact, while the prehistoric population was probably somewhat larger.

The problem of year round occupation of Yosemite Valley is also one of varied answers. Over seven villages were inhabited in March of 1851 while deep snow still surrounded the valley. However, it is possible that the area was serving as a retreat at this time, for raids had been made on white settlements the year before. Certainly the occupation of snowbound Lake Tenaya by Tenaya's group of 35 individuals in May, 1851, was prompted by the soldiers then occupying Yosemite Valley. Powers (1877, p. 365) received the definite statement that the Indians occupied the Valley area every winter. Steward (1933, p. 257) was told that the Paiute wintered in Yosemite Valley when pinenuts were scarce on the eastern slopes of the Sierras. Similar is Tenaya's explanation of the recent exit tracks seen in the snow by the First Battalion in March, 1851, as those of Paiutes trapped by snow the fall before who had just left (Marvin; actually it was the remnant of the

Awanichi who had left, but the explanation probably had some previous basis). Merriam (1917, p. 202) states that some permanent villages were occupied throughout the winter by depleted populations, while most of the inhabitants moved to their Merced Canyon territory upon the approach of cold weather. The archaeological findings do not support the idea of any large year-round occupation.

## ARCHAEOLOGICAL SITES

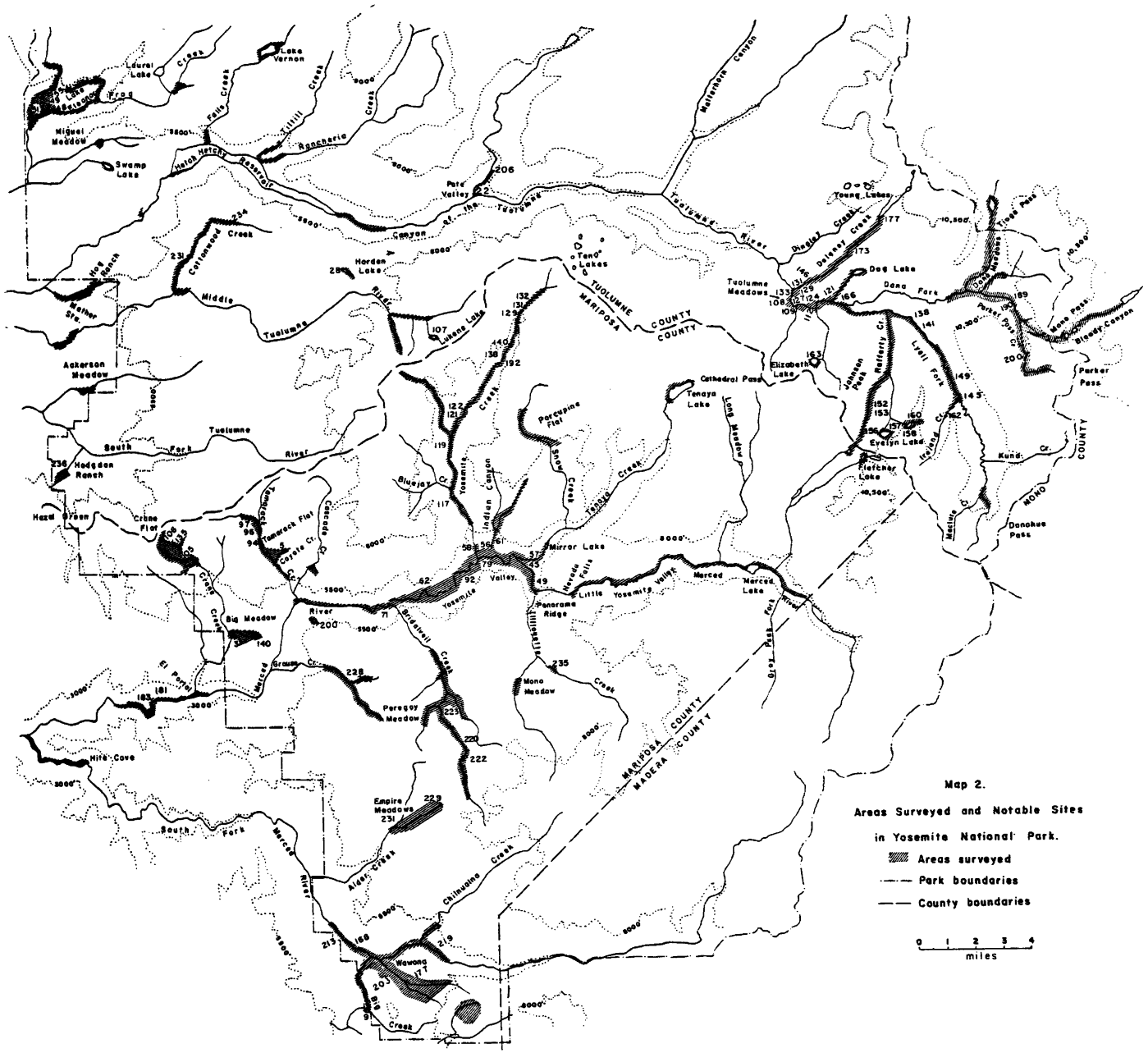
A total of 401 sites have been assigned numbers in Yosemite Park or the immediate vicinity, most of which represent village or camp sites. Of this total, 361 are within Park boundaries (190 in Mariposa County, 171 in Tuolumne County), and 40 are just outside the Park (10 in Mariposa, 24 in Tuolumne, and 6 in Mono Counties). The present survey located 337 of the total number for the first time.

### Areas Surveyed

An attempt was made to cover, as thoroughly as the time schedule allowed, certain areas such as Yosemite Valley, Tuolumne Meadows, Lyell Fork, Dana Meadows and the Mather and Wawona areas (see Map 2). Certain creeks which penetrated the higher elevations from these main centers were selected for detailed coverage, notably Yosemite, Bridalveil, Rafferty, Delaney, Parker Pass and Cottonwood Creeks. A number of lake shores were walked completely: Harden, Lukens, Elizabeth, Dog, Evelyn, Tenaya and Fletcher. Bloody Canyon, Indian Canyon, and the north side of Little Yosemite Valley were examined carefully because of their importance as trail routes. A number of small meadows and flats were covered with relative completeness but were not tied in with adjacent areas: Big Meadow, Tamarack, Porcupine and Crane Flats. Occasional spots along highways and roads were checked without completeness, such as Tioga Road, upper Grouse Creek, upper Alder Creek, and Ackerson, Hodgdon, and Mono Meadows. The long hike into Pate Valley was made in one day to record the pictographs at Tuo-22. The Merced River between Moss Canyon and El Portal and the north side of the South Fork of the Merced River up to Hite Cove were also surveyed. Lake Eleanor, Hetch Hetchy Reservoir, and certain of the tributary creeks had been surveyed previously.

### Survey Methods and Problems

Prior to the actual field work a list of areas which it would be profitable to survey was made on the basis of discussions with various Park officials, reference to the maps prepared by Merriam and McIntyre, and the accessibility of the region. A schedule was outlined, but the


Laurel Lake
Lake Vernon
Miguel Meadow
Swamp Lake
Hetch Hetchy Reservoir
Falls Creek
Tilltill Creek
Rancheria Creek
Pate Valley
Tuolumne Canyon
Matterhorn Canyon
Young Lakes
Dingley Creek
Delaney Creek
Tioga Pass
Dog Lake
Tuolumne Meadows
Dana Fork
Lyell Fork
Parker Pass Creek
Mono Pass
Bloody Canyon
Parker Pass
Elizabeth Lake
Johnson Pass
Rafferty Cr.
Cathedral Peak
Tenaya Lake
Long Meadow
Evelyn Lake
Fletcher Lake
Ireland Cr.
Kuna Cr.
Mather Ste.
Hog Ranch
Cottonwood Creek
Middle Tuolumne River
Horden Lake
Tenaya Lakes
Tuolumne
Mariposa
County
County
Ackerson Meadow
South Fork Tuolumne River
Hodgdon Ranch
Hazel Green
Crane Flat
Tamarack Flat
Cascade Cr.
Bluejay Cr.
Yosemite Creek
Indian Canyon
Porcupine Flat
Moraine
Tenaya Creek
Mirror Lake
Yosemite Valley
Merced River
Nevada Falls
Little Yosemite Valley
Merced Lake
Panorama Ridge
Illilouette Creek
Bridalveil Creek
Big Meadow
Merced Grove
El Portal
Peregoy Meadow
Hite Cove
Empire Meadows
South Fork Merced River
Alder Creek
Chilnualna Creek
Wawona
Big Creek
Mono Meadow
Mono Creek
Bear Creek
Mariposa County
Madera County
Mono
County
Donohue Pass
Map 2.
Areas Surveyed and Notable Sites
in Yosemite National Park.
Areas surveyed
Park boundaries
County boundaries
0 1 2 3 4
miles

time allotted was never sufficient to cover any area as thoroughly as was desired.

All areas were walked on foot, which occasionally necessitated daily hikes up to 14 miles in length. As all obsidian was traded into the region, surface flakes were collected to provide a sample of the range in opacity and color. All small artifacts, including fragments, were collected; cobble pestles were usually measured and left at the site. An attempt was made to measure the size of most bedrock mortars, including the area and height of rock, number of holes and the size of holes. The specific location, a sketch map, and a variety of pertinent information about each site were recorded on U. C. Archaeological Survey Site Records. The site was located on the USGS Topographic Map of Yosemite National Park. It must be emphasized that this map of the high country is often inaccurate as regards small creeks and trails so that some sites could not be located exactly. The sketch maps are therefore of great value as future guides to many of the higher sites. Each site was given a field number which was later changed to a permanent U. C. Archaeological Survey number prefixed by the appropriate county symbol. Mariposa County sites (Southern Miwok territory) are recorded as Mrp-, while those in Tuolumne County (Central Miwok territory) are prefixed by Tuo-.

Photographs were taken of representative sites. Artifacts were catalogued in the field. The surface collections and the excavated specimens from Mrp-9 have been added to the permanent collections of the U. C. Museum of Anthropology; the excavated collection from sites Mrp-97, Mrp-105 and Mrp-106 will be retained by the Yosemite Museum.

Unfortunately, much of the record has already been lost at this late date. Many sites were never more than mere surface accumulations of obsidian flakes, and the artifacts needed to establish the cultural position of the remains have been removed by frequent collectors and tourists. Few were the sites which yielded more than a point or so, and the frequent piles of rejected obsidian flakes were mute testimony that we were not the first to surface collect. Indeed, even the unmodified flakes of obsidian were hard to find in Yosemite Valley. Paving and camp areas have often obliterated all remains but the mortar rocks, while tourist fires which have darkened the soil and blackened the walls of caves confuse the search for aboriginal settlements. Time and nature have been somewhat less active, but midden and mortar rocks are frequently covered with leaves and needles, spring freshets have probably covered many flat camp surfaces with a sterile overlay, and once open parkland has become thickets of brush and small trees with the cessation of annual fires set by the Indians (Bunnell, 1890, p. 10; Ernst; Colby, p. 26).

## Nature of Sites

Aboriginal occupation of most of the Yosemite Park region was limited by climatic conditions to the warmer months of the year, roughly between April and November; penetration of the higher altitudes was delayed by

snow until May, or even July. This seasonal pattern and the smaller population in this region did not favor the formation of refuse mounds such as characterize the Great Valley, but midden remains appear to have been scattered rather uniformly over the area available for settlement. Charcoal and refuse have darkened the soil of only the larger sites because of the limited occupation, the relatively small population, the increased moisture, and the granular nature of the soil in most of this granitic area. No bone or shell was found on open sites, and portable stone artifacts other than flake scrapers are extremely rare when compared with the number of sites. No instance was observed in which the midden had been sufficiently altered to favor the growth of plants distinctive from those growing on the surrounding soil; the amount of moisture was the primary factor which influenced vegetation.

The most abundant evidence for aboriginal settlement consisted of the chipping refuse of obsidian which served to delimit the area of occupation. All such obsidian was foreign to the Park area, having been obtained by trade from the Mono Lake area to the east of the Sierras. At the lower altitudes mortar rocks provided an invaluable clue to former habitation sites; in modern tourist camps they frequently represent the only evidence of former Indian occupation.

A minimum of five scattered obsidian flakes, an artifact, a mortar rock, or pictograph was required before a site was recorded with a UCAS number. In this region of intensive surface collecting for over half a century, combined with the frequent surface cover of leaves and needles, it is felt that five obsidian flakes are not too small a requirement for the definition of a site. Were it not for the mortar rocks, most of Merriam's ethnographic villages would have to go unrecorded because it was seldom possible to obtain this number of flakes from the surface of Yosemite Valley sites.

## Size of Sites and Length of Occupation

The grinding of acorns was usually a social affair, the women gathering at the mortars to prepare the day's meal and to chat (Barrett and Gifford, p. 143). The number of mortar holes associated with a site allows a vague estimate of the size of the former settlement. Barrett and Gifford were told that a mortar hole was usually abandoned when it reached a depth of about five inches. To some extent the depths of a group of mortar holes would therefore give some indication of the length of occupation of a particular site.

Detailed information is available on mortar rocks associated with 140 sites. The number of holes associated with a single site varies from 1 to 473 holes, (Table 2), while the depth may vary from the slightest depression to nine inches (in one case eleven inches).

A total of 56 sites have only 1 to 7 mortar holes available for grinding, of which 33 sites have no more than 3 holes. Only 9 of these

mortar holes exceed three inches in depth, and only 2 holes were used to a depth of five inches. Neither a large population nor any lengthy occupation could be represented by such sites. Very likely only a single family occupied the site at any one time. This group of sites will be classed as house sites.

Sites with from 8 to 19 associated mortar holes are next most numerous and will be classed as small villages. A total of 48 sites comprise this group. Several families probably occupied the site. The maximum depth of mortar holes is six inches for most of these sites, with only 15% of the holes exceeding five inches in depth. Suitable rocks were limited at Mrp-146 with the result that 42% of the holes are over five inches deep. Depths up to nine inches are rare at four sites (Mrp-57, -100, -75, Tuo-212), at all but one of which the available space for holes had been completely utilized.

The 36 sites with more than 20 associated mortar holes will be classed as large villages. At 33 of these there are from 21 to 59 mortar holes; Mrp-177 near Wawona has 85 holes, Tuo-236 at Hodgdon Ranch has 156, and Mrp-3 in Big Meadow has 473 mortar holes. An average of 14% of the mortar holes at the large villages exceed five inches in depth. Suitable rocks were limited at Mrp-148 where some 54% of the holes were five inches deep or more. Most of these sites must have been favored living areas for generations.

Too many unknown factors exist to warrant any refined estimate as to length of occupation of these sites. The depth to which each hole was worn is dependent not only upon the time factor, but also upon the amount of unused space available for new holes, and the advantages of comfort which might be associated with a particular grinding spot. It is possible that each woman had some claim to a specific mortar hole or holes and the amount of use might vary with the individual. Excavation at a variety of these sites is needed to provide some clue as to the full signigicance of the number and depth of mortar holes.

A total of 188 sites do not have mortar rocks associated, but are represented by surface obsidian flakes. These will be classed as campsites which were occupied by hunting, gathering, or traveling groups; possibly some of the sites represent village sites of the earlier occupants who used the mano and metate rather than the bedrock mortar. Most of these sites represent small camps, less than 1500 square yards in area, where a lengthy search is often necessary to obtain any sizeable sample of obsidian flakes. Some 121 sites are classed as small camps.

A total of 67 sites are classed as large camps, with an area of more than 1500 square yards. The surface of these is littered with flakes. Such sites probably were centers for related groups from which individual parties dispersed to hunt or gather food. It is quite likely that many of them were on well-used trails. Occupation was of some duration and the site must have been revisited season after season.

## Location of Sites

The locations of the vast majority of sites provide clear evidence of the selective factors which determined the specific placement of a village or camp. Accessible water was obviously a primary requirement, but seldom posed a problem in this area where the innumerable tributaries of the Merced and Tuolumne Rivers were fed by long-lasting snow and springs. Dampness, in fact, was the most restrictive factor, for the aboriginal settlers clearly sought dry, well-drained areas for their habitation sites, even when this required a walk of some distance to obtain water or to use a mortar rock. Where meadows occurred, sites were always along the drier edges. Of the numerous rock shelters scattered along the edge of Yosemite Valley, only those with dry floors contain evidence of continued occupation.

Another important factor which determined the selection of habitation sites within the oak belt was the accessibility of boulders suitable for mortar rocks. Preferably the mortar rock was within the site area itself. Adequate rocks were often absent on the floor of Yosemite Valley, so villages were placed near a water supply, and a considerable walk up the slope to the base of the talus deposit was sometimes necessary to find rocks suitable for mills. Occasionally suitable rocks were sufficiently rare as to necessitate the occupation of brushy or wooded areas, though such areas were probably cleared by burning in aboriginal times.

Sunny exposure was a desired feature. A greater number of sites in Yosemite Valley were placed on the north side, rather than the shady south side, away from the river and closer to the sunny slopes. A limited forest cover and a level or gently sloping surface were preferred for settlement.

The Yosemite Valley, Wawona, Big Meadow, Mather, Lake Eleanor, and Hetch Hetchy regions were the most favorable occupation areas. Situated at the lower edge of the Transition Zone, many of the Upper Sonoran plants penetrated these regions and provided more varied food supplies. Winter occupation in reduced numbers was possible only at the more favored of these lower settlements. Valley floors or gentle terrain afforded a habitat easily traversed and well stocked with food. It is in these areas that the largest villages occur, with very few campsites.

Some 47 sites have been recorded in Yosemite Valley between the New Big Oak Flat Road and Happy Isles, 28 of which represent historic villages (Table 1). The great majority of sites are on the valley floor, averaging 4000 feet elevation, but one house site was found at the mouth of Indian Canyon at 4300 feet elevation. Little remains on the surface of most sites which would allow the delimitation of midden areas; even obsidian flakes are rarely found except at the largest sites. Mortar rocks are the primary indicators of aboriginal occupation, but as these are often isolated it is sometimes difficult to determine whether individual sites are represented or whether groups of mortar

rocks should be classed as single sites. A total of 71 mortar rocks have been grouped into 38 village or house sites; 20 sites have only a single mortar rock, 10 sites have 2 rocks, 2 sites have 3 rocks, 5 sites have 4 rocks, and 1 site has 5 mortar rocks. Large villages are represented by 12 sites, with from 21 to 58 mortar holes. This latter figure probably should be 88 holes since Anthony (p. 54) mentions a mortar rock with 46 holes at Indian Canyon; this is probably the historic village of Yowatchke where our survey located five mortar rocks with a total of 42 holes, but we apparently missed the largest mortar rock (much of the site is now a residential area). All but two of these large villages were historic settlements. The two exceptions represent three rocks with a total of 85 mortar holes a short distance east of Wiskahlah (with 57 mortar holes) and across Tenaya Creek from Hookehatchke (with 3 mortar holes). It is conceivable that the three mortar rocks should be included with the two historic villages.

Small villages are represented by 11 sites in Yosemite Valley, with from 8 to 17 mortar holes. All but three of these sites were named historic settlements. Some 15 sites can be classed as house sites, with from 1 to 6 mortar holes. Only 7 of the sites can be associated with an historic name. One large camp and four small camps were located in the Valley. No mortar rocks or midden could be found for 12 of the historic sites referred to by Merriam or Powers, though pictographs were found in the general area of two of these. It seems probable that the majority of these unlocated sites were campsites. Caves or rock shelters represent seven sites; the shelters include two small villages, two house sites and a small camp; the two caves are near a large and a small village. Another occupied cave near the Awanee Hotel was not visited by members of the survey. Four simple pictograph sites were located.

Within a two-mile radius of Wawona, on the South Fork of the Merced River and its tributaries, are 24 sites at elevations between 3900 and 4500 feet. Large villages are represented by five sites with from 27 to 85 mortar holes; the eight small villages have from 9 to 12 mortar holes. Only three house sites were found, with from two to six mortar holes. Large camps include five sites and small camps are represented by three sites.

Big Meadow was a very favored locality, at about 4400 feet elevation. Though there was insufficient time to make a complete reconnaissance, at least 11 and probably 14 sites occur within a 1 by 1½-mile area. The largest site in the Yosemite region, Mrp-3, is located here. This site has an extensive midden deposit and 14 mortar rocks with 473 holes according to Presnall (1930b; the present survey located 12 rocks with 417 mortar holes, but additional search will probably reveal two more large mortar rocks). Two other large villages with 28 and 46 mortar holes were found around the meadow. Two small villages with 8 and 19 mortar holes, three house sites with one or two mortar holes, one large camp and two small camps were also located. Presnall found six mortar rock sites besides Mrp-3, and three of these (one large and two small villages) were not located by the present survey.

Some 19 sites were previously recorded around Lake Eleanor, but detailed information is lacking as to the nature of the sites. Hetch Hetchy Valley was flooded before any survey was done, but six sites without detailed information are known along the present shores of the reservoir.

The hanging valleys which descend gradually to the edge of the Yosemite Valley cliffs before dropping abruptly were favored occupation spots also. Yosemite Creek, Tamarack Creek, Little Yosemite Valley, and Bridalveil Creek are all typical examples. Rare mortar rocks occur in all of them, above the oak and pine belt, but small campsites are the most common archaeological remains. The stream courses provided the least resistant travel routes, while frequent tributaries afforded access to the whole upland region. A total of 24 sites were located on Yosemite Creek, ranging in elevation from 6800 to 8600 feet. These sites represent one small village (8 mortar holes), two house sites (3 and 6 mortar holes), six large camps and fifteen small camps. On Bridalveil Creek in the vicinity of Peregoy Meadow (around 7000 feet) were found 11 sites. One was a large village (34 mortar holes), three were small villages (8 to 11 holes), two were house sites (2 and 4 mortar holes), three were large camps and two were small camps. One site had a pictograph (Fig. 10b). Around the shores of Harden Lake (elevation 7700 feet) were a small village (9 mortar holes), a house site (6 mortar holes) and two small camps.

Still higher are the sub-alpine gardens, of which Tuolumne and Dana Meadows, as well as Lyell Fork, are outstanding examples. The campsites that are found on every sandy projection into these lush meadows present abundant evidence of the favored hunting areas provided by these broad, flat regions. It is here that the highest frequency of large camp sites occur, many of extended occupation. The meadowlike character is retained on the gentle approaches to the eastern passes, and a variety of trade items flowed through the area. Tuolumne Meadows, with an elevation of just over 8500 feet, was a favored summer camping area. Around the edges of the meadow, in an area about 1 by 2½ miles, a total of 17 large camps and 13 small camps were recorded. The Lyell Fork was not surveyed completely, but five large camps and ten small camps were located between Rafferty Creek and Ireland Creek, at an elevation of about 8700 feet.

The sites range still higher, up the varied drainages of swift flowing creeks, appearing in any open flat and on the margins of the numerous fishless lakes. Only the steep, narrow gorges were avoided because no accessible hinterland was available. Parker Pass Creek, leading up to Mono and Parker Passes, was lined with sites. At elevations between 9500 and 10,700 feet were five large camps and fifteen small camps. Three large camps and five small camps were scattered along the upper half of Delaney Creek from 9200 to 10,000 feet elevation. On the shores of Lake Tenaya, at 8100 feet, were a large camp and two small camps. Lukens Lake (elevation 8400 feet) had one large camp. One large and two small camps were on the shores of Dog Lake at 9200

feet elevation. Elizabeth Lake, at 9500 feet, had three small camps. Fletcher Lake, at 10,200 feet, had one large camp. Evelyn Lake and the adjacent smaller lake, around 10,300 feet, both had one large and two small camps on the shores.

## Archaeological Sites and Life Zones

Sites recorded in this survey range in altitude from 1600 to 10,700 feet (Table 3). It appears possible to deal with the wide range in environment in terms of the biological "life zones," with particular emphasis on vegetation as outlined by Jepson, (pp. 4-8; see also Hall and Grinnell). It is fully realized that there is seldom a sharp dividing line between these vegetation belts so that the placement of some sites in a particular zone must be somewhat arbitrary. This problem is reduced in the Yosemite area because of the frequency of deep, steep-walled canyons, and by noting the dominant trees associated with each site it is possible to place each settlement in the Upper Sonoran, Transition, or Boreal Zones without undue error. The transition from the Canadian (approximately 6500 to 9000 feet) to Hudsonian Zones (varying from about 9000 to 10,200 or 10,700 feet) is so gradual and so variable in altitude in different parts of the Park that the term Boreal will be used for all areas above the Transition Zone, as done by Grinnell (p. 328) and Smiley. There is no indication that the change from Canadian to Hudsonian to Alpine affected human habitation of the area to any extent since hunting was the major activity at these elevations.

Barrett and Gifford (pp. 142-163) present a detailed list of vegetable foods used by the Miwok, and it will be useful to review these in some detail because they afford the best explanation for the concentration of mortar rocks and large villages at the lower altitudes. Most of their information applies to the Central Miwok of the foothills, but the common plants agree with the foods given by Clark (1904, pp. 46-48) for the Southern Miwok of Wawona, and by Godfrey (p. 11) for Yosemite. The distribution of these plants is given by Hall and Hall, and Jepson.

Because of the nature of the areas surveyed, only 2.7% of the 328 sites with detailed information fell into the Upper Sonoran Zone, 36.1% were within the Transition Zone, and 61.2% were placed in the Boreal Zone (Table 4b).

The only area surveyed which fell within the definite Upper Sonoran Zone (up to about 3000 feet) was the Merced Canyon below El Portal. Certain foothill plants and animals extend to such Park borders as Wawona, Yosemite, Big Meadow, and Hetch Hetchy, but the dominant vegetation pertinent to the Indian food supply was Transitional in these areas. The Upper Sonoran assemblage includes such nuts and fruits as the blue oak,[3] interior live oak, buckeye, Digger pine, madrone, the preferred manzanitas, bay, blackberries, wild plum, grape, night shade, and toyon; of the 18 native seeds, 13 are restricted to the foothills; 3 of the bulbs and 7 greens are usually found at these lower altitudes.

Mammals were abundant (Grinnell and Storer; Parker), as were birds (Beatty and Harwell), but their migratory nature or wide distribution did not associate an advantage with the Upper Sonoran Zone in the non-winter months. The deer, in fact, migrated to higher country. The cottontail and beaver were the only notable mammals used by the Indians which did not range to higher altitudes. Rainbow trout were the only native fish of importance.

It is thus apparent that this zone provided the most varied and abundant food supplies used by the Indians, yet of the ten sites recorded in the El Portal region, none can be classed as large; three were small villages, four were house sites, and three were large camps. However, the sample may not be adequate, as the survey was not complete. At the same time, it would appear that the upper Merced Canyon was too steep and narrow to provide a sufficient supply of foothill products to support many large settlements.

Most of the Indians in the Yosemite region spent the winter in the Upper Sonoran Zone. A small part of the total population probably remained at the larger villages in favorable Transition Zone valleys.

Of the areas surveyed, the Transition Zone (up to 6000-6500 feet) provided the most favorable habitat. Out of the total number of large villages, 83.3% occur in this zone, while 58.3% of all the small villages, and 64.3% of the house sites are also associated with this belt. As shown in Table 4a, large and small villages are about equal in number, but are not quite as frequent as house sites; camping places are in a definite minority.

It is obvious that this concentration of sites with mortar rocks is associated with the black oak, one of the trees limited to this zone. Other important vegetal foods were plentiful in this region of large valleys and numerous meadows: canyon live oak, sugar pine, western yellow pine, California laurel, less desirable manzanitas, nine bark, choke cherry, wild currant, strawberry, thimbleberry, and gooseberry all were available, and most of their products were stored. Nuts and seeds were more restricted, with only seven (hazel, madia, balsam root, buena mujer, paintbrush, and skunkweed) out of 18 reported seed plants having been common in this zone. Bulbs were more abundant, including the Mariposa lily, seven brodiaeas, squaw root, soaproot, camass, and St. John's wort. Of some 20 native plants used for greens, 10 are found in this zone. While the Mariposa Battalion burned the food supplies of the Yosemite Indians in the spring of 1851, Bunnell (1880, p. 78) noted caches of acorns, California laurel, pine nuts, chinquapin nuts, grass seeds, and wild rye or oats (the latter is not native).

Animal life was abundant. Of the many mammals found in Yosemite, the mule deer and white-tailed jackrabbit were the most important food animals. The black bear, grizzly bear, grey squirrel, Sierra ground squirrel, raccoon, gopher, marmot, chipmunk, rats and mice provided food and skins. A variety of carnivores also furnished useful furs, such as coyote, gray fox, mink, weasel, marten, fisher, wolverine, and badger.

Mountain quail was the most important bird which was hunted, though pigeons, jays, flickers, and woodpeckers were also sought (Barrett and Gifford, pp. 183-185). Rainbow trout were important fish, and the high waterfalls prevented their advance beyond the Transition Zone.

From the above summary it is quite clear that, in the area surveyed, most of the gathering of vegetal foods was done in the Transition Zone. As this was woman's work, the wives and children spent much of their time close to the village, collecting and preparing plant foods for storage. Wives accompanied their husbands on major hunting trips into the high country where they collected the much more limited plant foods when not occupied with camp routine and the preparation of meat. The whole family was occupied in the Transition Zone at the time of the acorn and pine nut harvest. Abundant food supplies were stored here throughout the winter for use in the following spring.

