

ANTHROPOLOGICAL RECORDS

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THE COVILLE ROCK SHELTER, INYO COUNTY, CALIFORNIA

BY
CLEMENT W. MEIGHAN

With Appendixes by
Martin A. Baumhoff, Chérie N. Grégoire, and J. Arthur Freed

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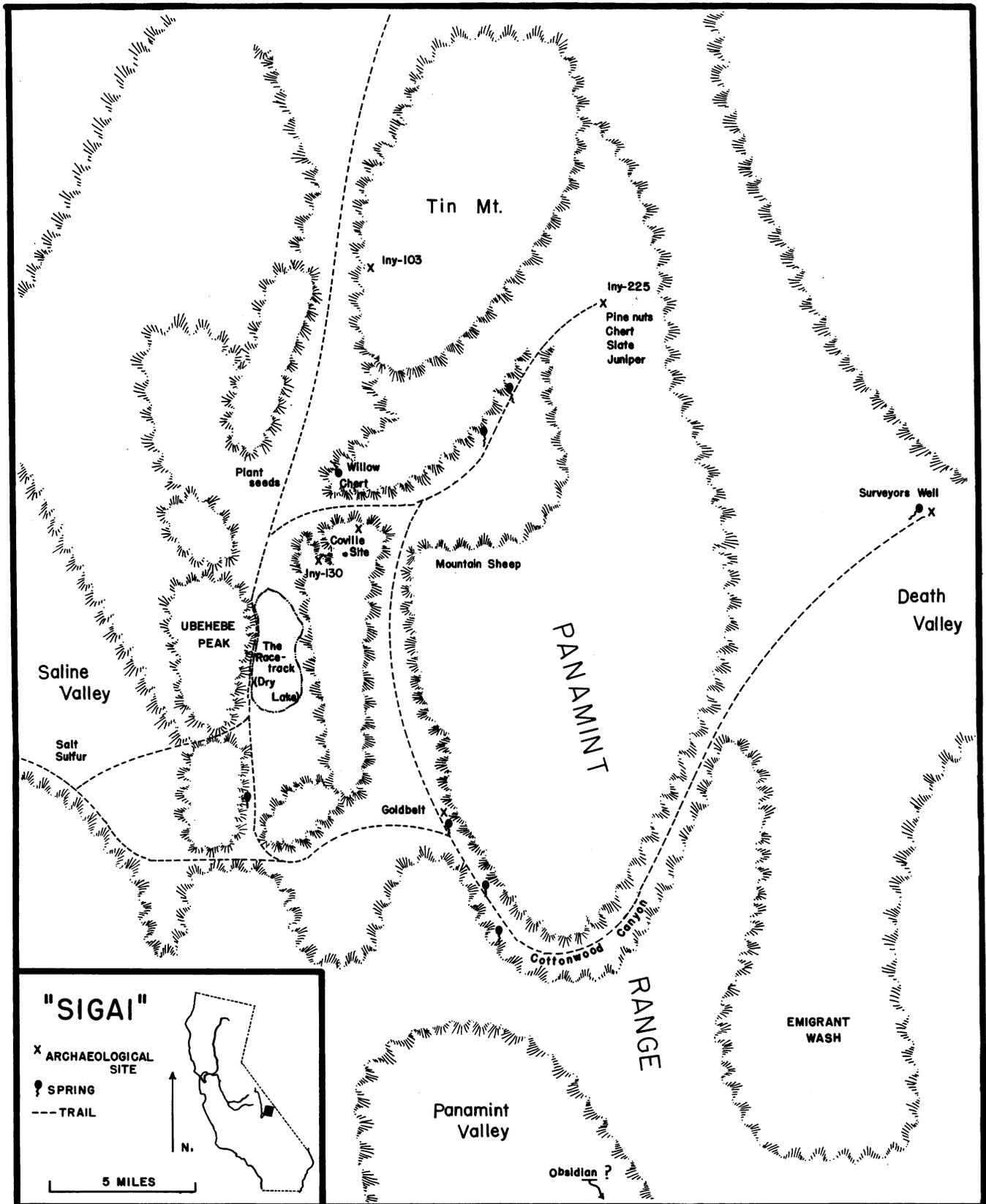
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Map 1. Ecological Map of the Coville Site Area

THE COVILLE ROCK SHELTER, INYO COUNTY, CALIFORNIA

BY

CLEMENT W. MEIGHAN

INTRODUCTION

The excavation here described was carried out as a cooperative project by the National Park Service and the University of California Archaeological Survey (UCAS). The San Francisco office of the National Park Service (Headquarters for Region 4) made arrangements for excavation within the Death Valley National Monument and furnished funds for subsistence of the field crew. The UCAS contributed the services of the writer, plus transportation and camping equipment for the field crew.

The site, officially designated as 4-Iny-222 in the records of the Archaeological Survey, was named by us after Frederick V. Coville, botanist with the United States Expedition to Death Valley in 1891. Coville took time from his other duties to write a short, but valuable, paper on the Panamint Shoshone (1892), and his contribution is the earliest scientific account of the Indians in the immediate region of the site.

The shelter was discovered by a UCAS crew in February, 1951, after the area had been called to our attention by a visitor to the region who had reported a canyon containing a large number of caves. The February survey crew felt that there was a real danger to the sites discovered, since a newly built dirt road permitted easy access to the sites by tourists and relic hunters. The sites are in a remote and unpatrolled section of the Death Valley National Monument, and it appeared only a matter of time before they would be damaged or destroyed by pot hunters.

Recognizing the danger of site destruction, the National Park Service, at the request of R. F. Heizer, Director of the UCAS, sponsored an emergency excavation aimed at salvaging the available archaeological material with a minimum of delay. A field crew was accordingly organized by the UCAS, and the work was accomplished in June and July, 1951.

The field crew made a complete excavation of the only site of any size in the canyon surveyed, as well as excavating minor sites and making a comprehensive survey of the area within a few miles of the canyon. Although the site excavated is small by the standards of other areas, it is the largest one in this part of the Death Valley Monument, and the material recovered probably represents as complete a sample as can be obtained in the immediate region.

As in most archaeological undertakings, the labor of many individuals has gone into the project described here.

My first thanks are due the University of California students who worked under often trying field conditions to recover the specimens: Martin A. Baumhoff, Leroy G. Fischer, Ernst Goldschmidt, and Bruce Harding. I am additionally indebted to Ernst Goldschmidt for doing the field mapping and for preparing the maps which accompany this report. Leroy Fischer assisted me in the preparation of the photographic illustrations. Martin A. Baumhoff, now Assistant Archaeologist of the UCAS, wrote the report on the smaller sites excavated (App. A).

Personnel of the National Park Service were instrumental in furthering the excavation. Dr. Aubrey Neasham aided in setting up the work contract between the University and the Park Service. Superintendent T. R. Goodwin and Park Naturalist L. F. Keller of the Death Valley staff cooperated with the crew in the field. Dr. Jesse Nusbaum spent several days with the field crew on behalf of the Park Service and gave valuable advice on the excavation.

The problem of specimen identifications was solved by the willing cooperation of experts who took time from their other duties to report upon the Death Valley material. A sample of the plant specimens was identified by G. Thomas Robbins of the University of California Herbarium. Dr. R. A. Cockrell of the University of California Forestry Department studied the wooden artifacts. J. Arthur Freed analyzed the mammal bones, and Chérie N. Grégoire was kind enough to undertake a report on the cordage specimens. Dr. S. F. Cook, Department of Physiology at the University, identified a lizard found in the site.

In describing the artifacts, I have grouped them on the basis of function rather than material. This makes it much easier to view the objects in their cultural context and gives a more coherent picture of prehistoric Shoshone life. In the tabulations in Appendix E, however, the artifacts are listed by their material for the convenience of students seeking individual items for comparative purposes.

The collection of specimens from the site is in the Museum of Anthropology, Berkeley Campus of the University of California. Catalogue numbers used in the text are the permanent numbers assigned by the Museum.

Normally the UCAS publishes in its Reports series the results of field work carried out under its auspices, but the present report is too extensive for the Reports and has therefore been placed in the Anthropological Records series.

DESCRIPTION OF THE SITE

THE SHELTER

The Coville Shelter is situated in a small canyon of dolomitic limestone in the Panamint Mountains of south-eastern California. The site is in the Death Valley Monument, roughly halfway between Ubehebe Crater and Ubehebe Mountain. The canyon containing the Coville Shelter trends east and west; the site is in the south wall of the canyon and faces north. It is a little over 150 ft. above the canyon floor, on a steep slope which is covered by a layer of loose rocky talus. Above the site is a nearly vertical cliff of limestone about 100 ft. high. The limestone of the canyon is in tilted layers, which have split and weathered to form shelves a few feet wide. Many small caves have weathered into the back wall of these shelves, and the Coville Shelter is composed of two small pockets extending a few feet into the rock at either end of a rock shelf. The shelf itself is a little over 45 ft. east-west by 15 ft. north-south; originally the whole shelf formed a single protected shelter, but the center part of the roof has caved in, leaving only the ends now habitable.

Vegetation is sparse in the site area. The canyon floor has scattered desert shrubs of different types, the largest of which is *Prunus andersonii* ("desert peach") which reaches a height of four or five feet. The rock walls of the canyon are bare except for scattered tufts of grass, small plants, and a few Joshua trees (*Yucca brevifolia*). A few species of cactus also grow here; the most common are *Echinocactus polycephalus* and *Opuntia basilaris*. The elevation of the site is almost exactly 5,000 ft.; 1,500 ft. higher there are junipers (*Juniperus utahensis*) and piñon pines (*Pinus monophylla*). Birds and mammals are very rarely seen in the region of the site. During the month of field work, birds were seen only once or twice a week. The only mammals at all common were several types of nocturnal mice and rats which appeared in the camp. Mountain sheep (*Ovis nelsoni*) still inhabit the surrounding cliffs, and wild burros have become common throughout the area since the advent of the Caucasians.

Surface water does not occur at the site at the present time. There are several small springs within a few miles, however, the closest of which is Quartz Springs, 1.25 mi. to the north. This spring is over a couple of ridges from the site, but one familiar with the terrain could undoubtedly make a round trip for water in an hour or so. Water may have been obtainable at the shelter at some times, since there would be temporary pools after each rain-storm. Also, the narrow ravine just east of the site contains green vegetation all summer, suggesting that water might be obtained here by digging a shallow well.

A note on the climate may be of some interest, since the Death Valley Monument is noted for its extremely hot weather on the valley floor. The site area, being at an elevation of 5,000 ft., is quite different in climate from the lower elevations in the region. The winters are extremely cold and windy, with occasional light snows at this elevation. In summer the days are hot, but not unbearably so, being often milder than the summer weather in the San Joaquin Valley. Summer nights are cool enough to make a blanket welcome for sleeping.

THE SITE DEPOSIT

The occupation deposit in the shelter consisted of a layer of dust and vegetal material which was only a few

inches thick at the outer edge of the shelter but increased to a depth of 36 to 40 in. against the back wall. The midden did not extend into the central rock fall, although a few artifacts were found in the rocks, presumably transported there by pack rats.

Below the occupation deposit, there was a zone of mixture between the midden and the base; this was only a few inches thick in most places. The base material was a white powdery dust from the decomposed limestone. This dust layer was up to 24 in. thick and rested on the bed-rock limestone ledge. The dust contained occasional pieces of charcoal, abundant seeds of *Prunus andersonii*, and an occasional flake of stone or obsidian. The dust layer probably does not represent human occupation, however, the articles occurring in it being most likely due to rodent activity.

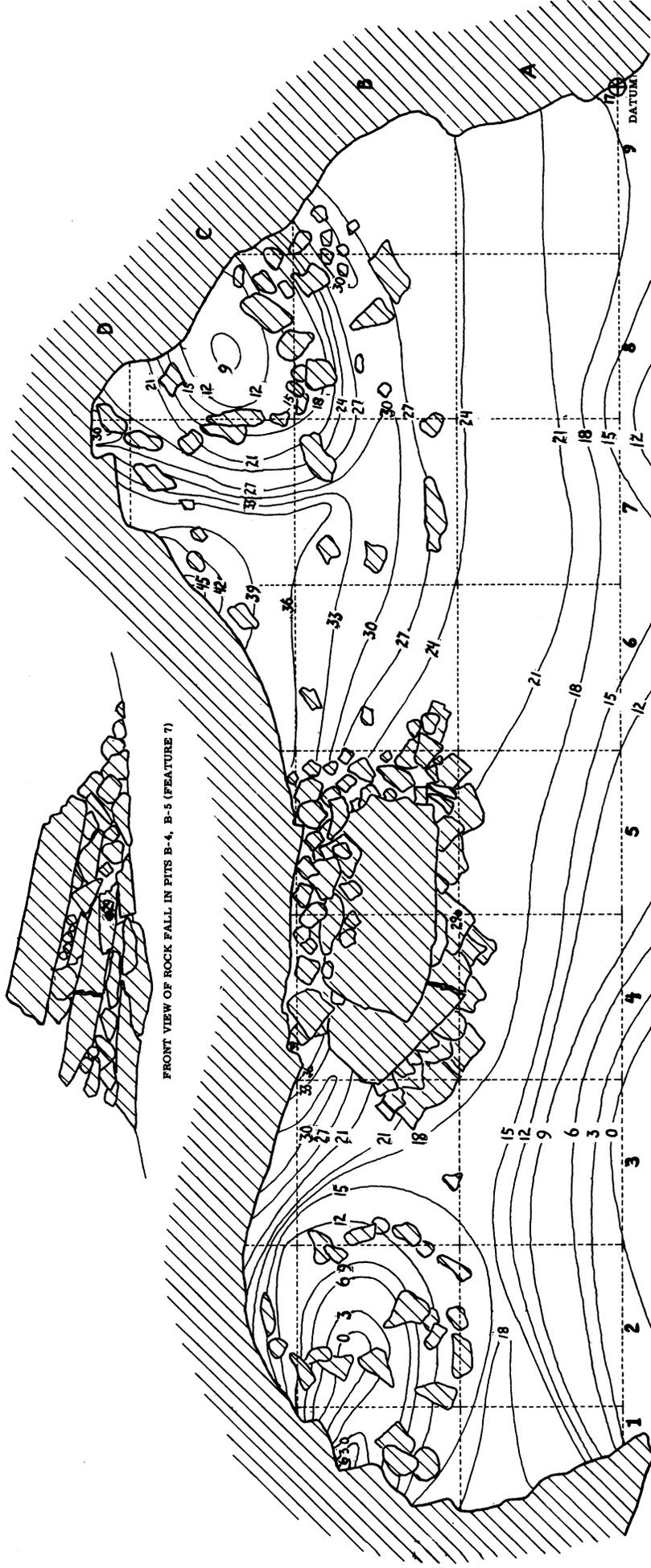
The deposit of the shelter was protected by a slight overhang of the cliff above and by the niches in the back wall at either end of the shelter. The deposit was therefore dry enough for the preservation of basketry and cordage. A little moisture could get into the shelter, however, particularly at the mouth of the opening, and occasional artifacts from this part of the site show some moisture damage.

The entire deposit of the site was troweled to bedrock by 6-in. levels and screened in a 1/4-in. screen. The material here described thus represents a total sample of the site. Of 354 counted artifacts, it is interesting to note, 109, or 30 per cent of the total, were found in the course of screening and were overlooked by the trowelers. Most of the artifacts missed were small bits of cordage, which were not spotted in the mass of vegetable material composing the midden. However, the shelter is not dark, and the fact that careful trowelers could miss so many specimens is a strong indication of the desirability of using screens when working cave deposits.

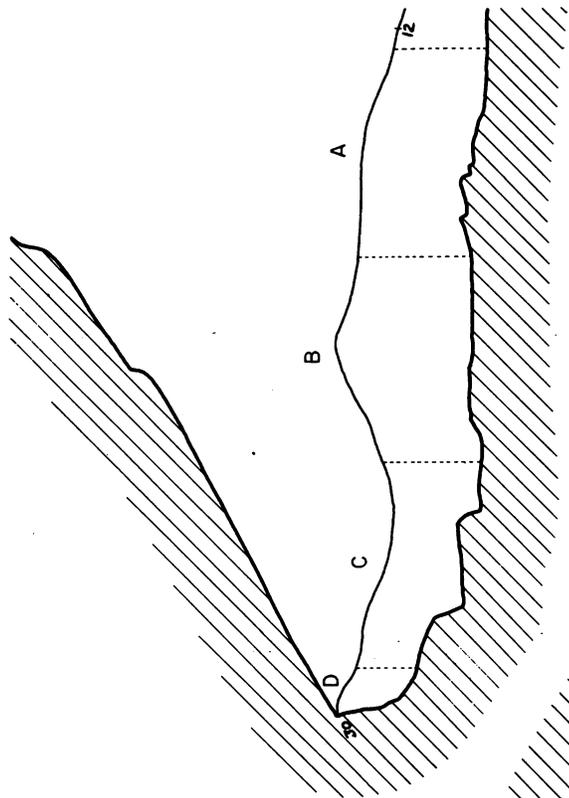
FEATURES WITHIN THE SITE

The most prominent surface features of the site were two house pits, one at either end of the shelter, separated by the large pile of limestone blocks which had fallen from the roof of the shelter. These were separately defined as features 2 and 3 (house pits) and feature 7 (rock fall). The term "house pit" may be somewhat of a misnomer, since there is no evidence that these features ever had a surface structure built over them. However, they are excavated areas which represent the habitation centers of the site, and the term "house pit" seems applicable.

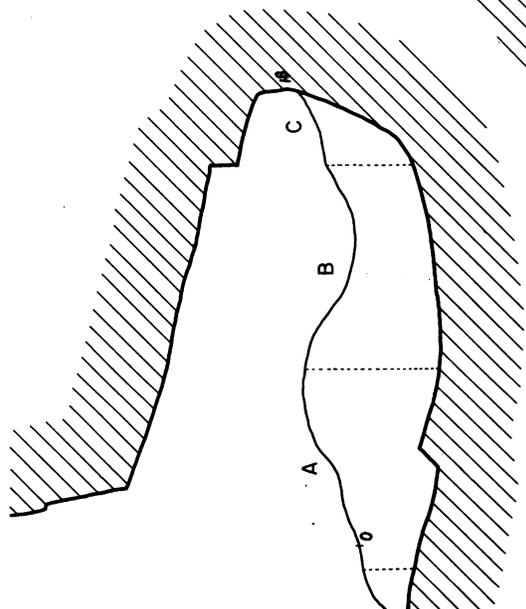
To give a coherent discussion of the surface features it is necessary to summarize the history of the shelter to show the relationship and development of the features. Originally, the shelter was a single 45 by 15 ft. depression formed by weathering of a limestone layer. At some time in the past, probably several hundred years ago at least, the central part of the roof caved in, leaving the two sheltered ends separated by a large pile of limestone blocks. Subsequent to the rock fall, the shelter gradually accumulated rock dust and rodent-carried seeds. It was not until a foot or so of dust had gathered on the shelter floor that the first human occupants entered the site. The first people enlarged the living area and improved protection from the elements by digging shallow pits in the deepest corners of the site, lining them with grass and other material. In



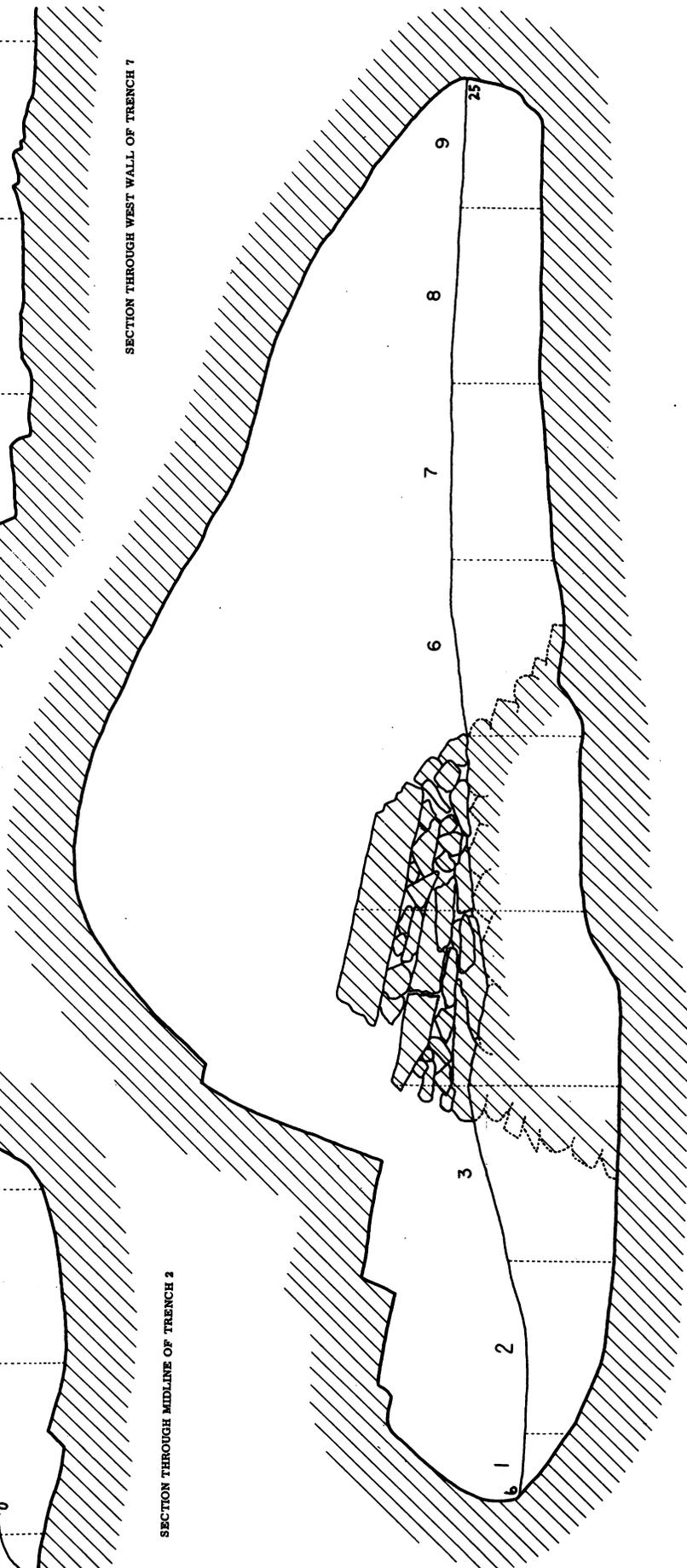
Map 2. Contour Map of the Coville Rock Shelter



SECTION THROUGH WEST WALL OF TRENCH 7



SECTION THROUGH MIDLINE OF TRENCH 2



SECTION THROUGH MIDLINE OF TRENCH B

Map 3. Section Views of the Coville Rock Shelter

the east house pit (feature 2) the pit was not dug to base, but the grass layer was placed on sterile rock dust a few inches above the shelter floor. The west house pit (feature 3), at the shallow end of the site, was excavated to bedrock. The two living areas were probably excavated at about the same time, although the east house pit contains a greater depth of deposit and may have been occupied slightly longer.

After the initial human occupation, the site was visited sporadically by small groups. Fresh grass was occasionally added to the pit floors, and this, plus plant seeds, broken artifacts, and other debris, accumulated in each pit to a depth of 2 to 3 ft. against the back wall of the shelter.

The site was abandoned at some time prior to Caucasian contact. Since abandonment, there has been some wind erosion; the top few inches of dust and debris have been blown away, leaving a layer of small rocks on the surface of the site.

Each of the house pits was close to 7 ft. in diameter; the depth of the west pit was only 7 in., while the east pit had a maximum depth of 22 in. in the center. The pits may have been slightly deeper before the surface erosion, but they are probably quite close to their original size.

The central rock fall is well shown in the site maps (maps 2 and 3). The archaeologists could not refrain from hoping that the rock had fallen on a habitation area, thereby burying and preserving such artifacts as might be in the area. This was not so; the pile of rocks went all the way to the bottom of the site, and the labor of removing them added nothing to the cultural picture.

The only other feature immediately observable on entering the shelter was an accumulation of five sticks and three stones wedged into a crevasse of the back wall, just above the rock fall. The longest stick was about two feet in length by an inch in diameter; the stones were cobbles of the local dolomite. One of the stones was slightly battered on the end, possibly because it had been pounded into the crevasse, but none of the other objects showed any signs of workmanship. The function of such a collection of material is problematical. Campbell noted several similar features in the Twentynine Palms area; she believes that such sticks serve as "spirit protectors" or tabu signs to guard the cave against robbery (Campbell, 1931). The location of the Coville feature in relation to the rock fall might also suggest a magical function for the prevention of further cave-ins, since dwellers in the shelter must have been acutely aware of large blocks of limestone hanging above their heads.

Other features of the site included fire hearths, cache pits, and one cache of artifacts. Only two clearly definable fire areas were found, although fragments of charcoal occurred throughout the midden. Both fire hearths are outside the house pits, and cooking was apparently done over fires located near the edge of the shelter. Description of the individual hearths is as follows:

Feature 4: Pit B-3, just outside the east house pit. A circular concentration of charcoal and ash, 14 in. in diameter and an inch or so in thickness. Fire was not built in a pit but is a surface feature, just below the surface dust of the deposit.

Feature 8: Pit A-7, near the rim of the shelter at the west end:—a fire area 24 in. in diameter and 5 in. in depth. Like feature 4, there is no prepared pit or hearth; this is simply an area where fires have been built.

Four pit features were recorded. Feature 5 is a simple dug pit, 16 in. in diameter. The top of the pit is 12 in. below the surface of pit B-2 and extends into the

layer of decomposed limestone. Nothing was found in the pit, but such cache pits may have been relatively common, being rapidly prepared. Feature 5 was noted because of the color change between the midden-filled pit and the white dust base soil. Pits in the midden proper could not be distinguished, although feature 1 (an accumulation of artifacts) must have been placed in such a pit.

The west house pit also had a grass-lined cache pit in pit C-7. The feature (no. 9) was excavated by the Indians from a level 15 in. below the surface level, and consisted of a pit 18 by 24 in. and 9 in. deep. The bottom of the pit was only an inch above bedrock, and the interior of the pit was lined with bundles of grass from 1 to 2 in. thick. Nothing was in the pit to indicate its former use.

Two additional storage pits were found, one in each house pit. These pits were lined with slabs of dolomite and were then lined with a grass layer a few inches thick. Both pits were empty, although feature 6 had some artifacts around its rim (see pl. 26, a for illustration. The other cache pit, feature 10, is illustrated in pl. 26, h).

Feature 6 was the largest cache pit discovered. It was 36 in. in diameter, 17 in. deep, and was dug originally from a layer 9 in. below the surface of the east house pit. The walls of the pit were made up of 11 angular dolomite slabs, one of which had been used as a metate for a brief time. The interior was lined with grass (of an unidentified species now growing in scattered tufts at the mouth of the shelter).

Feature 10 was a small pit, 20 in. in diameter and a few inches deep, excavated from 9 in. deep in the west house pit. The cache pit was dug to bedrock; in the illustration (pl. 26, h) the grass lining has been removed.

Grass and slab-lined storage pits are of nearly universal occurrence in the Basin and Southwest. Ethnographically, the Death Valley Shoshone and all Nevada Shoshone groups used bark or grass-lined cache pits for the storage of seeds. (Steward, 1941, pp. 231, 281.) Steward reports, "Pits were preferred to storage houses because they could be concealed, as people were constantly searching for caches to rob" (ibid., p. 333). The Northern Paiute also reported seed storage in bark-lined or grass-lined pits (Stewart, 1941, p. 376), and several Ute groups also affirmed the use of stone-lined cache pits.¹

California shows the following archaeological occurrences of slab-lined cache pits. An open site (SBa-477) near the Santa Barbara coast (M. A. Baumhoff, personal communication), a rock shelter in Deep Springs Valley, Inyo County (Steward, 1933, p. 334), and numerous examples in the Twentynine Palms area.²

In Nevada caves, cache pits are common but do not seem to make use of stone slab linings. Lovelock Cave had forty-eight cache pits, eight of which contained burials. They were lined with grass, rushes, or scraps of basketry. (Loud and Harrington, 1929.) Similar pits occurred in Humboldt Cave (Heizer and Krieger, MS) and Hidden Cave, the latter near Fallon (G. L. Grosscup, personal communication).

Farther north, grass-lined cache pits are recorded for Massacre Lake Cave in extreme northeastern California. (Cressman, 1942, p. 121.)

Slab-lined cache pits are common in the Southwest. Nusbaum reports (1922, pp. 23-60) thirty-one round slab-

¹Stewart, 1942, p. 251. The specific groups include the Kaibab and San Juan Southern Paiute and the following Ute groups: Tömpañwotsnunts, Taviwatsiu, Mōwataviwatsiu, Mowłtci, Wimōnutci.

²Campbell, 1931, p. 32. In the Twentynine Palms area: "Generally a place in a cave was scooped bare and then circled with large stones, inside of which smaller stones were laid to form a shallow pit and over this grasses and brush were spread bird-nest fashion, often the whole braced with soft decaying yucca stumps."

lined cists with an average diameter of 5 ft. found in a Utah Basketmaker cave. Other examples occur in Basketmaker caves in Arizona (Guernsey and Kidder, 1921, p. 30, pl. 9, c; Kidder and Guernsey, 1919, pp. 77, 78), the Hueco, Big Bend, and Upper Gila areas (Cosgrove, 1947, p. 164), and in Fremont Basketmaker caves of northwestern Colorado.³ One large slab-lined cist, 8 ft. in diameter, is reported for the Rio Fuerte of Chihuahua (Zingg, 1940, p. 37). Kluckhohn and Reiter report (1939, p. 33) slab-lined cists, some of them roofed, from Chaco Canyon sites dated between 800 and 1100 A. D.

From the distribution just outlined, it appears that the practice of lining cache pits with stone slabs is a distinctive Southwestern trait. The examples from the Basin area seem to be typically grass-lined. Slab-lined cache pits in California are all southern and, with the exception of the Santa Barbara pit, in regions which show other influences from the Southwest. Even the Santa Barbara region could have had fairly close contacts with the Southwest, as evidenced by pictograph motifs and other cultural elements (Lathrap, 1950, p. 22; Heizer, 1946).

It may be remarked that cache pits dug into the usual powdery cave deposit require a lining of some sort if the wall of the pit is not to cave in. Grass or bark is sufficient for the purpose, and these linings also protect the articles placed in the pit. The stone-lined pits, how-

³ Burgh and Scoggin, 1948, p. 32. Small slab-lined cists occur, but the common Fremont Basketmaker type is a bell-shaped hole in the cave floor.

ever, frequently have a grass lining within the stone wall of the pit, and it is difficult to understand the function of the grass in these.

The only other feature recorded for the Coville site was a cache of flint blades and mineral materials (feature 1). The cache was found at a depth of 11 in. against the east wall of the shelter in pit A-1. The associated objects included: 7 blades of gray chert, all more or less the same size and shape (see pl. 29, b, c, d); 2 unworked lumps of rock sulfur a few inches in diameter; 1 crumbling lump of yellow ochre (blades which were in contact with this showed oxidation stains); 1 small coil of basketry weft material, probably willow (this was slightly above the other objects and may be a fortuitous association). These objects were in a small pocket a few inches in diameter, but there was no indication that they had originally been placed in a container or a prepared pit. They appear to have been buried in a shallow hole with no other preparation.

The occurrence of sulfur in the cache is of some interest. Native sulfur occurs in Saline Valley, a few miles to the west, and it is probable that the present specimens derive from this source. The sulfur may represent a mineral paint, but it could equally well have been used ritually or medicinally. The pieces are rounded and look waterworn; they show no signs of working. The yellow ochre in the same cache had crumbled into fragments, and it was impossible to tell whether it had originally been a shaped lump of mineral material.

DESCRIPTION OF ARTIFACTS

DOMESTIC UTENSILS

Items of domestic use recovered from the Coville Rock Shelter include containers, grinding implements, firemaking tools, stone tools, and a sheephorn spoon. Articles of dress and adornment are discussed in the next section. The general assemblage indicates that the site was used primarily for domiciliary purposes. This is worth mentioning at the outset, for the inaccessible location of the site might suggest some other use, such as storage, "fortification," or even ritual use, as in some Southwestern caves.

Basketry.—Although no complete specimens were recovered, 115 fragments of baskets were found in the deposit (this figure includes 7 specimens from the survey reported in Lathrap and Meighan, 1951). The specimens are individually tabulated in Appendix E, and the present section is devoted to general description and discussion.

The Coville basketry fits easily into the pattern of Great Basin specimens. The most common form is an open-twined conical burden basket, but there are also examples of twined winnowers or seed beaters, pitch-covered baskets (possibly water containers), cooking "bowls," and circular coiled trays. There can be no doubt that baskets were very important to the aboriginal inhabitants of the site. On the basis of quantity, baskets were the most important single item of domestic use, serving as they did for carrying, seed harvesting and storage, cooking, and water containers.

A summary tabulation of basketry fragments is as follows.

<u>Baskets</u>	<u>No. of pieces</u>
Twined (68)	
Close-twined	3
Open-twined	65
Up-to-right	66
(2 close-twined, 64 open-twined)	
Up-to-left	2
(1 close-twined, 1 open-twined)	
Coiled (47)	
3-rod foundation	30
2-rod-and-bundle	7
Interlocking stitch	7
Split stitch, one side	10
Split stitch, both sides	8
Top rod split by stitches	28
(all 3-rod pieces in sufficiently good condition for identification)	
Up-to-right	43
Up-to-left	4

How many baskets are represented by the fragments recovered is a question which cannot be answered exactly. It would of course be possible to get dozens of fragments from a single burden basket, and the total collection recovered might then represent only two or three large baskets. However, a check of specimens shows a minimum of 10 baskets, including 4 burden baskets, 2 or 3 trays, and 1 each of winnowers, seed beater, cooking basket, and pitch-covered container. The similarities of technique, lack of decoration, and small size of some pieces make an accurate count impossible. A study of the distinctive baskets which can be surely identified, however, suggests that there are not more than five pieces of any one basket

in the site, and for some baskets only one or two fragments remain. It appears probable, therefore, that the pieces recovered represent at least 20 to 25 individual baskets.

There are two probable explanations of the smallness of the pieces of broken and discarded baskets found in the site. Broken baskets and similar debris could easily have been tossed out of the shelter to the talus slope, where the weather would soon destroy them. It is also possible that in this region of scant firewood discarded wooden and basketry objects were used as fuel. This seems particularly likely here, for the replenishment of firewood required scrambling down to the desert floor and then climbing back up the cliff—an arduous exercise that would be understandably avoided if combustible debris were at hand. The supposition finds some slight confirmation in the recovery of a single carbonized piece of coiled basketry (1-130191). If broken baskets were consistently used thus, then the baskets whose fragments were found in the site were either used around the cache pit rims or happened to be concealed in the dust and grass of the shelter floor. Broken baskets could be used as mends for other baskets, reinforcements to keep dust out of caches, or fuel, and the fragments remaining to the archaeologist were in a sense "lost" by the Indians rather than thrown away. This is of course true to some extent for most specimens found.