The largest number of sites were found in the Boreal Zone but 80.5% of these were campsites, the majority of which were small stopping places. It is interesting to note that 39 sites in this zone represent settlements with from 1 to 52 mortar holes in association, forming 19.5% of all Boreal sites. No oaks were noted in the vicinity of any of these sites, though most of them occur in the lower Canadian Zone, just beyond the upper limit of the oaks. Some thirteen of these sites with mortar rocks occur above 6500 feet. Four of these, including one large village, occur at 7000-7200 feet near Peregoy Meadow. A small village occurs at 7000 feet near the head of Alder Creek. A house site and small village occur at 7100 and 7500 feet, respectively, on lower Yosemite Creek.* Two house sites and a small village occur near Harden Lake at 7600 feet elevation, at the very edge of Tuolumne Canyon where the Transition Zone extends to higher elevations than is normal elsewhere. It would appear that the Indians established settlements in the upland valleys in order that they might more easily gather the acorns produced on the upper slopes of the adjacent canyons. Although suitable rocks were available, no mortars were noted at higher elevations.

The remaining campsites must have been associated primarily with hunting because the number of useful plants at these elevations is extremely limited, and fish were not available. The following plant foods could be gathered in the Boreal Zone: juniper berries, sugar and Jeffrey pine nuts, chinquapin nuts, occasional patches of wild currant or gooseberry, a few seeds (balsam root, gumweed, paintbrush), several bulbs (golden brodiaea, Eulophus, corn lily, squaw root), and a few greens. Few of these went above 8000 feet, and none of them were staple foods. Animal life, on the other hand, was very plentiful, with deer migrating in the spring to the higher meadows already inhabited by rabbits, bear, squirrels, raccoons, and a variety of other important food and fur sources.

A considerable number of these campsites would also be associated with trails leading to Mono Lake and adjacent Sierran groups and areas. In view of the close similarity in the late points used by both the Miwok and Paiute it is doubtful whether remains of the different groups could be differentiated.

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* Two house sites occur in Mono Meadow and at the head of Grouse Creek, at 6900 and 7200 feet elevation respectively.

## Rock Shelters and Caves

The talus slopes along both edges of Yosemite Valley contain numerous rock shelters formed by the tilting and balancing of gigantic boulders. The majority of these shelters remain wet or damp through most of the year and would be unsuitable habitation areas. Modern tourists often find the drier and larger of these shelters appealing spots for campfires. Only five rock shelters and two caves were found which still have some evidence of possible aboriginal occupation.

Two rock shelters were found which remain dry and in which obsidian flakes and artifacts were found, Mrp-62 and Mrp-68. Site Mrp-62 is probably the small historic village "Helejah" (Merriam, 1917, p. 206). Late type points and flake scrapers were found on the surface with no indication that tourists had disturbed the site. A mortar rock is nearby. Mrp-68 is not close to any historic village. One mortar hole was associated.

Two other shelters, Mrp-77 and Mrp-161, yielded no obsidian, but both have dry floors. Roughly piled rock walls have been built to block one or more side entrances. The roof of the Mrp-77 shelter appears fire-blackened but no mortar was found. A mortar rock was associated with Mrp-161 and a note on a Yosemite Museum map records the birth of Chief Leemee in a "cave" in this vicinity.

Mrp-163, with no historic associations, is a shelter with a fire-blackened wall, close to a mortar rock.

There are two cave areas which contain some passages which are in perpetual darkness, Mrp-57 and Mrp-58. Mrp-57, or "Indian Caves," is behind the historic village "Hollow," and was occupied by the Indians as a winter shelter and a retreat area when in danger of attack (Merriam, 1917, p. 205). It may be noted that the one or two aged Awanichi found in the Valley by the Mariposa Battalion were living in a cave in winter, and this site is most likely the one referred to by Bunnell (1911, p. 83) and Marvin. A nearby mortar rock places the site in the small village category. The two main shelters contain midden. Beatty (1933b, p. 8) states that basketry was found in the upper cave in the 1890's, while pictographs were once visible in the lower cave but have been blackened by tourist fires. He reports circular depressions in front of the caves as house pits; excavated interiors for dwellings are not reported for this area, so sweathouses may be indicated by the pits. (See also McLellan, 1951; Smith, 1930).

Site Mrp-58 ("Yosemite Falls Cave") has two mortar holes at the main entrance which were occasionally used by the inhabitants of "Koomine" (Anthony, p. 54). A crude rock wall nearby is probably aboriginal. The most accessible chamber is a shelter with walls blackened by tourist fires. A network of totally dark passages meanders through a concentration of immense boulders. All of the passages visited by the present survey were found to have wet sand floors and the walls were unblemished except for tourist names. Most of the passages were small and their exploration requires an agile contortionist. Despite these arguments against occupation, the obliquely flaked point shown in outline in Figure 6o was found in one of these dark passages in 1951 (McLellan, 1951, pp. 119, 120).

In addition to the above, Beatty (1933b, p. 8) reports a cave inside the Awanee Hotel grounds which was not visited by this survey. A bow and three mortar holes were associated, and the site probably represents "Lesamaiti" village (Powers, 1877, p. 365).

## Pictograph Sites

Pictographs have been reported for only six sites in the Yosemite Park area, four of which occur in the Yosemite Valley. All designs are painted in red, with very rare use of black at Tuo-22. The pictographs at Mrp-57 in Yosemite Valley were long ago obliterated by tourist campfires (Beatty, 1933b, p. 8). This site was a cave with occasional occupation and a name in the historic period (Merriam, 1917, p. 205, No. 2).

Mrp-158 represents a large isolated boulder on the Valley floor with traces of red paint on a protected surface near the ground, but the specific designs can no longer be discerned. No mortar rock or obsidian was located in the vicinity, but Merriam places a small village in this area (Ibid., p. 206, No. 11).

Mrp-49 represents a large boulder on the east slopes of Yosemite Valley with a single long rake design on one face (Fig. 10a). The painting is a short distance above the house site Mrp-48 and near the historic village Mrp-80.

Mrp-71 is another isolated boulder just west of Bridalveil Creek on the Valley floor. A circle of dots is the only pattern (Fig. 10c). Merriam (1917, p. 207, No. 21) places a village or camp in this area, but no other trace of it was noted by this survey.

Two dot and circle motifs and two horizontal rows of short parallel lines are associated with the occupation site Mrp-223 on Bridalveil Creek above the Valley (Fig. 10b). Tripp (p. 26) also refers to this site.

The only extensive paintings in the Park area so far reported are to be found at Tuo-22, in Pate Valley (Figs. 10-d-j'; 11). These were first published in 1908 (Harnden; later by Steward, 1929, pp. 69, 70 and Presnall, 1930a). An area some 240 by 16 feet at the base of a high cliff is decorated with scattered pictographs, a few of which may have incised outlines. Weathering has blurred many of the designs. With two exceptions all the pictographs were done in red paint; one oval was done in black and has short red lines around it (Fig. 10b'); another oval consists of black dots (Fig. 10c').

The majority of designs at Tuo-22 are rectilinear in style. Rakes (such as Fig. 10r, 11d) are the most common element, with at least 19 examples. Possible rain symbols (Figs. 10q, t, u; 11j) and various crossed lines (Figs. 10s, v-y, d'; 11g) are also common. Other simple rectilinear designs include zigzags (Figs. 10o, p, f'; 11a, b, d, i),

chevrons (Fig. 11a, j, k), ladders (Figs. 10a', h'; 11c, g), gridirons (Fig. 10z, h'), diamond chains (Fig. 11k), and groups of straight or wavy parallel lines (Fig. 11a, b, d, f, i, k). Simple human figures are represented six times (Figs. 10i-l, h'; 11j). Hands (Fig. 10g, h), simple circles (Fig. 11g), dots (Fig. 10c', g'), stars (Fig. 10h'), a spoked wheel (Fig. 10e), and a sun disk (Fig. 10d) are also present. Curvilinear meanders are relatively rare (Figs. 10d', e'; 11b).

The Yosemite pictographs exhibit little similarity to the pictographs of the Tulare region of the southern Sierras (Area D, Steward, 1929). Shared elements include variations of the zigzag, sun disk, humans, star, dots, spoked wheel, and ladder, but the Tulare pictographs are more varied, more elaborate, and usually stylistically different. Greater similarity exists with the petroglyphs of the eastern edge of the Sierras in the Mono Lake-Owens Valley region, where all major elements found at Tuo-22 occur. Sites 35 and 41 (Steward, 1929, pp. 71, 75) share the greatest number of designs with Tuo-22. As a pictograph group, however, the Pate Valley site is distinctive because of the rare use of the circle, the emphasis on linear motifs and the general simplicity of the designs.

The state of preservation of these Yosemite pictographs suggests that this art expression dates from a relatively late period. The pictograph sites in Yosemite Valley are associated with or are near historic villages, while the house pits at the Pate Valley site probably indicate historic occupation. The similarity of design elements shared by the Pate Valley site and the eastern Sierran region would agree with the close contact between the Miwok and Paiute indicated by the ethnographic data.

## Construction Features

Some nine house pits, averaging twelve feet in diameter, were noted at Tuo-22. This site in Pate Valley may have been occupied the year round and the inhabitants perhaps excavated the floors of their dwellings for increased warmth. Smaller pits up to seven feet in diameter, were recorded for Mrp-189 (2 pits) and Tuo-231 (3 pits). Natural depressions may be represented at these two sites, however, since ethnographic sources mention only the surface dwelling for this area. House pits are reported as having been present at Mrp-57 (Beatty, 1933b, p. 8), but sweathouses may have been represented. It is also possible that house pits represent historic Paiute occupation, as this group did excavate the interior of winter dwellings.

Crude rock walls were associated with two rock shelters and a cave: Mrp-58, Mrp-77, and Mrp-161. In all cases the stones are crudely piled in a single row across one or more openings. The walls appear pointless as tourist constructions, but could have functioned for the Indian to keep the snow and wind out, and to protect him from enemy raids.

McIntyre records five "ceremonial circle" sites on his manuscript map, on Rancheria Creek, Paiute Creek, Rogers Canyon, Delaney Creek, and

near Turtle Dome. The latter is the only such site visited during the present survey, and has also been described by Michael, 1935. This site, Mrp-200, consists of two pairs of stone circles located on the bare granite slope. The first pair of circles have average diameters of about eight feet. The second pair have diameters which vary from about ten to fifteen feet. The circles are formed from one layer of unshaped, flattish granite cobbles, laid on the natural bedrock. The slope is too steep to have permitted dwellings, and the construction is not adequate to have served as hunting blinds. No practical function can be suggested and a ceremonial use seems likely.

### Cremation Area

Beatty (1933a) describes the account given by Leidig of the last Indian cremation in Yosemite Valley, in 1873. It took place in the vicinity of Camp Awanee and site Mrp-92. This survey obtained probable evidence of cremation at the north edge of the flat on which Mrp-92 is situated, just above the river marsh. The most tell-tale object found was the base of a melted glass bottle still filled with partially melted trade beads. It was a common feature of late Indian cremations to throw whole bottles of this wealth on the burning corpse. Melted glass, chinaware, and amorphous metal bits were also found, along with a few obsidian flakes. A few charred bones were very small, but appear to be animal. The nearby location of Camp Awanee clouds the Indian association of these remains, but the trade beads, taken with Beatty's account, tend to favor this area as having been used for cremation, at least in the historic period. The Paiute sometimes buried their dead in Yosemite Valley in the historic period; Caywood (pp. 48, 49) describes such a shaman's burial.

## TRADE AND TRAILS

Available references indicate that trade was most extensive between the Miwok and Paiute. Sample (p. 17) has summarized this information, noting that the Miwok supplied the Paiute with acorns, clamshell disc beads, baskets, arrows, manzanita and sow berries. The Paiute in return supplied raw obsidian and finished points, solid blocks of salt, sinew-backed bows, rabbit-skin blankets, piñon nuts, buffalo skins, insect pupae, baskets, and red and white paint. Additional Paiute trade items include pumice stone (Bunnell, 1911, p. 86) and caterpillars of the Pandora moth (Godfrey, p. 57). McIntyre (p. 5) reports paint fungus as a Miwok trade item.

Steward (1933, p. 329) records the eastern trails in detail. The major route according to his Paiute informants was through Bloody Canyon and Mono Pass, down Parker Pass Creek to Tuolumne Meadows, and up again to Cathedral Pass. Here two trails were available. One led down Long

Meadow to Little Yosemite Valley and thence to Yosemite Valley. Lucy Tellus told the author that this was the usual route taken by her Paiute father in their yearly trips between Mono Lake and Yosemite Valley; the trip took two days, with an overnight camp "in the mountains." The other route given by Steward was from Cathedral Pass to Lake Tenaya, thence along the rim of Tenaya Canyon to descend near Mirror Lake. Lucy remembered no such route, but she did recall occasional entries made by way of Yosemite Creek. Her father had also entered the Valley by way of Indian Canyon. The only route of escape mentioned by members of the Mariposa Battalion was Indian Canyon and thence on to Lake Tenaya.

Bloody Canyon, Indian Canyon, Yosemite Creek, and Little Yosemite Valley were checked for evidance of trails. The most definite association was five sites scattered through Bloody Canyon, the narrow gorge of which would be unsuitable for hunting. Parker Pass Creek is lined with sites, perhaps reflecting the main route of entry into the Yosemite area, but the surrounding region must have been a favorable hunting area also. Tuo-109 is an extensive concentration of obsidian flakes in Tuolumne Meadows, and this site was probably a major stopping place. Yosemite Creek has sites scattered along its entire length.

Although Indian Canyon has the gentlest approach of any route, the only evidence of settlement was one site with a bedrock mortar at the very mouth of the canyon. Little Yosemite Valley has sites in the flatter terrain, but they cease when the canyon walls narrow. It is most probable that the sites found here were primarily hunting or living sites (mortar rocks are associated with a few sites) and the existence of settlements may be only incidental to trails. Though no pass is available at the head of Delaney Creek, sites are found wherever meadows or flats occurred. Trails probably penetrated every drainage because good hunting spots were available in all of them. With the available information it is extremely doubtful whether even major trails could be identified as to detailed route with only archaeological evidence. The trip to Mono Lake required only one overnight stop, while hunting camps were established in any area of favorable terrain.

The Miwok obtained clamshell beads, Digger pine nuts, and other foods from the west, in exchange for obsidian, red paint, and certain woods, as well as skins. The main trail from the valley to the west led up the canyon slope below Bridalveil Creek and thence to the South Fork of the Merced. There is no indication that the Indians moved through the Merced Gorge. The inclusion of the Awanichi in the 1851 treaty meetings with the Pohonichi and Nutchu rather than with lower Merced River groups suggests that their contacts were more frequently with the upland valleys and areas immediately to the southwest of Yosemite.

Wegner (p. 67) repeats the claim of early stockmen that the old Mono trail went from Anderson Valley to Hazel Green, Big Meadow, Tamarack Flat, over Lightning Ridge, and down Bluejay Creek to cross Yosemite Creek about two miles above the falls. The size of site Mrp-3 in Big Meadow certainly suggests that a major stopping place is represented.

## TEST EXCAVATIONS

Test pits were excavated in four sites, Mrp-9, Mrp-97, Mrp-105 and Mrp-106. All sites are located within the territory occupied in historic times by the Southern Miwok Indians. Each site is located on a rise above a small stream which probably provided water the year round. Site Mrp-9 is in the Transition Life Zone and is surrounded by oaks, cedars and pines. The three remaining sites are found at the lower edge of the Canadian Life Zone, at elevations between 6000 and 6800 feet. Lodgepole pine and white fir are the dominant trees in the immediate vicinity of each site, but rare oaks and scattered sugar pines do occur in the general region. Much of the gathering of acorns had to be done at lower elevations, however, especially at Mrp-97.

All sites are open flats surrounded by forest. The level surface is largely devoid of vegetation as the granite sand and shallow bedrock preserve only enough moisture to support the growth of scattered low plants such as pussy paws and dwarf lupine. The settlement areas have fine sunny exposure while the enclosing forest provides protection from winds. The obsidian chips which litter the surface indicate the area of former settlement; as these chips are essentially coterminous with the open area there is a strong likelihood that the forest cover has remained essentially static at least since the latest occupation of the sites. Bedrock mortars are found at each site.

The same excavation techniques were used at all four sites. Test pits, five feet square, were dug in a random fashion so as to sample various parts of the site. Shovels and trowels were used to inspect the midden, which was dug in six-inch levels. One pit at both Mrp-97 and Mrp-105 was screened completely with a quarter-inch screen. Pits were excavated to bedrock or sterile subsoil (clearly indicated by absence of obsidian and charcoal, and usually by a color change in the soil). The location of artifacts which could be typed (such as points, manos or core tools) was fully recorded on artifact slips. Flake scrapers, small fragments of artifacts, bone and any unusual unmodified material were kept in six-inch level bags. All unworked obsidian flakes from the screened pits were kept by level. The collections from Mrp-97, Mrp-105 and Mrp-106 have been retained by the Yosemite Museum; the material from Mrp-9 and all other surface collections are in the University of California Museum of Anthropology. Contour maps of Mrp-97 and Mrp-105 are on file with the University of California Archaeological Survey.

### Site Mrp-9

Site Mrp-9 is located on the north side of Laurel Creek, near its juncture with Big Creek, at an elevation of 4500 feet. The site was probably abandoned during the winter months. The old Chowchilla Ranger

Station once occupied the north edge of the site, and nails, glass sherds and a stove handle were found in the top six inches of deposit. The main area of occupation measures 100 by 200 feet. This large village site is surrounded on the south and east sides by bedrock outcrops which contain 59 mortar holes. These holes vary in depth from ½ to 9 inches, but average 4 inches; 20 holes are 2 inches or less deep, and 17 are over 6 inches deep. The diameters range from 3½ to 10 inches, averaging 6 inches.

Three test pits, five feet square, were dug to subsoil. Pit A varied from 30 to 33 inches deep; Pit B varied from 33 to 35 inches deep; Pit C varied from 21 to 30 inches deep. The midden consisted of granite sand darkened with charcoal, with scattered chunks of granite. Obsidian flakes were most abundant in the 0-6 and 18-24 inch levels (Table 8). Bone was rare and poorly preserved; eight small pieces, probably of deer, were found in the top 24 inches.

A total of 95 artifacts were recovered, 78 from excavation (Table 7). Flake scrapers constitute 56% of the excavated specimens. Classifiable points comprise 11.5% of the excavated sample while incipient points, rejects and unclassifiable fragments represent 20.5% of the specimens.

The classifiable points represent 10 essentially complete points, 4 basal fragments and 1 mid-section. The unclassifiable specimens consist of 3 basal fragments, 3 mid-sections and 4 tips; the 3 bases appear to be leaf-shaped and may represent either Class B or C points.

The site appears to be culturally stratified though no adequate sample was obtained from the deeper levels. The top 18 inches of deposit represent the protohistoric period. The side-notched, concave based point (Type A4) is the most common point form. Flake scrapers, flake knives, hammerstones, and a steatite bead also occurred in the upper levels.

Two manos and a Class C point from the 18-24 inch level probably represent the earlier cultural assemblage found in the deep levels of *sites Mrp-105 and Mrp-97. Rare flake scrapers and two drills (Fig. 8b and like Fig. 8d) complete the artifact inventory from the deeper* levels of Mrp-9.

## Site Mrp-97.

Site Mrp-97 is on the south side of a west tributary of Tamarack Creek, northwest of Tamarack Flat. Seasonal occupation is indicated by the 6800 feet elevation. The main area of settlement is an open flat, 240 by 160 feet, some 300 yards upslope from the creek. The site is classed as a small village on the basis of the twelve mortar holes found in three bedrock outcrops around the edges of the site. The mortar holes vary in depth from ½ inch to 5 inches and average 3 inches deep. The diameters range from 2 to 6 inches.

Four scattered pits, five feet square, were dug to subsoil. Pit A was only 12 inches deep; Pit B was 42 to 44 inches deep; Pit D was 48-54 inches deep; Pit E was 18 inches deep. Pit C was begun but only dug to 18 inches depth. The midden consisted of loose granite sand mixed with granite cobbles and the soil color was lighter than at Mrp-105. Pit D was screened completely. Obsidian flakes were less abundant than at Mrp-105 (Table 12). Some 3% of the flakes were non-obsidian, mostly quartzite; rare chert, basalt and jasper flakes occurred in the top 18 inches of deposit. No bone was recovered.

The 88 surface specimens, including 26 points of non-protohistoric type gave promise of a rich midden. However, excavation produced only 75 specimens, 10 of which were points (Table 11). Of the excavated specimens 60% represent flake scrapers, 13.3% were points, and 9.3% were manos.

The classifiable points represent 26 essentially complete points and 11 basal fragments. The unclassifiable specimens consist of 3 bases and 2 tips. One of the base fragments suggests a leaf-shaped point of Class B or Class C.

One type A4 point from the surface is the only evidence for the protohistoric period at Site Mrp-97. The seven excavated Class B points were restricted to the top 36 inches of deposit, above manos and two of the three Class C points. Shouldered points with expanding stems (Type B7) would appear to be the characteristic projectile point. The number of Class B points at this site together with their limitation to the upper levels suggest that a distinct cultural complex is represented, falling in time between the protohistoric period and the earlier culture which emphasized the mano and metate and Class C points. The bedrock mortar and cobble pestle, flake scrapers, flake knives, blades and a triangular drill (Fig. 8d) complete the artifact inventory of the culture represented by the upper levels.

The deeper levels of the deposit, below 30 inches depth, yielded two Class C points, seven manos, and one metate, as well as flake scrapers and a flake knife. Fourteen Class C points and one mano were found on the surface. This earlier assemblage appears to be related to the cultural remains found in the deep levels of sites Mrp-9 and Mrp-105.

## Site Mrp-105

Site Mrp-105 is located on both sides of Crane Creek about one mile southwest of the Crane Flat Ranger Station. The main settlement area is some 18 feet above the creek, to the northeast. Obsidian is scattered over an irregular area approximately 180 feet in diameter. Seasonal occupation is indicated by the elevation of 6000 feet. The site has been classified as a large village on the basis of the 47 associated mortar holes found in three bedrock outcrops. The mortar holes vary in depth from incipient depressions to 6 inches; the average depth is 3 inches and

only four holes are 6 inches deep. The diameters of the holes vary from 2 to 9 inches.

The depth of deposit in the ten excavated pits varied from 6 to 53 inches, because of the irregular nature of the granite bedrock. Pit A1 was 6 to 14 inches deep; Pit A3 was 7 to 40 inches deep; Pit B1 was 10 to 53 inches deep; Pit B2 was 22 to 53 inches deep; Pit B3 was 40 to 53 inches deep; Pit C was 50 to 53 inches deep; Pit D was 32 to 36 inches deep, but only one-half of the pit was excavated below 12 inches; Pit E was 18 to 23 inches deep; Pit F was 12 inches deep; Pit G was 8 to 18 inches deep.

The midden consisted of loose granite sand, darkened with scattered charcoal and ash. Fractured and occasional stream-worn cobbles and pebbles of granite were common throughout the deposit. Obsidian flakes are abundant at all levels while flakes of jasper, basalt and chert are of rare occurrence. The top four to six inches were dry and contained pine needles and cones. The remaining deposit was damp with frequent tree roots, especially in the 12-18 inch level. Mammal bone was extremely rare, averaging one or two small fractured pieces per level down to 42 inches depth. Of the 23 pieces, all but three were calcined; unburned pieces usually crumbled. All specimens appeared to be deer bone.

The deposit from Pit B3 was put through a quarter-inch screen and all stone flakes were saved. Obsidian represents 97% of the unworked flakes; the frequency increases from 8.6% in the 0-6 inch level to 25.2% in the 24-30 inch level, then decreases to 0.8% in the 48-54 inch level (Table 16). Jasper and basalt flakes are next most common, with rare flakes scattered throughout the deposit. Chert flakes were very rare and are concentrated in the top 12 inches. It may be noted that obsidian flakes were consistently much more abundant at Mrp-105 than at Mrp-97; since Pit B at Mrp-9 was not screened the data from this site are not comparable.

The artifact frequency was quite variable in different pits at Mrp-105. Pits B2, B3 and C were comparable in volume excavated. As would be expected the screened pit (B3) yielded the greatest number of specimens (112), between two and three times as many as any other test area. However, Pit C was also screened, for artifacts only, but yielded only 11 modified specimens. From Pit B2 came 35 artifacts, while Pit B1 yielded 40 specimens even though the volume of this latter pit was reduced by sloping bedrock. Pit B3 yielded 8 manos while only two or three were found in adjacent pits. Only two flake scrapers were found below 36 inches in Pit B3 but ten such specimens were found in the deeper levels of the adjacent Pit B2.

A total of 319 specimens were recovered from Mrp-105, 302 from excavation (Table 15). Flake scrapers were the most abundant, representing 50.6% of all excavated artifacts. Classifiable projectile points constitute 14% of the total while an additional 13% represent unclassifiable fragments, incipient points and rejects. Manos formed 8.6% of the excavated sample.

The classifiable points represent 26 essentially complete specimens, 18 base fragments, and 4 mid-sections. The unclassifiable specimens consist of 17 basal fragments, 2 mid-sections, and 4 tips. Some 15 of the unclassifiable fragments appear to be leaf-shaped bases, only 4 of which are well chipped and many of them appear to have been asymmetrical. Class B or C points may be represented or perhaps small knives. Such specimens occurred throughout the deposit.

No physical stratigraphy was apparent aside from the drier top four to six inches of midden. No house remains were encountered. In individual pits the frequency of artifacts is greatest in the top 18 inches of deposit, though unmodified obsidian flakes were most abundant in Pit B3 in the 18 to 30 inch levels. This higher frequency of artifacts in the upper levels is exaggerated in Table 15 because of the shallow depth of four of the pits. Artifacts were quite rare below 42 inches depth where unmodified obsidian flakes are greatly reduced in number also. In the absence of contradictory evidence a temporal equivalence of horizontal levels has been assumed for all pits. It should be noted that the three manos shown in the 12-18 inch level in Table 15 all come from Pit E and were small fragments; no Class A points were found below 12 inches in this pit. Since all other manos came from deeper levels it is probable that the 12-18 inch level of Pit E should be equated with the 18-24 inch level elsewhere.

Site Mrp-105 is culturally stratified. The top 18 inches of deposit represent the protohistoric Southern Miwok occupation. All but one Class A point came from these upper levels. The most common type, with side notches and concave base (Type A4) was used by the historic Miwok and represents the protohistoric period type elsewhere in Central California. The bedrock mortar can be associated with this late period and flake scrapers were the most common artifact. Flake knives, pointed scrapers and a rubbing stone were limited to the top 18 inches of midden. Three long drills (Fig. 8a) were found in the top 24 inches. One steatite vessel sherd was found at 20 inches depth in Pit D, above any manos, and probably belongs with the upper culture. Two quartz crystals were found in the top 24 inches.

A different cultural assemblage is represented by the artifacts found below 18 to 24 inches depth. The mano and metate were the characteristic grinding implements. The projectile points are much larger, all but two of the excavated Class C points having been found below 18 inches depth. Obsidian was the dominant material used for points; only one chert specimen was found. Four core scrapers made of chert and basalt occurred in the lower levels only. Flake scrapers were found in reduced quantity. A nubbin drill and a combination scraper-knife came from the deeper levels.

A third point complex may be represented in the intermediate levels, where Class B points are concentrated. These points represent a distinct group stratigraphically at Mrp-97. At Mrp-105 Types B1 and B8 occur between Class A points and manos, but other Class B types are fully associated with Class C points and manos.

## Site Mrp-106

Site Mrp-106 is on the east side of upper Crane Creek at the south end of the meadow at Crane Flat, about one quarter mile southeast of the Crane Flat Ranger Station. The New Big Oak Flat Road cuts through the west edge of the site. Situated at 6000 feet elevation, the site must have been abandoned during the winter months. The settlement is classified as a small village on the basis of the nine mortar holes in two bedrock outcrops. The mortar holes are all shallow, from incipient to 5 inches deep (average 2 inches) with diameters which vary from 2 to 7½ inches.

Two test pits were excavated to bedrock. Pit A was 53 inches deep; Pit B varied from 20 to 56 inches deep. No evidence of physical or cultural stratigraphy was found. Three mano fragments were found at 4, 9 and 37 inches depth. One type C9 point was found at 12 inches depth. Two obsidian point fragments occurred in the 24-30 inch level. The manos and Class C point indicate relationship with the lower levels of sites Mrp-9, -97 and -105. The presence of bedrock mortars indicates that late groups did occupy part of the site but the small shallow holes indicate that such an occupation was not of long duration.