None of the Coville basketry has a colored design, and only one piece (1-130340, pl. 27, d) shows decoration achieved by spacing of weft rows and modification of weave. This absence of decoration emphasizes the utilitarian nature of the basketry. All of it was made for service and, except for the one piece mentioned above, ideas of aesthetic merit do not appear to have entered the basketmaker's mind. The work is not fine, and the emphasis on utility is also shown by irregularities in weave and by the crude mends applied for repair.

Techniques used in making the baskets were relatively few and simple. New wefts were simply caught under one stitch; new warps (inserted at intervals in the conical burden baskets) are usually sharpened at the ends before insertion. Mends (6 examples recovered) are made of either hastily applied strips of bark or of cordage and other basketry fragments. Details of mends are given in the tabulation of basketry (App. E) and examples of mends are shown in plate 27, c, d, e. Except for a specimen previously recovered and described elsewhere (Lathrap and Meighan, 1951, p. 17), there are no starts present in the pieces recovered.

Rim treatment includes the following techniques.

(1) A possible rim for a twined burden basket (1-130172) consists of 5 twigs, presumably warp elements, attached to a heavy stick by a weft coiled around the whole bundle. Specimen 1-130398 is similar but has only 2 twigs wrapped against the rim piece.

(2) A twined winnowers rim (1-130185) made of three warp elements. Paired wefts cross one another on the outside of the rim; one weft encircles the rim before crossing the other weft. The two weft elements then proceed back across the basket, forming another weft row.

(3) A twined winnowers (?) rim (1-130220); paired wefts are twisted together (S twist) about 5 times at the edge warp and then reverse and go back across

the basket.

(4) Unidentified twined form (1-130391) in which weft elements simply cross one another at the edge warp and then proceed back across the basket.

(5) Unidentified twined form (1-130388, see pl. 27, b); paired wefts cross at the edge warp and proceed back across basket. A heavier stick is added for the rim—it is bound to the edge warp by a willow splint which coils between the weft rows.

(6) Twined winnow (1-130430, see pl. 27, d); a "bundle" rim attached by coiling. The analysis is complicated by a mend or reinforcement on the rim; for complete description see p. 210.

(7) Coiled tray (1-130280) with 2-rod-and-bundle foundation; the rim is simply the top coil. Both rods of the top coil are split, possibly accidentally; the piece is in too poor condition for detailed analysis.

(8) Coiled bowl (1-130190); 3-rod foundation with top rod split. Rim is simply the top coil without the top rod split.

The conical, open-twined burden basket, noted previously as the commonest form in the site, is a type of basketry most common to Central California and the Great Basin. Although archaeological remains of such baskets are relatively rare, they are known ethnographically for such groups as the Pomo (Barrett, 1908, pl. 26), Miwok (Barrett and Gifford, 1923, p. 230, pl. 54), and Paiute (Stewart, 1942, pl. 2, a). The type does not occur in the Anasazi basketry of the Southwest.⁴ The Southwest area has conical burden baskets, but their only similarity to the California type is in form, and even this shows significant differences. The Basketmaker and Pueblo specimens are of fine coiling and not at all comparable to the rigid openwork pieces here described. The northern Great Basin also seems to lack this type of basket archaeologically, although the modern Paiute have it (Stewart, 1941, p. 387). Cressman does not report it (1942), and Fenenga and Riddell failed to find it in Lassen County, northeastern California (Fenenga and Riddell, 1949; Riddell and Fenenga, MS). To the east, the type was not found in caves near Salt Lake (Steward, 1937, p. 35) or in northwestern Colorado (Burgh and Scoggin, 1948). Lovelock Cave in central Nevada yielded 104 pieces of twined basketry, but this was the least common type of basketry at the site, and the burden baskets were primarily of soft-twined tule (Loud and Harrington, 1929). A few specimens of the Coville type were also found, including one fragment which shows an identical rim treatment to that described under (3) above (Loud and Harrington, pl. 31, g, i). A single fragment of this basketry was also found near Lovelock in a cave designated as 26-Pe-8 (Robson and Baumhoff, MS), and it has also been reported from the Leonard Rock Shelter (Heizer, 1951b, p. 91, fig. 40) and from Humboldt Cave (Heizer and Krieger, MS). In California, one of these burden baskets has been recovered from a cave in Amador County (UCMA specimen [with burial 12-8313]).

Spier gives a distribution of conical burden baskets (1928, pp. 153-155, fig. 27), but it is based on form only, without consideration of technique of manufacture. It appears that the rigid open-twined form discussed here is more restricted in distribution, centering in the western and central part of the range of conical burden baskets in general.

The absence of open-twined burden baskets in many of the archaeological sites suggests a relatively late date for this type of basket, simple as it is in construction. As

previously mentioned, the type occurs ethnographically in some regions where it has not been found archaeologically (i. e. the northern Great Basin, where it is absent except for a couple of pieces in Lovelock Cave and vicinity). At the same time, this type is abundant in late period sites, such as the Coville Shelter, in the southern Basin. Definite statements are not possible, but it appears that in at least part of their range open-twined burden baskets are later in time than other forms of carrying containers, including close-twined burden baskets and soft "bags" of open-twined tule. However, the type occurs in the lowest levels of Humboldt Cave, dated by the C¹⁴ method at 1,953 years (Heizer, 1951b, p. 97), where it constituted only about 2 per cent of the total number of baskets in the site (Heizer and Krieger, MS). On present evidence, it might be suggested that this open-twined type of burden basket originated in central Nevada or possibly eastern California.

Aside from burden baskets, the Coville site yielded open-twined winnow fragments and three pieces of close-twined basketry. Three pieces of one winnow were found that could be fitted together to form half the original basket, which was 26 cm. wide at the fourteenth weft row from the handle. All the pieces (nos. 1-130051, 1-130053, and 14 in the original survey) were found in an area of one square foot in pit B-2, one on the surface, one at a depth of 6 in. and one at 7 in. The first fragment found is described elsewhere (Lathrap and Meighan, 1951, pp. 17, 18, pl. 3G), so the description is not repeated here.

The three close-twined specimens cannot be definitely assigned to any one basket form, although the largest (1-130070, 37, b) could well be a piece of a close-twined burden basket, of the type illustrated for Yokuts-Mono groups (Gayton, 1948, p. 18).

Coiled basketry fragments in the site seem to represent only trays and cooking bowls. Remarks on the occurrence and distribution of the trays are made by Lathrap and Meighan (1951, pp. 14-16). The single bowl-shaped cooking basket (1-130190, pl. 28, q) has an interlocking stitch and an up-to-the-left weave, both of which traits are rare in this site.

Coville, referring to the Panamint Shoshone of 1891, comments that coiled basketry is made on a foundation of "two or three grass stems and one very slender withe" (Coville, 1892, p. 359). For decoration, devil horns (*Martynia proboscidea*) served for black patterns and tree yucca roots (*Yucca brevifolia*) were used for red (ibid.). The Paiute of Owens Valley used a 3-rod foundation most commonly, although 2-rod foundations were used for crude specimens. When 3-rod foundations were used in non-interlocking stitch, the top rod of the foundation was split by the stitches. There were some grass bundle foundations also (Steward, 1933, pp. 270-271). The 3-rod type appears to be identical with the Coville types, although neither 2-rod nor grass bundle foundations occur in the Coville site. Farther north, the Surprise Valley Paiute have only single- and double-rod coiling, and stitches are not interlocked or consistently split (Kelly, 1932, pp. 121, 122).

A marked difference between the archaeological and ethnographic specimens in the Death Valley region is the fineness of weave. Four Death Valley specimens at the University of Utah Museum of Anthropology have been tabulated as having respectively 60, 76, 95, and 102 stitches per 10 cm. (Steward, 1933, p. 272). The finest of the Coville Shelter specimens had only 40 stitches per 10 cm., and only three fragments were this fine, some of the specimens having only 18 or 20 wefts per 10 cm.

Six fragments of the coiled basketry have a pitch coating; three have pitch on one side only, and the other

⁴ Morris and Burgh, 1941. See also Nusbaum, 1922; Guernsey and Kidder, 1921, p. 59; Cosgrove, 1947; Zingg, 1940.

three have it on both sides. These could represent a water container, but since the conventional water bottle of this region is twined, it seems more likely that the present specimens are pieces of cooking vessels. Steward notes (1933, p. 271) that coiled containers of the Mono Lake region were sometimes pitch-coated on the inside for cooking, pottery not being made there. The Coville specimens probably represent this same practice in the Panamints; there were only two small sherds of pottery in the site and basketry must have been used for cooking.

The 3-rod coiled basket, like the twined ware, is most characteristic of the Great Basin. Similar 3-rod basketry is reported for Lovelock Cave,⁵ Humboldt Cave (Heizer and Krieger, MS), Tommy Tucker Cave (Fenenga and Riddell, 1949, p. 206; Riddell and Fenenga, MS), and in some of the Oregon caves (Cressman, 1942, p. 48). This basketry is not typical of Southwestern archaeological specimens and did not appear in the Southwest until Pueblo III times (Morris and Burgh, 1941, fig. 4B).

Two-rod-and-bundle coiling, of which there were seven fragments in the Coville site, is more typical of the Southwest. It was the commonest type in a Utah Basketmaker site (Nusbaum, 1922, pp. 90 ff.), and also occurred in northeastern Arizona (Guernsey and Kidder, 1921, p. 59) and the upper Gila district of New Mexico (Cosgrove, 1947, p. 173). Morris and Burgh (1941, pp. 12, 13, fig. 3J) date this foundation type as from Basketmaker II to modern times, and give a distribution of its occurrence in some fifty Southwestern sites.

Two-rod-and-bundle did not occur in the Oregon Caves,⁶ Lovelock Cave (Loud and Harrington, 1929, pp. 65-68), Tommy Tucker Cave (Fenenga and Riddell, 1949; Riddell and Fenenga, MS), the Leonard Rock Shelter (Heizer, 1951b, p. 91, fig. 40), or Humboldt Cave (Heizer and Krieger, MS). The foundation is not recorded ethnographically for the Ute-Southern Paiute or Northern Paiute,⁷ Nevada Shoshone (Steward, 1941, p. 291), Owens Valley Paiute (Steward, 1933, pp. 270, 271), or Surprise Valley Paiute (Kelly, 1932, p. 121). To sum up, the two-rod-and-bundle foundation is characteristically Southwestern and seems to be lacking in the Great Basin except for the Coville Rock Shelter specimens. These may logically be regarded, therefore, as due to influences from the Southwest or as actual trade pieces. The former supposition seems more likely, since the bundle appears to be joshua tree fiber, which is a local material. In one Coville specimen (1-130280), the bundle is grass and the stitches are interlocking, differentiating this piece from all the other specimens and indicating the presence in the site of at least two baskets with this type of foundation.

Cordage.—The Coville site yielded 155 fragments of cordage. This total includes 4 pieces of braid and 11

⁵Loud and Harrington, 1929, pp. 65, 66. Lovelock Cave yielded 309 pieces of coiled basketry, 91 per cent of which have stitches split on one or both sides. The pieces are mostly 3-rod and up-to-the-right; some of them have the top rod split.

⁶Cressman, 1942, pp. 45-57. Cressman considers the 2-rod-and-bundle triangular foundation as "structurally the same as the 3-rod triangular" and in comparisons treats it as the same thing, correlating (p. 49) the Oregon caves with Basketmaker and variants of this early culture. However, Morris and Burgh indicate that there is a sharp temporal difference between the two types of foundation in the Southwest, and since there also appears to be a clear areal difference between these foundation types in the Southwest and the Great Basin, the comparison lacks validity. Similarity in structure does not necessarily mean temporal or areal comparability.

⁷Stewart, 1942, p. 270; 1941, p. 386. Informants were not specifically asked about this trait, but the overwhelming predominance of 2-rod and 3-rod affirmations makes it unlikely that the 2-rod-and-bundle formation was used.

fragments of twisted animal skin which are probably pieces of the rabbitskin blanket (1-130320, pl. 27, y). Also included are 6 specimens composed of bundles of willow twigs or grass stalks twisted together; these are rigid and could not have functioned like the other cordage, but they are classified here because they were made in the same way as the other cordage.

Most of the Coville Shelter cordage is 2-ply right-twist cordage of Amsonia, joshua fiber, or juniper bark. The pieces are all quite small, none exceeding a few inches in length. A few pieces are in place on other specimens (basketry and sandals), giving some indication of cordage use.

Chérie N. Grégoire, who has studied the aboriginal cordage of California in some detail, has kindly undertaken the task of checking my field identification and of adding some distributional data. Her more detailed report on the cordage specimens is included here as Appendix B.

Grinding implements.—A single metate and mano were found. There is nothing particularly distinctive about them, both conforming to the usual simple type found in the Great Basin. Description as follows:

1-130410. Mano, of heavy pink stone with relatively coarse crystalline structure. Size 8 x 7 x 6 cm.; shaped on all surfaces. One flat side has been used and one edge appears partly used. Found against the west wall of the shelter (pit A-9, 6-12 in.).

1-130484. Metate, made from a natural angular slab of dolomite which has a somewhat granular texture. Dolomite like this can be picked up in the canyon below the site but not at the site itself. The slab has a circular used area in the center of one surface; there is no other modification and the specimen could not have been used more than a few times. Size 31 x 28 x 7.5 cm. This piece formed the main slab in the wall of a cache pit (feature 6).

Fire drills and hearths.—The following firemaking equipment was found: (a) 4 hardwood fire drill fragments (1-130016; 1-130060; 1-130061, pl. 27, t; 1-130249); (b) 1 hardwood foreshaft for composite fire drill (1-130305, pl. 27, l); (c) 1 juniper hearth (1-130139, pl. 27, u). Measurements and description of the pieces are given in Appendix E.

Comparative material is relatively abundant, for fire hearths and drills are well documented, both archaeologically and ethnographically. The Coville Shelter has evidences of both simple and compound fire drills, the hardwood foreshaft of the compound drill being presumably mounted in a cane shaft. Hough has commented (1890, p. 538) that the composite fire drill is distinctive of the Shoshonean area. The foreshaft and hearth are generally of sage (*Artemisia tridentata*); the drill is used in the hands, the bow drill being unknown (ibid.).

Specific groups affirming the fire drill include the Northern Paiute (Stewart, 1941, p. 381), and the Surprise Valley Paiute.⁸ One-piece drills were claimed by the Owens Valley Paiute (Steward, 1933, p. 276, pl. 3, a), who say that drills were cane or hardwood, used with willow or sage hearths. Among the Ute-Southern Paiute all groups except the Goshute denied compound drills, claiming instead a simple drill with an *Artemisia* or juniper hearth (Stewart, 1942, pp. 261, 262). In Southern California, the Kamia used a simple drill and a hearth of arrowweed, the hearth being used once only (Gifford, 1931, pp. 42, 43).

⁸Kelly, 1932, p. 142. The tip was of sagebrush. Kelly saw a conical one, 3-1/2 in. long, which fitted into a 30-in. shaft. The hearth was usually juniper.

Archaeological specimens have been recorded from the following sites:

Lovelock Cave: 6 simple drills (4 hardwood and 2 softwood), and 36 hearths, mostly willow but some of cane and cattail stalks (Loud and Harrington, 1929, p. 96).

Humboldt Cave: 1 fire drill of cane, 11 hearths (Heizer and Krieger, MS).

Oregon caves: 13 compound drills, 2 simple drills, 1 hearth (Cressman, 1942, p. 71).

Tommy Tucker Cave: 1 sagebrush foreshaft for fire drill, 2 sagebrush hearths, 1 possible greasewood drill (Fenenga and Riddell, 1949, p. 205, fig. 56c; Riddell and Fenenga, MS).

Twentynine Palms area: 1 fragmentary hearth of softwood (Campbell, 1931, p. 77).

Pueblo ruins: "Fire drills and hearths were recovered from nearly every dwelling investigated. The former are round sticks averaging 3/8 in. in diameter . . . All the hearths are of soft wood save one, which is made of a sunflower stalk, and all but one are round" (Kidder and Guernsey, 1919, pp. 120, 121, pl. 50).

Salt Lake Caves: Hardwood foreshafts for fire drills; a complete specimen also had a hardwood shaft (Steward, 1937, p. 19).

Upper Gila and Hueco Areas, New Mexico and Texas: 60 drills, 86 hearths. Eight drills are of hardwood, others are of yucca bloom stalks. Hearths are all yucca except 2 cedar or juniper (Cosgrove, 1947, pp. 146, 147).

Blades and scrapers.—The Coville Rock Shelter yielded 23 stone blades and fragments. None was found in a context which would indicate function, but since they are much too large for projectile points it may be assumed that they are blades used for cutting and scraping. All appear to be utility tools, with the emphasis on simple and rapid manufacture. All are percussion flaked and subtriangular in shape with a convex base (pl. 29, *b, c, d* shows range of variation; 29, *b* is the only one with a base which approaches a square shape). Size range for the whole specimens is from 4.5 to 8.5 cm. in length, the average being 7.0 cm. Materials used include red chert, 2 examples; white chert, 4; gray chert, 11; obsidian, 6. Details of individual specimens are in Appendix E, table 6. Blades were apparently used without hafting; no evidence of a haft was found. Seven of the blades (1-130025 to 1-130031) were found in a cache (feature 1) with lumps of rock sulfur and yellow ochre. Two of these were unfinished, being only partially chipped along the edges.