## ARTIFACTS

The following analysis deals with some 1270 collected specimens, 770 of which represent flake scrapers, 346 are classifiable projectile points, and 47 are manos while the remainder consists of much rarer chipped and ground stone objects. The existing collections in the University of California Museum of Anthropology from Yosemite Valley, Mrp-3, Big Oak Flat Road, Dingley Creek, Tuo-108, Tuo-166, and Tuolumne and Dana Meadows have been included. The projectile points from Mather Station and Ackerson Meadow are in the collection of Mr. O. L. Wallace of Yosemite Valley. The specimens from the remaining named sites (such as Panorama Ridge, Bridalveil Creek, etc.) as well as those from Mrp-61, Mrp-79, and Tuo-22 are in the Yosemite Museum; since the projectile points in this collection were not weighed, only those specimens which obviously fell into one of the three weight classes were included in the tabulations. Mr. O. Braeski of Hetch Hetchy has an extensive collection from the Lake Eleanor-Hetch Hetchy region, but few of the specimens have been recorded with site provenience; certain specimens from Tuo-48, -49, -51 and -55 are the only material from this collection included in the present report.

### Projectile Points

Materials and Workmanship.

Over 90% of the points were made of black obsidian. There is

considerable variation in the appearance of this material which ranges from opaque to translucent and may be banded or filled with white specks. Occasional red and black or clear glass-like flakes and points are found. Chief Leemee claimed that lighter colored obsidian came from Casa Diablo, while opaque varieties were obtained in the Mono Craters area (Pattee, p. 106). Usually all variations (except the very rare glass-like flakes) can be found at any site with a large collection of flakes. Other source material includes a variety of cherts, jasper, chalcedony, quartzite, basalt and slate. Although flakes of non-obsidian materials are rather common, only 15 of the 346 points were not made of obsidian (6 were of chert, 5 of basalt, 3 of quartzite, and 1 of slate). Most of these non-obsidian points were Class C specimens (11 points) while four were Class B points; all Class A points were of obsidian.

Pressure flaking was less of an art in the Yosemite region than in the Central Valley. Symmetrical outlines were only approximated and the thickness is often irregular on opposite sides. Many of the Class A points were not flaked on all surfaces; such thin flakes were often used that it was necessary only to chip the edges with minimal thinning of the faces. The retouching on most Class C specimens is relatively coarse and irregular.

Descriptive Typology.

The author is in agreement with the need to classify archaeological specimens into historical types, i.e., to organize the available specimens into groups which have "demonstrable historical meaning in terms of behavior patterns" (Krieger, 1944, p. 272). However, the methods for the determination of historical types for any particular region, such as outlined by Krieger, require more knowledge of the cultural associations in time and by area than is now available for the Yosemite area. The majority of specimens in the present collection are surface artifacts with indefinite associations; few surface sites yielded more than one or two points. The limited excavation has not produced all the form variations found in the surface collection, nor is the series of points secured from controlled excavation large enough to allow adequate judgment as to the range of variation which should be allowed for each modal form. The apparent lack of aboriginal interest in the production of carefully chipped, symmetrical points and the fragmentary condition of many specimens are additional problems which hinder classification. With the limited information available it is not yet possible to assess the significance of the numerous rare but distinct forms which are found in the area covered by this report. It would also be premature to ignore such differences as the form of the stem (whether straight, expanding or contracting) merely because no historical significance can be ascribed to such variations at the present time. It is therefore necessary to present descriptive types for which an effort has been made to indicate the range of variation for certain repeated forms.

Those descriptive types which seem to have historical significance will be discussed in the analytical sections following the description

of each weight class. Too little is known about the temporal or areal distribution of these possible historical types to warrant the assignment of a name to each type. At present it is most convenient to refer to each descriptive type by a letter and number designation. The present collection appears to fall into three weight groups which have temporal significance. These three groups have been labeled A, B, and C so as to allow for convenient expansion of each group if future work reveals new forms. Those forms which are represented by two or more specimens have been assigned number designations within each weight group. Each number has no other symbolic significance than to indicate a distinct form variation; Type 1 in Class A has no necessary correlation with Type 1 in Class B or Class C. Single specimens which at present seem to fall outside of the clusterings represented by labeled types are referred to by pertinent figure references.

The points have been separated into three primary groups on the basis of weight because of stratigraphic differences in their distribution which appear to be significant at sites Mrp-97 and Mrp-105.[4] Class A represents those points which weigh one gram or less. At site Mrp-105 all but two of the 24 points from the 0-18 inch levels weighed one gram or less, while all but one of the fifteen points from below 18 inches depth weighed more than one gram (see Figure 1; Table 13). Of the 37 points from site Mrp-97, only one surface point weighed one gram or less. All specimens included in those specific forms which do not occur in the heavier weight groups (such as A3, A4, and A5) weigh one gram or less. A full gram usually separates specimens of those types which share the same basic form in both Class A and Class B (such as types A1-B2, A2-B3, A7-B7, A11-B10). The one definite exception is Type A10 which tends to merge with Type B9. It may be necessary to expand the weight division for Group A stemmed points slightly above one gram if future excavation reveals the definite association of these slightly heavier points with other Group A types. It may be noted that one stemmed, barbed fragment (reconstructed weight 1.3 grams, Figure 1n) was found above 18 inches depth at Mrp-105. However, since eight stemmed points weighing one gram or less were found in the top levels of Mrp-105 it would appear at present that the defined limits for Class A are satisfactory.

Class B points weigh between 1.1 and 3.5 grams. Of the six such points excavated at Mrp-105, five were found in intermediate levels (Table 13, Fig. 1). At site Mrp-97, six of the seven excavated Class B points occurred in the top 18 inches (Table 9). When the group is divided into specific forms the distinctness of this weight group is reinforced by the weight range within each type. Types B4, B5, and B11, with no specific counterparts in the other weight groups, span the defined weight division.

Class C points weigh over 3.5 grams. At site Mrp-105, nine of the eleven excavated specimens in the group occurred below 18 inches depth (Table 13, Fig. 1). At site Mrp-97, two of the three excavated Class C points were found below the Class B points. This group has a wide range of variation in weight (from 3.9 to 16.9 gms.) though about 80% of the Class C specimens weigh between 3.9 and 7 grams. The sheer

size of the points separates this group from all Class A points, and most Class B specimens.

Fenenga (1953) has discussed the functional and temporal significance of the weight of projectile points for a series of North American sites. He proposes (p. 322) a small point tradition consisting of points weighing less than 3.5 grams and a large point tradition with points weighing more than 4.5 grams. Cultures of the small point tradition used the bow and arrow and are relatively late in time. The large point tradition can tentatively be associated with the dart and atlatl and is generally earlier in time than the small point tradition. The stratigraphic weight distribution of the Yosemite points is in agreement with Fenenga's findings, Classes A and B belonging to the small point tradition and Class C representing the large point tradition.

The other dimensions of length, width, and thickness do not show as definite a correlation with stratigraphic location as does weight. The average dimensions for each weight group do show a progressive increase correlated with weight, but the frequency of overlapping specific measurements is too great to allow the use of length, width or thickness as primary typological determinants.

The forms of basal modification have been used to define descriptive types within the three weight classes. It can be seen that the majority of basic forms occur in all three groups: simple triangular, triangular with concave base, side-notched, side-notched with concave base, etc. However, the frequency of these basic forms is not the same in each weight group. In addition, these basic forms often differ in minor details between the different weight groups. For example, Types A3, B4 and C6 are all side-notched but the proportions, form of the side-notches, and the basal treatment differ significantly for each group.

Class A Points.

Weight less than one gram. Average weight 0.7 gms. Average length 24 mm. (15-38 mm. range). Average width 14 mm. (9-23 mm. range). Average thickness 3 mm. (2-5 mm. range). All specimens are made of obsidian. Total of 171 points (50% of total point collection) from at least 41 sites. Measurements for each type are given in Table 17 while the distribution by site is given in Table 18.

Type A1. Small triangular point with straight base (one with slightly convex base); slightly convex sides. Material: obsidian. Total of 6 uniform specimens from 6 sites. Figure 3a-c.

Type A2. Small triangular point with concave base; 8 specimens have convex sides, 3 have concave sides, 2 have straight sides. Material: obsidian. Total of 14 uniform specimens (1 excavated) from 11 sites. Figures 1g, 3d-f.

Type A3. Small point with narrow side notches and straight box-like base; straight sides. Material: obsidian. Total of 7 uniform specimens (2 excavated) from 6 sites. Figures 1h, 3g-i.

Figure 1 i. Small point with wide side notches and convex base. Possibly this specimen is a poorly executed Type A3. Total of one excavated specimen, of obsidian.

Type A4. Small point with narrow side-notches and concave or V-shaped base. This historical type varies in minor details in different areas. One of the form variations is the degree of curvature or indentation of the base. In the Yosemite region the curved base is more frequent though the two forms merge into each other and a division is somewhat arbitrary. However, to indicate the general frequency of each form this type has been divided into two variants, A4a and A4b. Both variants appear to be contemporaneous in the Yosemite region and usually occur at the same site. If both variants are combined, the following data result for type A4: total of 75 points (11 excavated) from at least 26 sites. Average weight 0.65 gms.; average length 25 mm.; average width 13.5 mm.; average thickness 3 mm. Material: obsidian.

Type A4a. Small triangular point with narrow side-notches relatively high on the sides; concave base. Slightly serrated edges (Fig. 1k, 3m) appear on 14 specimens (Mrp-9 (2), Mrp-105, Tuo-153, Tuo-166 (2), Bridalveil Creek, Little Yosemite Valley (2), Panorama Ridge (4), Yosemite Valley). Material: obsidian. Total of 49 uniform specimens (9 excavated) from at least 21 sites. Figures 1j, k, g'; 2a; 3j-m.

Type A4b. Small triangular point with narrow side-notches relatively high on the sides; indented V-shaped base. The sharp angle of the basal notch is the primary feature which separates this subtype from A4a, though the dimensions of A4b points tend to be slightly larger as well. Slightly serrated edges appear on 3 specimens from Mrp-79, Mrp-140 and Tuo-166 (Figure 3p). Material: obsidian. Total of 26 specimens (2 excavated) from at least 13 sites. Figures 1, l; 3 n-p.

Type A5. Small triangular side-notched point with straight, notched base. Two specimens from Mrp-105 have serrated edges. Figure 3r is typical; Figure 3s is represented by one specimen. Rare points intergrade with Type A4. Material: obsidian. Total of 30 uniform specimens (3 excavated) from at least 17 sites. Figures 1a, 3q-s.

Type A6. Small shouldered point with straight stem. Material: obsidian. Total of 3 uniform specimens (1 excavated) from 3 sites. Figure 3t.

Type A7. Small shouldered point with expanding stem. Material: obsidian. Total of 13 somewhat variable specimens from 10 sites. Figure 3u-x.

Type A8. Small shouldered point with contracting stem. Material: obsidian. Total of 3 uniform specimens (1 excavated) from two sites. Figures 1o; 3y.

Type A9. Small shouldered point with concave-based stem. Material: obsidian. Total of one specimen but also present in the Braeski collection from Tuolumne County. Figure 3z.

Type A10. Small tanged point with straight stem. One specimen has slightly serrate edges. Material: obsidian. Total of 2 excavated specimens from 1 site. Figures 1q; 3a'.

Type A11. Small tanged point with expanding stem. Material: obsidian. Total of 11 uniform specimens (2 excavated) from 6 sites. Figures 1r, s; 3b'.

Type A12. Small tanged point with contracting stem. Material: obsidian. Total of one specimen but also present in the Braeski collection from Tuolumne County. Figure 3c'.

Tanged fragments. Three baseless obsidian fragments from site Mrp-105 could represent Type A10, A11, or A12, probably A11 (Figure 1p).

Discussion. The great majority (67.8%) of Class A points are side-notched. Stemmed points represent 19.7% of the class (10.5% are shouldered, 9.2% are tanged). Simple triangular points with straight or concave bases account for 12.5% of Class A specimens.

Side-notched, concave-based points (Type A4)[5] are by far the most common Class A type, representing 44% of the small light points. The type occurs at all sites with more than three Class A points. The temporal significance of this historical type is indicated by the following associations. The points are concentrated stratigraphically in the top levels of Mrp-9 and Mrp-105 (Tables 5, 13). Similar points are found on ethnographic Miwok arrows (Barrett and Gifford, Pl. 59, No. 2) and occur on the surface of historic Miwok sites described herein (Mrp-61, Mrp-62). This type was a common ethnographic form among the adjacent Washo (Rust, p. 13) and Foothill Yokuts (Gayton, 1948, Fig. 10e, f) as well as the Yahi (Pope, Pl. 2). Similar points occur in historic and protohistoric levels of sites in the surrounding region: Vermilion Valley, Site Fre-115 (Lathrap and Shutler, shape 1, Fig. 67a-i); Owens Valley, site Iny-2 (Riddell, Types 7, 9, Fig. 1); Kaweah River, site Tul-10 (Fenenga, 1952, p.344); Lake Tahoe, Kings Beach Complex (Heizer and Elsasser, Fig. 1b, e, i, j, a', c'-e'); Honey Lake, site Las-1 (Fenenga and Riddell, Fig. 58s) and Buena Vista Lake (Wedel, Pl. 39 e-g). The type is presumably late in the Mohave Desert (Rogers, M. J., Pl. 18i, t). This point type does not appear in the Sacramento River Delta and adjacent coast until after the beginning of Phase 2 of the Late Horizon.[6] At present it seems probable that this side-notched, concave-based point did not appear in the Delta area before 1600 A.D. and an eastern derivation is suggested by the wider distribution and earlier occurrence of the type in this direction.

The occurrence of this type in the Great Basin is largely undocumented as yet. It may have been the most common Nevada Shoshone point.[7] Type A4 may be of some antiquity in Southeast Oregon (Cressman, Williams and Krieger, Table II, Type 4 small; Cressman, 1942, Table 20, Type 4) but it does not appear at Lovelock Cave or Gypsum Cave. Similar points seem to first appear in the Southwest around 900 A.D. in Pueblo II and Sedentary Hohokam sites and continued to be used by later cultures (Brew,

Fig. 172n; Woodbury, Fig. 25i; Gladwin, Haury, Sayles and Gladwin, Pl. 86; Kidder, Fig. 4b, d, l, u; Fig. 6a, f; Haury, 1945, Pl. 35p). The relative rarity of this type in the Southwest suggests that the area was peripheral to a more northerly center of distribution of such points. At present it must be assumed that the paucity of archaeological research is responsible for the poor documentation of side-notched, concave-based points in the Great Basin.

Side-notched, end-notched points (Type A5) represent the second most abundant form in the Yosemite area and comprise about 18% of Class A points. The historical significance of the type is indicated by temporal and areal factors. Such specimens were found in the upper levels only of site Mrp-105 and occurred on the surface of the historic Miwok sites Mrp-61 and Mrp-62. All Yosemite sites with more than two Class A points which yielded Type A5 also produced Type A4. The type is represented in historic Paiute sites (site Iny-2: Riddell, Type 8; Walker River area: Meighan, 1955, Type 11) and protohistoric Washo sites (Kings Beach Complex: Heizer and Elsasser, Fig. 1x, y) to the east and north of Yosemite. No specimens from the Central Valley have been noted so the separation of this form from the related Type A4 seems justified. A Great Basin center of distribution seems indicated even though the type is documented adequately only on the peripheries of this area. The side-notched, end-notched point is reported to be the most common form used by the Nevada Shoshone and occurs archaeologically in the area (Steward, 1941, p. 237, Fig. 2c, 3q). A hafted point from Gypsum Cave is probably of this type (Harrington, 1933, Fig. 13). Type A5 appears to be more common than Type A4 in Southeast Oregon (Cressmen, Williams, and Krieger, Table II, Type 5, p. 44; Cressman, 1942, Table 20, Type 5), and in the Colorado River-Mohave Desert region (Schroeder, Pl. 18; Rogers, M. J., Pl. 18h, j, q, r; Campbell, Pl. 48; Harrington, 1952, p. 193). Rare specimens occur in Pueblo III-V, (Morris, Fig. 122v; Kidder, Fig. 6d; Woodbury, Fig. 25b-g, Fig. 26n), Hohokam (Haury, 1945, Pl. 35j, k) and Papago sites (Haury, 1950, Fig. 56r). Steward (1936, pp. 34-37) notes that the type first appears in Basket Maker-Pueblo sites in Utah.

The simple triangular, concave-based point (Type A2) is the third most common form in the Yosemite area (8.2% of Class A points), and can be considered an historical type. Single specimens were found in the upper levels of Mrp-105 and on the surface of two historic Miwok sites in Yosemite Valley (Mrp-61, Mrp-62). All Yosemite sites represented by more than two Class A points which yielded Type A2 have Type A4 points associated. Similar points occur at historic and protohistoric sites in the surrounding region: Vermilion Valley, site Fre-115 (Lathrap and Shutler, shape 2, Fig. 67k-q), Kaweah River, site Tul-10 (Fenenga, 1952, p. 344), Owens Valley, site Iny-2 (Riddell, Types 1, 2), Lake Tahoe, Kings Beach Complex (Heizer and Elsasser, Fig. 1c, j'). The Yahi made similar points (Pope, Pl. 2). The type occurs in the Mohave Desert and on the Colorado River (Rogers, M. J., Pl. 181, m, s; Campbell, Pl. 48; Schroeder, Pl. 18). Type A2 is presumably related to the most frequent late point type in the southern San Joaquin Valley and on the Santa Barbara Coast, though a distinct variant, longer and heavier than Type A2, is more characteristic of both regions (San Joaquin: Wedel, Pl.

38a-c, e, h; Walker, 1947, p. 22; Harrington, 1954, Fig. 4, bottom; Santa Barbara coast: Rogers, D. B., Pl. 75, smallest points). The type is unreported for the Central Sacramento Valley. The type is common in Southeast Oregon (Cressman, Williams and Krieger, Table II, Type 3 small). Similar points appear in Pueblo III times in the Southwest (McGregor, Fig. 132; Kidder, Fig. 3e, i, j, n, o).

Shouldered points with expanding stems (Type A7) represent 7.6% of the Class A points but have less definite associations. The type is restricted to the upper levels of Mrp-9 but was not found at site Mrp-105 or the historic sites in Miwok or immediately adjacent territory. The type does not occur in Long Valley, Mono County (Dixon, 1953, Fig. 3g). Nonetheless, when Type A7 does occur with other points in the Yosemite region, Type A4 is always associated. Elsewhere Type A7 is late in the Lake Tahoe region (Kings Beach Complex: Heizer and Elsasser, Fig. 1a, p, q) and in the Central Sacramento Valley (Lillard, Heizer and Fenenga, Pl. 24, Nos. 41, 42).

Points with expanding stems and short tangs (Type A11) represent the fifth most abundant Class A form in the Yosemite region. The type was limited to the upper levels at site Mrp-105 and it is represented in the surface collection from the historic site Mrp-61 in Yosemite Valley. Sites with multiple points which produce Type A11 also yield Type A4. In neighboring areas similar points occur in Owens Valley (Steward, 1933, Fig. 3g), Mono County (Meighan, 1955, Pl. 3, Nos. 23-25), and near Honey Lake (site Las-1: Fenenga and Riddell, Fig. 58m, n, p. This form is the most frequent type at Las-1 but most specimens slightly exceed the 1 gm. limit used for Class A herein). The type is late in the Central Sacramento Valley (Lillard, Heizer and Fenenga, Pl. 24, No. 37). This basic form is very widespread on all sides of the Yosemite area, but the weight class of published specimens can be determined for so few specimens that wider comparisons are not warranted.

Side-notched, straight-based points (Type A3) represent only 4.2% of Class A points. The type was restricted to the upper levels of site Mrp-105. Type A4 was associated at the two multiple point sites which yielded Type A3. Though the type was not found at site Iny-2, this form does occur in Owens Valley where side-notches were considered to be characteristic ethnographically (Steward, 1933, Fig. 3h, p. 262). Similar points are historic and protohistoric in the Lake Tahoe (Rust, p. 13; Heizer and Elsasser, Fig. 1k, o, k') and Mohave Desert areas (Rogers, M. J., Pl. 18p). This type is common in the Southwest from Pueblo II and Sedentary Hohokam times on (Brew, Fig. 172h-m; McGregor, Figs. 118, 132; Morris, Fig. 122; Gladwin, Haury, Sayles, and Gladwin, Pl. 88a, b; Haury, 1945, Pl. 35f-i).

Simple straight-based triangular points (Type A1) represent 3.6% of the Class A specimens. The type was restricted to the upper levels at site Mrp-9 and was found at the historic Miwok site Mrp-62. When Type A1 points were found with other Class A points, Type A4 was always associated. Specimens are reported from historic or protohistoric sites in Vermilion Valley, site Fre-115 (Lathrap and Shutler, shape 3, Fig. 67r-t), Owens Valley (Riddell, Type 3; Steward, 1933, p. 262), Lake Tahoe (Kings Beach Complex: Heizer and Elsasser, Fig. 1b', g') and also occur

in Long Valley, Mono County (Dixon, Fig. 3c, d). The type is of minor importance in Phase 2 of the Late Horizon in the Sacramento Valley (site Sac-6, unpublished specimens). Larger variants are also found in the southern San Joaquin Valley in historic and protohistoric sites (Walker, 1947, p. 22; Wedel, p. 63).

Types A6, A8, A9, A10 and A12 are at present too rare in the Yosemite region to have historical significance, though all are associated with Types A4 or A5. It may be noted that all but Type A8 somewhat resemble protohistoric points from the Kings Beach Complex in the Lake Tahoe region (Type A6: Heizer and Elsasser, Fig. 1, 1; Type A9; Ibid., Fig. 1g, h; Type A10: Ibid., Fig. 1w; Type A12: Ibid., Fig. 1d). Type A9 is also somewhat similar to one Owens Valley point (site Iny-2: Riddell, Type 12; the tangs and length of base are exaggerated in Riddell's Figure 1 illustration).

In summary, the side-notched, concave-based projectile point (Type A4) represents the most common form of projectile point in the Yosemite region and numerous associations indicate that this type has historical significance as the characteristic point form in the protohistoric period. The stratigraphic associations of Types A2, A3, A5, A8, A10, A11 and A12 with Type A4 at site Mrp-105 indicate that these points also represent the latest prehistoric period of occupation, while the associations found in surface collections strongly suggest that all Class A points have a similar significance. Types A2, A4, A5, A7 and A11, all represented by more than ten specimens and repeatedly found together, comprise about 84% of all Class A points.

While the distribution of many of these types is quite general the type frequencies and total point assemblages are quite variant at the few excavated sites in adjacent regions. The 28 Class A points from the historic Western Mono site in Vermilion Valley (Fre-115) represent Types A1, A2 and A4. In contrast, the 26 Class A points from the protohistoric site Mrp-105 represent nine types. Type A4 is dominant at both sites but at Mrp-105 only one Type A2 was found, and Type A1 was absent. Points without side-notches (Types A1, A2) were more common at Vermilion Valley, while at Mrp-105 the side-notched specimens represent almost half of the Class A points. At Mrp-105 about one-third of the small points were stemmed, but none of the Class A specimens from Vermilion Valley were of this form. All Class A points were made of obsidian at both sites.

The historic Paiute site Iny-2 in Owens Valley yielded almost twice as many Class A points as Mrp-105. Some five types are shared by these two sites (Types A1, A2, A4, A5, and perhaps A9). Though Type A4 is most common at both sites, Type A2 is the next most frequent at Iny-2 in contrast to Type A5 at Mrp-105. The relationship of Types A1, A2 and A4 at Iny-2 is more similar to that of Vermilion Valley than to Mrp-105. Leaf-shaped points are the third most common type at Iny-2, but are as yet unreported for the Yosemite or Vermilion Valley regions.

Despite the proximity of the five surveyed areas of Mono County (Meighan, 1955) no Class A point assemblage comparable to that of

Yosemite is yet apparent. General similarity can be seen between eight of the Class A types shared between the Yosemite region and the Kings Beach Complex of the Lake Tahoe region, though sizes, proportions and frequencies are often at variance. The total point assemblages from Northeast California, the Sacramento Valley, the southern San Joaquin Valley and more distant regions display even greater differences.

Class B Points.

Weight between 1.1 and 3.5 gms. inclusive. Average weight 2.3 gms. Average length 30 mm. (19-53 mm. range). Average width 17 mm. (12-25 mm. range). Average thickness 5 mm. (3-7 mm. range). Material: 65 obsidian, 3 chert, 1 basalt. Total of 69 specimens (20% of total point collection) from at least 26 sites. See Tables 17 and 19 for measurements and site distribution of each type.

Type B1. Medium-sized leaf-shaped point with pointed or straight base. Material: obsidian. Total of 3 variable specimens (1 excavated) from 3 sites. Figures 1v; 4a, b.

Type B2. Medium-sized triangular point with straight (3 specimens) to convex base (1 specimen). Material: 3 obsidian, 1 chert. Total of 4 specimens from 4 sites. Figure 4c, d.

Type B3. Medium-sized point with concave base. Material: 3 obsidian, 1 chert. Total of 4 variable specimens (1 excavated) from 4 sites. Figures 1x; 4e, f.

Type B4. Medium-sized point with wide side-notches and convex base. Material: obsidian. Total of 3 specimens from 3 sites. Figures 2b; 4g.

Type B5. Medium-sized point with side-notches and concave base. Material: obsidian. Total of 5 somewhat variable specimens (2 excavated) from 3 sites. Figures 2c, r; 4h.

Type B6. Medium-sized shouldered point with straight stem. Length and width of stem variable. Material: obsidian. Total of three variable specimens from 3 sites. Figures 2d; 4i, j.

Type B7. Medium-sized shouldered point with expanding stem. Material: obsidian. Total of 14 somewhat variable specimens (3 excavated) from 4 sites. Figures 1b, c, z; 2e-g, s; 4k.

Type B8. Medium-sized shouldered point with wide stem and slightly concave base. Material: 3 obsidian, 1 basalt. Total of 4 specimens (2 excavated) from 3 sites. Figures 1d, w; 2t; 4l.

Type B9. Medium-sized point with short tangs and short straight stem. Material: 4 obsidian, 1 chert. Total of 5 specimens (1 excavated) from 4 sites. Figures 2u; 4m.

Type B10. Medium-sized point with variable tangs and a short expanding stem. Material: obsidian. Total of 13 specimens (1 excavated) from 11 sites. Figures 2h, w; 4n-q.

Type B11. Medium-sized point with angled sides and concave base. Material: obsidian. Total of 2 similar specimens from 2 sites. Figure 4r.

Figure 1y. Medium-sized narrow point with a slightly defined stem. Total of one excavated specimen, of obsidian.

Fragments. One shouldered and seven tanged point fragments lack the stem portion.

Discussion. Of the 69 Class B points the great majority are stemmed (68.5%). Tanged specimens represent 35.7% and shouldered types comprise 32.8% of the Class. Only 11.4% are side-notched. Only two types are significant quantitatively. Type B7 represents 20% of Class B specimens and Type B10 includes 18.6% of the group. Types B5 and B9 represent uniform types, each with five specimens. The remaining types are either very rare or of variable form. All specimens are so rare that no significant association of types occurs repeatedly in different site collections. Of the 28 sites which yielded Class B points, 20 produced only one such specimen and for 13 of these sites no other points are available. The following sites share more than one type: Mrp-97 and Mrp-105 share Types B7, B8 and probably B10; Mrp-97 and Mrp-129 share Types B5, B6 and B10; Mrp-97 and the Coyote Creek site share Types B4 and B6; Mrp-105 and the Hog Ranch site share Types B1 and B9.

The historical significance of Class B points is somewhat uncertain, and the cultural unity of the Class remains to be established. Some seven types (19 specimens) are associated at site Mrp-97 which produced only one surface Class A point. The seven excavated points from this site represent five types and six of the specimens were restricted to the top 18 inches of deposit (Table 9). At site Mrp-105 there were five types clustered in intermediate levels, below Class A specimens and overlapping with Class C points (Table 13). The point sample and stratigraphic associations from these two sites seem sufficient to tentatively propose that Class B points are most typical of a distinct complex which is earlier than the protohistoric period (represented by Class A points) and later than the Class C point assemblage.

Wider comparisons are not possible at this time because the weight group can seldom be determined from the available literature. The following may be noted. Type B10 occurs at Fre-115 in Vermilion Valley (Lathrap and Shutler, shape 4, Fig. 67v-y), site Iny-2 in Owens Valley (Riddell, Type 11), and four areas in Mono County (Meighan, 1955, Type 6, Pl. 3, Nos. 17-24). The most common point type at Las-1 near Honey Lake was tanged with an expanding stem (Fenenga and Riddell, Type 1); however, the weight variation (0.6 to 1.5 gms.) is below that of Type B10. Type B2 and perhaps B8 are also represented at Las-1 (Ibid., Fig. 58, d, c). Type B7 occurs in three areas of Mono County (Meighan, 1955, Type 4,

Pl. 3, Nos. 13, 14). Type B3 may appear at Fre-115 in Vermilion Valley, but Type C3 is perhaps represented (Lathrap and Shutler, shape 7, Fig. 67 ab). Types B2 and B10 occur at Iny-222 (Meighan, 1953, Pl. 26, e, f, g). One type B11 specimen was found at Fre-120 near the confluence of Kaiser Creek and the upper San Joaquin River (UCMA collections).

Class C Points.

Weight over 3.5 grams. Average weight 6.5 gms. (3.9-16.9 gms. range). Average length 45 mm. (26-95 mm. range). Average width 25 mm. (13-36 mm. range). Average thickness 7 mm. (5-8 mm. range). Material: 95 obsidian, 4 basalt, 3 chert, 3 quartzite, 1 slate. Total of 106 specimens (30% of total point collection) from at least 43 sites. See Tables 17, 20, and 21 for measurements and site distribution of each type.

Type C1. Large leaf-shaped point with pointed or rounded base. Maximum width near middle of specimen. Material: obsidian. Total of 6 variable specimens (1 excavated) from 6 sites. Figures 1a', 2i; 5a, b.

Type C2. Large leaf-shaped point with pointed base. Maximum width toward basal end. Material: 1 obsidian, 1 quartzite. Total of 2 variable specimens from 2 sites. Figure 5c, d.

Figure 5e. Large leaf-shaped point roughly pentagonal in outline. Maximum width toward basal end. Material: quartzite. Total of 1 specimen.

Type C3. Short, heavy leaf-shaped point with indented base. Material: obsidian. Total of 5 variable specimens (2 excavated) from 4 sites. Figures 1c', h'; 5f, g.

Type C4. Short, heavy, roughly triangular point with convex sides and straight base. Material: 2 obsidian, 2 green chert, 1 slate. Total of 5 uniform specimens (2 excavated) from 5 sites. Figures 2j; 5h, i.

Type C5. Large point with deeply concave base. Material: obsidian. Total of 17 specimens (2 excavated) from 10 sites. Figures 1e, f, u, f'; 2k; 5j.

Type C6. Large point with narrow side-notches and convex base. Material: obsidian. Total of 3 uniform specimens from 3 sites. Figure 5k.

Figure 5.1. Short, heavy triangular point with broad side-notches near the straight base. Material: basalt. Total of one specimen.

Type C7. Large point with wide side-notches and concave base. Material: 5 obsidian, 1 basalt. Total of 6 uniform specimens from 6 sites. Figures 2l; 5m.

Type C8. Short, heavy point with developed shoulders and wide, expanding stem. Material: obsidian. Total of 2 uniform specimens from 1 site. Figures 2m; 5n.

Type C9. Short, heavy point with developed shoulders and wide, expanding stem. Material: obsidian. Total of 9 uniform specimens (1 excavated) from 6 sites. Figures 2x; 5o.

Type C9 variants. An additional 5 specimens, each from a different surface site, also represent shouldered points with expanding stems. However, each is so distinctive in terms of weight, length, or form that each has been presented individually in Tables 17, 20, and 21, and Figure 5p-t. All are of obsidian except Figure 5s, which is quartzite.

Type C10. Short, heavy shouldered point with contracting stem. Material: obsidian. Total of 3 uniform specimens (1 excavated) from 3 sites. Figures 1b', 2o; 6a.

Type C11. A total of 12 specimens from 8 sites fall into the category of heavy shouldered points with an indented stem. The average dimensions are: weight 5.3 gms., length 38 mm., width 23 mm., thickness 7 mm. However, the variations in form, size and distribution are such that three sub-groups will be described.

Type C11a. Short, heavy point with weak shoulders and slightly expanding stem with indented base. Material: 3 obsidian, 1 pink chert. Total of 4 uniform specimens from 4 sites. Figure 6b-e.

Type C11b. Long, heavy point with variable shoulder development and straight to slightly expanding stem with indented base. Material: obsidian. Total of 5 specimens (2 excavated) from 3 sites. Figures 1d', i'; 6f, g.

Type C11c. Long, heavy point with weak shoulders and a flaring stem with deeply indented base. Material: obsidian. Total of 3 specimens from 1 site. Figure 2p.

Type C12. Large, heavy, tanged point with straight stem. Material: obsidian. Total of 3 variable specimens from 3 sites. Figure 6h-j.

Type C13. Short, heavy, tanged point with expanding stem. Material: obsidian. Total of 6 uniform specimens (2 excavated) from 3 sites. Figures 2q, v, y; 6k.

Type C14. Long, heavy, tanged point with contracting stem. Material: obsidian. Total of 5 specimens (1 excavated) from 4 sites. Figure 6l.

Type C15. Heavy, tanged point with expanding stem and indented base. Material: obsidian. Total of 3 specimens from 3 sites. Figure 6m (2 specimens), 6n.

Type C16. Long, parallel-sided blade with expanding base and basal concavity. Oblique flaking. Material: one basalt one obsidian. Total of 2 specimens from 2 sites. Figure 6o, p.

Figure 6q. Short, heavy point with angled sides and concave base. Material: obsidian. Total of one specimen.

Figure 1e'. Heavy, shouldered point with bulging stem. Material: obsidian. Total of one excavated specimen.

Discussion. A total of 106 Class C points were classified. Almost half of the specimens are stemmed (49.4%), of which 31.9% are shouldered and 17.5% are tanged. Side-notched points represent 11.3% of the collection. Type C5 is the only uniform type which is abundant (17 specimens). Types C9 and C11 are also rather common, but are variable in form.

Types C1, C3, C4, C5, C10 and C11b were concentrated in the deep levels of Mrp-105, below the occurrence of Class A points but overlapping with Class B types (Table 13). Types C9 and C13 were found in the deep levels of Mrp-97, below the occurrence of Class B points (Table 9). A type C14 point occurred below Class A specimens at Mrp-9 (Table 5). Although the excavated sample is small it seems evident that the heavy points represent an assemblage of earlier date than the Class A types. The relationship of Class B and Class C is less certain stratigraphically but the location of points at Mrp-97 supports the suggestion that the Class C assemblage may be distinct and of earlier date than most Class B points.

Of the 40 sites which produced Class C points, 24 yielded only one such specimen; no other points were found at 17 of these sites. The following sites share more than one type.

| Sites | Types Present |
|---|---|
| Mrp-97, Mrp-105 | C1, C4, C5, C10, C11 |
| Mrp-97, Mrp-138 | C1, C9 |
| Mrp-97, Mrp-105, Mrp-231 | C5, C10 |
| Mrp-97, Dingley Creek | C7, C9, C11 |
| Mrp-97, Donohue Pass | C4, C7 |

Type C7 occurs in Vermilion Valley (Lathrap and Shutler, shape 9, Fig. 67ah). Types C1, C5, C11 and C14 occur in several Mono County regions (Meighan, 1955, types 2, 3, 9, 7). Type C5 is found at site Iny-2 in Owens Valley, with serrations (Riddell, type 13). The size range of the points of the Martis Complex from the Lake Tahoe region is similar to Class C specimens. Different materials were used, however, and only a few forms are similar, notably C1, C4, C7 and C8 (Heizer and Elsasser, Types 1c, 2, 4b, 10). Type C5 occurred at site Tul-10 on the Kaweah River (Fenenga, 1952, p. 344). Types C3, C5, C7 and C9 were found in the San Joaquin Valley at Tule Lake (Harrington, 1954, Fig. 2). Types C5 and C8 are common in Middle Horizon sites in the Sacramento Valley (Lillard, Heizer and Fenenga, Pl. 24, Nos. 2, 14). Types C3, C5 (serrated), C8, C9 and C11 fall within the range of points associated with the Pinto Complex of the Southern California Desert (Amsden, Pl. 13; Hamilton, p. 362; Rogers, M. J., Pl. 13; see also Lister, pp. 264, 265, for the distribution of the "Pinto" point, Type C11).

The Type 16 specimen, shown in Figure 6o, from Yosemite Falls Cave (Mrp-58) has been termed a "Yuma" point with implied antiquity (Harrington, 1939, p. 163; McLellan, 1951, p. 119). The specimen is of glassy basalt, and the elongate shape and oblique flaking certainly recall the classic Yuma points of the Plains. However, the expanding base is atypical, and as discussed by McLellan (1952, pp. 112-114), there is perhaps more evidence in favor of the point being a Middle Horizon form. Similar specimens, of obsidian, occur in the Sacramento Valley (Treganza and Cook, Pl. 27, No. 1), at Fre-122 on Cold Creek near Vermilion Valley (UCMA collections), and at Fre-105 in the San Joaquin Valley (Figure 6r, herein). Blade fragments with oblique flaking are reported from protohistoric foothill sites in Fresno and Tulare Counties, as well as from Lake Tenaya, Wawona, and Spider Meadows in Yosemite National Park (McLellan, 1952, pp.112, 113).

## Flake Scrapers

A total of 770 flake scrapers were collected, 520 of which represent surface specimens (see Tables 6, 10, 14, 22 and 23). All but 13 specimens are made of obsidian; the exceptions include 7 of chert, 2 of glass, 3 of basalt and 1 of jasper. The only modification usually consists of a single row of tiny flakes removed by pressure from along one or more edges of one face; with the exception of irregular scrapers the side opposite the bulb of percussion was almost invariably preferred. The scrapers have been divided into seven descriptive types on the basis of shape and the extent of chipping, but only the notched scraper would appear to be functionally distinct; all others very likely served as side scrapers.

Unworked flakes of "flint" were used to scrape maple shoots for basketry and similar obsidian flakes were used to scrape down bows and for scarifiers ethnographically (Barrett and Gifford, p. 212). In all probability the flake scrapers described herein served similar purposes. The "upper mountaineers" made most of the bows and many of the arrows for the groups living in the plains and at lower elevations (Ibid., p. 215). Very likely such scrapers were also used in the manufacture of other wooden objects such as fire drills, mesh sticks, pipes, for scraping bone tools, and for trimming feathers. The notched scraper would be suitable for scraping arrow shafts and other cylindrical objects.

Side Scrapers. Thin flakes of variable shape with the edge of only one side retouched. For obsidian specimens the average length is 29 mm. (18-52 mm. range); average width 18 mm. (11-32 mm. range); average thickness 3 mm. (2-16 mm. range; 11 specimens between 8 and 16 mm. thick represent small nodules of obsidian); average length of retouched edge 20 mm. (10-32 mm.). The non-obsidian specimens are larger: average length 52 mm. (35-62 mm. range); average width 23 mm. (18-29 mm. range; one basalt flake is 46 mm. wide); average thickness 6 mm. (4-9 mm. range; one basalt flake is 18 mm. thick); average length of retouched edge 28 mm. (25-43 mm. range). Five specimens, from Mrp-61, Mrp-105,

Mrp-129, Tuo-112, and Tuo-204, could be classed as end scrapers (Figure 7b). Total of 483 specimens (63% of all flake scrapers). Material: 470 obsidian, 6 chert, 3 basalt, 2 glass, 1 jasper. Figure 7a, b.

Irregular Scrapers. Thin, irregular flakes of obsidian retouched on two or more non-parallel edges; approximately one-third are chipped on both the upper and lower faces but the flaking on neither face intersects (i.e., the scrapers are not bifacial in the sense of a knife or blade). Average length 27 mm. (18-50 mm. range); average width 19 mm. (11-29 mm. range); average thickness 3 mm. (2-7 mm. range). Total of 177 specimens (23% of all flake scrapers). Figure 7c, d.

Elongate Scrapers. Thin, narrow flakes of obsidian retouched along two parallel edges. Average length 32 mm. (22-50 mm. range); average width 17 mm. (12-27 mm. range); average thickness 3 mm. (2-10 mm. range); average length of retouched edges 22 mm. (10-42 mm. range). On four specimens the retouching occurs on opposite faces. Six specimens which also feature retouched ends have been included with side-and-end scrapers; the sites represented are Mrp-9, 6-12 inch level; Mrp-105, 0-6 and 42-48 inch levels; Mrp-117; Mrp-141; and Mrp-231. Total of 43 specimens (5.5% of all flake scrapers). Figure 7e.

Notched Scrapers. Thin irregular flakes of obsidian with a retouched concave notch. Average length 25 mm. (21-32 mm. range); average width 18 mm. (12-35 mm. range); average thickness 3 mm. (2-8 mm. range); average length of notch 10 mm. (6-13 mm. range); average depth of notch 2 mm. (1-3 mm. range). Total of 26 specimens (3.5% of all flake scrapers). Figure 7f, g.

Side-and-end Scrapers. Thin flakes of obsidian retouched along one side and one adjacent end. Six specimens could be classed as elongate end scrapers for two parallel sides and the end are retouched (Figure 7i); see Elongate Scrapers for site distribution. Average length 24 mm. (20-25 mm. range); average width 15 mm. (10-20 mm. range); average thickness 3 mm. (2-6 mm. range). Total of 24 specimens (3% of all flake scrapers). Figure 7h, i.

Pointed Scrapers. Thin flakes retouched along two adjacent edges which come together at a sharp angle. The obsidian specimens average 28 mm. in length (26-30 mm. range); 18 mm. in width (14-20 mm. range); 3 mm. in thickness (3-6 mm. range). The single chert specimen is over 55 mm. long, 42 mm. wide, and 6 mm. thick. Total of 10 specimens (1.5% of all flake scrapers). Figure 7j.

Oval Scrapers. Thin oval flakes of obsidian retouched along 50% or more of their edge. Average length 21 mm. (16-28 mm. range); average width 17 mm. (16-21 mm. range); average thickness 3 mm. (2-5 mm. range). Total of 4 specimens (0.5% of all flake scrapers). Figure 7k.

A large flake scraper and knife is shown in Figure 7l. The parallel sides were retouched on opposite faces while the end exhibits bifacial flaking. Length 83 mm., width 43 mm., thickness 8 mm. It was found at 28 inches depth at Mrp-105. Another unique specimen from Mrp-61 is shown

in Figure 7m. The length is 78 mm., maximum width is 68 mm., and the thickness is 10 mm. Only the upper face was flaked and both ends were retouched.

Few temporal differences are indicated by the stratigraphic excavations (Tables 6, 10, 14). Oval scrapers are limited to intermediate levels at Mrp-97 and Mrp-105 but specimens are so rare that this possible association with Class B points cannot be emphasized. Pointed scrapers were found only in the upper levels of Mrp-105, with Class A points, but again this type of scraper is quite rare. The remaining types occur at all depths but are most frequent in levels which contain Class A points. At sites Mrp-97 and Mrp-105 about 64% of all scrapers are side scrapers and 15 to 22% are irregular scrapers while other types are much rarer. The same general relationship holds for the total surface collection (Tables 22, 23). Side and irregular scrapers were of equal frequency at Mrp-9.

All types except pointed scrapers are found at Fre-115 in Vermilion Valley (Lathrap and Shutler, pp. 235, 236), but the frequencies differ. Side scrapers represent about 70% of the specimens at Fre-115, notched and elongate scrapers were next most frequent (both 8%), followed by side-and-end (5.5%), irregular (4.5%) and oval (4%). Scrapers were relatively rare at Iny-2 in Owens Valley (Riddell, p. 18) and in the Kings Beach Complex of Lake Tahoe (Heizer and Elsasser, p. 20).

## Flake Knives

A total of 15 specimens represent large flakes with bifacial retouching along the edges only. On eight specimens both sides have retouched edges. All are fragmentary. Width varies from 22 to 35 mm., and thickness varies from 5 to 12 mm. Material: 9 obsidian, 4 chert, 1 jasper.

These artifacts are found with all three classes of projectile points but appear to have been most common in the latest period of occupation. The six specimens from Mrp-105 were all found in the top 18 inches of deposit; three from Mrp-97 were found between 12 and 42 inches depth; two from Mrp-9 occurred on the surface and at 18 inches depth. Single flake knives from Mrp-129, Mrp-156, Mrp-213, and Mrp-220 represent surface finds.

It may be noted that the historic Indians often used sharp, unworked flakes of various stones, including granite, for cutting twigs and grass (Barrett and Gifford, p. 237).

## Blades

Leaf-shaped blades, mostly fragmentary, are represented by 41 specimens (Figure 8h-j). One specimen found near Sentinel Bridge (Mrp-79) is stemmed (Figure 8k). Except for two chert fragments, all are of obsidian.

They vary in size from 6.5 to 16 cm. long, 2.1 to 3.7 cm. wide, and 0.7 to 1.2 cm. thick. Both faces are flaked completely but only a few specimens exhibit careful workmanship.

Sites represented include Mrp-3 (2), -61, -62, -79, -94, -97, -105 (3), -121, Bridalveil Creek, Coyote Creek (2), Empire Meadows, Gray Peak Fork, Indian Canyon, Sunrise Trail, Yosemite Valley (2); Tuo-107, -109, -112, -127, -131, -146, -149, -156, -162, -163, -177 (3), -189, -190, -200, Laurel Lake, Rancheria Creek, and Tuolumne Meadows (3).

## Blanks

Two large obsidian blanks crudely flaked on both sides by percussion flaking were found at site Mrp-3 (Figure 81). Average length 13 cm., average width 5.8 cm., average thickness 1.5 cm.

## Drills

A total of 17 specimens can be classed as probable drills. All but one chert specimen are of obsidian. The most common form represented by seven specimens, consists of a long, tapering drill section projecting from an irregular, unretouched base (Figure 8a). The drill section is carefully flaked bifacially and is diamond-shaped in cross-section. No complete specimens were found, but the length of the drill section varies from 20 to more than 40 mm., the width varies from 5 to 10 mm., and the thickness varies from 3 to 7 mm. The basal portion varies from 15 to 20 mm. in length, 18 to 23 mm. in width, and 3 to 7 mm. in thickness. Sites represented include surface specimens from Mrp-97 (2), Mrp-181, Mrp-222, and Tuo-166, while two specimens from Mrp-105 occurred in the top 18 inches of deposit.

One drill found at Mrp-9 at 21 inches depth lacks the expanding base (Figure 8b). The length exceeded 40 mm., the width was 12 mm., and the thickness was 7 mm. Another drill from the surface of Mrp-61 has an expanding base which is completely flaked (Figure 8c). The drill section is 25 mm. long, 6 mm. wide and 6 mm. thick; the base is 15 mm. long and 20 mm. wide.

Three specimens consist of a sharply pointed flake, triangular in cross section, retouched bifacially along the narrow projection (Figure 8d). The length varies from 24 to 36 mm., the width from 16 to 30 mm., and the thickness from 2 to 9 mm. Specimens were found at Mrp-9 (surface and 24-30 inch level) and Mrp-97 (6-12 inch level).

Two nubbin drills have rectanguloid bases and very short, projecting drill sections (Figure 8e). The drill sections are 7 and 10 mm. long, 7 mm. wide, and 3 mm. thick. The bases are 23 and 20 mm. long, 18 and 19 mm. wide. One specimen was found on the surface of Mrp-97 and one was found at 48 inches depth at Mrp-105. The latter specimen is flaked on one surface only.

Two fragments appear to have been reworked from tanged points (Figure 8f). One is from Mrp-222 and one was found at Mrp-105 (18-24 inch level). A large chert specimen from Johnson Peak may represent a reworked point (Figure 8g). The length is 64 mm., width 28 mm., thickness 6 mm.

## Core Scrapers

A total of seven core scrapers were recovered, four of basalt and three of chert. Specimens represent thick, flat-based cores with large flakes removed by percussion from one or more edges (Figure 7n). The workmanship is quite crude and no special care was devoted to their manufacture. The one exception is the chert scraper shown in Figure 7o, which was worked into a keeled form by the removal of flakes from all surfaces except the base. The average length is 7.5 cm. (5.5-9.7 cm. range), average width 6.4 cm. (4-9.3 cm. range), and average thickness 3.4 cm. (2.5-5 cm. range).

Four specimens are from Mrp-105, between 28 and 50 inches depth and are thus associated with Class C points and manos. Single specimens were found on the surface of Mrp-3, Mrp-97, and Mrp-228. Similar specimens are associated with Pinto sites in the Southern California desert (Amsden, Pl. 9e, f; Rogers, M. J., Pl. 11c).

## Choppers

Three choppers were made from fractured cobbles by the removal of percussion flakes from both surfaces of a convex edge. Two are made of basalt and one is of quartzite. The cutting edge of the basalt specimens is battered and dulled from use. The range in length is from 6 to 9.3 cm., width 5.1 to 6.5 cm., thickness 3.1 to 4.5 cm., and weight 113.6 to 170.4 gms. One surface specimen came from Mrp-97 and the two basalt choppers were found at Mrp-105 at depths of 12-18 inches and 43 inches.

## Mortar Rocks and Pestles

Bedrock mortars were associated with 140 sites which have been designated village or house sites. At least 11 additional bedrock mortar sites lack detailed information. The number of mortar rocks found near a single village may vary from one to twelve. All mortar rocks were granite except for one metamorphic outcrop at Hite Cove. Bedrock outcroppings or large boulders with a broad, flat, level area close to the surface of the ground were preferred, and represent the majority of these aboriginal mills. Occasionally when no better resource could be found, high or sloping rocks were used, sometimes difficult of access. Barrett and Gifford (pp. 143, 208) present a description of the use of these mortars for grinding acorns, seeds and berries, as well as the method of starting new holes. A discussion of the number and size of mortar holes will be found herein under Size of Sites and Length of Occupation. The

shape of all mortar holes noted was conical; none of the elliptical holes found in the lower Mariposa foothills (also Southern Miwok territory) were seen. As discussed in the following section, it appears probable that the earliest occupants of the Yosemite region used the mano and metate while the bedrock mortar came into use later, along with Class B points. Use of the mano and metate was abandoned and the bedrock mortar continued to be used into the historic period.

The pestles with which the mortar holes were made were unmodified, streamworn, granite cobbles, selected for an elongate shape with a somewhat pointed or tapering end. The only indication that they were used by man is the use-worn tip and their association with the mortar holes. A total of 94 such specimens were noted at 22 sites. None were recovered from excavations. The pestles vary from 6 to 13 inches long (average 9 inches), 3 to 8 inches wide (6 inches average), and 2 to 5 inches thick (average 3 inches). A typical specimen weighs about 6 pounds, but occasional pestles weigh as much as 13 pounds. Some indication of the variability in shape is given in Barrett and Gifford, Plate 33. Kroeber (1921, Pl. V) illustrates one of these irregular cobbles in use. No shaped pestle has yet been reported from the Yosemite area. The historic Sierran Miwok all relied upon the cobble pestle (Barrett and Gifford, pp. 208-209) as did most other Sierran groups.

## Metates and Manos

A total of nine metate fragments were recovered, seven from site Mrp-105, one from Mrp-97, and one from Mrp-62. One other specimen was observed in the Braeski collection from Tuo-51. All are flat granite slabs. The specimen from Mrp-62 is bifacial, but the remainder have been ground on one surface only. The original shape was probably oval, but no attention was given to careful finish; the edges have been rounded by battering and the rough bottoms are unmodified. No specimens are large enough to provide length or width measurements but one specimen was at least 52 cm. long. The thickness of the outside edge varies from 2.8 to 6.6 cm. with one unusual specimen measuring 11.7 cm. thick. Thickness near the center averages 3.8 cm. The grinding surface was usually roughened by pecking. Two specimens from Mrp-105 still retain traces of red ochre on the grinding surface.

The metate fragment from Mrp-62 was a surface find and might represent a late use of this implement since the site is historic. However, the specimens from Mrp-105 and Mrp-97 were restricted to the deeper levels (Tables 11, 15) and represent the earlier period of occupation.

No bedrock metates were noted in the Yosemite area.

A total of 47 whole or fragmentary manos were noted for the Yosemite area (Figure 9). All were made of granite stream cobbles of a size suitable to be used with one hand. The majority of specimens are oval in outline but five are rectangular and two are asymmetrical cobbles. All but four exhibit bifacial grinding, and the grinding surface is

slightly convex rather than flat. The grinding surface of at least ten specimens was roughened by pecking. In size the manos average 9 cm. long (range 7-15.5 cm.), 7.3 cm. wide (range 5.8-8.9 cm.), and 5.3 cm. thick (range 3.3-7.8 cm.). Figure 9d is exceptionally long. The weight of manos is quite variable; with the exception of the two asymmetrical specimens, the weight ranges from 340.8 gms. to 908.8 gms., averaging 596.2 gms. The asymmetrical cobbles weigh 1022.4 and 1249.6 gms. and both had been only slightly used bifacially.

Single manos were found on the surface of sites Mrp-3, -5, -96, -181, Happy Isles, Grouse Creek, Yosemite Valley, Tuo-51, Tuo-55, and Tuo-234. Additional specimens were recovered by excavation at four sites. At Mrp-105 the 26 manos were found in the deep levels below the occurrence of Class A points (Table 15). The two manos from Mrp-9 also were found deeper than Class A points (Table 7). At Mrp-97 seven of the eight specimens occurred below Class B points while one mano was found on the surface (Table 11). At Mrp-106 the three manos occurred between 4 and 37 inches depth and only one Class C point was recovered from the site.

The 41 manos and metate fragments recovered by excavation from the deeper levels of Mrp-97 and Mrp-105 indicate that these grinding implements were of primary importance to the cultural group which made use of the Class C points. While there is no proof that the mano and metate were the only grinding implements used by these early occupants, the number of specimens suggests that the bedrock mortar was of no importance at this time. Manos were twice as numerous as projectile points in the levels which produced Class C points at Mrp-105 and three times as frequent as points at Mrp-97. Additional evidence for the non-use of the bedrock mortar in the earliest period is afforded by the size of the mortar holes at these sites. At Mrp-105, with 4½ feet of midden deposit over much of the site, the average depth of the 47 mortar holes is only three inches, with only four holes as deep as six inches. If the bedrock mortar had been used during the entire occupation of the relatively large site one should expect much deeper mortar holes. The shallowness of the holes does seem consistent with the 18-inch depth of the protohistoric midden (Class A points), and a possible brief occupation by the users of Class B points who also seem to have relied upon the bedrock mortar.

At Mrp-105 three of the six Class B points were found in the same levels as manos. This perhaps indicates that the users of Class B points also employed the mano and metate, but the evidence from Mrp-97 suggests otherwise and it is more probable that the association of Class B points with manos and Class C points is fortuitous, resulting from only occasional visits to Mrp-105 by the intermediate group which used Class B points. At Mrp-97 no manos were found in the upper half of the deposit, which produced Class B points. Since only one Class A point occurred at this site, on the surface, it seems probable that the 12 mortar holes were made by the users of Class B points. The grinding holes average three inches deep, and do not exceed five inches depth, so again it seems unlikely that the bedrock mortar was used throughout the occupation of this site with a midden deposit of 4½ feet. The size of the mortar

holes appears to be consistent with the 30 inches of deposit which contained Class B points, in view of the high elevation of this bedrock mortar site (6800 feet).

The use of only the bedrock mortar in the protohistoric period is indicated by the absence of manos in the upper levels of Mrp-9 and Mrp-105, and agrees with the dependence on this grinding implement by the historic Southern Miwok. Occasional use of the metate is reported as a recent intrusion, perhaps in the historic period, for the Central Miwok; this group used the side of a cobble pestle as a mano, however (Barrett and Gifford, p. 210). No archaeological pestles were noted which showed such use.

It is doubtful whether this change in grinding implements was accompanied by a change in diet. The mortar (either bedrock or portable) was definitely preferred for the grinding of acorns by most historic California Indians, while the metate was characteristically a seed grinding implement. However, some Sierran groups did use the metate successfully for the preparation of acorn meal, and in view of the scarcity of suitable seeds at these elevations, it seems probable that the acorn was the staple food for all groups in the Yosemite area.

Subsidiary use of the manos as hammerstones may be indicated for 26 specimens with battered ends or sides (9 show both end and side battering, 11 on the sides only, and 6 on the ends only). Manos were also used to pulverize red ochre; this pigment still adheres to three specimens from Mrp-105, two from Mrp-97, and one from Mrp-106.

Similar manos and slab metates are found in the early Martis Complex in the Lake Tahoe region (Heizer and Elsasser, pp. 16, 17). Manos from the southern San Joaquin Valley are quite similar to Yosemite specimens (Gifford and Schenck, Pl. 31). Manos and bedrock metates were used in the much later cultures represented at Fre-115 in Vermilion Valley (Lathrap and Shutler, p. 236) and at Iny-2 in Owens Valley (Riddell, p. 16; one slab metate also occurred at this site).

### Hammerstones

Four oval hammerstones were collected, two of granite and two of basalt. All are streamworn cobbles with battering on one end (one specimen) or both ends (three specimens). The length varies from 6 to 8 cm., width 4.7 to 7.6 cm., thickness 3.2 to 6.5 cm., and weight 113.6 to 453.6 gms. Two were found at Mrp-9 (0-12 inches depth) and two came from Mrp-105 (6-12 and 40 inches depth).

### Rubbing Stones

One thin, oval-shaped, granite stone from Mrp-105 (12 inches depth) has one flat surface abraded from use as a rubbing stone. The dimensions are 8.3 cm. length, 6.3 cm. width, and 2.1 cm. thickness. A small, thin,

oval piece of slate from Mrp-135 exhibits one slightly ground edge. It is 6 cm. long, 2.3 cm. wide, and 0.5 cm. thick.