Scrapers from the site number 20 specimens, all but two of which are exceedingly simple and appear to be random pieces which were picked up, used once, and then discarded. A count of types includes the following (see App. E, table 6 for individual descriptions)

Carefully made chert end scrapers (1-130092, 1-130303, pl. 29, <i>f</i>)	2
Amorphous chert flakes with use chipping only . . .	5
Amorphous chert flakes with minor retouching . . .	5
Obsidian flakes showing use retouch	3
Quartzite flakes showing use retouch	1
Coarse dolomite core scrapers of amorphous form with edge chipping	4

The function of the scrapers is problematical; the amorphous flakes could have been used for cutting as well as scraping. The two end scrapers were probably used for shaping wooden objects such as arrow foreshafts. One of the foreshafts found (pl. 27, *j*) shows surface striations of the sort which would be made in shaping with a scraper of this kind.

Choppers.—Thirteen very crude choppers were recorded from the site (individually tabulated in App. E, table 6). All are natural angular pieces of dolomite which have been chipped and/or used along one or more edges. Maximum lengths range from 10.5 to 25 cm.; the largest specimens weigh several pounds. These artifacts are so rudimentary in manufacture that none appears to have been used more than once or twice. What uses such heavy tools could have been put to is a puzzling question. They may have been used for chopping (more properly "battering") down Joshua tree trunks for fuel, and could also have served for chopping and pounding Joshua tree spines in preparing them to be made into cordage.

Pottery.—Only two small sherds were found; these fit together to form a rim piece. Both sherds were found in the west house pit, one in pit B-8 (surface), the other in pit B-9 (6-12 in. level). The pieces are important as an indication that the end of occupation dates from the pottery period of this region. However, the exceedingly small quantity of pottery suggests that the site was abandoned shortly after pottery was introduced into the area. Surface sites of the historic and protohistoric period yield a fairly large number of sherds (over 900 from limited work at Iny-2) (H.S. Riddell, 1951, p. 20), and the presence of two small fragments of a single vessel at the Coville Shelter probably means that pottery was still fairly uncommon in the Panamint area at the time the site was occupied.

Description of the fragments is as follows.

1-130069. Rim piece forming a corner of the larger sherd below. Dimensions: 2.5 x 2.0 x 0.6 cm.

1-130415. Roughly smoothed inside and out. Rounded rim, appears to be from a bowl with outward flaring sides, not from a hemispherical or incurving vessel. Dimensions: 7.0 x 6.8 x 0.65 cm.

The pottery is fired in a reducing atmosphere, sand-tempered (no mica visible), black in color throughout, with a crumbling fracture. There is no decoration. Although interpretation based on a single vessel fragment must be regarded as tentative, this does not appear to be the same pottery previously found in the site area (Lathrap and Meighan, 1951) and later defined as Owens Valley Brown Ware (H.S. Riddell, 1951, pp. 20-23). The evidence of reduction in firing plus the apparent outward-flaring shape make the pottery most similar to Southern Paiute Utility Ware (Baldwin, 1950). If this similarity is authentic, the pottery affiliations of the Coville site are toward the east rather than the west.

Sheephorn spoon.—A single damaged spoon or scoop of sheephorn (10.8 x 5.4 cm.) was recovered in the original survey of the site. It is described elsewhere (Lathrap and Meighan, 1951, p. 21) and additional comment is unnecessary.

Bone flesher.—Completing the inventory of domestic utensils is a bone artifact which is here called a flesher, largely for want of a better term. The piece is of split mammal bone, 12.3 by 1.9 cm., and has all edges and surfaces polished (1-130081, pl. 27, *p*). The longitudinal edges are slightly beveled as if from use and it seems likely that this tool was used in the preparation of small animal skins, either for scraping the flesh from hide or for softening the skin. A closely similar object from an

Arizona cliff dwelling is figured by Kidder and Guernsey (1919, pl. 128, fig. 51), who call the piece a scraper.

DRESS AND ORNAMENT

As might be expected from ethnographic accounts of the region, evidence for clothing is rare in the Coville site. There are a couple of sandals and fragments of a rabbitskin blanket, but presumably the aboriginal inhabitants of the site used little or no clothing. More surprising is the virtual absence of ornament types. Pendants, shell beads, and similar common type ornaments are entirely absent, only a few bone tubes indicating ornament. At Iny-2 in Owens Valley, some 60 shell beads representing ten types were found (H.S. Riddell, 1951, pp. 18, 19). This site was occupied in the nineteenth century, and the disparity of ornament types found in this site and in the Coville Shelter may indicate a marked increase in the use of shell beads in this region during the historic period.

Rabbitskin blanket.—Two fragments of what appears to be a rabbitskin blanket were found on the rim of a cache pit (feature 6); they are described as follows:

1-130320. Made from strips of twisted skin, presumably rabbit (hair is all gone), woven together in simple twining. The twining is rather haphazard; some of the weft elements pass over two warps rather than one. All elements are S twist; new elements are added by tying them on with a square knot. Associated with this piece was specimen 1-130312 which is probably part of the same blanket. The latter piece is 20 x 25 cm. in size and is the same as above except that some strands are Z twist. Both pieces are central fragments, and the edge treatment cannot be observed. Dimensions: 21 x 17 cm. Pl. 27, y.

Rabbitskin blankets were used as robes, mostly during the winter, by the following groups: Owens Valley Paiute (Steward, 1933, p. 266), Surprise Valley Paiute (Kelly, 1932, pp. 107, 108), Northern Paiute (Stewart, 1941, p. 388), many groups of Ute-Southern Paiute (Stewart, 1942, pp. 271, 272), Nevada Shoshone (Steward, 1941, p. 245), and the Kamia of Imperial Valley (Gifford, 1931, p. 33). Most of these groups also used the robes as blankets—for example, beds for the Paiute of Owens Valley were rabbitskin blankets on the ground (Steward, 1933, p. 266).

All the ethnographic accounts describe rabbitskin blankets made with warps of twisted skin and widely spaced wefts of string or cordage. None of them describe the Coville Rock Shelter type which has twisted skin for both warps and wefts. Some groups do attest the occasional use of buckskin for wefts, including the Owens Valley Paiute (*ibid.*), Surprise Valley Paiute (Kelly, 1932, pp. 107, 108), Northern Paiute (Stewart, 1941, p. 388), and Ute-Southern Paiute (Stewart, 1942, pp. 271, 272). However, this is not comparable to the Coville specimens, which have warps and wefts of the same material and must have had both elements covered with hair at the time the blanket was made. The most common practice in recent times has been to have warps of twisted skin (the hair-covered element which makes the blanket soft) and wefts of a fibrous material, including such things as bark fiber cord, cloth strips, twine, sinew, or apocynum cordage. (See references cited in this and the preceding paragraph.)

Archaeological specimens of twisted-skin blankets have been found in several dry sites. In California, a rabbitskin blanket was found in a Kern County cave (Ker-185) (Heizer, 1951a, p. 31). Lovelock Cave contained skin blankets of several types (Loud and Harrington, 1929).

All had cord wefts, and those made of delicate skin strips were supported by twisting the skin strips over a cord before weaving. Skin blankets with yucca cord wefts occurred in northeastern Arizona (Kidder and Guernsey, 1919, p. 175) and in the Upper Gila and Hueco areas (Cosgrove, 1947, pp. 66, 67). Zingg reports (1940) fur-cloth fragments from the Rio Fuerte Basketmaker of Chihuahua, but they are not described in detail. The most interesting pieces, for purposes of comparison with the Coville specimens, are described from caves in Colorado:

A few fragments of fur cloth were found. Strips of rabbit fur about 0.2 in. wide were twisted to bring the soft fur outside to form a fluffy cord. These were interwoven to form blankets, probably without the usual warp foundation of fiber cordage (Burgh and Scoggin, 1948, p. 66).

From the description, these pieces are the only ones recorded which are identical in manufacture with those from the Coville Rock Shelter.

The differences in manufacture between the Coville Rock Shelter specimens and ethnographic pieces from the same region also extend to the method of attaching new elements. The Coville specimens have new elements tied on with square knots, whereas the Owens Valley Paiute joined the strips of rabbitskin by inserting the end of one through a hole in the end of another and twisting (Steward, 1933, p. 266).

Rabbitskin blankets occur in both the Great Basin and the Southwest, hence the Coville examples mark the center of the distribution of the type. The differences between the Coville specimens and those made in recent times may imply some antiquity for the archaeological specimens.

Sandals.—Since sandals are not reported ethnographically for the site region, the occurrence of three of them (possibly 4) in the Coville site is of some interest. Steward has commented:

Although the occurrence of fiber sandals in the Southwest and among Paviotso Northern Paiute and in northern California would suggest a former use of them in this area [southern Nevada and eastern California], there is no evidence of it, except from a cave in Owens Valley. (Steward, 1941, p. 246.)

The modern Owens Valley Paiute deny having sandals and claim to have used skin moccasins (Steward, 1933, p. 274); the Surprise Valley Paiute also claimed moccasins but made theirs of twined tule or sagebrush bark (Kelly, 1932, p. 109). Groups which affirmed use of fiber sandals include the Southern Paiute (Stewart, 1942, p. 283), the Pahvant Ute (*ibid.*), the Kuyui, Tovusi, and Sawa bands of Northern Paiute in Nevada (Stewart, 1941, p. 295), and the Kamia (Gifford, 1931, p. 38). This spotty distribution, plus the presence of archaeological sandals in areas where they were not made in recent times, probably indicates that moccasins in this part of the Great Basin are a relatively recent introduction which have replaced sandals.

The Coville specimens are described as follows:

1-130226. Joshua fiber, a small fragment 10 x 7 cm. in poor condition. Made by simple twining of paired elements, knotted together in a square knot. Warps are doubled; twining is on one set of warps only. The piece is fragmentary, however, and the twining may have passed over both sets. Edge is formed by the doubling of the warps.

1-130117. Joshua fiber, 18 x 8 cm. The heel is worn out, but this is probably very close to the original size, indicating that the sandal was worn by a very

small person or a child. The warp is composed of a doubled piece of 2-ply joshua fiber cordage (see cordage tabulation under the same number for description). A loop is left at the toe end, and bundles of joshua fiber (slight S twist, ca. 1 cm. diam.) are closely twined across the two warp elements. Wefts cross only once in the center of the sandal, passing in a figure-eight motion from warp to warp. The loop of cordage at the front of the sandal is apparently intended to pass over the toes. Three unattached pieces of cordage (1-130116) were associated with the sandal and may have formed the heel attachment. They total 36 cm. in length, which would be about right for passing around the heel and attaching somewhere on the front of the sandal. Details of heel construction cannot be made out. This piece is illustrated in plate 28, t.

1-130015. Juniper bark, 15 x 8 x 2 cm. A small edge piece which is doubtfully classified as a sandal fragment; it may well be part of a carrying bag instead. Made by simple twining with warps and wefts diagonal to the edge. At the edge the wefts pass over the warps and are woven under one stitch to catch the ends. The piece is very fragmentary and other details cannot be ascertained.

1-130313. Twined rabbitskin strips with juniper bark sole (24 x 11 x 2.5 cm., pl. 28, u). This appears to be made of a piece of a rabbitskin blanket. The blanket piece had a bundle of juniper bark placed over the sole, and the edges of the blanket fragments were then bent over the bark to the size desired. The bent-over portions range from 2 to 6 cm. in width and served to hold the juniper bark in position without further preparation. To judge by the packed-down portion of the sandal, it was worn on the right foot. There is a short piece of 2-ply juniper bark cordage attached to the front of the sandal in such a position that it would pass between the big toe and second toe. An associated but unattached piece of the same sort of cordage, no. 1-130139, appears to have formed the sandal tie. The specimen is ingeniously made, but its construction does not appear very practical—the juniper bark sole would be worn out or fall out with very little use. The sandal was probably never intended to serve as more than a temporary expedient and was discarded after a short period of use.

Archaeological sandals are commonly reported from the Great Basin and Southwest. In the Basin, the Oregon caves have yielded three types of multiple-warp sandals, none of which is closely comparable to the Coville specimens (Cressman, 1942, pp. 57-61, fig. 91). From Lovelock Cave (Loud and Harrington, 1929, p. 54) and Humboldt Cave (Heizer and Krieger, MS) there are numerous sandals of tule and rushes, again none of them very similar to the Coville examples. One sandal from Tommy Tucker Cave does appear to be like specimen 1-130117 described above.⁹ The Twentynine Palms region of California yielded one pair of woven sandals, twined of loosely twisted yucca leaves, and three fragments of hide sandals (Campbell, 1931, p. 72).

Outside of California, the Salt Lake caves contained no sandals but did have skin moccasins (Steward, 1937, pp. 57 ff.). In the Southwest, Pueblo sandals illustrated by Kidder and Guernsey (1919, pp. 100-107) are not like the Coville pieces, being much more elaborately made and having more complicated sandal ties. The very finely made sandals characteristic of Basketmaker sites (ibid.;

⁹ Fenenga and Riddell, 1949, pp. 206, 207. Their specimen 1-81565 is similar in manufacture but is not made on a cordage warp.

also Nusbaum, 1922, pp. 79-80; Haury, 1945, p. 42, pl. 17G) are very different from the Coville specimens, although one type of Basketmaker sandal is somewhat similar to 1-130117. This is Kidder and Guernsey's type 1b, made of twined yucca leaves but not twined over cordage warps (Kidder and Guernsey, 1919, p. 158). The Hueco and Upper Gila areas are characterized by a predominance of scuffer toe sandals, with full-length sandals rare. There are some two-warp sandals, but none with cordage warps (Cosgrove, 1947).

The modern sandal of the Southern California desert tribes is the type most comparable to the Coville sandals. Kroeber (1925, p. 807, pl. 62) illustrates a Cahuilla sandal which is made of "mesal fiber, untwisted bundles of which are woven back and forth across a looped cord." This sort of sandal was also worn by the Kamia (Gifford, 1931, p. 38) but is not recorded for the Colorado River tribes (Kroeber, 1925, p. 807). It should be noted that in the ethnographic form the entire loop of cordage is filled in by weft material, whereas in the archaeological specimen the loop of cordage at the toe end is left free. However, there is probably some historical connection between the two occurrences, for the technique of weaving on a looped cord seems to have a quite restricted distribution.

Nothing comparable to the Coville sandal made from a rabbitskin blanket fragment has been noted in the literature. The Los Angeles County Museum has on exhibit a sandal of animal skin, collected in a Southwestern cave, which is similar in having the sole padded with juniper bark.

Bone beads and bone tube.—Tubular bone beads are the only Coville artifacts which appear to have been used for bodily adornment. Even these may not be beads, for they could equally well have been used for gambling counters or gaming pieces. Four specimens were found; they appear to have been made by scoring the end of the bone, breaking off the tube, and then polishing the broken end. The pieces are all of small size, and descriptions are given in Appendix E, table 5 (see also pl. 27, g, r, s).

Cut bone tubes are nearly universal in distribution, and their areal occurrence is probably of little significance. However, they do not seem to be reported as common from any one locality. Other cave sites which have yielded cut bone tubes include Lovelock Cave (15 specimens) (Loud and Harrington, 1929, p. 38), Tommy Tucker Cave (14 pieces) (Riddell and Fenenga, MS), caves of the Upper Gila area (only 4 examples, noted as "rare") (Cosgrove, 1947, p. 151, fig. 146), Humboldt Cave (Heizer and Krieger, MS), and scattered examples from caves in the Salt Lake Region (Steward, 1937, pp. 27, 28), northwestern Colorado (Burgh and Scoggin, 1948, p. 65, pl. 14F), northern Arizona (Kidder and Guernsey, 1919, p. 189, pl. 86C,D) and Oregon (Cressman, 1942, pp. 65, 66).

Body paint (?).—Small lumps of yellow ochre (1-130032) and red ochre (1-130479, 1-130482) were found in the site. This is mentioned as possible body paint, although there is no positive evidence that it was so used.

HUNTING TOOLS

The only weapon evident from remains in the Coville site is the bow and arrow. Related objects include arrow parts, tools for flaking stone arrowheads, and one wrench for straightening arrow shafts. There is no evidence for slings, snares, or other hunting aids, although these may have been used in addition to the bow and arrow.

Arrow parts: points.—Stone points for arrows were relatively scarce in the site; only five specimens were

found, all in the west house pit (description of individual specimens in App. E, table 6—see also pl. 26, d-g). Four of the points are more carefully flaked miniatures of the blades previously described, having simple square to convex bases. The fifth example is a triangular corner-notched type of common occurrence in the West. None of the points were hafted. Since they were all found in a restricted part of the west house pit it seems likely that they were made at the site and were never used because they were "lost" in the midden.

An interesting comparison may be made between the Coville pieces and the points recovered from Iny-2, a historic site in Owens Valley (H. S. Riddell, 1951, p. 17, fig. 1). Although both the Coville forms occurred at Iny-2 (Riddell's types 5 and 11), the Iny-2 points are consistently smaller. The convex-based points ranged from 1.7 to 2.4 cm. in length at Iny-2; at the Coville site the range is from 2.1 to 3.8 cm. The single corner-notched point at the Coville site is 3.8 cm. long; at Iny-2 there were no complete specimens but they are estimated to have been about 3.0 cm. in length. Although the sample for comparison is small, the difference is sufficiently great to indicate a definite decrease in the size of projectile points with the passage of time. This change has been noted for many other areas of the country, but the Coville examples are interesting because the same forms are shown to persist in a smaller size. It is worth noting that many of the unworked flakes in the Coville site are large enough to be used for making the small historic points.