## Steatite Dishes

A few vessels or sherds of steatite have been found in the Yosemite Park region. Barrett and Gifford (p. 211) record the ethnographic use of such vessels for cooking over the fire, and as general receptacles. Platters and shallow bowls are the usual form (Ibid., Pl. 32, Fig. 9). Occasional specimens have simple handles. The available complete dishes range from 45.7 to 56 cm. long, 28 to 38.1 cm. wide, and 15.3 to 20.4 cm. deep. Most specimens are very crudely made by gouging and scraping, with minimal smoothing. One complete vessel is known from Mrp-45. One body sherd was found at 20 inches depth at Mrp-105, representing a vessel bottom and varying in thickness from 0.6 to 1.8 cm. Surface sherds were collected from Tuo-48, Tuo-49, Tuo-55, Ten Lakes, Yosemite Valley and above Mirror Lake.

One steatite sherd was found at Fre-115 in Vermilion Valley (Lathrap and Shutler, p. 236), and such sherds were common at Tul-10, a site in the lower foothills (Fenenga, 1952, p. 344).

All reported finds of pottery in the Yosemite region which have been checked have turned out to be steatite vessel sherds.

## Beads

Single, small, grey steatite disc beads were found at 6 inches depth at Mrp-9 and on the surface of Mrp-223. Both were 8 mm. in diameter and 3 mm. thick, with a conical central perforation 3 mm. in diameter. Similar beads, all conically drilled, were found at Iny-2 (Riddell, p. 16) and Vermilion Valley (Lathrap and Shutler, p. 236).

Clamshell disc beads, diagnostic of Phase 2 of the Late Horizon in Central California, as well as cupped Olivella beads and one short Tivela bead were noted in the C. E. Miles collection at Gustine from Pate Valley (Tuo-22).

Small, white glass trade beads were found on the surface of Mrp-92. They were fused together in the base of a melted glass bottle and probably represent a cremation offering.

## Quarts Crystals

Two small quartz crystals were found at Mrp-105 in the top 24 inches of midden.

## PREHISTORIC CULTURAL COMPLEXES

A temporal sequence of archaeological complexes has been revealed by areal surveys and limited excavation in the Yosemite National Park region. It must be emphasized that the following discussion is based on a small collection of artifacts and that much more excavation is needed to confirm and elaborate the conclusions presented here. The artifact yield is relatively low at these high elevation sites and most specimens reflect economic pursuits. Occupation was seasonal at all but a few villages at low elevations in the Hetch Hetchy, Yosemite Valley, and Wawona areas. Much of the material culture was made of perishable materials and none of the unburned bone recovered by excavation was well preserved. At the present time it is possible to define three successive archaeological complexes of chipped stone tools and grinding implements, which have been called the Mariposa, Tamarack, and Crane Flat Complexes.

### The Mariposa Complex

The Mariposa Complex, named after Mariposa County, represents the protohistoric period of occupation. It can be identified with the ancestors of the historic Southern and Central Miwok Indians. The type sites are Mrp-9 and Mrp-105, upper levels. Small points weighing less than one gram (Class A), all of obsidian, are the primary diagnostic trait and presumably represent arrow points. Side-notched, concave based points (Type A4) and side-notched, end-notched points (Type A5) are particularly significant numerically. Other types of frequent occurrence are simple triangular points with concave bases (Type A2), shouldered points with expanding stems (Type A7), and tanged points with expanding stems (Type A11).

The bedrock mortar and cobble pestle were used for grinding acorns and seeds. Flake scrapers of various forms are the most common artifact; the pointed scraper may be limited to the Mariposa Complex and the oval scraper may be absent, but other scraper forms occur in all three complexes. Drills are long, parallel-sided forms, diamond-shaped in cross section, with an expanding base. Flake knives, blades, choppers, and hammerstones occur but are non-diagnostic. Steatite vessels, steatite disc beads, and clamshell disc beads can be associated with this complex. Most of the pictographs probably pertain to this culture since they are usually found near historic sites. Cremation of the dead can be proposed on the basis of ethnographic custom.

Major sites of the Mariposa Complex include Mrp-3, Mrp-9, Mrp-61, Mrp-62, Mrp-105, Panorama Ridge site, Glacier Point Road site, Wawona site, Tuo-22, Tuo-166, and the Mather Station site. All sites listed in Table 18 probably had some protohistoric occupation and most of the historic sites recorded for Yosemite Valley with little doubt represent the protohistoric period as well.

The Mariposa Complex is closely related to the protohistoric Washo culture (Kings Beach Complex) to the north, the Owens Valley Paiute culture as found at site Iny-2 to the southeast, and the Western Mono

culture as found at the Vermilion Valley site to the south. Shared traits include a hunting and gathering economy, use of the bow and arrow (inferred from the small, light points and ethnographic use), a preference for obsidian for arrow points, side-notched concave-based points as the most common type, simple triangular points and triangular points with concave bases in differing frequencies, and use of the bedrock mortar and cobble pestle for seed grinding. All but the Kings Beach Complex share serrated points, the long drill with diamond-shaped cross section and expanding base, and conically drilled steatite disc beads. Flake scrapers are most common in the Mariposa Complex and at the Vermilion Valley site. Site Iny-2 and the Vermilion Valley site are linked by two traits which are absent from the Mariposa and Kings Beach Complexes; at both southern sites the mano and portable or bedrock metate were used, and Owens Valley Brown Ware pottery was found.

A terminal date of 1850 can be assigned to the Mariposa Complex, after which date the aboriginal conditions were completely disrupted by American military campaigns directed toward placing the Indians on reservations. No adequate beginning date can yet be proposed. The side-notched, concave-based point does not seem to have appeared in the Sacramento River Delta region before 1600 A.D., while it appears in the Southwest around 900 A.D. An eastern origin for this point type is assumed, so it probably reached the Sierra region before it entered the Great Valley. A guess date of 1200 A.D. is therefore suggested for the beginning of the Mariposa Complex.

## The Tamarack Complex

The Tamarack Complex is named from Tamarack Creek, on which the type site, Mrp-97, is located. In time this cultural unit falls between the protohistoric Mariposa Complex and the earlier Crane Flat Complex. The diagnostic trait consists of projectile points weighing between 1 and 3.5 grams, which presumably were used with the bow and arrow. Obsidian was the preferred material from which points were made, but chert and basalt occasionally were used. The most common point types were shouldered or tanged points with expanding stems (Types B7, B10). Leaf-shaped points with concave bases (Type B3), side-notched points with concave bases (Type B5) and tanged points with straight stems (Type B9) are rarer forms.

The bedrock mortar and cobble pestle appear to have been the primary grinding implements. Flake scrapers are common though less frequent than in the Mariposa Complex. The oval scraper may be a distinctive trait of the Tamarack Complex but it is quite rare. Flake knives and a short triangular drill are also part of this cultural assemblage.

The Tamarack Complex must be regarded as tentative until substantiated by additional excavation at Mrp-97 and perhaps Mrp-129 and Tuo-166. The stratigraphic separation of Class A and B points at site Mrp-105 and the virtual absence of Class A points at Mrp-97 supports the distinctness of these two point assemblages. The occurrence of Class B points above Class C points and manos at site Mrp-97 provides evidence for the separation of the Tamarack and Crane Flat Complexes, even though such separation

is indefinite at site Mrp-105. No sites other than Mrp-97 and Mrp-105 produced more than three Class B points. No similar complex is yet apparent in adjacent areas, though site Iny-222 yielded only Class B points (Types B2, B10, all of non-obsidian).

No adequate basis exists for dating the Tamarack Complex. Points of similar weight first appear in the Sacramento Valley at the beginning of the Late Horizon, around 500 A.D. It is therefore suggested that the Tamarack Complex falls somewhere between 500 A.D. and 1200 A.D.

### The Crane Flat Complex

The Crane Flat Complex is named from Crane Flat, near which is located the type site Mrp-105. It represents the earliest cultural assemblage yet definable for the Yosemite region. Diagnostic traits are projectile points weighing more than 3.5 grams and the mano and portable slab metate. It seems probable that the bedrock mortar was not used. Obsidian was the preferred source material for points, though basalt, chert, quartzite and slate were occasionally used. The most common point types were long, concave-based forms (Type C5), simple leaf-shaped forms (Type C1), shouldered points with expanding stems (Type C9) and shouldered, stemmed points with indented bases (Type C11). It seems probable that spear or dart points are represented, perhaps used with the spear thrower. Heavy core scrapers of chert and basalt also appear to be diagnostic traits. Nubbin drills may be distinctive of this complex. Flake scrapers are less abundant than in later cultures. Blades, choppers, and hammerstones complete the cultural inventory.

The Crane Flat Complex is represented in the lower levels of sites Mrp-9, Mrp-97, and Mrp-105. Surface collections suggest that additional sites may include Mrp-3, Mrp-96, Mrp-106, Mrp-231, the Dingley Creek site, and probably many of those sites listed in Tables 20, 21.

The mano, slab metate, and several types of heavy projectile points are shared with the Martis Complex found in the Lake Tahoe region. The Martis points, however, are usually made of basalt. Point types C5 and C8 are common Middle Horizon forms in the Sacramento Valley. Core scrapers and several point types are shared with the Pinto Complex of the Southern California desert, though dacite was the characteristic material used for points in this early southern culture.

The emphasis on obsidian in the Crane Flat Complex may indicate that this Sierran assemblage is not as old as the Pinto or Martis Complexes. A terminal date of 500 A.D. is suggested.

## CONCLUSIONS

Three field trips devoted to site survey and test excavations in Yosemite National Park have confirmed previous reports of the varied archaeological resources to be found throughout the region and have

provided the outline of a succession of three cultural complexes. Great quantities of obsidian flakes offer concrete evidence of the thorough and long continued exploitation of nearly all altitudes by the former Indian population despite the seasonal limits on occupation.

Some 401 sites have now been recorded in the Yosemite Park region, ranging in altitude from 1600 to 10,700 feet. These sites are concentrated around the edges of the valleys, meadows, and lakes and scattered along the numerous watercourses. Dry, sandy flats with sunny exposure near a water supply were preferred, with an accessible hinterland. In the oak belt villages were located near bedrock outcrops suitable for mortar holes. About 43 percent of these sites represent house sites or large and small villages, with from one to 473 bedrock mortar holes in association. Such sites are concentrated in the Transition Zone where the black oak provided an abundant supply of acorns. Occasional bedrock mortars are found above the upper limits of the oak belt in the lower Canadian Zone, but no higher. Most of the remaining sites are small and large campsites which often occur at such high elevations that one must conclude that hunting was the major activity responsible for their location. Some of the campsites also represent trail stations. Six rock shelters and two caves in Yosemite Valley present evidence of occupation. Simple pictographs occur at five sites. Two pairs of stone circles appear to represent a ceremonial site. The majority of named historic villages in Yosemite Valley were located.

Despite the ardent efforts of surface collectors for many years it is still possible to obtain a sample of projectile points from the surface of sites which is representative of this Sierran region, though individual sites seldom yield more than one or two points. Flake scrapers are the most abundant artifact found while cobble pestles occasionally occur with bedrock mortars. Drills, core scrapers, manos, slab metates, steatite vessel sherds, and steatite or shell beads are rare surface finds.

Limited excavation in four sites has provided stratigraphic evidence for a succession of three cultural assemblages. The latest has been termed the Mariposa Complex and represents the protohistoric period, ancestral to the historic Southern and Central Miwok Indian culture. The dating is quite tentative, but a duration of from about 1200 A.D. to 1850 A.D. is suggested. Small obsidian arrow points weighing less than one gram are the primary diagnostic trait. Side-notched points with concave bases or an end-notch are most typical, but other frequent forms are triangular points with concave bases, and shouldered or tanged points with expanding stems. The bedrock mortar and cobble pestle were used for grinding acorns and seeds. Steatite vessels, steatite disc beads, clamshell disc beads, and pictographs are perhaps limited to this complex. Flake scrapers, flake knives, blades, drills, choppers and hammerstones are additional cultural traits. Cremation of the dead can be proposed from ethnographic practice. Most of the material culture traits of the Mariposa Complex were shared by the Kings Beach Complex (protohistoric Washo) to the north, the Owens Valley Paiute culture to the southeast, and the Western Mono culture to the south. Pottery and the bedrock metate are late traits found further south which did not reach the Yosemite region.

The Tamarack Complex is poorly defined at present but appears to represent the remains of a hunting and gathering people with a distinctive projectile point assemblage. The bearers of this culture preceded those of the Mariposa Complex and quite possibly were ancestral to the later group. A temporal placement of 500 A.D. to 1200 A.D. has been suggested. The diagnostic trait consists of projectile points which weigh between 1 and 3.5 grams and which were probably used with the bow and arrow. The most typical points were shouldered or tanged with expanding stems, usually made of obsidian. Other distinctive forms are leaf-shaped points with concave bases, side-notched points with indented bases, and tanged points with straight stems. The bedrock mortar and cobble pestle were used for seed grinding. Flake scrapers, flake knives, and triangular drills also occur. No close external relationships are obvious at present, though some of the projectile points are similar to types which mark the appearance of the Late Horizon in the Central Valley.

The Crane Flat Complex is the earliest cultural unit yet definable for the Yosemite region and perhaps represented a functioning culture prior to 500 A.D. Groups of hunters and gatherers used the mano and slab metate for food grinding and heavy projectile points weighing more than 3.5 grams which were probably attached to spears or darts rather than arrows. Obsidian was preferred for manufacture of long, concave-based points, simple leaf-shaped points, shouldered points with expanding stems, and shouldered, stemmed points with an indented base. Heavy core scrapers and nubbin drills may be distinctive traits. Flake scrapers, choppers, blades and hammerstones are also found. The rarity of surface manos in comparison to their frequency in excavated sites suggests that most of these early sites were reoccupied by later groups. Certain point types and the use of the mano and metate suggest a general similarity to the Martis Complex of the Lake Tahoe region, the Middle Horizon of the Sacramento Valley, and the Pinto Complex of the Southern California desert.

Archaeological research has thus revealed a long sequence of occupation of the high Sierras by hunting and gathering groups. Available information suggests that the larger sites in the Yosemite region were reoccupied seasonally for centuries. The prehistoric remains so far collected pertain primarily to economic activities and the cultural sample available is too limited to support any extensive interpretation or speculation. Linguistic evidence suggests the dispersal of the speakers of the Miwok language from the Central Valley. One might postulate that the Southern and Central Miwok who occupied the relatively isolated Yosemite region might retain more of the early Penutian culture than did the Plains Miwok who inhabited the Central Valley. However, little similarity is as yet apparent between the artifact inventories of the archaeological cultures which can with some certainty be associated with these historic groups. The unexcavated slab house, the bedrock mortar and cobble pestle, the very small size of arrow points of relatively poor workmanship, certain point types, steatite vessels, and the abundanse of flake scrapers found at historic and protohistoric Southern Miwok sites are all distinctive of the Sierras. If nothing but the artifacts were considered one would suggest a closer affiliation of Southern Miwok with Paiute rather than with Plains Miwok. The abundance

of Southern Miwok myths dealing with the local landscape suggests that this group had long occupied the Yosemite Valley. One might speculate that sites of the Tamarack Complex represent the arrival of the Central and Southern Miwok in the Yosemite region after these groups had already acquired such Sierran traits as the bedrock mortar and cobble pestle. The stemmed projectile points found in this Complex suggest similarities with those found in the Central Valley, though the Tamarack points are smaller and show no trace of the serration which is typical of Phase 1 of the Late Horizon. Sites of the later Mariposa Complex probably represent Central and Southern Miwok occupation after these groups were well established in their Sierran environment, while the arrow points suggest influence from their eastern Shoshonean neighbors. The Crane Flat Complex very likely represents pre-Miwok occupation; perhaps the strongest affiliation of this early period is with the Southern California desert, though relationships will probably appear in the Southern San Joaquin Valley when more is known about this latter area. Much more archaeological information from a variety of sites, including the winter villages at lower elevations, is needed before the prehistory of Yosemite National Park can be seen in proper perspective.

## ENDNOTES

1. Hereafter cited merely as "Paiute." Many reports on the Yosemite region refer to these Indians as "Mono." However, this term is reserved in modern ethnography for the Western Mono, another Shoshonean group occupying the western Sierras just south of the southernmost Miwok.

2. The following represent a few of the contradictions pertaining to Indians:

   Bunnell (1911, p. 83) reports that only one old woman was found in Yosemite by the 1st Battalion. Marvin claims that Tenaya's father and mother were found. Hunt (Hutchings, 1856, p. 4) claims that 600 Indians were found in the Valley. (Hunt has confused Yosemite with an earlier attack on a Nutchu village; Bunnell, 1911, p. 105, reports only 350 captives, <u>including</u> 72 Yosemites and a small band of Pohonichi.)

   Bunnell (1911, p. 99) reports that the above captives escaped, which is supported by a government document referring to the return of the Nutchu and the flight of the Yosemite over the Sierras (Comm. Ind. Aff., p. 88). Hunt and Marvin both report that the Indians were delivered to the reservation.

   The following secondary account is also confused: Bunnell (1911,pp. 298-299) reports that Tenaya led the Awanichi to Mono Lake to escape the 3rd expedition; after his return to Yosemite the next summer he was killed by a Mono raid. Hunt (Hutchings, 1856, p. 8) relates that Chief Ptompkit led the Awanichi to Mono Lake, Tenaya having died of old age in Yosemite. Tomquit was a Yokuts Indian, appointed by the Indian Commission as grand chief of five Yokuts and Western Mono groups living on the San Joaquin River (Comm. Ind. Aff., p. 75). It is extremely unlikely that he would be associated with the Yosemite. Maria Lebrado, the claimed granddaughter of Tenaya who remembered the Mariposa Battalion, reported that Tenaya was killed at Mono Lake in a gambling squabble (Russell, 1947, pp. 47-48).

3. For Latin equivalents of plants see Barrett and Gifford, pp. 142-163. Brockman provides more pertinent discussion of the trees.

4. Only 146 specimens of the 346 classified points were sufficiently complete to yield a reliable weight measurement. However, the weight of the fragment together with the form and other measurements were sufficient to allow the placement of most basal point fragments. The available sample of weighed points by group is as follows: 61 of 171 Class A points were weighed; 50 of the 69 Class B specimens were weighed; 35 of the 106 Class C points were weighed.

5. The distinction between types A4a and A4b is a descriptive convenience at the present time. Both forms appear to be fully contemporaneous in the Yosemite area but the distinction may ultimately have significance

elsewhere. It may be noted that the two forms in the Yosemite region have the same relative frequency at site Iny-2 (Riddell, types 7, 9). Other minor differences in this basic form do have areal significance. The common north central California variant with deep side-notches and a short base (Treganza, 1954, Pl. 2 e-g; Pope, Pl. 27, Nos. 15-17) does not occur in the Yosemite region. Concave-based points with notches high on the sides (Haury, 1945, Pl. 35 a-c) appear to be a distinctive Classic Hohokam form.

6. Unpublished study by M. A. Baumhoff; see Lillard, Heizer and Fenenga, Pl. 24, Nos. 23, 38, 39; Schenck and Dawson, Pl. 91i, 94c. The size range is much greater in this area than elsewhere (compare Schenck and Dawson, Pl. 91c, Pl. 94a, b).

7. Steward, 1941, p. 237, Fig. 2c. This illustration would represent Type A5 herein. However, it seems likely that in dealing with side-notched points Steward lumps the concave-based and end-notched variants together. His type 2 (Steward, 1936, Fig. 11) is end-notched yet is illustrated (Ibid., Fig. 12 bottom, Fig. 14f) by specimens which would be classed as concave-based herein.

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## Explanation of Illustrations

No. ___: 1953 U. C. Field Catalogue (Collection at Yosemite Museum). 1-____: UCMA catalogue number. Y____: Yosemite Museum catalogue number. All specimens are illustrated actual size by outline tracings. All points are obsidian unless otherwise stated.

Figure 1. Stratigraphic occurrence of points, site Mrp-105. (Only representative specimens illustrated; see Table 13 for total occurrence of points).

a. 1-134691. b. 1-134690. c. No. 111. d. No. 46, basalt. e. No. 110. f. No. 1. g. 1-134703. h. No. 14. i. No. 16. j. No. 13. k. 1-134722. l. 1-134702. m. 1-134698. n. No. 9. o. No. 8. p. No. 29. q. No. 19. r. 1-134696. s. No. 15. t. No. 41. u. No. 103. v. No. 31. w. No. 47. x. No. 120, chert. y. No. 90. z. No. 48. a'. No. 89. b'. No. 33. c'. No. 93. d'. No. 108. e'. No. 32. f'. No. 43. g'. No. 99. h'. No. 122. i'. No. 121. j'. No. 38, chert.

Figure 2. Stratigraphic occurrence of points, site Mrp-97. (Only representative specimens illustrated; see Table 9 for total occurrence of points).

a. No. 166. b. 1-134657. c. No. 160. d. No. 162. e. No. 159. f. 1-134622. g. No. 152. h. No. 154. i. 1-134658. j. 1-134653a, chert. k. No. 170. l. No. 156. m. No. 153. n. 1-134660. o. No. 155. p. 1-134648. q. 1-134649. r. No. 194. s. No. 180. t. No. 195. u. No. 198. v. No. 179. w. No. 182. x. No. 201. y. No. 189.

Figure 3. Class A projectile point types.

a. Tuolumne Meadows, 1-64212. b. Mrp-9, 1-208028. c. Mrp-62, 1-134619. d. Mrp-62, 1-134585. e. Yosemite Valley, 1-7013b. f. Mrp-168, 1-134839. g. Tuo-22, Y482. h. Tuo-206, 1-154288. i. Yosemite Valley, 1-7013c. j. Mrp-129, 1-134770. k. Mrp-203, 1-207895. l. Tuo-166, 1-64220. m. Tuo-166, 1-62525. n. Mrp-61, 1-134576. o. Mrp-229, 1-207941. p. Mrp-140, 1-134809. q. Tuo-108, 1-62518. r. Tuo-166, 1-64221. s. Tuo-108, 1-62519. t. Mrp-9, 1-208006. u. Yosemite Creek Trail, Y449. v. Mrp-9, 1-208046. w. Mrp-9, 1-207992. x. Tuo-166, 1-64218. y. Mrp-61, Y297. z. Ackerson Meadow site, O. L. Wallace collection. a'. Mrp-105, No. 5. b'. Mrp-183, 1-134853. c'. Mrp-105, No. 41.

Figure 4. Class B projectile point types.

a. Dana Creek, South Fork, 1-64049. b. Hog Ranch, Y434. c. Dana Creek, 1-64053. d. Mrp-9, 1-207987. e. Tuo-211, 1-154297. f. Tuo-172, 1-154225. g. Coyote Creek, Y7453b. h. Mrp-129,

1-134759. i. Coyote Creek, Y7453a. j. Mrp-129, 1-134762. k. Tuo-157, 1-134989. l. Tuo-156, 1-134983. m. Tuo-166, 1-64215. n. Tuo-124, 1-134907. o. Tuo-160, 1-134998. p. Tuo-152, 1-134973. q. Mrp-203, 1-207896. r. Mrp-135, 1-134785.

Figure 5. Class C projectile point types.

a. Tuolumne Meadows, Y6473. b. Tuo-129, 1-134922. c. Mrp-57, Y6471. d. Tuo-156, 1-134984. e. Upper Fletcher Lake, Y6910. f. Tuo-121, 1-134900. g. Mrp-9, 1-207993. h. Mrp-9, 1-208010, slate. i. Mrp-96, 1-134640. j. Mrp-192, 1-134752. k. Mrp-3, 1-24080. l. Mrp-129, 1-134771, basalt. m. Mrp-132, 1-134779. n. Mrp-97, No. 151, basalt. o. Tuo-138, 1-134944. p. Mrp-96, 1-134639. q. Rafferty Creek, 1-64069. r. Tuo-149, 1-134968. s. Mrp-106, No. 141. t. McClure Glacier Lake Shore, Y7456.

Figure 6. Additional Class C projectile point types.

a. Mrp-231, 1-207950. b. Tuolumne Meadows, 1-64211. c. Mrp-131, 1-134777. d. Mather Station, O. L. Wallace collection. e. Hog Ranch, Y429. f. Dingley Creek, 1-64059. g. Dingley Creek, 1-64208. h. Big Oak Flat Road, 1-18584. i. Four Mile Trail, Y7855. j. Dana Creek, South Fork, 1-64050. k. Yosemite Valley, 1-7013d. l. Mrp-119, 1-134740. m. Dana Creek, 1-62513. n. Hog Ranch, Y432. o. Mrp-58, Y7874, basalt. p. Mrp-231, 1-207949. q. Mrp-129, 1-134769. r. Fre-105, 1-172346.

Figure 7. Flake and core scrapers.

a. Side scraper. Mrp-135, 1-134790. b. Side (or end?) scraper. Tuo-112, 1-134887. c. Irregular scraper. Mrp-231, 1-207965. d. Irregular scraper. Mrp-9, 1-208086. e. Elongate scraper, Mrp-97, No. 229. f. Notched scraper. Mrp-88, 1-134628. g. Notched scraper. Tuo-204, 1-154285. h. Side and end scraper. Mrp-105, No. 277. i. Elongate and end scraper. Mrp-105, No. 258. j. Pointed scraper. Mrp-207, 1-207901. k. Oval scraper, Mrp-97, No. 204. l. Flake scraper and knife. Mrp-105, No. 45. m. Unique end scraper. Mrp-61, Y6112. n. Basalt core scraper. Mrp-105, No. 83. o. Chert core scraper. Mrp-105, No. 64.

Figure 8. Drills, blades and blank.

a. Drill, Mrp-105, 1-134716. b. Drill, Mrp-9, 1-208004. c. Drill, Mrp-61, no number. d. Drill, Mrp-97, No. 203. e. Nubbin drill, Mrp-97, No. 169. f. Drill fragment, Mrp-222, 1-207928. g. Drill, Johnson Peak, Y7356. h. Blade, Rancheria Creek, Y7019. i. Blade, Mrp-3, 1-24078. j. Blade, Mrp-97, No. 150. k. Stemmed blade, Sentinel Bridge, from notes of R. F. Heizer, l. Blank, Mrp-3, 1-24077.

Figure 9. Bifacial manos.

a. Mrp-9, 1-208041. b. Mrp-105, No. 75. c. Mrp-105, No. 130. d. Yosemite Valley, Y7432.

Figure 10. Pictographs from the Yosemite region.

a. Mrp-49 (Yosemite Valley). Red. 16½ by 3 inches.
b. Mrp-223 (Bridalveil Creek). Red. 19 by 20 inches.
c. Mrp-71 (Yosemite Valley). Red. 15 by 11 inches.
d-j'. Pictographs from Tuo-22 (Pate Valley). All are done in red except b' (black oval with red lines) and c' (black). Approximate scale: 1:10. d-c': isolated figures. d'-j': pictograph groups.

Figure 11. Pictographs from site Tuo-22.