It may also be observed that there was a great increase in the number and variety of points during the early historic period in this part of the Great Basin. The Coville site yielded 5 points of 2 types; Iny-2 yielded 58 points of 12 types (Riddell, 1951, table 1). Most of the points from Iny-2 were surface finds, but since there is no evidence that this site was a specialized hunting camp the great disparity in numbers found at the two sites must indicate cultural change.

The relative scarcity of stone points in the protohistoric period may be due to the Indians' use of wooden foreshafts without stone points. This supposition is supported by several ethnographic sources. Coville observed in 1891 that wooden arrow points were used and commented: "Stone arrowheads appear to have fallen into entire disuse among the Panamints since the days when they were employed in war" (Coville, 1892, p. 360). The Owens Valley Paiute used plain blunt greasewood foreshafts for rabbits, probably the commonest game hunted (Steward, 1933, pp. 260-262). The Surprise Valley Paiute used one-piece sharpened sticks for small game (Kelly, 1932). The Northern Paiute habitually used plain wooden points (Stewart, 1941, p. 384), as did the Ute-Southern Paiute (Stewart, 1942, p. 267). All of the Ute-Southern Paiute sometimes used merely a sharpened wooden arrowshaft. The evidence suggests that stone arrow points were primarily used, in aboriginal times, for warfare and the hunting of large animals. Since neither of these activities was of major importance, so far as can be known, it is difficult to explain the abundance of points in sites of the historic period. Apparently the late groups began using stone points for small game; this may have had some effect on the observable reduction in point size. The practice must have been short-lived, however, for by 1891 Coville, as quoted above, found only wooden points in use.

If the reconstruction just given can be used as a working hypothesis, the points in the Coville Rock Shelter must represent either warfare or the hunting of mountain sheep, which are the only large game animals in the region. Bones of mountain sheep were found in the site, and it is possible

that the stone arrow points were made specifically for use in hunting this animal. Small game was apparently hunted near the Coville site with wooden points, as shown by the presence of the foreshafts described below.

The point types found in the Coville Rock Shelter are so common as to have little distributional significance. The corner-notched form (pl. 27, g) occurs in the Southwest from Basketmaker to recent times (Kidder and Guernsey, 1919, p. 183, fig. 90; p. 126, fig. 48). This is one of the commonest ethnographic shapes for the Nevada Shoshone (Steward, 1941, p. 237, fig. 2), and is also recorded archaeologically from such scattered localities as Oregon (Cressman, 1942, fig. 39), Colorado (Burgh and Scoggin, 1948, p. 49, figs. 20-22), New Mexico (Cosgrove, 1947, p. 141, figs. 130, 131), and Texas (Coville, 1892, p. 360).

Arrow parts: shafts.—Evidence for arrow shafts in the Coville site rests on a single fragment of cut cane (1-130248, 12.0 x 0.7 cm.). The hardwood foreshafts are also presumptive evidence that cane arrow shafts were used. Coville reports (1892, p. 360) that the Panamint Shoshone used arrow shafts of willow and cane.

Other ethnographic groups which use cane for arrow shafts include the Owens Valley Paiute (Steward, 1933, p. 260), Northern Paiute (Stewart, 1941, p. 384), and Kamia (Gifford, 1931, p. 28). Cane arrows were not used, however, by the Surprise Valley Paiute (Kelly, 1932, p. 143), who employed rose, currant, and service for arrow shafts; nor were they used by any Southern Paiute bands except the Shivwits and Kaibab groups (Stewart, 1942, p. 267).

Cane is by far the commonest material for arrow shafts from archaeological sites in the Great Basin and Southwest. It is reported from Lovelock Cave (Loud and Harrington, 1929, p. 97) (the only site noted which also contained solid shafts in the form of 1 softwood arrow and 5 hardwood arrows), Humboldt Cave (Heizer and Krieger, MS), Northeastern Arizona (Kidder and Guernsey, 1919, pp. 122, 123; fig. 47), New Mexico and Texas (Cosgrove, 1947, p. 62), the Twentynine Palms area of California (Campbell, 1931, p. 74), Chihuahua, Mexico (Zingg, 1940, p. 59), and the Salt Lake caves in Utah (Steward, 1937, pp. 13, 14).

Arrow parts: foreshafts.—Three arrow foreshafts were found, in addition to the fire drill foreshaft previously described. All specimens are more or less carefully shaped to a blunt point on both ends (1-130159, 1-130219, 1-130329, pl. 27, h, j, k). One piece has wrappings of sinew around the hafting end, but none show any trace of attachments at the point end. Two of the foreshafts appear to be greasewood; the third was thought to be willow until Dr. R. A. Cockrell examined the specimen, stating that it was definitely not willow, but an unidentified hardwood from some desert shrub.

These foreshafts are closely similar to, although a trifle smaller than, those described for the Panamint Shoshone by Coville, who reports (1892, p. 360):

The head of the arrow is a pin of very hard wood, taken, I believe, from some species of *Atriplex* or greasewood. It is about five inches long and tapers evenly to a blunt point. The base is inserted about three-fourths of an inch into the hollow of the reed and rests against the uppermost joint. It is bound in place by a thin band of sinew.

Steward mentions recently made Death Valley arrows with 4-in. wooden foreshafts fitted into cane and bound with sinew (Steward, 1933, p. 262). Other groups in the Great Basin which used such foreshafts in historic times

include the Owens Valley Paiute,¹⁰ Northern Paiute¹¹ Nevada Shoshone (Steward, 1941, p. 290), and Ute-Paiute bands in Northern Arizona and Utah (Stewart, 1942, p. 267).

Archaeologically, Lovelock Cave contained fifty foreshafts of which forty-eight are identified as greasewood (*Sarcobatus vermiculatus*) (Loud and Harrington, 1929, p. 97, pl. 47). The illustrated specimens are longer and less carefully made than the Coville ones, and they also appear to be more sharply pointed. The average Lovelock specimen is more than 22 cm. long, of which 9 cm. is imbedded in the cane arrowshaft. The Coville specimens are much shorter, being 13 cm., 7.5 cm., and 5.8 cm. in length.

Other archaeological foreshafts have been found in the Southern California desert (Campbell, 1931, p. 77), at Tommy Tucker Cave (Fenenga and Riddell, 1949, pp. 209, 210), Humboldt Cave (specimens average 27.3 cm. in length) (Heizer and Krieger, MS), the Salt Lake caves (Steward, 1937, p. 12), and numerous Southwestern sites (Nusbaum, 1922, pp. 110-113; Kidder and Guernsey, 1919, p. 122; Cosgrove, 1947, pp. 62, 63; Zingg, 1940, p. 60).

The small size of the Coville foreshaft is not typical of the sites in the Great Basin, although it is quite close to the ethnographic form for the Death Valley-Owens Valley region. This similarity might suggest a more recent date for the Coville Rock Shelter, but it could equally well indicate an areal variation not previously recorded.

Flaking tools.—No flaking tools could be positively identified in the collection from the Coville site. Possibilities include one bone object (1-130402, App. E, table 5) and one wooden object (1-130373, App. E, table 4, pl. 27, g); both of these implements should probably be interpreted as something else. Lack of flakers in the site may reflect a predominance of percussion flaking, although some of the projectile points are made by pressure flaking.

Arrow wrench.—A single arrow wrench of sheephorn was found, described as follows:

1-130252, 1-130266. Two pieces of a sheephorn arrow wrench (see pl. 27, w). Wrench is formed of a slightly curved piece of shaped horn with one hole in the wide end. The piece is 13 x 3 x 1.1 cm.; it has three random indentations on each edge and two on each face, which look as if they were made with a sharp stick when the horn was plastic. The perforation is 1.2 cm. in diameter and biconical. The piece broke at the perforation and was discarded in the west house pit; the fragments were found three feet apart in the 0-6 in. level of pit C-7.

The sheephorn arrow wrench is another object from the Coville site which is not recorded for the historic tribes of the region. Coville mentions (1892, p. 360) the grooved stone used as a shaft straightener, but he apparently did not see a sheephorn wrench. There is no mention of a sheephorn wrench for the Owens Valley Paiute (Steward, 1933) or the Surprise Valley Paiute (Kelly, 1932). Among the Nevada Shoshone, only the northern bands affirmed this implement; the Death Valley and Beatty groups denied having it (Steward, 1941, p. 290).

¹⁰ Steward, 1933, p. 260: "Cane arrows had willow foreshafts, 6 inches long, with heads varying in type. A plain, blunt greasewood ... foreshaft served for rabbits."

¹¹ Loud and Harrington, 1929, p. 154: "In shooting birds, rabbits, or any small ground animal, arrows tipped with hard greasewood, *Sarcobatus*, were used; never arrows tipped with stone, which were reserved for large game." See also Stewart, 1941, p. 384.

Only the Central Nevada and Northeastern California bands of Northern Paiute reported it (Stewart, 1941, p. 385). To the east all the Ute-Southern Paiute bands did affirm use of the sheephorn wrench which had from one to four holes and was heated to make the horn pliable for working. However, the Paiute of Southern Utah reported single-hole wrenches (Stewart, 1942, p. 268).

Campbell recovered a fragmentary archaeological specimen with two perforations from the Twentynine Palms area of California (Campbell, 1931, p. 73, pl. 42L). In the Great Basin, there are examples from Lovelock Cave (2 specimens) (Loud and Harrington, 1929, p. 42, pl. 15, j, k), and Humboldt Cave (Heizer and Krieger, MS). A few more pieces are in collections from the Southwest. Kidder and Guernsey report four specimens from Pueblo sites in Arizona, one example being identical with the Coville specimen (Kidder and Guernsey, 1919, p. 129, pl. 46, a). A single specimen of subrectangular shape is recorded from a Basketmaker cave in Utah (Nusbaum, 1922, pp. 123, 124; pl. 61, a), and a wrench with one perforation was found at Mantle's Cave, Colorado (Burgh and Scoggin, 1948, p. 43, pl. 17, a).

The general distribution of the sheephorn arrow wrench suggests that it was more widespread than the ethnographic distribution indicates; it probably occurred everywhere in the West where horn was obtainable. However, these wrenches are relatively uncommon in the areas where they do occur, and there may be a functional difference to explain their rarity. Steward comments, "The perforated horn arrow wrench was used for straightening hardwood arrows" (Steward, 1941, p. 237). If this was a general rule, sheephorn arrow wrenches might be expected to be scarce because of the predominance of cane arrow shafts in the area under consideration.

RITUAL OBJECTS

The Coville Rock Shelter contained a few objects which cannot be interpreted as functional tools and are therefore presumably for some other use, such as medicine, aesthetics, magic, or religion. The Coville specimens are rocks and minerals of various sorts, as described below.

Quartz crystal.—A single quartz crystal (1-130205, 5.2 x 3.3 x 1.9 cm.) was found in the 24-30 in. level of pit B-3. It is much flaked and battered and could have been used for striking sparks from another stone in making fire. However, as firemaking appears to have been by means of a fire drill, the stone is more logically classified as a ritual object.

Quartz crystals were widely used in California. The Luiseño used them for the tips of wooden wands in the ritual of the Chungichnich cult (Kroeber, 1925, p. 665). Archaeologically, quartz crystals occur as burial offerings in all horizons of Central California (Lillard, Heizer, and Fenenga, 1939). Three cracked quartz crystals were also found in Tommy Tucker Cave (Fenenga and Riddell, 1949, p. 209). In contrast to their abundance in California, quartz crystals seem to be rare or absent in most of the Great Basin and Southwest. In the Great Basin, aside from the Coville and Tommy Tucker sites which are close to the Sierras, the only similar occurrences are a calcium (calcite?) crystal from Lovelock Cave (Loud and Harrington, 1929, p. 108) and a single quartz crystal from Humboldt Lake bed (26-Ch-15) (Heizer, MS). Quartz crystals may be a characteristically California artifact, but this conclusion must be regarded as tentative until more evidence is at hand.

Incised slate objects.—These small decorated tablets of slate are the only artifacts from the Coville site which

show aesthetic elaboration. There are three specimens; none are complete and only one is large enough to give any indication of pattern. Complete description follows:

1-130290. A thin tabular piece of black slate, painted red on both sides (mineral paint, presumably red ochre). One side bears an incised pattern, made after the piece was painted. The edges are not worked, and there is no evidence of an attachment which would permit the object to be worn as a pendant. Dimensions: 6.4 x 2.5 x 0.3 cm. Pl. 26, b.

1-130372. A fragment of incised tablet like the specimen above. This example is also painted red on both sides, but differs in having both sides incised. The fragment is too small for the determination of pattern, but one side has 4 parallel lines and the other side has 2 wavy lines and a chevron. Dimensions: 3.0 x 2.0 x 0.2 cm. Pl. 26, c.

1-130393. A small chip; this specimen is not painted and shows only 2 lines on one side. Dimensions: 1.5 x 1.0 x 0.13 cm.

There is little comparative material for these specimens. Lathrap and Meighan describe (1951, p. 24, fig. 1C) an identical example from a site a few miles away. The only other closely similar pieces are described from the Southern California desert region (Rogers, 1939, pp. 63, 64, pl. 17). To the east, the caves in the Salt Lake region yielded unshaped slate pieces which had incised geometric designs. Other caves in the region have the same objects in limestone rather than slate (Steward, 1937, pp. 77-79). Owens Valley has yielded two steatite pendants, one of which is 4 in. long and bears an incised pattern (Steward, 1933, p. 275, fig. 7). Whether these bear any relationship to the Coville specimens is conjectural; they look sufficiently different to be entirely independent.

Stream pebbles.—The west house pit yielded four unworked stream pebbles, all subrectangular in shape and of a hard, black slatelike material. They were probably picked up in the wash below the site, where such rocks can be found with a little searching. When the first of these objects was found in the site, it was decided by the field crew, after some discussion, that the pebble was probably brought in by pack rats; it was therefore thrown away. Shortly after, the second one appeared, almost identical to the first, and it began to seem as though the pebbles were selected by the Indians and carried to the site. The function of these stones is unknown; they may represent raw material, fetishes, or even mere souvenirs which happened to strike the fancy of a passing Indian.

A fifth pebble of the same material added some weight to the hypothesis of selection by the aborigines. This specimen (pl. 29, h) is a natural ring-shaped stone which would be picked up as a souvenir by almost any passerby. Measurement of the pieces is as follows.

1-130441. Dimensions: 3.5 cm. diam., 0.9 cm. thick; perforation 1.6 cm. diam., pl. 29, h.

1-130380. Dimensions: 5.3 x 1.6 x 0.5 cm.; see pl. 29, j.

1-130439. Dimensions: 5.1 x 2.3 x 0.5 cm.; see pl. 29, k.

1-130447. Dimensions: 4.6 x 3.0 x 0.8 cm.;

Rock sulfur.—The occurrence of two lumps of rock sulfur in a cache has been previously noted (p. 176). The pieces (1-10033, 1-10034) are fist-sized and unworked; the exteriors are smoothed as if waterworn. The use of

this material is unknown—possibly it served as paint or medicine.

Mineral paints (?).—Presumed mineral paints occurred as follows.

1-130032. Lump of yellow ochre in feature 1; ca. 4 x 3 cm.

1-130479; 1-130482. Two small lumps of red ochre; 1-2 cm. diam.

Red ochre was used for painting the incised slate tablets described previously. Both red and yellow ochre are also suggested as possible body paints.

MISCELLANEOUS AND UNIDENTIFIED

Like all sites, the Coville Rock Shelter contained its quota of problematical objects. These are briefly described below.

Worked twigs.—Sixteen objects which can only be classed as "worked twigs" were recovered in the excavation. Most of these show a minimal amount of working and many are no doubt the result of idle experimentation. Some may have been functional, as parts of snares, for example, but none can be explained by their shape or position in the site. Individual specimens are described in Appendix E, table 4.

Gaming pieces (?).—Two short sections of twigs with carefully cut ends were found (1-130158, 1-130333; see pl. 27, m, n). They are the same size and are differentiated only by the fact that one specimen has the bark peeled off and the other retains its bark. Since they are small enough to be easily held in the hand, these may represent gaming pieces for some sort of hand game. This theory would be considerably strengthened if the two objects had been found together, but it must be admitted that they were found at opposite ends of the site, one in the east house pit and one in the west house pit. Nonetheless, the case for the use of similar objects as gaming pieces seems sufficiently strong to suggest this function for the Coville specimens. Wooden pieces were sometimes used by the Owens Valley Paiute in the hand game. These were small enough to hide in the hand and one of the pair was marked with dark material in the center (Steward, 1933, pp. 285, 286). The Surprise Valley Paiute used similar cylinders "just big enough to hold in the hand," usually of willow (Kelly, 1932, p. 172).

There seem to be no similar archaeological specimens in the Basin. There are three examples from the Southwest, however, all of which are mentioned as possible gaming pieces. Morris found short wooden cylinders in northern New Mexico (Morris, 1928, p. 45), and Kidder and Guernsey report (1919) cottonwood twigs with one flat surface (some marked with incised lines at the ends). A number of small softwood twigs were found in the Hueco and Gila areas. Many were painted; some were plain and some had the bark removed. (Cosgrove, 1947, pp. 152, 153.)

Problematical sheephorn objects.—In addition to the spoon and arrow wrench previously described, two problematical objects of sheephorn were found, described as follows.