Pictograph groups done in red paint. Approximate scale: 1:10.

| Merriam, 1917, pp. 205-206 | UCAS Site Number Mrp- | Powers, 1877, p. 365 | Other References (Bunnell entries refer to 1880 edition) |
|---|---|---|---|
| M-1. Hookehatchke | 45? | | Bunnell, p. 75; ftpc. |
| M-2. Hollow | 57 | | Ross, p. 67 |
| M-3. Wiskahlah | 51, 52 | Wiskulla | Bunnell, p. 75; ftpc. |
| M-4. Yowatchke (Mahchato) | 61 | Macheto | Leidig: Paiute village |
| M-5. Ahwahne | 56 | Awani | |
| M-6. Koomine | 58, 59, 240 | Kumaini | |
| M-7. Wahogah | 63 | Wahaka | |
| M-8. Soosemoolah | 66 | | |
| M-9. Hahkiah | 67, 69 | | |
| M-10. Kompompasah | 159, 160 | | Wheeler; Leidig No. 3 |
| M-11. Awokoie | near 158 (pictograph) | | |
| M-12. Helejah | 62 | | |
| M-13. Haengah | 65 | | |
| M-14. Yuachah | not located | | |
| M-15. Hephepooma | 64 | | Bunnell, p. 73; ftpc. |
| M-16. Tietemah | 187 | | |
| M-17. Hokonah | not located | | |
| M-18. Wetumtah | not located | | |
| M-19. Pootpootoon | 189 | | |
| M-20. Ahwahmah | not located | | |
| | 188 | P-1. Notomidula | |
| | not located | P-2. Lesamaiti | Probably the cave reported by Beatty, 1933b, p. 8, inside Ahwahnee Hotel grounds. |
| | 54 | | Leidig X: Paiute village |

North Side Villages

Table 1. Concordance of Ethnographic and Archaeological Sites in the Yosemite Valley.

| Merriam, 1917, pp. 207, 208 | UCAS Site Number Mrp- | Powers, 1877, p. 365 | Other References |
|---|---|---|---|
| M-21. Sappahsammah | near 71 (pictograph) | | |
| M-22. Lemmehitchke | 73 | | |
| M-23. Hoptone | not located | | |
| M-24. Wesummeh | 75? | | Bunnell, p. 78? |
| M-25. Kisse | 76 | | |
| M-26. Chachakallah | not located | Sakkaya | |
| M-27. Hammooah | not located | | |
| M-28. Loiah | 92, 83 | | Bunnell, ftpc.; Leidig No. 4 |
| M-29. Hookoomekotah | 161, 162 | | |
| M-30. Hawkawkooetah | 79, 78 | Hokokwidok | Bunnell, ftpc. |
| M-31. Holow | 82 | | |
| M-32. Wahtahkitchke | not located | | |
| M-33. Toovuyuyu | not located | | |
| M-34. Toolahkahmah | 84 | | |
| M-35. Ummataw | 80, 186 | | Bunnell, ftpc. |
| M-36. Apoomeh | 85 | | |

South Side Villages

Table 1 continued.

| Number of Mortar Holes Associated With Each Site | Number of Sites |
|---|---|
| **House Site** | |
| 1 | 9 |
| 2 | 9 |
| 3 | 15 |
| 4 | 8 |
| 5 | 6 |
| 6 | 8 |
| 7 | 1 |
| **Small Village** | |
| 8 | 8 |
| 9 | 7 |
| 10 | 5 |
| 11 | 7 |
| 12 | 9 |
| 13 | 5 |
| 15 | 2 |
| 16 | 2 |
| 18 | 1 |
| 19 | 1 |
| **Large Village** | |
| 21 | 2 |
| 22 | 2 |
| 23 | 1 |
| 24 | 3 |
| 25 | 2 |
| 27 | 1 |
| 28 | 2 |
| 29 | 2 |
| 34 | 1 |
| 35 | 2 |
| 37 | 1 |
| 42 | 1 |
| 45 | 1 |
| 46 | 2 |
| 47 | 1 |
| 51 | 1 |
| 52 | 2 |
| 56 | 1 |
| 57 | 1 |
| 58 | 1 |
| 59 | 1 |
| 85 | 1 |
| 156 | 1 |
| 473 | 1 |

Table 2. Number of Mortar Holes Associated With Sites.

| Elevation in feet | Large Village | Small Village | House Site | Large Camp | Small Camp | Total Sites |
|---|---|---|---|---|---|---|
| 10,001-10,700 | | | | 4 | 8 | 12 |
| 9,501-10,000 | | | | 5 | 20 | 25 |
| 9,001- 9,500 | | | | 6 | 12 | 18 |
| 8,501- 9,000 | | | | 2 | 7 | 9 |
| 8,001- 8,500 | | | | 21 | 32 | 53 |
| 7,501- 8,000 | | 1 | 2 | 2 | 7 | 12 |
| 7,001- 7,500 | | 3 | 2 | 3 | 8 | 16 |
| 6,501- 7,000 | 1 | 3 | 3 | 8 | 4 | 19 |
| 6,001- 6,500 | 2 | 5 | 8 | 2 | 4 | 21 |
| 5,501- 6,000 | 3 | 5 | 1 | 2 | 5 | 16 |
| 5,001- 5,500 | 2 | 0 | 2 | 0 | 1 | 5 |
| 4,501- 5,000 | 5 | 7 | 8 | 1 | 4 | 25 |
| 4,001- 4,500 | 8 | 5 | 6 | 5 | 6 | 30 |
| 3,501- 4,000 | 15 | 16 | 18 | 4 | 3 | 56 |
| 3,001- 3,500 | 0 | 0 | 2 | 0 | 0 | 2 |
| 2,501- 3,000 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2,001- 2,500 | 0 | 0 | 1 | 0 | 0 | 1 |
| 1,600- 2,000 | 0 | 3 | 3 | 2 | 0 | 8 |
| Totals: | 36 | 48 | 56 | 67 | 121 | 328 |

Table 3. Distribution of Sites by Elevation.

| Type of Site | No. | % of all sites | Life Zone: Upper Sonoran No. | % | Transition No. | % | Boreal No. | % |
|---|---|---|---|---|---|---|---|---|
| Large Village | 36 | 11.0 | 0 | 0 | 30 | 83.3 | 6 | 16.7 |
| Small Village | 48 | 14.7 | 3 | 6.3 | 28 | 58.3 | 17 | 35.4 |
| House Site | 56 | 17.1 | 4 | 7.1 | 36 | 64.3 | 16 | 28.6 |
| Large Campsite | 67 | 20.5 | 2 | 3.0 | 10 | 14.9 | 55 | 82.1 |
| Small Campsite | 121 | 36.7 | 0 | 0 | 14 | 11.7 | 107 | 88.3 |
| Total Sites | 328 | | 9 | | 118 | | 201 | |

a. Distribution by Size of Site

| Life Zone | No. | Percent of all sites | Large Village No. | % | Small Village No. | % | House Site No. | % | Large Camp No. | % | Small Camp No. | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Sonoran | 9 | 2.7 | 0 | 0 | 3 | 30.0 | 4 | 40.0 | 2 | 30.0 | 0 | 0 |
| Transition | 118 | 36.1 | 30 | 25.4 | 28 | 23.7 | 36 | 30.5 | 10 | 8.5 | 14 | 11.9 |
| Boreal | 201 | 61.2 | 6 | 3.0 | 17 | 8.5 | 16 | 8.0 | 55 | 27.5 | 107 | 53.0 |
| Total Sites | 328 | | 36 | | 48 | | 56 | | 67 | | 121 | |

b. Distribution of Sites by Life Zone

Table 4. Archaeological Sites and Life Zones.

| Depth/Type | A1 | A1a | A5 | A6 | A7 | B2 | Shouldered Fragment | C3 | C4 | C14 | Class Totals A | B | C | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface | | 1 | 2 | | | 1 | | 1 | | | 3 | 1 | 1 | 5 |
| 0-6" | 1 | 1 | | 1 | 1 | | 1 | | 1 | | 4 | 1 | 1 | 6 |
| 6-12" | | 2 | | | | | | | | | 2 | | | 2 |
| 12-18" | | | | | 1 | | | | | | 1 | | | 1 |
| 18-24" | | | | | | | | | 1 | | | 1 | | 1 |
| 24-30" | | | | | | | | | | | | | | 0 |
| 30-36" | | | | | | | | | | | | | | 0 |
| Total | 1 | 4 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 10 | 2 | 3 | 15 |

Table 5.

Distribution of Projectile Points at Site Mrp-9.

| Depth/Type | Side | Irregular | Elongate | Notched | Side and End | Total |
|---|---|---|---|---|---|---|
| Surface | 2 | 1 | 1 | | | 4 |
| 0-6" | 8 | 7 | 2 | 1 | | 18 |
| 6-12" | 4 | 3 | 2 | 1 | 1 | 11 |
| 12-18" | 1 | 2 | | | | 3 |
| 18-24" | 4 | 3 | 1 | | | 8 |
| 24-30" | | 2 | | | | 2 |
| 30-36" | | 1 | | | 1 | 2 |
| Total | 19 | 19 | 6 | 2 | 2 | 48 |

Table 6.

Distribution of Flake Scrapers at Site Mrp-9.

| Depth | Artifact Point Classes A | B | C | Unclassifiable Point Fragments | Incipient Points, Rejects | Flake Scrapers | Flake Knives | Drills | Hammerstones | Manos | Steatite Bead | Total | Percent of Excavated Sample |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface | 3 | 1 | 1 | 4 | 1 | 4 | 2 | 1 | | | | 17 | |
| 0-6" | 4 | 1 | 1 | 4 | 1 | 18 | | | 1 | | 1 | 31 | 39.7 |
| 6-12" | 2 | | | 2 | 2 | 11 | | | 1 | | | 18 | 23.1 |
| 12-18" | 1 | | | 1 | 2 | 3 | 1 | | | | | 8 | 10.3 |
| 18-24" | | | 1 | 1 | 1 | 8 | | 1 | | 2 | | 14 | 17.9 |
| 24-30" | | | | 1 | | 2 | | 1 | | | | 4 | 5.1 |
| 30-36" | | | | 1 | | 2 | | | | | | 3 | 3.8 |
| Total | 10 | 2 | 3 | 14 | 7 | 48 | 3 | 3 | 2 | 2 | 1 | 95 | |

Table 7. Distribution of All Artifacts at Site Mrp-9.

| Depth | Obsidian No. | Percent |
|---|---|---|
| 0-6" | 63 | 23.5 |
| 6-12" | 46 | 17.1 |
| 12-18" | 29 | 10.8 |
| 18-24" | 67 | 25.0 |
| 24-30" | 47 | 17.6 |
| 30-36" | 16 | 6.0 |
| Total | 268 | |

Table 8.

Frequency of Unworked Flakes in Pit B (Unscreened), Site Mrp-9.

| Depth/Type | A4a | B4 | B5 | B6 | B7 | B8 | B9 | B10 | C1 | C4 | C5 | C7 | C8 | C9 | C10 | C11c | C13 | Class Totals A | Class Totals B | Class Totals C | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface | 1 | 1 | 1 | 1 | 7 | | | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 2 | 1 | 12 | 14 | 27 |
| 0-6" | | | 1 | | | 1 | | | | | | | | | | | | | 2 | | 2 |
| 6-12" | | | | | 1 | | | | | | | | | | | | | | 1 | | 1 |
| 12-18" | | | 1 | | 1 | | 1 | | | | | | | | | | 1 | | 3 | 1 | 4 |
| 18-24" | | | | | | | | | | | | | | | | | | | | | 0 |
| 24-30" | | | | | | | | | | | | | | | | | | | | | 0 |
| 30-36" | | | | | | | | 1 | | | | | | | | | | | 1 | | 1 |
| 36-42" | | | | | | | | | | | | | | 1 | | 1 | | | | 2 | 2 |
| 42-48" | | | | | | | | | | | | | | | | | | | | | 0 |
| 48-54" | | | | | | | | | | | | | | | | | | | | | 0 |
| Total | 1 | 1 | 3 | 1 | 9 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 3 | 4 | 1 | 19 | 17 | 37 |

Table 9. Distribution of Projectile Points at Site Mrp-97.

| Depth/Type | Side | Irregular | Elongate | Notched | Oval | Total |
|---|---|---|---|---|---|---|
| Surface | 28 | 15 | 1 | 1 | | 45 |
| 0-6" | 3 | 1 | | 2 | | 6 |
| 6-12" | 1 | | | | | 1 |
| 12-18" | 9 | 3 | 2 | | | 14 |
| 18-24" | 3 | 1 | 1 | | 1 | 6 |
| 24-30" | 3 | | 1 | | | 4 |
| 30-36" | 4 | 1 | | 1 | | 6 |
| 36-42" | 4 | 1 | | | | 5 |
| 42-48" | 1 | | | | | 1 |
| 48-54" | 1 | | | | | 1 |
| Total | 57 | 22 | 5 | 4 | 1 | 89 |

Table 10.

Distribution of Flake Scrapers

at Site Mrp-97.

| Depth | Artifact | Point Classes A | B | C | Unclassifiable Point Fragments | Incipient Points, Rejects | Flake Scrapers | Flake Knives | Blades | Drills | Core Scraper | Chopper | Manos | Metate | Total | Percent of Excavated Sample |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface | | 1 | 12 | 14 | 2 | 7 | 45 | | 1 | 3 | 1 | 1 | 1 | | 88 | |
| 0-6" | | | 2 | | | 2 | 6 | | | | | | | | 10 | 13.4 |
| 6-12" | | | 1 | | 2 | 2 | 1 | | | 1 | | | | | 7 | 9.3 |
| 12-18" | | | 3 | 1 | 1 | | 14 | 1 | 1 | | | | | | 21 | 28.0 |
| 18-24" | | | | | | 1 | 6 | 1 | | | | | | | 8 | 10.7 |
| 24-30" | | | | | | | 4 | | | | | | | | 4 | 5.3 |
| 30-36" | | | 1 | | | | 6 | | | | | | 4 | | 11 | 14.7 |
| 36-42" | | | | 2 | | | 5 | 1 | | | | | 1 | | 9 | 12.0 |
| 42-48" | | | | | | | 1 | | | | | | 2 | 1 | 4 | 5.3 |
| 48-54" | | | | | | | 1 | | | | | | | | 1 | 1.3 |
| Total | | 1 | 19 | 17 | 5 | 12 | 89 | 3 | 2 | 4 | 1 | 1 | 8 | 1 | 163 | |

Table 11. Distribution of All Artifacts at Site Mrp-97.

| | Unworked Flakes | | | | | |
|---|---|---|---|---|---|---|
| | Obsidian | | Jasper | Basalt | Chert | Quartzite |
| Depth | No. | Percent | No. | No. | No. | No. |
| 0-6" | 128 | 24.6 | 1 | 1 | | |
| 6-12" | 65 | 12.5 | 1 | 1 | 1 | 1 |
| 12-18" | 71 | 13.7 | | | 2 | 1 |
| 18-24" | 54 | 10.4 | | | | 1 |
| 24-30" | 37 | 7.1 | | | | |
| 30-36" | 45 | 8.6 | | | | |
| 36-42" | 57 | 11.0 | | | | 1 |
| 42-48" | 49 | 9.4 | | | | 6 |
| 48-54" | 14 | 2.7 | | | | |
| Total | 520 | | 2 | 2 | 3 | 10 |

Table 12. Frequency of Unworked Flakes in Screened Pit D, Site Mrp-97.

| Depth/Type | A2 | A3 | Fig. 1 i | A4a | A4b | A5 | A8 | A10 | A11 | A12 | Tanged Fragments | B1 | B3 | B7 | B8 | Tanged Fragments Fig. 1 y | C1 | C3 | C4 | C5 | C10 | C11b | Fig. 1 e' | Class Totals A | B | C | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface | | | | | | 1 | | | | | | | | 2 | 1 | | | | | 2 | | | | 1 | 3 | 2 | 6 |
| 0-6" | | 2 | | 3 | 1 | 1 | | | 1 | | 1 | | | | | | 1 | | | | | | | 9 | | 1 | 10 |
| 6-12" | 1 | | 1 | 2 | 1 | 2 | 1 | 2 | 1 | | 1 | | | | 1 | | | | | 1 | | | | 12 | 1 | 1 | 14 |
| 12-18" | | | | | 1 | | | | | 1 | 1 | | | | | | | | | | | | | 3 | | | 3 |
| 18-24" | | | | | | | | | | | | 1 | | 1 | | | | | | 1 | 1 | | 1 | | 2 | 3 | 5 |
| 24-30" | | | | | | | | | | | | | 1 | | | 1 | 1 | | | | | | | | 2 | 1 | 3 |
| 30-36" | | | | | | | | | | | | 1 | | | | | | 1 | | | | 1 | | | 1 | 2 | 3 |
| 36-42" | | | | 1 | | | | | | | | | | | | | | | 1 | | | | | 1 | | 1 | 2 |
| 42-48" | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| 48-54" | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | 2 | 2 |
| Total | 1 | 2 | 1 | 6 | 3 | 4 | 1 | 2 | 2 | 1 | 3 | 1 | 1 | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 4 | 1 | 2 | 1 | 26 | 9 | 13 | 48 |

Table 13. Distribution of Projectile Points at Site Mrp-105.

| Depth/Type | Side | Irregular | Elongate | Notched | Side and End | Pointed | Oval | Total | Percent |
|---|---|---|---|---|---|---|---|---|---|
| Surface | 8 | | 1 | | | | | 9 | |
| 0-6" | 23 | 3 | 1 | 3 | 2 | | | 32 | 19.7 |
| 6-12" | 19 | 6 | 2 | 1 | 1 | 4 | | 33 | 20.5 |
| 12-18" | 24 | 4 | 2 | 2 | 1 | 1 | | 35 | 21.6 |
| 18-24" | 14 | 5 | 1 | 2 | 2 | | | 24 | 14.8 |
| 24-30" | 10 | 5 | 1 | 1 | | | 1 | 18 | 11.1 |
| 30-36" | 4 | 1 | | | | | | 5 | 3.1 |
| 36-42" | 5 | 2 | 2 | 2 | 1 | | | 12 | 7.4 |
| 42-48" | 2 | | | | 1 | | | 3 | 1.8 |
| 48-54" | | | | | | | | 0 | |
| Total | 109 | 26 | 10 | 11 | 9 | 5 | 1 | 171 | |
| Percent | 63.7 | 15.2 | 5.8 | 6.4 | 5.3 | 3.0 | 0.6 | | |

Table 14. Distribution of Flake Scrapers

at Site Mrp-105.

| Depth | Artifact Point Classes A | B | C | Unclassifiable Point Fragments | Incipient Points, Rejects | Flake Scrapers | Flake Knives | Scraper-knife Blades | Drills | Core Scrapers | Choppers | Hammerstones | Rubbing Stone | Manos | Metate fragments | Steatite Sherd | Total | Percent of Excavated Sample |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface | 1 | 3 | 2 | 2 | | 9 | | | | | | | | | | | 17 | |
| 0-6" | 9 | | 1 | 2 | 3 | 32 | 3 | | 1 | 1 | | | | | | | 52 | 17.2 |
| 6-12" | 12 | 1 | 1 | 2 | 4 | 33 | 2 | | 1 | | | 1 | 1 | | | | 58 | 19.2 |
| 12-18" | 3 | | | 3 | 3 | 35 | 1 | | | 1 | | 1 | | 3 | | | 50 | 16.6 |
| 18-24" | | 2 | 3 | 6 | 3 | 24 | | | | 1 | | | | 2 | | 1 | 42 | 13.9 |
| 24-30" | | 2 | 1 | 5 | 1 | 18 | | 1 | | | 2 | | | 7 | 2 | | 39 | 12.9 |
| 30-36" | | 1 | 2 | 1 | 1 | 5 | | | 1 | | | | | 2 | 2 | | 15 | 5.0 |
| 36-42" | 1 | | 1 | 2 | 3 | 12 | | | | 1 | | 1 | | 6 | 1 | | 29 | 9.6 |
| 42-48" | | | | | 2 | 3 | | | | 1 | 1 | | | 6 | 1 | | 13 | 4.3 |
| 48-54" | | | 2 | | | | | | | | 1 | | | | 1 | | 4 | 1.3 |
| Total | 26 | 9 | 13 | 23 | 20 | 171 | 6 | 1 | 3 | 4 | 4 | 2 | 2 | 1 | 26 | 7 | 1 | 319 | |

Table 15. Distribution of All Artifacts at Site Mrp-105.

| | Unworked Flakes | | | | |
|---|---|---|---|---|---|
| | Obsidian | | Jasper | Basalt | Chert |
| Depth | No. | Percent | No. | No. | No. |
| 0-6" | 144 | 8.6 | 3 | 4 | 2 |
| 6-12" | 188 | 11.3 | 2 | | 5 |
| 12-18" | 204 | 12.3 | 9 | 2 | |
| 18-24" | 297 | 17.8 | 5 | 4 | |
| 24-30" | 420 | 25.2 | 2 | | 1 |
| 30-36" | 184 | 11.0 | | 1 | |
| 36-42" | 140 | 8.4 | 2 | | |
| 42-48" | 76 | 4.6 | 2 | 1 | |
| 48-54" | 13 | 0.8 | | 1 | |
| Total | 1666 | | 25 | 13 | 8 |

Table 16. Frequency of Unworked Flakes in Screened Pit B3, Site Mrp-105.

| Type | Number of Specimens | Weight, gm. Range | Ave. | Length, mm. Range | Ave. | Width, mm. Range | Ave. | Thickness, mm. Range | Ave. |
|---|---|---|---|---|---|---|---|---|---|
| A1 | 6 | 0.4-0.9 | 0.6 | 16-30 | 23 | 12-15 | 13 | 2-3 | 2 |
| A2 | 14 | 0.4-1.0 | 0.7 | 17-32 | 24 | 9-22 | 14 | 2-4 | 3 |
| A3 | 7 | 0.3-1.0 | 0.7 | 21-33 | 26 | 12-18 | 14 | 2-4 | 3 |
| Fig. 1i | 1 | 0.8 | | 20 | | 11 | | 4 | |
| A4a | 49 | 0.4-1.0 | 0.6 | 17-28 | 23 | 10-17 | 13 | 2-5 | 3 |
| A4b | 26 | 0.4-0.9 | 0.7 | 20-38 | 28 | 11-20 | 14 | 2-5 | 3 |
| A5 | 30 | 0.4-0.7 | 0.5 | 15-31 | 22 | 11-20 | 14 | 2-3 | 3 |
| A6 | 3 | 0.6 | | 22-23 | 22 | 11-20 | 16 | 2-3 | 3 |
| A7 | 13 | 0.8-1.0 | 0.9 | 20-34 | 25 | 10-20 | 16 | 2-4 | 3 |
| A8 | 3 | 0.8 | | 28-30 | 29 | 14-22 | 17 | 2-4 | 3 |
| A9 | 1 | - | | 24 | | 16 | | 3 | |
| A10 | 2 | 0.9 | | 21,30 | | 16,17 | | 3,4 | |
| A11 | 11 | 0.6,0.9 | | 20-32 | 22 | 10-23 | 16 | 2-4 | 3 |
| A12 | 1 | 0.9 | | 25 | | 18 | | 3 | |
| B1 | 3 | 3.0,3.2 | | 25-32 | 29 | 17-19 | 18 | 6-7 | 6 |
| B2 | 4 | 1.9-3.0 | 2.6 | 26-38 | 33 | 16-23 | 19 | 5-6 | 5 |
| B3 | 4 | 2.0 | | 30-42 | 35 | 13-22 | 18 | 5-7 | 7 |
| B4 | 3 | 1.8,1.9 | | 19-25 | 22 | 18-20 | 19 | 5-8 | 6 |
| B5 | 5 | 1.1-3.1 | 2.1 | 21-27 | 23 | 15-23 | 19 | 3-6 | 5 |
| B6 | 3 | 3.5 | | 28-40 | 34 | 16-22 | 19 | 5-6 | 5 |
| B7 | 14 | 1.4-3.0 | 2.0 | 21-45 | 29 | 14-20 | 17 | 3-7 | 5 |
| B8 | 4 | 1.2-2.1 | 2.0 | 23-27 | 24 | 17-20 | 18 | 4-5 | 5 |
| B9 | 5 | 1.2-2.0 | 1.6 | 23-43 | 30 | 17-20 | 19 | 3-4 | 4 |
| B10 | 13 | 1.1-3.0 | 2.1 | 24-53 | 39 | 13-23 | 19 | 3-5 | 4 |
| B11 | 2 | 1.5,3.5 | | 19,28 | | 18,25 | | 6,7 | |
| Fig. 1y | 1 | 1.7 | | 35 | | 12 | | 4 | |
| C1 | 6 | 3.9-11.1 | 7.5 | 44-57 | 51 | 13-24 | 21 | 6-9 | 7 |
| C2 | 2 | 7.3 | | 45,60 | | 23,30 | | 8,8 | |
| Fig. 5e | 1 | - | | 73 | | 30 | | 9 | |
| C3 | 5 | 4.7-8+ | | 37,52 | | 18-24 | 22 | 4-8 | 7 |
| C4 | 5 | 5.2-6.9 | 5.9 | 30-40 | 36 | 23-24 | 23 | 6-9 | 8 |
| C5 | 17 | 11.8 | | 53-95 | 70 | 24-32 | 26 | 6-10 | 8 |
| C6 | 3 | - | | 70 | | 29,36 | | 6,7 | |
| Fig. 5 l | 1 | 4.9 | | 34 | | 24 | | 6 | |
| C7 | 6 | - | | 30-60 | 45 | 20-27 | 24 | 5-8 | 7 |
| C8 | 2 | 4.2,4.9 | | 38,40 | | 23,24 | | 5,5 | |
| C9 | 9 | 4.1-6.5 | 5.1 | 26-49 | 36 | 18-32 | 25 | 6-8 | 7 |
| Fig. 5p | 1 | 5.7 | | 40 | | 32 | | 6 | |
| Fig. 5q | 1 | 4.1 | | 28 | | 22 | | 7 | |
| Fig. 5r | 1 | 9.2 | | 50 | | 28 | | 7 | |
| Fig. 5s | 1 | 10.2 | | 55 | | 21 | | 9 | |
| Fig. 5t | 1 | - | | 65 | | 34 | | 6 | |
| C10 | 3 | 5.2,5.6 | | 32-40 | 35 | 23-26 | 25 | 6-8 | 7 |
| C11a | 4 | 3.9,4.0 | | 30-33 | 32 | 19-23 | 21 | 6-7 | 6 |
| C11b | 5 | 5.2-6.2 | 5.8 | 41-45 | 42 | 21-25 | 23 | 6-9 | 7 |
| C11c | 3 | 6.4 | | 40 | | 30 | | 5-7 | 6 |
| C12 | 3 | 16.9 | | 55-77 | 63 | 27-35 | 30 | 6-8 | 7 |
| C13 | 6 | 5.7 | | 35-50 | 42 | 22-31 | 27 | 5-7 | 6 |
| C14 | 5 | - | | 85 | | 20-28 | 27 | 5-7 | 6 |
| C15 | 3 | - | | 34-65 | 53 | 22-32 | 28 | 4-6 | 5 |
| C16 | 2 | - | | 116 | | 28,33 | | 8,9 | |
| Fig. 6q | 1 | 4.4 | | 28 | | 24 | | 8 | |
| Fig. 1e' | 1 | - | | 50 | | 21 | | 7 | |

Table 17. Projectile Point Dimensions.

| Site | Type | A1 | A2 | A3 | Fig. 11 | A4a | A4b | A5 | A6 | A7 | A8 | A9 | A10 | A11 | A12 | Tanged Fragments | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mrp-3 | | 1 | | | | 2 | | | | | | | | | | | 3 |
| -9 | | 1 | | | | 4 | | 2 | 1 | 2 | | | | | | | 10 |
| -61 | | | 1 | | | 3 | 2 | 3 | 1 | | 2 | | | 1 | | | 13 |
| -62 | | 1 | 1 | | | 2 | | 1 | | | | | | | | | 5 |
| -79 | | | | | | | | 1 | | | | | | | | | 1 |
| -97 | | | | | | 1 | | | | | | | | | | | 1 |
| -105 | | | 1 | 2 | 1 | 6 | 3 | 4 | | | 1 | | 2 | 2 | 1 | 3 | 26 |
| -117 | | 1 | | | | | | | | | | | | | | | 1 |
| -122 | | | 1 | | | | | | | | | | | | | | 1 |
| -129 | | | | | | 1 | | | | | | | | | | | 1 |
| -140 | | | | | | | 1 | | | | | | | | | | 1 |
| -168 | | | 1 | | | | | | | | | | | | | | 1 |
| -183 | | | | | | | | | | | | | | 1 | | | 1 |
| -203 | | | | | | 1 | | | | | | | | | | | 1 |
| -219 | | | | | | 1 | | | | | | | | | | | 1 |
| -220 | | | | | | | | | | 1 | | | | | | | 1 |
| -229 | | | | | | | 1 | | | | | | | | | | 1 |
| -231 | | | | | | 1 | | | | | | | | | | | 1 |
| Panorama Ridge | | | 3 | | | 7 | 5 | 2 | | 3 | | | | | | | 20 |
| Glacier Point Road | | | 1 | | | 2 | 1 | | | 1 | | | | | | | 5 |
| Bridalveil Creek | | | | | | | 1 | | | 1 | | | | 1 | | | 3 |
| Illilouette Canyon | | | | 1 | | 1 | | | | 1 | | | | | | | 3 |
| Wawona | | | | | | 1 | 1 | 1 | 1 | 1 | | | | 3 | | | 8 |
| Yosemite Creek Trail | | | | | | | | | | 1 | | | | | | | 1 |
| Yosemite Valley | | 1 | 1 | 1 | | 2 | | 1 | | | | | | | | | 6 |
| Little Yosemite Valley | | | 1 | | | 3 | 6 | 5 | | 1 | | | | 3 | | | 19 |
| Tuo-22 | | | | 1 | | | | | | | | | | | | | 1 |
| -28 | | | | 1 | | | | | | | | | | | | | 1 |
| -107 | | | | | | | | 1 | | | | | | | | | 1 |
| -108 | | | | | | | | 2 | | | | | | | | | 2 |
| -153 | | | | | | 1 | | | | | | | | | | | 1 |
| -166 | | | 2 | | | 6 | 1 | 1 | | 1 | | | | | | | 11 |
| -206 | | | | 1 | | | | | | | | | | | | | 1 |
| Dingley Creek | | | 1 | | | 1 | | 1 | | | | | | | | | 3 |
| Mather Station | | | | | | 2 | | 2 | | | | | | | | 1 | 5 |
| Hog Ranch | | | | | | | 2 | | | | | | | | | | 2 |
| Ackerson Meadow | | | | | | | | 1 | | | | 1 | | | | | 2 |
| Harden Lake | | | | | | 1 | 1 | 1 | | | | | | | | | 3 |
| Matterhorn Canyon | | | | | | | 1 | | | | | | | | | | 1 |
| Tuolumne Meadows | | 1 | | | | | | | | | | | | | | | 1 |
| Dana Meadows | | | | | | | | 1 | | | | | | | | | 1 |
| Total Mariposa | | 5 | 11 | 4 | 1 | 38 | 21 | 20 | 3 | 12 | 3 | 0 | 2 | 11 | 1 | 3 | 135 |
| Total Tuolumne | | 1 | 3 | 3 | 0 | 11 | 5 | 10 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 36 |
| Grand Total | | 6 | 14 | 7 | 1 | 49 | 26 | 30 | 3 | 13 | 3 | 1 | 2 | 11 | 1 | 4 | 171 |