1-130369, 1-130370. Two pieces of worked sheephorn which fit together to form a spiral-shaped object. This may have been wrapped around something at one time, or may simply be a scrap from the manufacture of another artifact. Specimen 1-130369 is 2.6 cm. in diam., 0.6 cm. wide, and 0.3 cm. thick. Pl. 27, x.

1-130395. An oblong, shaped piece of sheephorn,

possibly a handle for something. One end broken.
Dimensions: 5.7 x 2.1 x 1.4 cm.

Leather fragment.—A triangular piece of gray leather was found (1-130304), 6 x 3.5 x 0.1 cm. It is soft and pliable and must have been tanned. There is no indication of use and the piece is probably a scrap trimmed off another object. What the inhabitants of the site were making of leather is unknown, since no other piece was found. The present specimen seems too soft to have been used for moccasins, for moccasins of this kind of leather would be short-lived in the rocky area of the site.

Odds and ends.—Specimens not previously described are summarized as follows:

1-130326. The specimen is basically a fragment of open-twined basketry. A single pair of weft elements with their associated warps forms the foundation of the piece. The warps have been bent so that

they lie approximately parallel to the wefts; the whole bundle is then secured by two coils of joshua-fiber cordage at one end and a twisted willow twig at the other (see cordage under same number for description). Function unknown—may have been intended as a basket mend. Dimensions: 26 x 4 cm. Plate 28, k.

1-130140. Fragment of pitch, probably pine.
Dimensions: 4 x 3 x 1 cm.

1-130225. Natural angular piece of dolomite with red ochre on one corner. Dimensions: 6.5 x 5.5 x 1.5 cm.

1-130426, -27, -28, -29, -45, -77. Unworked obsidian flakes—spalls from chipping activity. All are large enough to serve for making the very small points produced in the early historic period.

1-130480. Ten small chips of obsidian from 12- to 18-in. level of pit C-8. Remains of chipping activity in this level.

ECOLOGICAL FACTORS

Having discussed the objects recovered in the excavation, we may now pay some attention to ecological factors and the place of the site in the general culture pattern of the Indians. The questions who occupied the site, when, and why, are essential to an understanding of the archaeology of the region.

In historic times, the area of the site was occupied by a small group of Panamint Shoshone. There is no reason to doubt that the archaeological remains found in the Coville Rock Shelter belong to the rather immediate ancestors of the people living in the region when the Caucasians first entered it. The linguistic boundary between Shoshone and Paiute is only twenty miles west of the site (along the crest of the Inyo Mts.), and it is conceivable that the occupants of the site may have been Paiute-speakers. However, the few evidences of contact with other areas (discussed in our conclusion) suggest an eastward orientation, and it is concluded that the Coville site represents a prehistoric Shoshone camp.

Steward gives a summary account (1938, p. 80) of the region of the Coville site at the time of contact.

Sigai (flat, on the mountain top) or Sigai watŋ, the mountains separating Saline, Death, and Panamint Valleys, People called Sigaitsi. Two villages. One at Goldbelt Spring . . . the other at the springs in Cottonwood Canyon . . . called Navadŋ . . .

Sigai people procured pine nuts, various seeds, rabbits, and mountain sheep in their own territory. When local seeds were unusually abundant visitors came from Saline Valley and sometimes from Surveyor's Well to gather them near Navadŋ . . .

For festivals Sigai people either went to Saline Valley or Saline Valley people came to Sigai; but both places never held them simultaneously . . . Chiefs' powers were definitely extended and groups more closely associated in post-Caucasian days.

The village census given by BD for perhaps 1890 showed: Navadŋ, 2 families totaling 14 persons . . . Tuhu, one family (seven persons) . . .

The Coville site is situated in the center of the district known as Sigai (see map 1).

CHOICE OF SITE BY THE INDIANS

There is little in the immediate area surrounding the Coville site to attract settlement. The canyon where the shelter is situated has too sparse a vegetation to permit more than a meager seed harvest at any time, and there is no water within a mile of the site. The determining factor in the choice of the site was probably its well-sheltered location near a trail, possibly with some consideration given to use of the camp as a base for hunting mountain sheep. Food and water seem to have been secondary considerations, the site serving merely as a way station for people en route to or from the pine nut harvest, Saline Valley, or the village at Goldbelt Springs. The scarcity of evidence of domestic activity (such things as grinding implements and fire hearths) also affirms the temporary nature of the site.

The elevation of the site above the valley floor (over

150 ft.) and its difficult approach suggest defense as one of the factors in the choice of the shelter. Actually, defense is probably not to be taken as a serious determinant; the site is the only rock shelter of any size in the canyon, and had there been one lower on the slope it would probably have been the one occupied.

POPULATION

The size and configuration of the site are such that it would be impossible for more than two families, say ten or twelve people, to occupy the area without serious crowding. From what is known of the sparse population of the region, it seems probable that there were never more than six Indians at the shelter at any one time. These probably included occasional small bands of hunters and families passing through the area. The presence of a mano and metate in the site attests some occupation by women; the presence of a child's sandal indicates children at the site and hence, presumably, family groups.

As to the season of occupation, this was probably the fall, chiefly September and October when groups were passing through the canyon to gather pine nuts at higher elevations. From November to March the site would be almost uninhabitable because of cold weather; it is exposed to biting cold winds in the winter, and snow falls occasionally even at this elevation. If the camp had been occupied at all during this part of the year, one would expect to find much more evidence of fire. Spring and summer visits to the site are not evident from the material recovered, but there were probably occasional stopovers made at the shelter. Steward mentions the visits between the people of Saline Valley and Goldbelt Springs. Assuming that this sort of visiting through the area was going on in protohistoric times, occasional stopovers might be made at the Coville Rock Shelter at almost any season.

The site, therefore, was probably not occupied for more than a day or two at a time. If we use the population estimates previously made, this means that the shelter was probably used not less than 12 nor more than 36 man-days each year. Such minimal occupation does not lead to the accumulation of much refuse, and the three feet of deposit in the site may therefore represent a fairly long time span.

SOURCES OF SUBSISTENCE AND RAW MATERIALS

It is of some interest to examine the artifacts from the site with a view to determining their origins. This information is presented visually in map 1 and is also tabulated below. Information in the tabulation is largely from observations made by the field crew in the course of their survey work in the region, although some documentary information has also been used. Sources given are the closest places the material could have been obtained. These are not necessarily the actual places from which materials were derived, although for most of them it appears likely that they were obtained from the nearest source on occasion, if not as a regular practice. The term "local" is used to mean within one mile of the site.

ANTHROPOLOGICAL RECORDS

<u>Material</u>	<u>Use</u>	<u>Closest Source</u>	<u>Distance from the Site</u> (mi. on foot)
Seeds of grasses and shrubs	Food	Local	
Pine nuts	Food	Crest of the Panamints	13
Mountain sheep	Food	Local	
Rabbits	Food, skins	Local	
Water.....	...	Quartz Springs	1.5
Willow	Basketry	Quartz Springs	1.5
Greasewood	Foreshafts	Local	
Juniper bark	Cordage	Crest of Panamints	13
Juniper wood	Fire hearth	Crest of Panamints	13
Cane.....	Arrow shafts	Saline Valley (?)	10
Joshua-tree fiber	Cordage	Local	
Spike rush	Cordage	Saline or Death valleys	10-15
Amsonia	Cordage	Local (?)	
Mammal bone	Tools	Local	
Sheephorn.....	Arrow wrench, spoon	Local	
Chert.....	Blades, points	Some local, some from higher in Panamints	1-10
Obsidian	Blades, points	Possibly Darwin at S end of Panamint Valley	ca. 40
Dolomite.....	Core tools	Local	
Slate.....	Tablets	Crest of Panamints	13
Ochre	Paint	?	
Rock sulfur	?	Saline Valley	10
Quartz crystal.....	?	Probably the Sierras	ca. 40

Excluding food, this list includes 18 raw materials—8 derived from plants, 3 from animals, and 7 from minerals. As might be expected, most of these can be obtained near the site, yet it is interesting to note that probably every item in the site came from within 40 miles. This emphasizes the general impression of a marginal group living in a self-contained subsistence area with little outside contact.

CONCLUSIONS

DATING

Factors which indicate some antiquity for the Coville shelter include: (1) the complete absence of Caucasian materials; (2) some degradation of the surface of the site; (3) differences between artifacts in the site and objects made by the Indians of the region in historic times. At the same time, many of the artifacts are much like ethnographic specimens, and it appears most likely that the site was abandoned not too long before the entry of Caucasians into the region. Probably 1750 is a reasonable guess for the date of the last occupation of the site.

The beginning date is harder to determine. As noted previously, the occupation was so light that even the small amount of midden may represent many years of occupation. No change in the artifact types within the site can be observed, however, so the occupation cannot extend too far into the past. The writer's conjecture is that the shelter was visited sporadically for maybe 300 years, thus dating the site between 1450 and 1750 A. D. This dating may be several centuries in error but in the absence of any precise way of checking, the estimate seems a reasonable one.

If this date is accepted for purposes of discussion, several important questions arise. Unfortunately, the lack of comparative site reports and the small size of the Coville site make conclusions impossible at this time. However, as frank speculation which may lead to directed research in the region, the following problems are suggested.

Pottery.—The evidence from the Coville site suggests that: (a) Southern Paiute Utility Ware precedes Owens Valley Brown Ware in this region; and (b), there was no pottery whatever in the region before about 1700 A. D. The suggestion in (b) agrees with H. S. Riddell's tentative conclusion based on excavation of Iny-2 (H. S. Riddell, 1951, pp. 23, 24).

Moccasins.—The presence of sandals in the upper levels of the Coville site suggests that the moccasins which were in use in Owens Valley may be very late introductions to this general area. However, this may equally well be a divergence between Shoshone and Paiute cultural patterns.

General culture.—The scant comparable material from Iny-2 would seem to indicate an elaboration and diversification of material culture in the early historic period.

No stratigraphic change can be observed in the Coville deposits, probably because of the small size of the sample. Table 2, Appendix E, gives a depth distribution of artifacts, but it would be very hazardous to draw any conclusions from the small numbers of each artifact type represented. On paper, there is an increase of twined basketry in the late occupation of the site, but further work is necessary to confirm or deny this point.

RELATIONSHIPS TO OTHER AREAS

In discussing the distribution of artifact types, occasional reference has been made to possible connections with other areas. To sum up the statements presented this far, the Coville Rock Shelter shows some connections with the Southwest (slab-lined cists, two-rod-and-bundle coiling), a large number with the Great Basin, and virtually none with California. The culture may be defined as typically Great Basin of the proto-historic period, with slight evidence of some Southwestern connection.

The only distinctive specimens from the Coville site which link it to another California area are the incised slate tablets and the sandal woven on a cordage warp; both are probably connected in some way with those of the desert regions to the south. The slate objects are characteristic artifacts of the Amargosa II culture, defined by Rogers as a Basketmaker III type of culture and dated at 700-900 A. D. (Rogers, 1939, pl. 21). This dating does not conform to that given for the Coville Rock Shelter, and, since the latter site has also yielded point types comparable to some Amargosa specimens, a closer examination of the question is in order. Either the Coville dating is wrong, the Amargosa dating is wrong, or the Amargosa slate objects represent a modified and earlier form of the Coville pieces. Which of these theories is correct cannot be determined from present evidence, but the point is mentioned as worth further investigation.

The discussion of such connections as have been mentioned is not to be interpreted as necessarily implying direct contact between the Coville site and other regions. The similarities observed are more likely to represent the sharing of a common tradition. The cultural picture of the site is of a very small group of people, living by seed gathering and hunting in a marginal area which is a self-contained subsistence unit. Within these tiny groups, scattered across miles of empty desert, it must have been possible for a man to live his whole adult life without ever seeing a person he did not recognize. Under such conditions personal travel or even trade must have been minor influences in the lives of the people.

In handling the artifacts from the Coville site, one is struck by their lack of variation. Generally, objects are made in one or two ways, not more. They are made in the simplest way for utilitarian service and are almost never elaborated for aesthetic satisfaction. The site would serve as a good example for those who argue that necessity is never the mother of invention. The impression is of a group which, having developed a pattern that enabled it to wrest a meager living from a hostile environment, was slow to experiment or to play with the objects used in maintaining life.

APPENDIXES

APPENDIX A

MINOR SITES EXCAVATED

By

MARTIN A. BAUMHOFF

In addition to the main site (Iny-222) several smaller sites were excavated in the area. All but one were within a mile of Iny-222 and each was completely excavated in a day's time or less. All the artifacts recovered from these sites are reported on in the following paragraphs.

SITE INY-103

This small limestone cave, approximately 3 ft. long and 4 ft. in diameter, contained no midden. The only artifact found was a twined parching tray, apparently cached and then forgotten, which, although somewhat chewed by packrats, could be almost completely reconstructed.

The tray was more or less an isosceles triangle about 70 cm. in altitude and 55 cm. across the base. The wefts were ribbons (probably willow) 4 mm. wide and 1 mm. thick, the warps round sticks (again probably willow), averaging 3 mm. in diameter. The weave is diagonal twine (what Meighan calls over-two, under-two on alternate pairs of warps, as illustrated in plate 27, c, and the pitch of the stitch is up to the right. As each weft course reaches the tray's edge, which is a heavy stick about a centimeter in diameter, the two elements of the weft cross over one another and start back on the next higher course. The first few courses at the narrow end of the tray are made of round twigs about 1.5 mm. in diameter rather than the flat ribbons which make up the normal wefts.

Approaching the wide end of the tray the warps, which have been getting progressively smaller, are finally gathered by one course of 3-strand up-to-the-right twining. The remaining warps sticking out from this are bent down in either direction and secured to the course of 3-strand twining by a row of stitching such as would be used in coiled basketry. Finally, a stick is laid across the top of this and secured by another coil of stitching, the bundle of bent-down warps being used as if it were the bundle in bundle-foundation coiled basketry. In these two coils the stitches are interlocking. There may have been a decorative pattern in this piece with bark weft courses alternating with smooth ones but the piece is too weathered for us to be sure. The piece is certainly a parching tray because the concave side is covered with burnt material.

SITE INY-130

This is a small cave facing northwest and situated about 75 ft. above the floor of a small draw. There are two rooms in the cave, one about 10 ft. square, the other about half that size. Both rooms have outside entrances;

they are connected by a hole large enough to permit a man to crawl through. Only the larger of these two rooms contained any evidence of occupation. This had a mound of midden 78 in. in diameter and about 18 in. in depth although the deepest artifact was only 12 in. down. The middle of this mound was a concavity with a diameter of 63 in. This appeared to be a house pit of some kind although the cave was not more than 7 ft. high and would not contain much of a house. Also, it does not seem likely that people would want a covered house within a dry and well protected cave.

Basketry.—The basketry from Iny-130 is of three types: openwork diagonal twined, openwork plain twined, and close diagonal twined. On all the pieces the pitch of stitch is up to the right.

There are three pieces of plain twined openwork. The warps of these are peeled (willow ?) twigs with an average diameter of 4 mm. The wefts are of (willow ?) ribbons with an average width of 3 mm. and thickness of 1 mm. On one of the pieces the weft courses seem to be in pairs with an interval of 1-2 cm. between the members of each pair and 4-5 cm. between each two pairs. There seems no way of knowing whether all three pieces come from one basket.

The openwork diagonal twined specimen has warps and wefts of the same material as the plain-twined. The warps have an average diameter of 3 mm. and there are 25 warps per 10 cm. The wefts have a width of 2 mm. and a thickness of less than a millimeter. The count of the warps is 40 per 10 cm.

One piece of close diagonal twined basketry had peeled twigs 2 mm. in diameter for warps and ribbons 2 mm. wide for wefts. The warp and weft count was about 35 each per 10 cm.

Wooden objects.—Four wooden objects were found in Iny-130. Specimen 1-130719 was an arrow foreshaft of an unidentified hardwood, 25 cm. long and 8 mm. in diameter at the center, tapering to a point at either end. Specimen 1-130717 is a hardwood stick 38 cm. long and 8 mm. in diameter with one end cut off; its use is unknown. Specimen 1-130718 is a hardwood stick 25 cm. long and 13 mm. in diameter with one end blunted. Again, the function of this piece is not known. Specimen 1-130727 is a conical piece of softwood whose base measures 1.5 cm. in diameter, its length 6 cm.

Stone artifacts.—The only stone artifact from this site is a blade fragment of a green cherty substance. The piece is 5 mm. thick and seems to have been either leaf-shaped or triangular when whole.

Pottery.—Three potsherds, apparently all from the same vessel were recovered from Iny-130. In the following characteristics they agree very well with what Baldwin (1950) calls Southern Paiute Utility Ware.

Comparison of Inyo-30 Potsherds and Southern Paiute Utility Ware

	Inyo-130	Southern Paiute Utility Ware
Construction	Coiling	Normally coiling and thinning with paddle and anvil, although many vessels were thinned by scraping
Firing atmosphere . . .	Mainly reducing	Uncontrolled, but probably mainly reducing
Core color	Black	Dark gray to black
Temper	Very coarse	Very coarse
Carbon streak	None	Occasional
Texture core	Coarse	Coarse
Fracture	Crumbly	Usually crumbly
Luster	Dull	Dull
Surface color	Black	Very dark gray to reddish brown to black
Firing clouds	None	Present
Thickness of vessel walls	7 mm.	Bowls, 3.5 to 7 mm.
Rims	4-mm. flare	Bowls, straight to slightly outcurving, rounded or flattened, often uneven
Decoration	Fingernail decoration on the flaring rim	Often none. A number of jars have small fingernail decorations over entire surface
Slip	None	None
Paint	None	None

Thus in all characteristics except firing clouds and rims this pottery corresponds very closely to Southern Paiute Utility Ware and there can be little doubt that it is an example of that ware. Baldwin (1950) places it in the eighteenth and nineteenth centuries and perhaps somewhat earlier. Since this is on the periphery of distribution, it must be somewhat late with respect to the general area and thus places the site almost certainly late in time.

SITE INY-217

This is a triangular-mouthed cave about 12 ft. across at the mouth, tapering to a point at the rear 15 ft. away. A column of midden ran from front to back but with very little depth—the greatest depth at which an artifact was found being one foot. One metate fragment was recovered, bringing the total from the site to five, since Lathrap and Meighan found four other fragments in their earlier survey (1951). This piece was of a gray sedimentary rock, as was theirs, and seems to conform in all other ways to the ones previously recovered. They are not all from the same metate, however, but represent at least three individual artifacts. One small chalcedony scraper (6 x 2 cm.) with bifacial chipping along one edge was found; also one other scraper in the form of a semicircle with a diameter of 4 cm. This last was made of pink and white chert and was chipped along part of the circular edge. A fragment of a chalcedony blade was found which had bifacial chipping along all but the broken edge. It was impossible to tell what the original form had been. A hardwood stick 4 cm. long and 1 cm. in diameter, with one end cut, was also recovered.

SITE INY-218

Inyo-218 is a small cave with a circular mouth about 50 ft. above the floor of Lost Burro Canyon. It is roughly tubular in shape, being 5 ft. in diameter and 7 ft. deep. One almost complete coiled parching tray and a flint scraper had already been recovered from it (Lathrap and Meighan, 1951).

There was a piece of coiled basketry in this cave. It was only a double coil 1 cm. long but it was possible to determine from it that it had a 3-rod foundation and non-interlocking stitches. One piece of twined basketry of the diagonal openwork variety was found; the warps were twigs 3 mm. in diameter, the wefts ribbons 3 cm. wide. The pitch of the stitch in this piece was up to the right. A small bipointed bone, 3.5 cm. long, 6 mm. wide, and 3 mm. thick was recovered. One end of it was covered with pitch or asphalt; it looked as if it might have been part of a composite fishhook. Another bone object from this site was a spatulate piece 4.6 cm. long, 1 cm. wide, and just 1 mm. thick. It was polished on the outside, while the interior had a sort of cellular structure; it might have been part of the leg bone of a bird. Besides these aboriginal artifacts two small pieces of cotton cloth of a late European style were recovered. These probably have nothing to do with the aboriginal occupation of the site.

SITE INY-220

From Lathrap and Meighan (1951) we have the following information.

Inyo-220 is a cave which is rather difficult to enter. It is 35 feet vertically distant above the canyon floor, and most of the 35 feet must be negotiated by hand over hand climbing. The cave is small in size, measuring 8.5 by 5 feet with a ceiling so low that it is impossible to sit erect within it. At least 16 inches of deposit has accumulated behind the single course rock wall which extends across the mouth of the cave. The artifacts found on the surface here include a piece of diagonal twined basketry, a winnowing fragment, and several coils of material for basketry weft.

In addition there were recovered, in the summer of 1951, a piece of rabbitskin cordage and a potsherd. The cordage, which had a Z twist, was the same as that found in Inyo-222 in the rabbitskin blankets. The potsherd is of the same type as that described previously for this area (Lathrap and Meighan, 1951; also H. S. Riddell, 1951).

APPENDIX B

ANALYSIS OF THE CORDAGE SPECIMENS, SITE INY-222

By

CHÉRIE N. GRÉGOIRE

A total of 155 fragments of cordage were recovered from the Coville site. Of this number 22 are composed of animal materials, whereas the remaining 133 are composed of vegetable materials. All the specimens of vegetable material have been identified through comparative microscopic study by the writer. The subtotals for the materials are as follows:

<u>Amsonia brevifolia</u> (Amsonia)	49
<u>Yucca brevifolia</u> (Joshua)	41
<u>Juniperus</u> (Juniper).....	30
<u>Chilopsis linearis</u> (Willow).....	6
<u>Eleocharis</u> (Spike Rush).....	4
Grass.....	2
<u>Juniperus</u> and <u>Yucca brevifolia</u>	1
Rawhide.....	5
<u>Oryctolagus</u> (Rabbit).....	11
Sinew.....	6
Total.....	155

The appended analysis of cordage gives detailed information concerning the specimens. The terms "S" (right) and "Z" (left) for twist of cordage, as used by Fenenga and Riddell (1949, p. 208), have been applied in this paper. All numbers of specimens are catalogue numbers of the University of California Museum of Anthropology.

In the following discussion the usual division between rope and string will not be made. There is little significant difference in the diameters of the Coville cordage, and there is no correlation between twist and diameter.

Amsonia brevifolia, Yucca brevifolia, and Juniperus sp. are the three most common materials used for cordage at Coville site. They account for 120 of the 155 total specimens, or 77.41 per cent.

Amsonia brevifolia.—The most common fiber used for cordage in the site, accounting for 49 of the specimens or 31.61 per cent of the total. Of the 49, 46 are 2-ply S twist, 1 is 2-ply Z twist, and of the remaining two, one is a strand of a 2-ply piece and the other is too fragmentary for identification. The average diameter is 2.11 mm., ranging from 0.3 mm. to 3.6 mm. The range in length is from 1 cm. to 53 cm.

These specimens have the finest texture of the cordage found. The Amsonia fiber is very similar in appearance to its relative Apocynum, ranging from gray through yellow to red and brown in color. It is soft and silky to the touch, although such texture depends upon the amount of original working of the fiber when the cordage was made. This plant is indigenous to the desert areas of California, extending eastward into the Great Basin. (See section on distributions.)

Yucca brevifolia.—Ranks second only to Amsonia in frequency. There are 41 specimens of this material, representing 26.51 per cent of the total. Of the 41, 30 are 2-ply S twist, 2 are 2-ply Z twist, 3 are 1-ply Z twist (probably part of 2-ply pieces), 5 are bundles of fiber not

twisted, and 1 specimen is too fragmentary to be analyzed. The average diameter of the specimens is 6.26 mm., ranging from 1.5 mm. to 8.5 mm. The range in length is from 3.3 cm. to 39.0 cm.

Among these specimens there is an even greater variety in texture than among those of Amsonia. Some of the fiber has been pounded until it has become a fine silky yellowish fiber. However, more often the spines have been stripped and the fibers pounded slightly, leaving a bundle of rough heavy filaments. Some of the specimens still show evidence of the original spiny skin. The color of the fiber ranges through yellows and pale greens. Yucca brevifolia is common throughout the desert regions of the southwestern United States. (See section on distributions.)

Juniperus sp.—Well represented in the site; the 30 specimens of this material represent 19.35 per cent of the total. Of the 30, 12 are 2-ply S twist, 6 are 2-ply Z twist, 3 are 1-ply S twist, 5 are 1-ply Z twist, 3 are bundles of fiber not twisted, and 2 are too fragmentary for analysis. The average diameter of the specimens is 8.61 mm., ranging from 0.7 mm. to 12.0 mm. The range in length is from 3.0 cm. to 20.0 cm.

Most of these specimens are made from loosely twisted shredded juniper bark. From the number of knots in the specimens it would seem that this type of cordage was probably used for tying bundles of sticks together. Specimens similar to the more tightly twisted fragments from the site have been found as parts of carrying baskets elsewhere. Color ranges from a light red to a deep brownish gray. Without close examination the deeper shades of red may be easily confused with cedar.

Chilopsis linearis.—There are 6 specimens of this material or 3.87 per cent of the total. Although they are twigs twisted around each other, they have been included in the classification of cordage for convenience sake. Of the 6, 2 are 5-ply S twist, 2 are 3-ply S twist, 1 is 2-ply S twist, and 1 is 2-ply Z twist. The average diameter of the specimens is 5.92 mm., ranging from 3.5 mm. to 8.0 mm. The range of length is from 2 cm. to 29 cm.

These specimens show no evidence of having been wefts in a basket and are therefore counted as some type of tie. The scrub desert willow is indigenous to the deserts of southern California and the Great Basin. (See section on distributions.)

Eleocharis.—The 4 specimens of this material constitute 2.58 per cent of the total. All 4 specimens are 3-ply braid. In cross section the braid ranges from 7.0 mm. to 10.0 mm. in width and 4.0 mm. to 6.0 mm. in thickness. There are 1 to 9 strands in each ply.

Each strand is a whole dried stalk of the rush—not pounded, split, or modified in any way. It is a common material used throughout the Great Basin for braid and matting. (See distributions.)

Grass.—The 2 specimens made of grass represent 1.29 per cent of the total. Of the 2, 1 is 2-ply S twist, the other is a bundle of stalks not twisted. The average diameter of the specimens is 3.4 mm., ranging from 1.3 to 5.5 mm.

The range in length is 4.0 cm. to 31.0 cm.

Combination of *Juniperus* and *Yucca brevifolia*.—Represented by 1 specimen which is 0.65 per cent of the total. It is 2-ply S twist and 82 cm. in length. The diameter ranges from 3.0 mm. to 8.0 mm.

This specimen was recovered in association with the sandal (1-130313) and is probably a sandal tie. It is composed of a large cord which is knotted in a square knot with 2 paired smaller cords. The large cord is of mixed juniper and joshua. For the initial 17 cm. one element is juniper and one is joshua; the next 7 cm. both elements are juniper; then 11 cm. of one juniper element and one joshua element; the last 12 cm. is entirely of joshua. The smaller cords are all joshua fiber.

At one end of this specimen there is a reef bend attaching a new element to the joshua element. At the other end the whole cord is tied into a square knot with the smaller cords.

The smaller cords are both 2-ply S twist. A new ply element is added in two places by being tied with a reef bend. The whole cord is looped and the two ends are tied into the large cord with a square knot. The second cord is probably worked in the same way, but it is impossible to be certain because of the poor condition of the piece. If the second small cord was the same, the over-all specimen formed a large cord with two pendent loops of smaller cord, each loop about 6 cm. in diameter.

The sandal found in association with this piece has a small piece of juniper cordage, of the same diameter as the heavy cord, attached to one corner.

Rawhide.—There are 5 fragments of rawhide which represent 3.23 per cent of the total. Of the five, 1 is 2-ply S twist, 3 are flat pieces not twisted. The average diameter of the specimens is 3.2 mm., ranging from 2.0 mm. to 5.0 mm. The range in length is from 5.0 cm. to 6.0 cm.; the strips are 2-3 mm. in width.

Apparently the flat untwisted fragments of hide were used as thongs or lashings.

Lepus (?)—Eleven specimens which represent 7.10 per cent of the total. Of the 11, 5 are 2-ply S twist, 4 are 2-ply Z twist, 1 is 1-ply Z twist, and 1 is a flat untwisted piece. The average diameter of the specimens is 2.92 mm. The diameter range is from 2.0 mm. to 3.0 mm. The range of length is from 5.0 cm. to 20.0 cm.

At least 10 of these specimens are probably fragments of rabbitskin blankets. Small bits of hair can still be seen caught in the twists.

Sinew.—Accounts for the remaining 6 specimens which are 3.87 per cent of the total. Of the 6, 2 are 2-ply S twist, 1 is 1-ply S twist, 1 is a flat piece of untwisted skin, and the last 2 specimens are 11-ply Z twist. The average diameter of the specimens is 2.68 mm., ranging from 1.7 mm. to 2.5 mm. The range in length is from 2 cm. to 10 cm.

TWIST FREQUENCIES

Twenty-two specimens either consist of untwisted elements or are too fragmentary for positive determination. For the others (total, 133) the twist frequencies are as follows:

1-ply S twist	4
2-ply S twist	99
3-ply S twist	3
5-ply S twist	2
1-ply Z twist	9
2-ply Z twist	14
11-ply Z twist	2

DISTRIBUTION OF CORDAGE MATERIALS

***Amsonia brevifolia*.**—Indigenous to desert flats and canyons, particularly the north side of the Colorado Desert, the eastern Mohave Desert, Inyo County. The distribution continues east to Utah. (Jepson, 1925, p. 768.)

In the literature this particular genus of the family Apocynaceae is not mentioned as being used for cordage. However, after a microscopic examination of all the specimens, the writer has come to the conclusion that the specimens from Coville site are *Amsonia brevifolia* and not *Apocynum cannabinum*. There has been some question of the wholesale identifications of cordage as belonging to the genus *Apocynum* and it is quite possible that a number of the specimens formerly identified as *Apocynum* from the interior of California and the Great Basin are in reality *Amsonia*.

***Yucca brevifolia*.**—The distribution is primarily limited to mesas, the Mohave Desert. It is widely distributed and forms extensive groves north of eastern Kern County and Inyo County. It continues east to Utah. (Jepson, 1925, p. 247.)

Yuccas are known widely from the desert areas of the United States. (Cosgrove, 1947, p. 67; Harrington, 1933, p. 159; Haury, 1945, p. 49; Haury, 1950, p. 391; Kidder and Guernsey, 1919, pp. 113, 171; Nusbaum, 1922, p. 103.) However, the identifications from the Southwest indicate different species from the one known from Coville site.

Yucca brevifolia plants were seen growing around the site and some cordage was made from specimens of the plant brought to the Museum of Anthropology. This cordage could, with care, be made to look very much like that from the site.

***Juniperus* sp.**—Mohave Desert south to Lower California and Kern County. The specimens may be *J. utahensis* or *J. californica*, both of which are distributed throughout the desert ranges and Inyo County. (Jepson, 1925, p. 59).

Juniper bark cordage is mentioned sporadically for Utah and Nevada. (Forde, 1931, p. 126; Haury, 1945, p. 49; Nusbaum, 1922, p. 103; Steward, 1937, p. 37; Stewart, 1942, p. 279.) However, as it does not make particularly effective cordage we may assume that it is used only when there is little else available.

***Chilopsis linearis*.**—Distributed through sandy washes or near springs, mostly in deserts. Principally in the Mohave and Colorado deserts. It extends east into Texas and south into Mexico. (Jepson, 1925, p. 950.)

There appear to be no references in the literature to cordage made from plants of this genus. However, since it is limited to exceptionally dry areas of the country, this is readily understandable. Usually the twigs are quite thin and have little tensile strength. *Salix* is the genus of this family that is used most commonly in Nevada and parts of the Southwest.

***Eleocharis*.**—Possibly the species *E. rostellata*, which is distributed in meadows, coastal Southern California, and the Colorado and Mohave deserts. It is generally distributed throughout North America. (Jepson, 1925, p. 149.)

Grass.—This has not been identified as to genus. A similar kind of material was located at Tommy Tucker Cave. (Fenenga and Riddell, 1949, p. 208.)

Sinew.—Although this material is not usually abundant it seems to occur in most sites which represent a hunting culture. Particularly in desert areas, where there is a shortage of suitable vegetable materials, everything at hand must be used to the best advantage. Sinew makes usable cordage and is excellent for lashing and binding. Its general tendency to become brittle is its major drawback.

KNOTS

Overhand.—Overhand are the most common of all the knots found on cordage in the site. This knot is probably the most simple of all, usually serving as a base for other more complicated ones. However, it is often used alone to prevent unraveling of a twisted cord. (Fig. 1, a.)

Square and reef bends.—These occur in almost equal numbers. Actually reef bend is another term for square knot; however, in this context it has been used to distinguish knots used to tie two pieces of cordage together from knots made in one piece of cordage only. Reef bend as used here refers to the former. (Fig. 1, c.)

The square or reef bend is a most useful knot. It does have two drawbacks: if the cords are of unequal diameter, the knot will slip; or if the knot is put under great tension, it will jam.

Sheet bend.—Only one example of this most common of all netting knots was recovered from the site. These knots are excellent for netting because they neither jam nor slip and will bear a great deal of tension. This particular specimen is unusual because it was tied with two parallel cords. (Fig. 1, d.)

Hitch.—Two specimens of this type of knot were recovered. It is a useful one for tying a cord around a bundle. (Fig. 1, e.)

Granny.—One specimen. This knot is often made by error when a square knot is the aim. It is a very poor knot because it usually jams and is unsafe. (Fig. 1, f.)

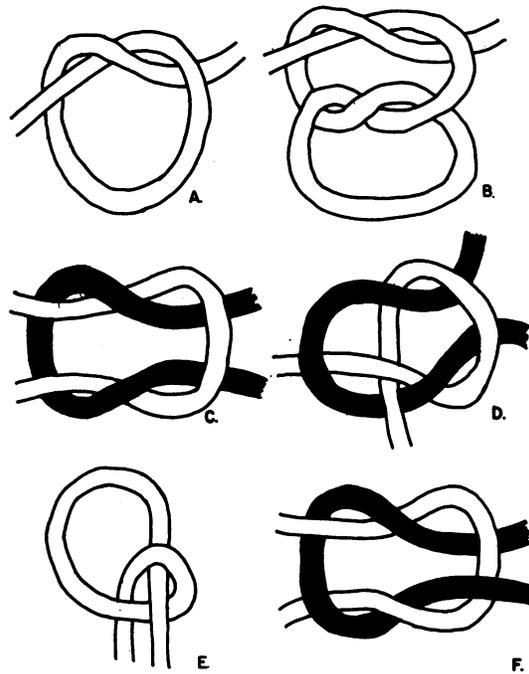


Fig. 1. Types of Knots in Coville Cordage.