Table 18. Distribution of Class A Projectile Points.

| Site | Type | B1 | B2 | B3 | B4 | B5 | B6 | B7 | Shouldered Fragments | B8 | B9 | B10 | Tanged Fragments | B11 | Fig. ly | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mrp-9 | | | 1 | | | | | | 1 | | | | | | | 2 |
| -56 | | | 1 | | | | | | | | | | | | | 1 |
| -97 | | | | | 1 | 3 | 1 | 9 | | 1 | 1 | 3 | | | | 19 |
| -105 | | 1 | | 1 | | | | 3 | | 2 | | | 1 | | 1 | 9 |
| -129 | | | | | | 1 | 1 | | | | | 1 | | | | 3 |
| -135 | | | | | | | | | | | | | | 1 | | 1 |
| -138 | | | | | | | | | | | | | 1 | | | 1 |
| -203 | | | | | | | | | | | | 1 | | | | 1 |
| -222 | | | | | | | | | | | | | 1 | | | 1 |
| -231 | | | 1 | | | | | | | | | | | | | 1 |
| -237 | | | | | 1 | | | | | | | | 1 | | | 2 |
| Coyote Creek | | | | | 1 | | 1 | | | | | | | | | 2 |
| Yosemite Valley | | | | 1 | | | | | | | | 1 | | 1 | | 3 |
| Tuo-107 | | | | | | | | | | | | | 1 | | | 1 |
| -124 | | | | | | | | | | | | 1 | | | | 1 |
| -133 | | | | | | | | 1 | | | | | | | | 1 |
| -145 | | | | | | | | | | | | 1 | | | | 1 |
| -152 | | | | | | | | | | | | 1 | | | | 1 |
| -156 | | | | | | | | | | 1 | | | | | | 1 |
| -157 | | | | | | | | 1 | | | | | | | | 1 |
| -158 | | | | | | | | | | | | 1 | | | | 1 |
| -160 | | | | | | | | | | | | 1 | | | | 1 |
| -166 | | | | | | | | | | | 2 | | | | | 2 |
| -172 | | | | 1 | | | | | | | | | | | | 1 |
| -178 | | | | | | | | | | | | 1 | | | | 1 |
| -211 | | | | 1 | | | | | | | | | | | | 1 |
| Dingley Creek | | | | | | 1 | | | | | | | | | | 1 |
| Hog Ranch | | 1 | | | | | | | | | 1 | | | | | 2 |
| Kuna Lake | | | | | | | | | | | 1 | | | | | 1 |
| Tuolumne Meadows | | | | | | | | | | | | 1 | 1 | | | 2 |
| Dana Meadows | | 1 | 1 | | | | | | | | | | 1 | | | 3 |
| Total Mariposa | | 1 | 3 | 2 | 3 | 4 | 3 | 12 | 1 | 3 | 1 | 6 | 4 | 2 | 1 | 46 |
| Total Tuolumne | | 2 | 1 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 4 | 7 | 3 | 0 | 0 | 23 |
| Grand Total | | 3 | 4 | 4 | 3 | 5 | 3 | 14 | 1 | 4 | 5 | 13 | 7 | 2 | 1 | 69 |

Table 19. Distribution of Class B Projectile Points.

| Site | Type | C1 | C2 | C3 | C4 | C5 | Fig. 5 l | C6 | C7 | C8 | C9 | Fig. 5 p | Fig. 5 s | C10 | C11a | C11b | C11c | C12 | C13 | C14 | C16 | Fig. 6 q | Fig. 1 e' | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mrp-3 | | | | | | 1 | | 1 | | | 1 | | | | | | | | | 1 | | | | 4 |
| -9 | | | | 1 | 1 | | | | | | | | | | | | | | | 1 | | | | 3 |
| -57 | | | 1 | | | | | | | | | | | | | | | | | | | | | 1 |
| -58 | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 |
| -96 | | 2 | | | 1 | | | | | | | 1 | | | | | | | | | | | | 4 |
| -97 | | 1 | | | 1 | 1 | | | 1 | 2 | 3 | | | 1 | | | 3 | | 4 | | | | | 17 |
| -105 | | 2 | | 2 | 1 | 4 | | | | | | | | 1 | | 2 | | | | | | 1 | | 13 |
| -106 | | | | | | | | | | | | | 1 | | | | | | | | | | | 1 |
| -119 | | | | | | | | | | | | | | | | | | | | 2 | | | | 2 |
| -129 | | 1 | | | | | 1 | | | | | | | | | | | | | | | 1 | | 3 |
| -131 | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 |
| -132 | | | | | | | | | 1 | | | | | | | | | | | | | | | 1 |
| -138 | | 2 | | | | | | | | | 1 | | | | | | | | | | | | | 3 |
| -140 | | | | | | 3 | | | | | | | | | | | | | | | | | | 3 |
| -192 | | | | | | 1 | | | | | | | | | | | | | | | | | | 1 |
| -222 | | | | | | | | | | | 1 | | | | | | | | | | | | | 1 |
| -231 | | | | | | 2 | | | | | | | | 1 | | | | | | | 1 | | | 4 |
| -235 | | | | | | | | | | | | | | | | 1 | | | | | | | | 1 |
| Coyote Creek | | 1 | | | | | | | | | | | | | | | | | | | | | | 1 |
| Yosemite Creek | | | | | | 1 | | | | | | | | | | | | | | | | | | 1 |
| Four Mile Trail | | | | | | | | | | | | | | | | | | 1 | | | | | | 1 |
| Big Oak Flat Road | | | | | | | | | | | | | | | | | | 1 | | | | | | 1 |
| Yosemite Valley | | | | | | 2 | | 1 | | | | | | | | | | | 1 | | | | | 4 |
| Total | | 9 | 1 | 3 | 4 | 15 | 1 | 2 | 2 | 2 | 6 | 1 | 1 | 3 | 1 | 3 | 3 | 2 | 5 | 4 | 2 | 1 | 1 | 72 |

Table 20. Distribution of Class C Projectile Points at Sites Within the Merced River Drainage.

| Type | C1 | Fig. 5e | C2 | C3 | C4 | C5 | C6 | C7 | C9 | Fig. 5q | Fig. 5r | Fig. 5t | C11a | C11b | C12 | C13 | C14 | C15 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tuo-22 | | | | | | | | 1 | | | | | | | | | | | 1 |
| -107 | | | | | | | | | | | | | | | | 1 | | | 1 |
| -121 | | | | 1 | | | | | | | | | | | | | | | 1 |
| -129 | 2 | | | | | | | | | | | | | | | | | | 2 |
| -138 | | | | | | | | | 1 | | | | | | | | | | 1 |
| -141 | | | | | | 1 | | | | | | | | | | | | | 1 |
| -149 | | | | | | | | | | 1 | | | | | | | | | 1 |
| -153 | | | | | | | 1 | | | | | | | | | | | | 1 |
| -156 | | 1 | | | | | | | | | | | | | | | | | 1 |
| -173 | 1 | | | | | | | | | | | | | | | | | | 1 |
| -231 | 1 | | | | | | | | | | | | | | | | | | 1 |
| Dingley Creek | | | | | | | | 1 | 2 | | | | | 2 | | | | 1 | 6 |
| Mather Station | | | | | | | | | | | | | 1 | | | | | 1 | 2 |
| Hog Ranch | | | | | | | | | | | | | 1 | | | | | 1 | 2 |
| Donohue Pass | | | | | 1 | | | 1 | | | | | | | | | | | 2 |
| Rafferty Creek | | | | | | | | | | 1 | | | | | | | | | 1 |
| Young Lakes | | | | | | 1 | | | | | | | | | | | | | 1 |
| Elizabeth Lake | | | | | | | | | | | | | | | | | 1 | | 1 |
| Maclure Glacier | | | | | | | | | | | | 1 | | | | | | | 1 |
| Upper Fletcher Lake | | | 1 | | | | | | | | | | | | | | | | 1 |
| Tuolumne Meadows | 1 | | | 1 | | | | 1 | | | | | 1 | | | | | | 4 |
| Dana Meadows | | | | | | | | | | | | | | | 1 | | | | 1 |
| Total | 5 | 1 | 1 | 2 | 1 | 2 | 1 | 4 | 3 | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 1 | 3 | 34 |

Table 21. Distribution of Class C Projectile Points at Sites Within the Tuolumne River Drainage.

| Site | Type | Side | Irregular | Elongate | Notched | Side and End | Pointed | Oval | Total |
|---|---|---|---|---|---|---|---|---|---|
| Mrp-3 | | 13 | 7 | 1 | | 1 | | | 22 |
| -5 | | | 1 | | | | | | 1 |
| -56 | | 5 | 3 | | | | | | 8 |
| -61 | | 1 | | | | | | | 1 |
| -62 | | 7 | 2 | 1 | | | | | 10 |
| -76 | | 6 | | | | | | | 6 |
| -77 | | 1 | | | | | | | 1 |
| -86 | | 6 | 1 | | | | | | 7 |
| -87 | | 10 | | | | | | | 10 |
| -88 | | 10 | 1 | | 1 | 1 | | | 13 |
| -89 | | 4 | 2 | | | | | | 6 |
| -94 | | 1 | 1 | | 1 | | | | 3 |
| -96 | | 18 | 8 | 2 | | 1 | | 1 | 30 |
| -98 | | 1 | | | | | | | 1 |
| -102 | | 1 | | | | | | | 1 |
| -103 | | 3 | 1 | | | | | | 4 |
| -104 | | | | 1 | | | | | 1 |
| -106 | | 1 | | | | | | | 1 |
| -111 | | 1 | 1 | | | | | | 2 |
| -112 | | 5 | | 1 | | | | | 6 |
| -117 | | 2 | 1 | | | 1 | | | 4 |
| -118 | | 1 | | | | | | | 1 |
| -119 | | 4 | | | | | 1 | | 5 |
| -122 | | 1 | 1 | | 1 | | | | 3 |
| -123 | | 5 | | 1 | | | | | 6 |
| -128 | | 2 | | | | | | | 2 |
| -129 | | 17 | 4 | 3 | | 1 | | | 25 |
| -130 | | | 2 | | | | | | 2 |
| -132 | | 1 | | | | | | | 1 |
| -133 | | 1 | 1 | | | | | | 2 |
| Mrp-134 | | 1 | | | | | | | 1 |
| -135 | | 11 | 5 | 1 | | | | | 17 |
| -136 | | 1 | 1 | | | | | | 2 |
| -137 | | 5 | | | 1 | | | | 6 |
| -138 | | 1 | 1 | 1 | | 1 | | | 4 |
| -140 | | | | 1 | | | | | 1 |
| -141 | | 7 | 2 | 1 | | 1 | | | 11 |
| -147 | | 3 | | 1 | | | | | 4 |
| -156 | | 1 | 2 | | | | | | 3 |
| -157 | | 2 | 1 | | | | | | 3 |
| -159 | | 1 | | | | | | | 1 |
| -165 | | 1 | | | | | | | 1 |
| -166 | | 4 | 1 | 2 | | 1 | | | 8 |
| -167 | | | 1 | | | | | | 1 |
| -168 | | 1 | | | | | | | 1 |
| -175 | | 2 | | 1 | | | | | 3 |
| -177 | | | | | | 1 | | | 1 |
| -181 | | 2 | 1 | | | | | | 3 |
| -183 | | | 1 | | | | | | 1 |
| -201 | | 2 | | | 1 | | | | 3 |
| -206 | | 3 | | | 1 | | | | 4 |
| -207 | | 3 | 1 | | | | 1 | | 5 |
| -209 | | 1 | | | | | | | 1 |
| -218 | | | 1 | | | | | | 1 |
| -228 | | 1 | | | | | | | 1 |
| -229 | | 1 | | | | | | | 1 |
| -231 | | 4 | 5 | | | 1 | | | 10 |
| -232 | | | 1 | | | | | | 1 |
| -233 | | 1 | | | | | | | 1 |
| Total | | 187 | 61 | 18 | 6 | 10 | 2 | 1 | 285 |

Table 22. Distribution of Flake Scrapers at Surface Sites Within the Merced River Drainage.

| Site | Type | Side | Irregular | Elongate | Notched | Side and End | Pointed | Oval | Total |
|---|---|---|---|---|---|---|---|---|---|
| Tuo-22 | | 8 | 3 | | | | | | 11 |
| -106 | | 1 | | | | | | | 1 |
| -107 | | 2 | | | | | | | 2 |
| -108 | | 4 | | | | | | | 4 |
| -109 | | 8 | 3 | | | | 1 | | 12 |
| -111 | | 1 | 1 | | | | | | 2 |
| -112 | | 1 | 1 | | | | | | 2 |
| -116 | | 1 | | | | | | | 1 |
| -117 | | 1 | | | | | | | 1 |
| -120 | | 2 | | | | | | 1 | 3 |
| -121 | | 1 | | 1 | | | | | 2 |
| -123 | | 1 | | | | | | | 1 |
| -124 | | | 1 | | | | | | 1 |
| -125 | | | | | | 1 | | | 1 |
| -126 | | 1 | | | | | | | 1 |
| -127 | | 1 | | | | | | | 1 |
| -128 | | | 2 | | | | | | 2 |
| -129 | | 4 | 2 | | | 1 | | | 7 |
| -130 | | | | | | | 1 | | 1 |
| -131 | | | | | 1 | | | | 1 |
| -132 | | | 2 | | | | | | 2 |
| -133 | | 1 | 1 | | | | | | 2 |
| -134 | | 2 | 1 | | | | | | 3 |
| -135 | | 1 | | | | | | | 1 |
| -139 | | 3 | 1 | | | | | | 4 |
| -140 | | 1 | | | | | | | 1 |
| -141 | | | 1 | | | | | | 1 |
| -142 | | 3 | | | | | | | 3 |
| -145 | | 1 | | | | | | | 1 |
| -146 | | 1 | 1 | | | | | | 2 |
| -152 | | 2 | | | | | | | 2 |
| -153 | | 1 | 1 | | | | | | 2 |
| -155 | | 1 | | | | | | | 1 |
| Tuo-156 | | 7 | 3 | | | | | | 10 |
| -157 | | 6 | 2 | | | | | | 8 |
| -158 | | 1 | 1 | | | | | | 2 |
| -159 | | 1 | | | | | | | 1 |
| -160 | | 6 | 2 | | | | | | 8 |
| -164 | | | 1 | | | | | | 1 |
| -171 | | 2 | | | | | | | 2 |
| -172 | | 2 | | | | | | | 2 |
| -173 | | 1 | | | | | | | 1 |
| -174 | | 1 | | | | | | | 1 |
| -175 | | 4 | | | | | | | 4 |
| -177 | | 2 | 2 | 1 | | | | | 5 |
| -181 | | 1 | 1 | | | | | | 2 |
| -185 | | 1 | | | | | | | 1 |
| -186 | | 5 | | | | | | | 5 |
| -189 | | | 2 | | | | | | 2 |
| -192 | | | 1 | | | | | | 1 |
| -194 | | | 1 | | | 1 | | | 2 |
| -195 | | 1 | | | | | | | 1 |
| -199 | | 1 | | | | | | | 1 |
| -200 | | 3 | 2 | | | | | | 5 |
| -202 | | 1 | | | | | | | 1 |
| -203 | | 1 | | | | | | | 1 |
| -204 | | 6 | 7 | | 1 | | | | 14 |
| -206 | | | 4 | | | | | | 4 |
| -208 | | 1 | | | | | | | 1 |
| -211 | | 1 | 1 | | | | | | 2 |
| -224 | | 1 | | | | | | | 1 |
| -226 | | 1 | | | | | | | 1 |
| -229 | | | | | 1 | | | | 1 |
| -236 | | 2 | | | | | 1 | | 3 |
| Dana Creek | | | | | | | | 1 | 1 |
| Total | | 113 | 51 | 2 | 3 | 3 | 3 | 2 | 177 |

Table 23. Distribution of Flake Scrapers at Surface Sites Within the Tuolumne River Drainage.

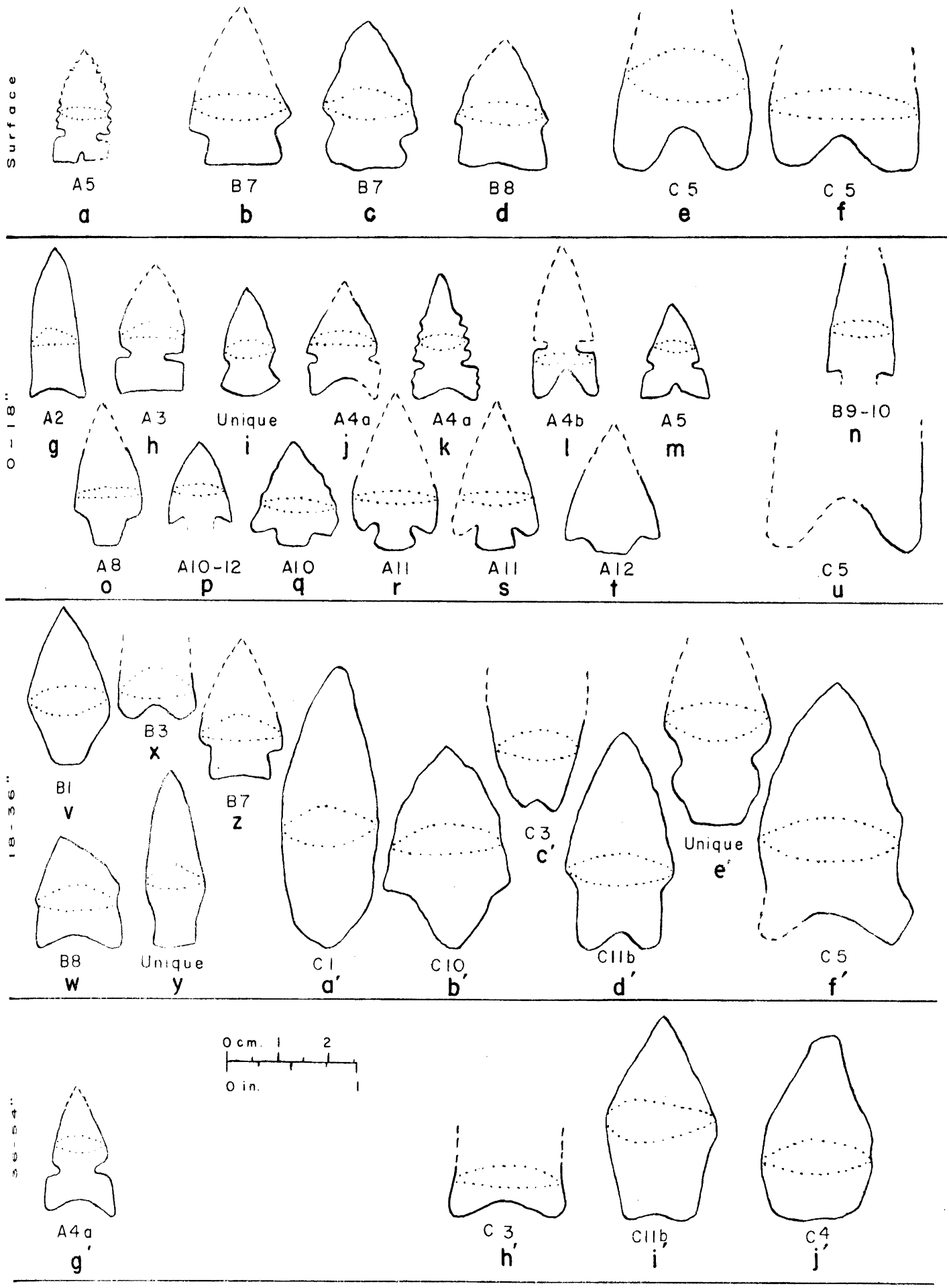


Figure I. Stratigraphic Occurrence of Points, Site Mrp-105.

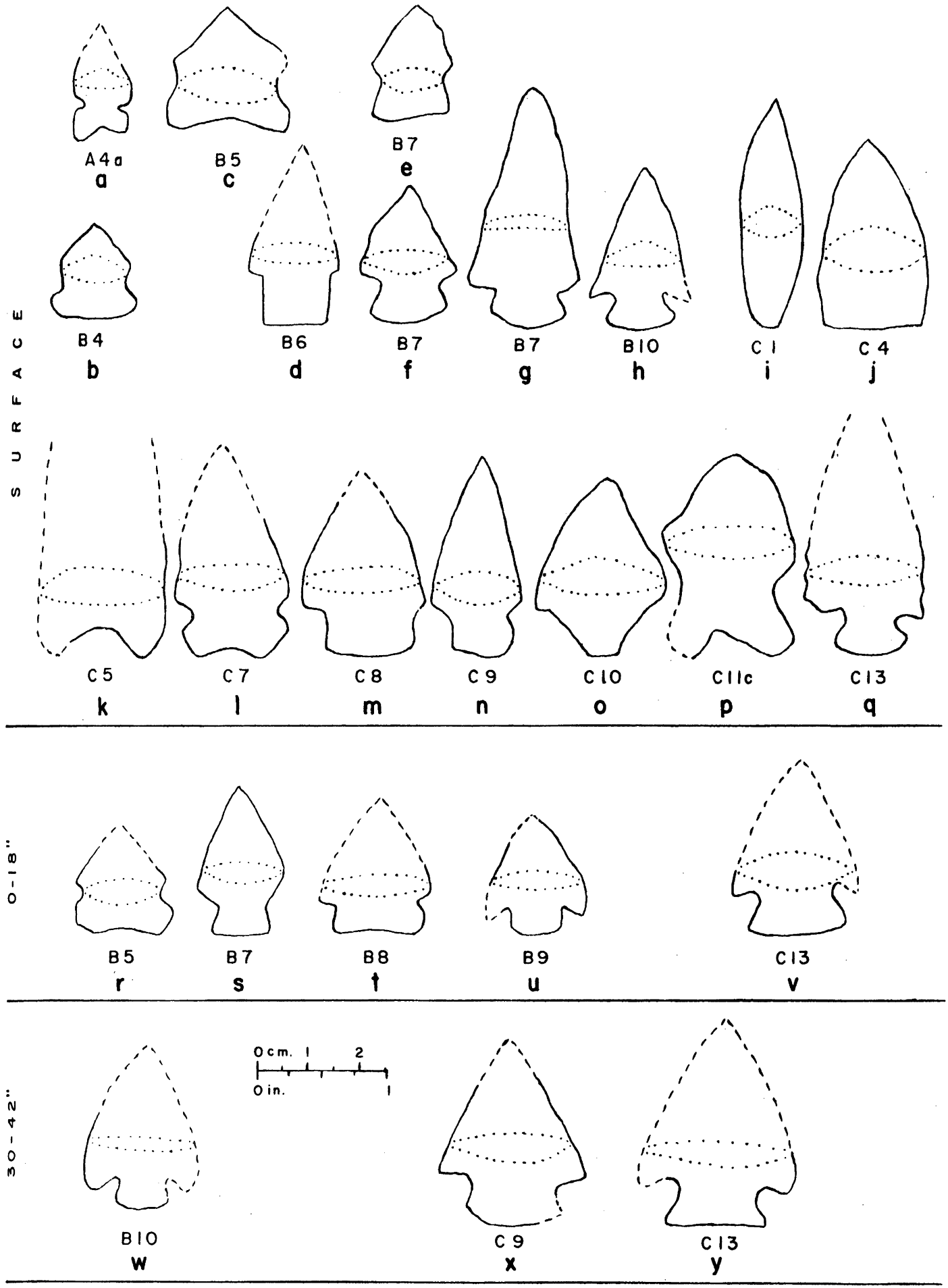


Figure 2. Stratigraphic Occurrence of Points, Site Mrp-97.

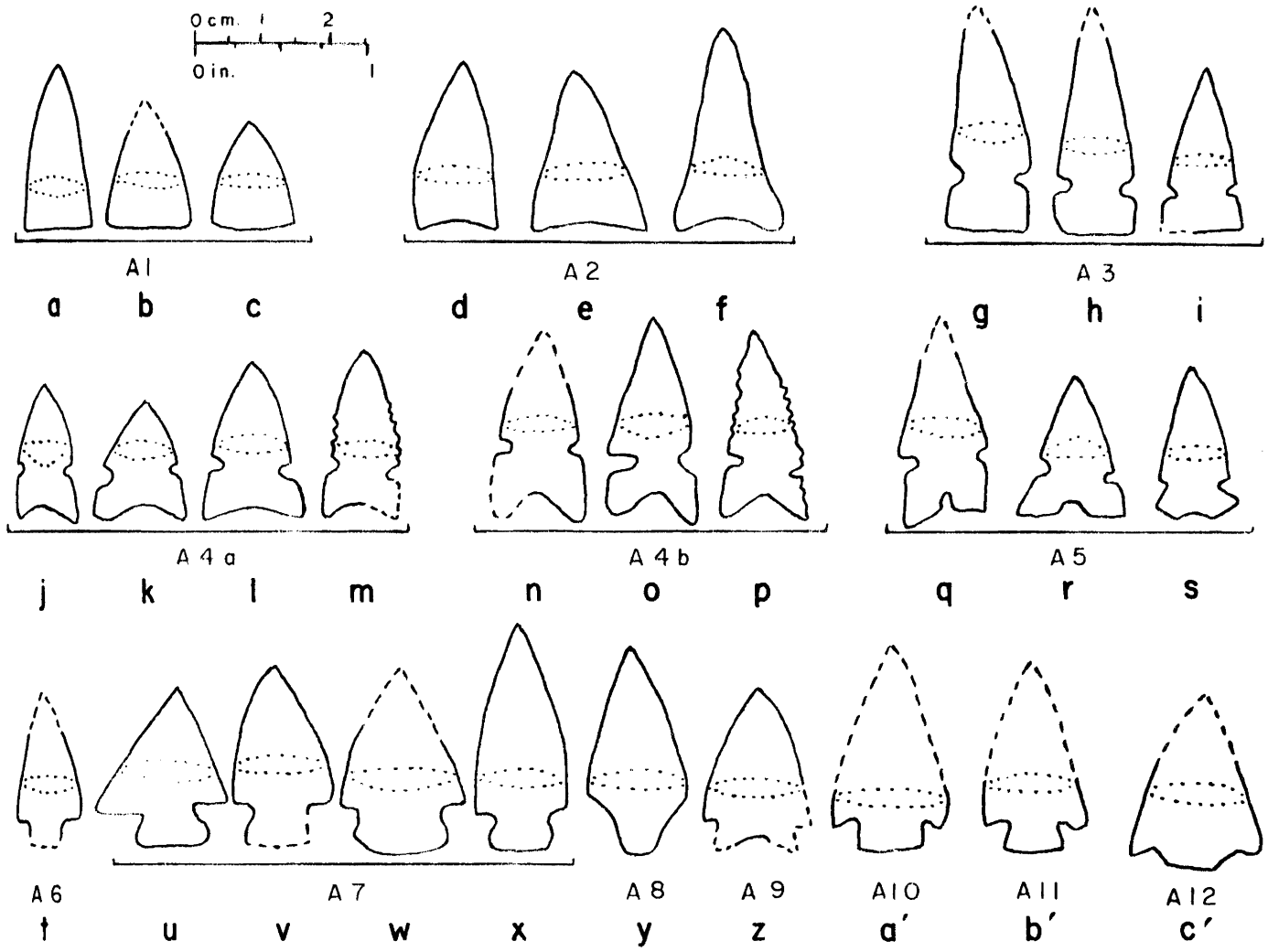


Figure 3. Class A Projectile Point Types.

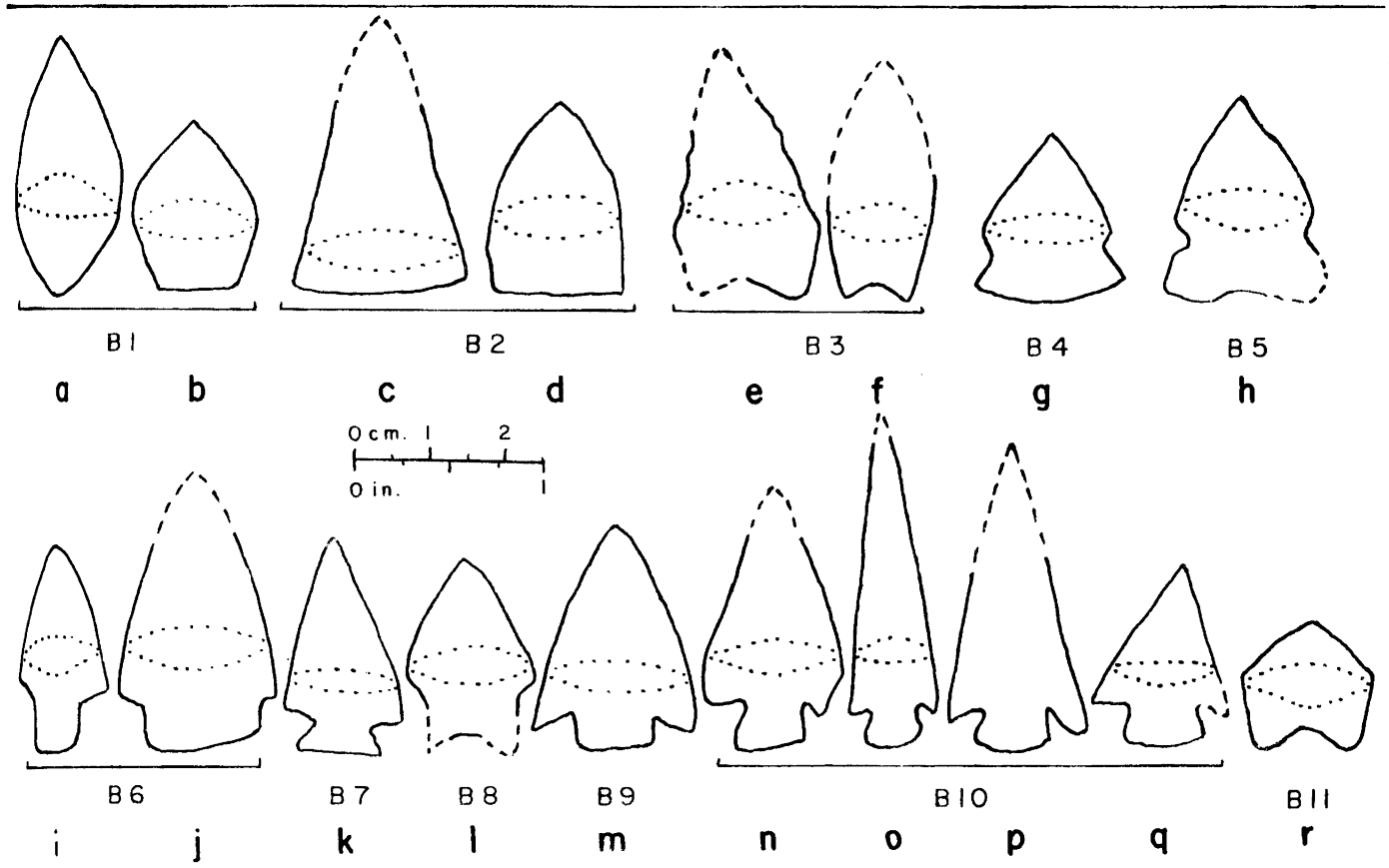


Figure 4. Class B Projectile Point Types

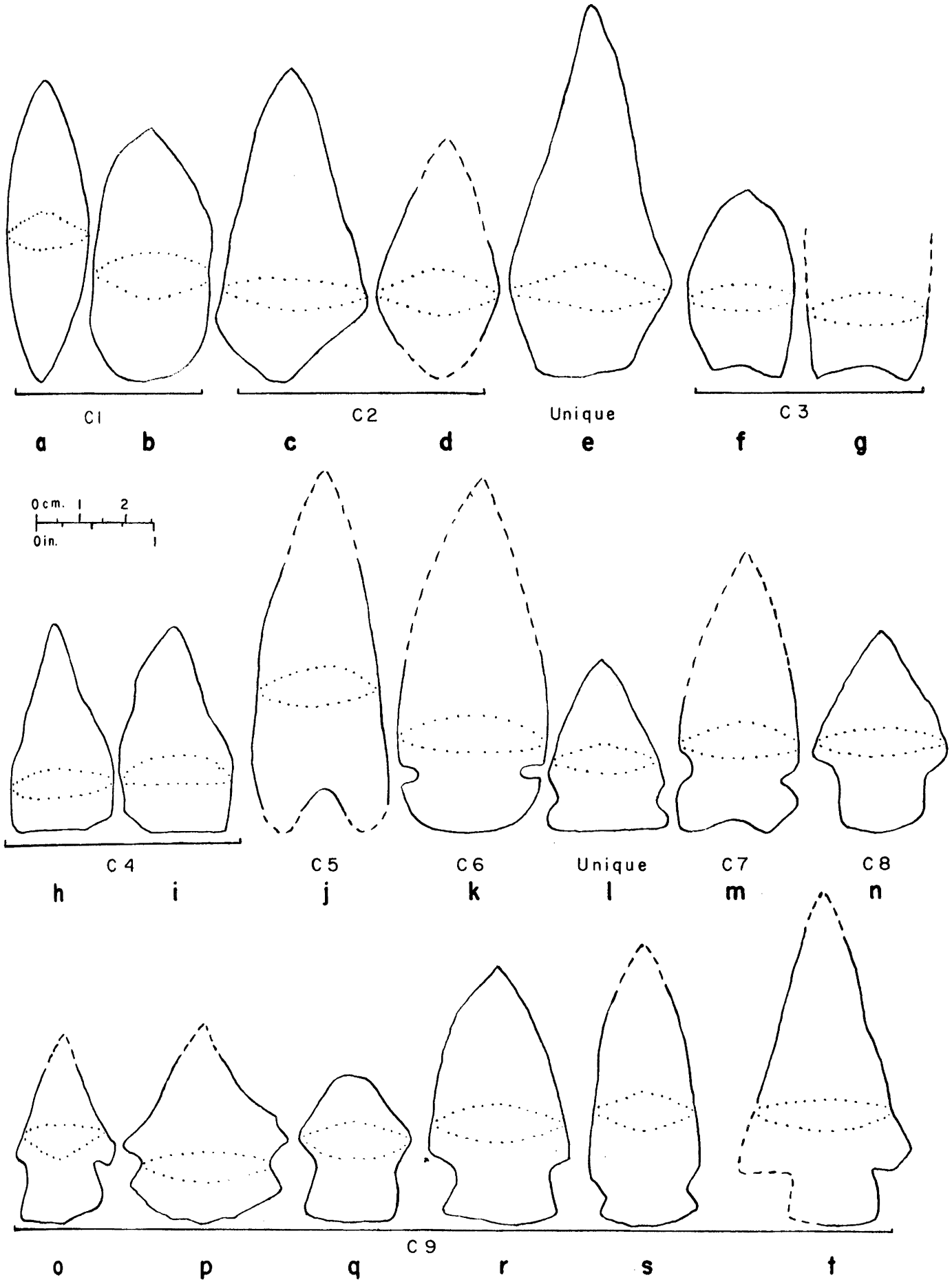


Figure 5. Class C Projectile Point Types.

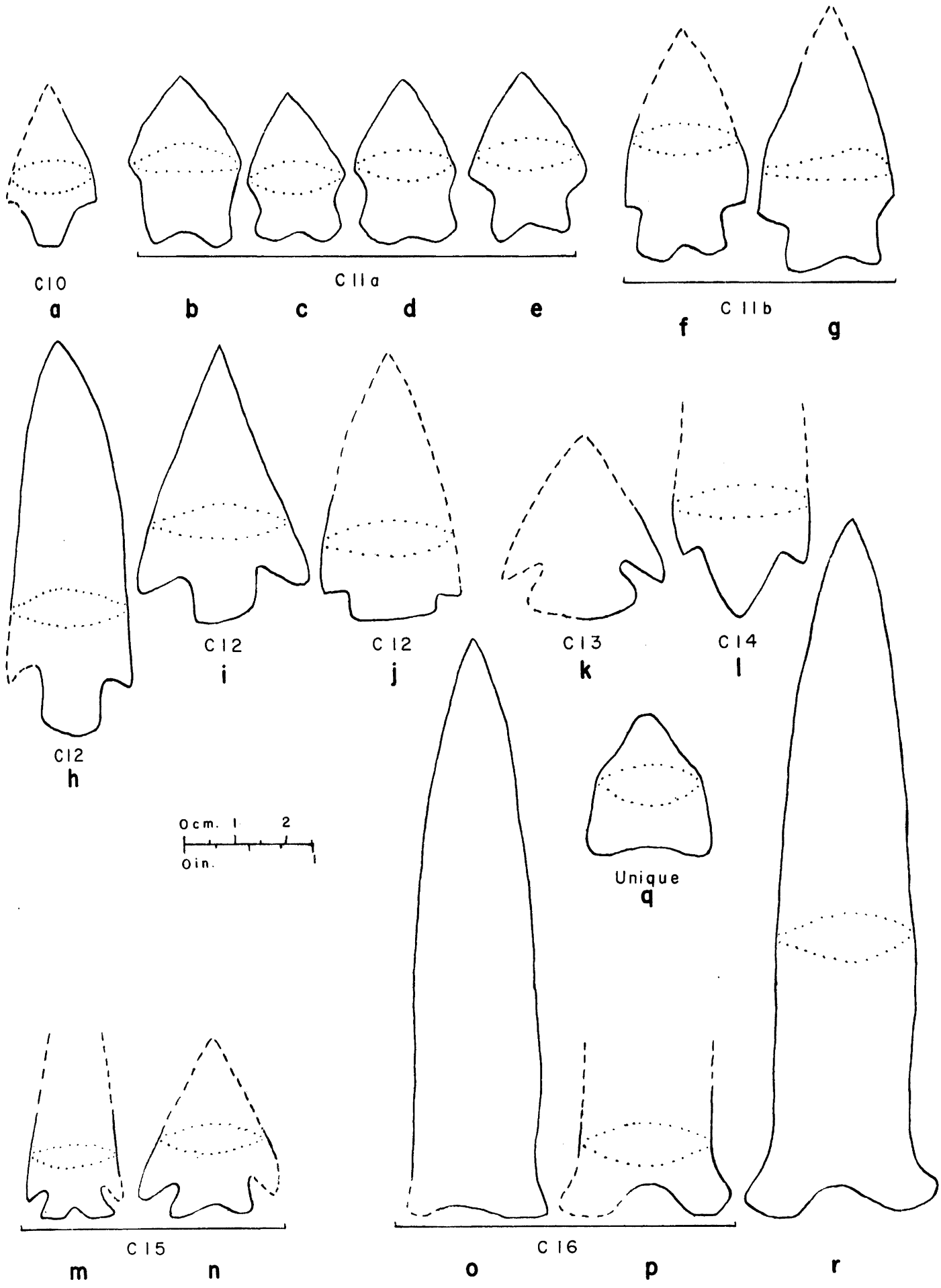


Figure 6. Additional Class C Projectile Point Types.

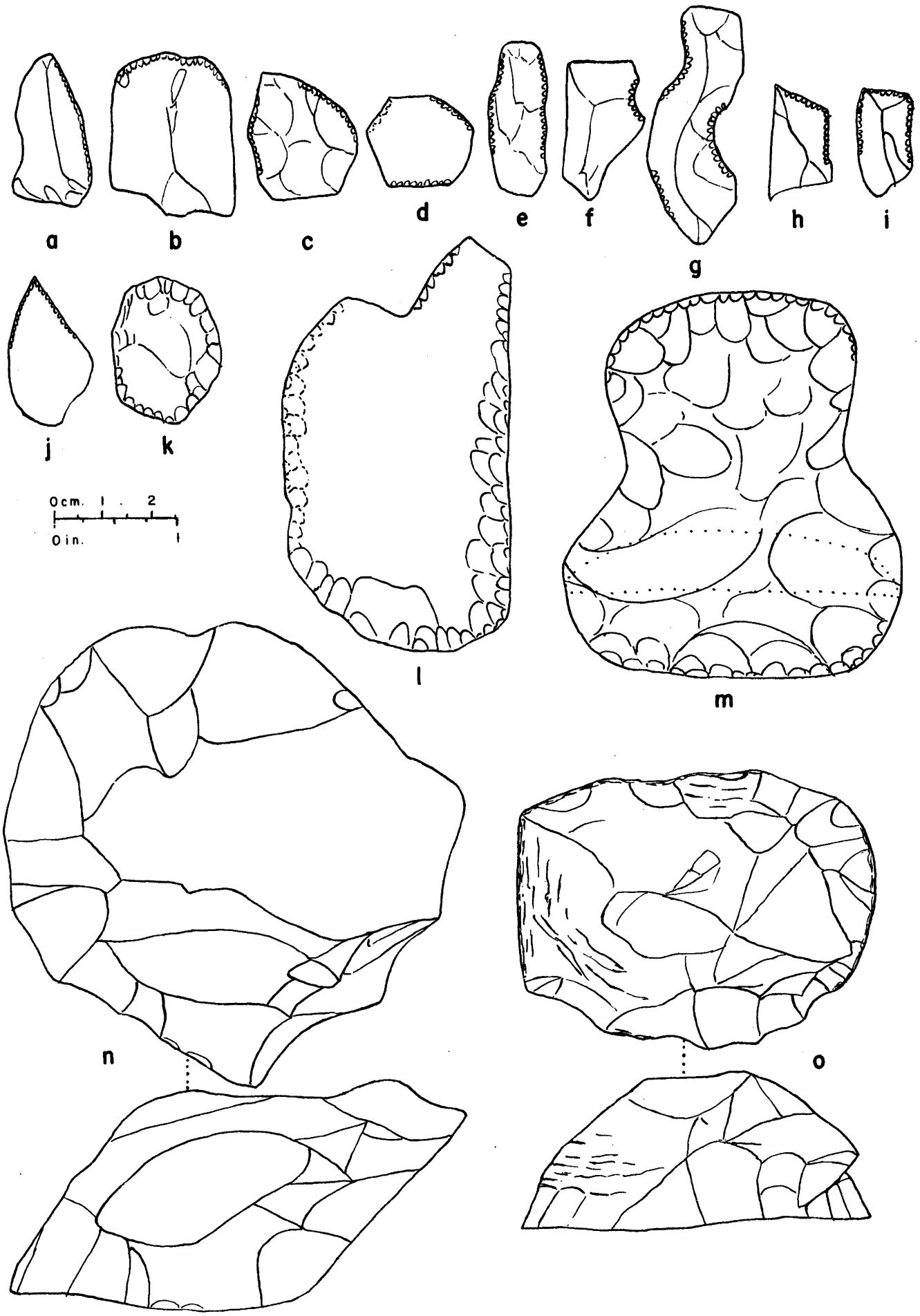


Figure 7. Flake and Core Scrapers.

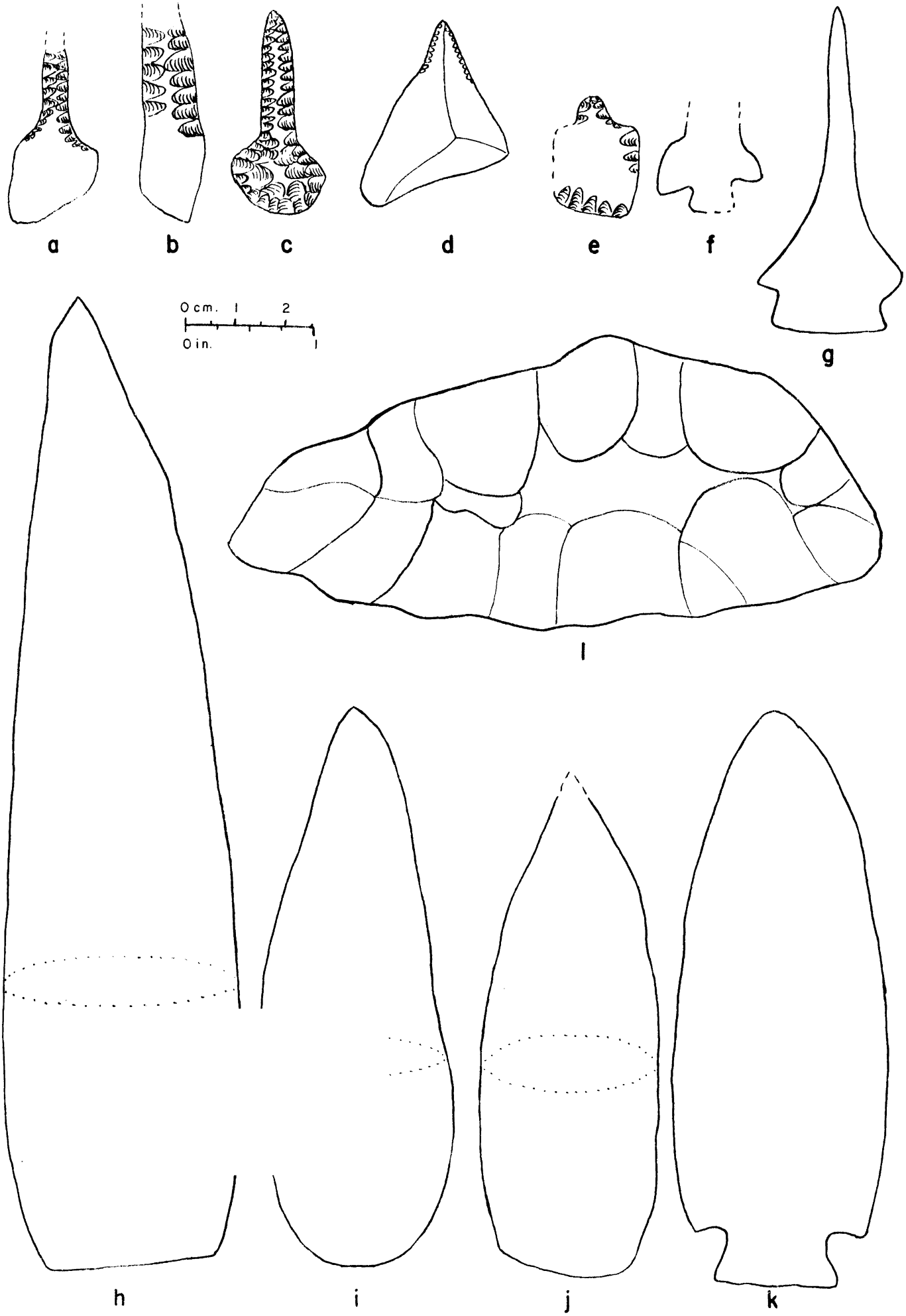


Figure 8. Drills, Blades, and Blank.

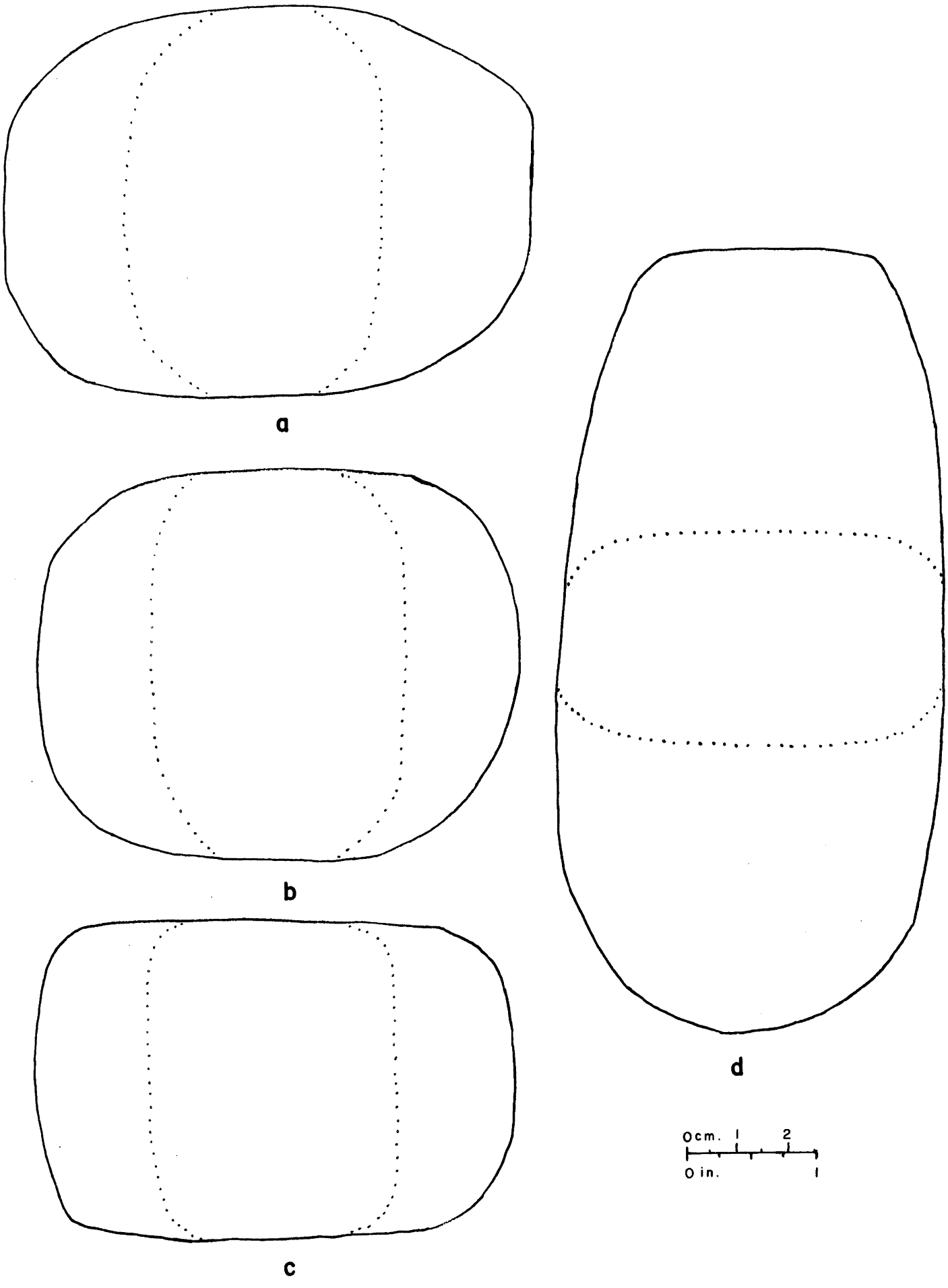


Figure 9. Bifacial Manos.

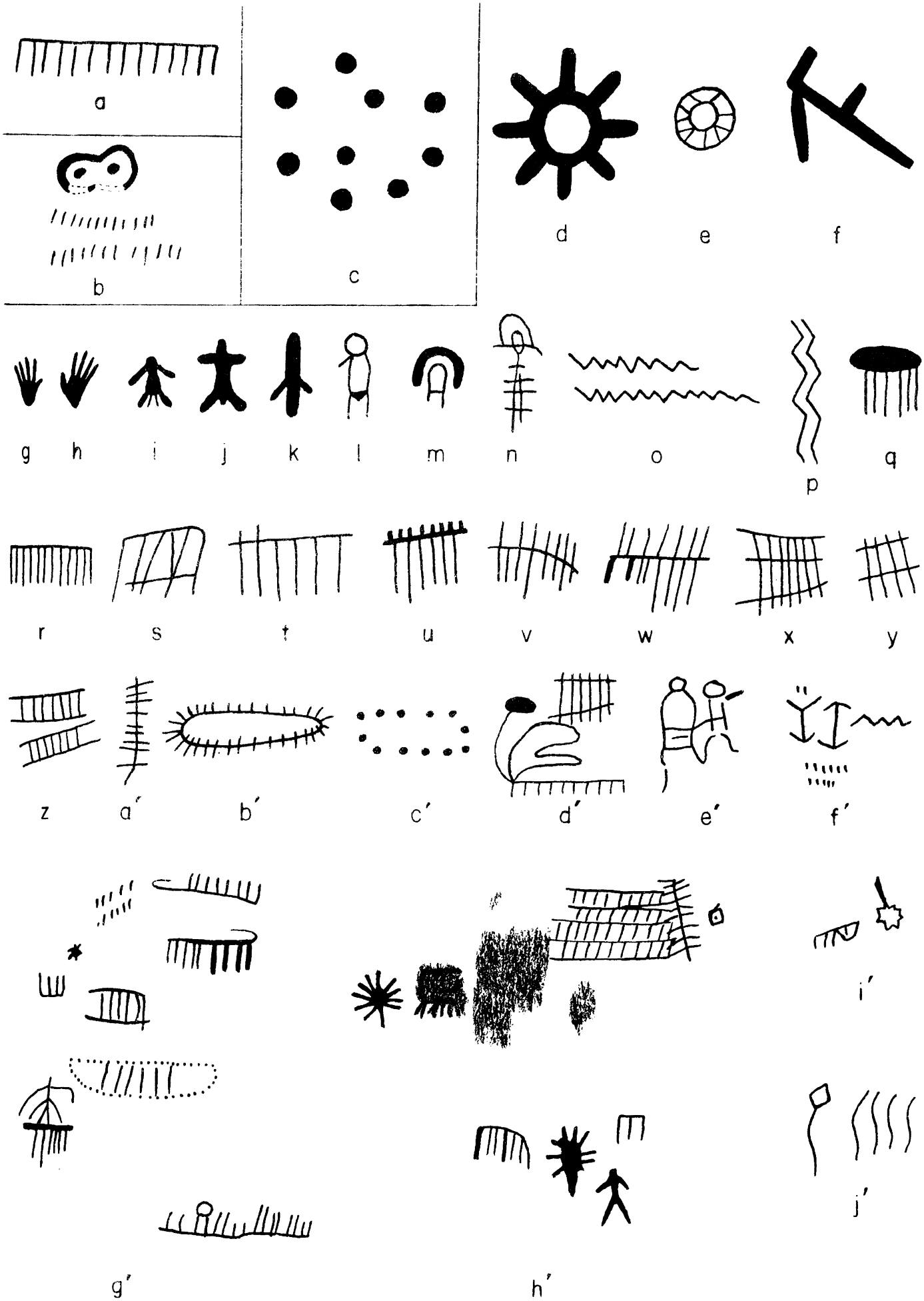


Figure 10. Pictographs From The Yosemite Region

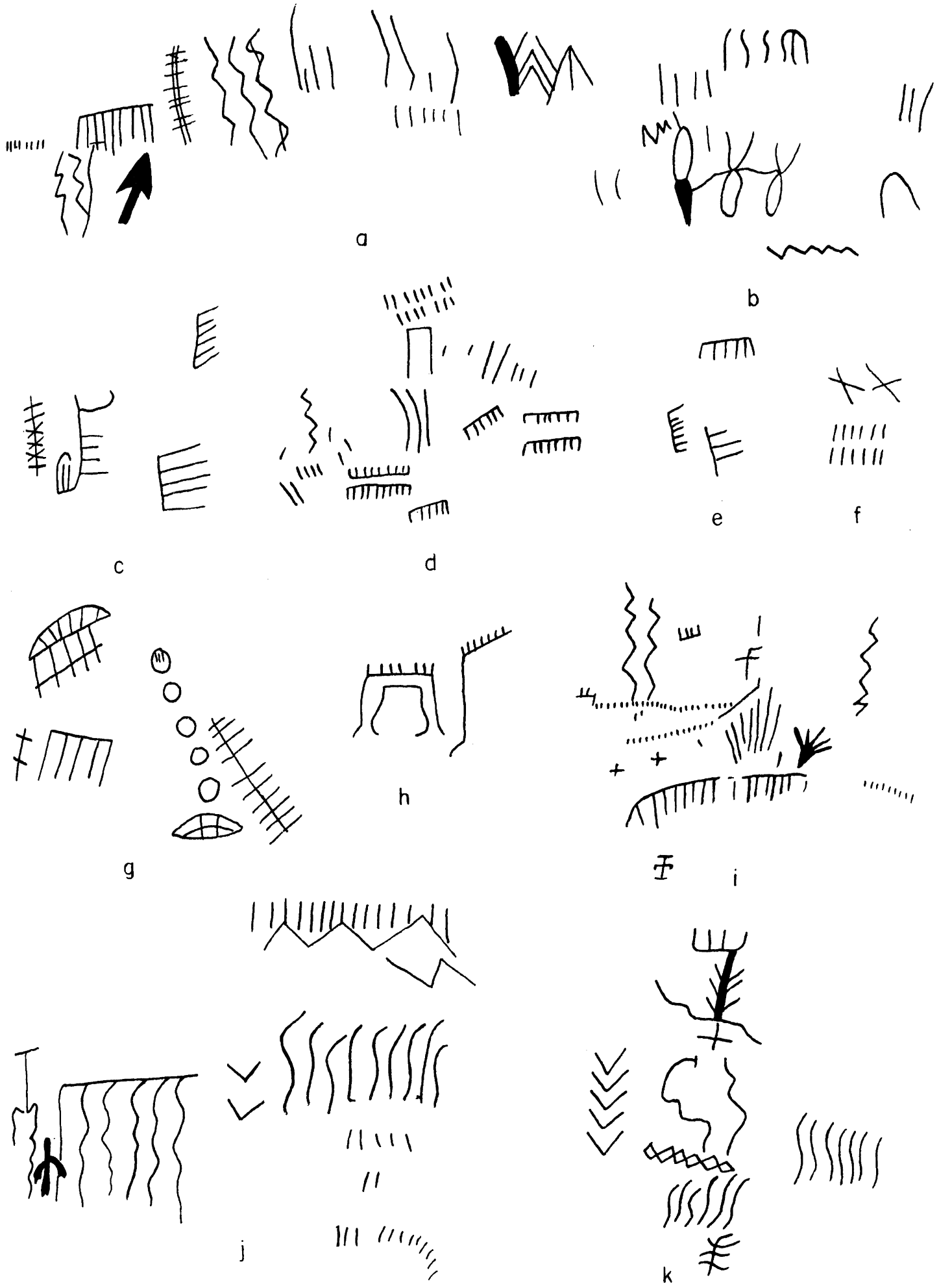


Figure 11. Pictographs From Site Tuo-22.