TABLE 1

Knot Frequencies

Material	Overhand	Square	Reef bend	Sheet bend	Hitch	Granny
Amsonia	1	...	2	1	...	1
Yucca	8	4	3	...	1	...
Juniperus	2	...	2	...	1	...
Grass	1	...	...	...	...	...
Yucca and Juniperus .....	...	1	2	...	...	...
Oryctolagus .....	...	2	...	...	...	...
Sinew	1	1	...	...	...	...
Total	13	8	9	1	2	1

TABLE 2

Cordage

Cat. No.	Material	Length (cm.)	Ply	Diam. (mm.)	Twist	Remarks
1-130019	Joshua	15	1	5	None	A square knot in one end and a reef bend in the other
1-130050	Joshua	9	2	5	S	Overhand knot in one end
1-130065	Juniper	...	...	...	...	Bundles of bark which may have been knotted; however, it is too fragmentary to be analyzed
1-130076* ...	Amsonia	3.5	2	2	S	Sheet bend made with double elements
1-130082	Joshua	10	...	...	None	Reef bend
1-130086	Amsonia	7.5	2	2	S	...
1-130093	Joshua	7	2	...	S	Damaged specimen
1-130096	Amsonia	2.4	2	2.5	S	Two pieces
	Amsonia	2.4	2	2.5	S	
1-130097	Rabbit skin	8.5	2	2	S	...
1-130098	Rabbit skin	8	2	2	S	...
1-130102	Joshua	6	2	3	S	...

*Described more fully in the text.

TABLE 2 (cont.)

Cat. No.	Material	Length (cm.)	Ply	Diam. (mm.)	Twist	Remarks
1-130115	Juniper	10	2	5	S	Reef bend
1-130116	Joshua	21	2	4	S	...
	Joshua	9	2	2	S	...
	Joshua	6	2	2	S	Recovered with sandal (1-130117) probably part of the sandal ties
1-130117	Joshua	39	2	8.5	S	Doubled and used as the foundation of the sandal (1-130117); see sandal description
1-130132	Juniper	4	2	4	Z	...
1-130133	Willow	29	5	8	S	Four twigs split one whole
1-130134	Juniper	10	2	4	Z	...
1-130135	Juniper	8	2	4	Z	...
1-130136	Rabbit skin	9	2	3	Z	...
1-130137	Rawhide	5	2	2	S	...
1-130138	Joshua	13	2	5	S	...
1-130141*	Rabbit skin	19.8	2	3	S	Square knot
	Rabbit skin	20	2	3	Z	...
	Rabbit skin	11	2	3	Z	...
	Rabbit skin	9	2	3	Z	...
1-130141	Rabbit skin	6.8	2	3	S	...
	Rabbit skin	5.3	3	4	Z	Square knot
1-130142	Joshua	8	1	5	None	Poor condition; may have been tied in a square knot at one time
1-130143	Amsonia	4.2	2	2.5	S	...
1-130143	Sinew	4	2	1.7	S	Square knot (?) in one end
1-130145	Amsonia	4.6	2	1.7	S	Reef bend in one end
1-130146	Amsonia	5.8	2	2.9	S	...
1-130147	Juniper	4	1	3	S	...
1-130148	Amsonia	4	2	2.7	S	...
1-130149	Joshua	10	1	5	None	Ends tied in square knot
1-130150	Juniper	9	1	4	S	...
	Juniper	5.2	1	2	S	...
1-130151	Joshua	10	2	3	S	...
1-130152	Joshua	4.5	2	3	S	...
1-130153	Amsonia	3	2	1.8	S	...
1-130154	Rabbit skin	9	2	2.5	S	Strip of skin doubled to form an eye, then the two ends twisted together
1-130155	Amsonia	5	2	2.5	S	...
1-130190	Joshua	?	2	3	Z	Woven into basket rim
1-130202	Joshua	8	1	5	None	Ends tied in square knot
1-130203	Amsonia	1.7	2	2	S	...
1-130204	Amsonia	4.9	2	2	S	...
1-130206	Joshua	5	2	2.5	S	...
1-130207	Amsonia	2.2	2	2.5	S	Two pieces
	Amsonia	2.2	2	2.5	S	...
1-130209	Joshua	5	2	2.5	S	...
1-130210	Joshua	3.3	2	4	S	...
1-130211	Joshua	1.9	2	4	S	...
1-130215	Joshua	14	2	8	S	...
1-130216	Amsonia	8	2	3.5	S	...
1-130217	Amsonia	25	1	0.3	S	Strand of thread found loose in the midden
1-130227	Amsonia	6	2	2	S	...
1-130228	Amsonia	3.5	2	1.5	S	...
1-130229	Amsonia	3.8	2	2.5	S	...
1-130230	Juniper	4	1	2	...	Probably 1 ply of a 2-ply piece
1-130231	Joshua	5	1	1.5	Z	Probably 1 ply of a 2-ply piece
1-130233	Willow	11	5	3.5	S	Four pieces of bark, one whole twig
1-130243	Joshua	12	2	3	S	Overhand knot in one end
	Joshua	3	2	2	S	Poor condition
	Sinew	8	11	1.8	Z	Overhand knot in one end
1-130246	Joshua	22	2	4	S	Overhand knot in one end
	Joshua	7	2	3.2	S	...
	Joshua	14	2	3	S	Overhand knot in one end
	Joshua	9	2	3.1	S	Overhand knot in one end
	Joshua	10	2	4.2	S	Reef bend and an overhand
1-130247	Amsonia	1	2	?	S	Poor condition
1-130256	Juniper	15	2	6	S	...

TABLE 2 (cont.)

Cat. No.	Material	Length (cm.)	Ply	Diam. (mm.)	Twist	Remarks
1-130258....	Joshua	2.5	1	3	Z	Probably 1 ply of a 2-ply piece
1-130260....	Juniper	7	2	6	S	...
1-130262....	Amsonia	3.3	2	2	S	...
1-130271....	Sinew	2	1	4	S	...
1-130272....	Amsonia	2	2	2	S	...
1-130274....	Juniper	7	2	3.5	S	Overhand in each end
1-130275....	Rabbit skin	5	1	3.6	None	Flat strip of skin
1-130277....	Joshua	3	2	4	S	Overhand knot in end
1-130281....	Juniper	9	...	10	None	Shredded Juniper bark tied in a reef bend
1-130285....	Juniper	7	2	1.5	S	...
1-130286....	Juniper	10	2	1.5	Z	...
1-130287....	Amsonia	4	2	2.2	S	...
1-130292....	Joshua	6	1	1.5	Z	Probably part of a 2-ply piece
1-130293....	Amsonia	53	2	1.8	S	...
1-130294....	Sinew	10	2	2.5	S	...
1-130295....	Juniper	4	1	2.0	Z	Probably part of 2-ply piece
1-130296....	Amsonia	10	2	2.0	S	...
	Amsonia	6	2	2.7	S	...
1-130297....	Juniper	11	2	6.6	S	...
1-130298....	Amsonia	15	2	2.7	S	Reef knot
1-130299....	Amsonia	6	2	2.5	S	...
1-130300....	Juniper	18	2	2.5	S	...
1-130313....	Juniper	8	2	5.0	S	Hitch, see sandal (1-130313) description
1-130319*....	Juniper and Joshua	82	2	3.0 to 8.0	S	Recovered in association with sandal (1-130313) and is probably a sandal tie
1-130321....	Amsonia	8	2	2.3	S	...
1-130324....	Grass	31	2	1.3	S	Each ply is composed of 12 strands
1-130325....	Amsonia	2	2	1.8	S	...
1-130326....	Joshua	26	2	4.5	S	Wrapped around a bundle of willow sticks with an overhand knot in one end
1-130327....	Juniper	5	1	0.7	Z	...
1-130328....	Joshua	12	2	3.5	S	...
1-130331....	Amsonia	6	2	1.5	S	...
1-130332....	Amsonia	9	2	3.3	S	...
1-130355....	Juniper	7	...	1.8	S	Bundle of shredded bark
1-130356....	Juniper	6	2	12.0	S	Poor condition
1-130357....	Amsonia	2	2	2.3	S	...
1-130358....	Amsonia	1.5	2	1.8	S	Overhand knot in center
1-130359....	Amsonia	3	2	2.8	S	...
1-130360....	Joshua	11	2	5.0	S	Overhand knot in one end
	Joshua	10	2	6.0	S	Poor condition
1-130361....	Grass	4	1	5.5	None	Bundle of grass with overhand knot in center
1-130362....	Juniper	3	2	3.7	S	...
1-130363....	Juniper	5	1	1.5	Z	...
1-130364....	Rawhide	6	1	5.0	None	Thong fragment
1-130365....	Rawhide	5	1	3.0	None	Thong fragment
1-130366....	Rawhide	6	1	2.8	None	Thong fragment
1-130367....	Amsonia	...	...	...	...	A few fragmentary strands not cordage
1-130372....	Rawhide	...	...	...	...	...
1-130379....	Amsonia	2	2	1.8	S	...
1-130383....	Juniper	20	2	5.0	Z	...
1-130384....	Sinew	2	1	2.5	Z	...
1-130385....	Juniper	30	2	5.0	Z	...
1-130392....	Joshua	4	2	2.0	Z	...
1-130394....	Amsonia	4	2	1.0	S	...
1-130396....	Willow	9	3	7.0	S	One twig twisted around the other two
1-130397....	Amsonia	3	2	2.3	S	...
1-130399....	Juniper	17	2	6.5	S	...
1-130401....	Amsonia	6	2	2.2	Z	Poor condition
1-130404....	Joshua	6	2	6.0	S	Square knot
1-130406....	Amsonia	2	2	2.0	S	...
1-130409....	Amsonia	3	2	1.8	S	...
1-130411....	Juniper	20	1	4.0	None	Shredded Juniper bark with overhand knot in one end
1-130412....	Juniper	10	2	9.0	S	...
1-130413....	Joshua	ca. 15	1	5.0	None	Wrapped around bundle of Erigonum sticks and tied with a hitch

TABLE 2 (cont.)

Cat. No.	Material	Length (cm.)	Ply	Diam. (mm.)	Twist	Remarks
1-130416....	Willow	11	2	6.5	S	Each ply composed of five or six twigs
1-130418....	Joshua	3	1	2.5	Z	Probably part of 2-ply piece
1-130420....	Sinew	2	1	3.0	?	Poor condition, twist and knot unidentifiable
1-130421....	Amsonia	12	2	1.4	S	These two pieces are tied together with a granny knot
		14	2	2.0	S	
1-130422....	Amsonia	14	2	1.3	S	...
1-130430....	Joshua	3	2	4.0	S	These two pieces are probably part of the same piece since they are found on the edge of a basketry fragment (1-130430)
		3	2	4.0	S	
1-130431....	Juniper	15	1	1.8	Z	...
1-130432....	Amsonia	3	2	3.0	S	...
1-130433....	Amsonia	3	2	3.0	S	...
1-130437....	Willow	9	3	7.0	S	One twig is twisted around the other two
1-130466....	Amsonia	3	2	2.8	S	...
1-130472....	Willow	2	2	3.5	Z	...
1-130473....	Amsonia	1	2	2.0	S	...
1-130478....	Amsonia	4	2	2.6	S	...

TABLE 3

Braid*

Cat. No.	Material	Length (cm.)	Width (mm.)	Thickness (mm.)	Remarks
1-130018....	Spike rush	9.0	7.0	4.0	One strand in each ply
1-130232....	Spike rush	13.0	9.0	4.0	Four strands in one ply and three in the other two
1-130310....	Spike rush	23.0	10.0	6.0	There are five to nine strands in each ply
1-130417....	Spike rush	30.0	10.0	5.0	Four strands in each ply

*All specimens of braid are 3-ply.

APPENDIX C

MAMMAL REMAINS, SITE INY-222

By

J. ARTHUR FREED

Four genera are listed in the following tabulation of identified mammal remains from the Coville Rock Shelter. These are Antrozous, Lepus, Neotoma, and Ovis. All are apparently to be found in the region today and are included in the list of mammals recorded by Grinnell for the area in Death Valley below sea level (1937, p. 117). Though his observations were limited to specific elevations there is no reason to believe that any of the four mammals found at Iny-222 were out of their natural range. It is on the basis of Grinnell's work, however, that specific names were assigned to the remains. For Ovis canadensis a subspecies designation was applied as well. All of these terms were given largely because geographical range differentiations for the mammals in question appear clear enough to warrant such precise nomenclature even on the basis of the limited skeletal material studied.

A few remarks may be made here regarding the occurrences of the desert wood rat, Neotoma lepida, and of the desert bighorn sheep, Ovis canadensis nelsoni. That the former may be found in caves or shelters, as at Iny-222, is indicated by Goldman (1910, p. 10): "As a rule the members of the genus [Neotoma] prefer rocky or mountainous areas, where they live commonly in cliffs or caves." Grinnell states that the desert wood rat ranges up to 7,000 ft. in altitude in areas surrounding Death Valley (1937, p. 158). Grinnell also wrote (1937, p. 134):

My own regrets are deep, that I did not, during my first two trips into the Valley, take opportunities then offering to learn more about the dependencies of the few Indians I met, upon the natural resources of the country. I did observe that in April the women and children were actively trapping rodents in the mesquite thickets around Furnace Creek Ranch. Neotoma and Ammosperophilus [desert antelope, ground squirrel] were the kinds mostly sought and caught—in deadfalls, each consisting of a flat rock. These, along with lizards of the larger kinds caught with nooses, were boiled in kettles and eaten.

As regards the desert bighorn sheep there seems to be considerable agreement that the particular form represented at Death Valley is Ovis canadensis nelsoni (Cowan, 1940, pp. 559-565). Ingles does not discuss the point, though he states (1947, p. 226) that the only species of mountain sheep found in California is O. canadensis. Ober states the case for subspecies designation while making it clear that he feels "climatic and geographic conditions were met" which accounted for changes in the original mountain sheep as they "migrated from the Canadian Rockies as far south as the northern states of Mexico." He writes further (Ober, 1931, p. 29): "As a matter of fact the environments of the localities where the sheep have made their homes for years have necessarily had all to do with their size and form. This fact is particularly exemplified in the Death Valley sheep." His paper embodies observations made during extensive field work

in the Death Valley region and in other parts of Inyo County. By way of a final comment an important point made by Grinnell (1937, p. 168) should be cited here:

The Desert Bighorn or Mountain Sheep is, interestingly, the only native ungulate mammal known to occur in the immediate neighborhood of Death Valley. Neither deer nor antelope have ever been reported authoritatively, to my knowledge, from anywhere in the surrounding mountain ranges, let alone from the Valley itself.

Identified Mammal Remains, Site Iny-222

Species	No. of specimens
<u>Antrozous pallidus</u>	
(Pallid Bat or Desert Pallid Bat)	
Mandible.....	1
<u>Lepus californicus</u>	
(Jack Rabbit or Desert Jack Rabbit)	
Skull fragment, maxillary	2
Mandible	3
Humerus	2
Radius.....	2
Ulna.....	1
Radius and ulna (fused).....	1
Innominate bone	3
Femur.....	4
Tibia	8
Tibia and fibula (fused).....	1
Right hind foot (articulated).....	1
Total	28
<u>Neotoma lepida</u>	
(Desert Wood Rat)	
Skull fragment.....	4
Mandible.....	13
Humerus.....	2
Innominate bone	2
Femur.....	12
Tibia	2
Total	35
<u>Ovis canadensis nelsoni</u>	
(Desert Bighorn or Mountain Sheep)	
Scapula	2
Metapodial	3
Astragalus	1
Astragalus and calcaneum (fused).....	1
Total	7
Grand total, identified specimens	71

APPENDIX D

PLANT MATERIALS AND MISCELLANEOUS NONARTIFACT REMAINS, SITE INY-222

PLANT MATERIAL

Mr. G. Thomas Robbins of the University of California Herbarium examined a sample of the plant specimens recovered from the Coville site. Some seeds and species of plants could not be identified, but the following determinations were made.

Seeds.—1-130679. Pinus monophylla; seed ripens in the fall.

1-130481. Appears to be something in the Cruciferae; identification uncertain.

1-130709. Lepidium aff. lasiocarpum; seed ripens in March, April, May.

1-130546. Prunus andersonii (desert peach).

1-130707. Opuntia sp.

1-130711. May be a species of Gilia.

There was an observable difference in the depths at which the seeds of Prunus andersonii and Pinus monophylla were found in the site, the former being heavily concentrated in the lower levels. This difference could represent some change in the food habits of the people. This species of Prunus, however, has little in the way of edible fruit, the exterior of the seed being a thin husk. Also, when it is considered that most of the Prunus seeds show evidence of gnawing by rodents, it seems likely that the Prunus seeds were brought in by rodents. They are local seeds and occur abundantly in the levels where hu-

man occupation is scarce or absent. The Pinus husks, however, are most abundant in the areas indicating the heaviest human occupation.

Other plant material.—The following plant material was identified from level bags: Eriogonum sp. (buckwheat), plant stalks; grass, not identifiable beyond Gramineae; Opuntia basilaris, various parts of the cactus; Juniperus sp., shredded bark; Gutierrezia sp., a shrub used in lining cache pits, of which numerous parts and some whole plants were found; Yucca sp., root, probably one of the smaller species and not Joshua tree; Yucca or Agave sp., bark, leaves, root parts scattered through midden; Argemone platyceras (?), seed pod found in the midden—seed ripens in the fall, but the pods remain on the plants through most of the year.

Additional species occurring in cordage.—Identification of these species was made by Chérie N. Grégoire: Amsonia sp.; Eleocharis sp. (spike rush).

Wooden objects.—The wooden specimens were examined by Dr. R. A. Cockrell of the University of California. With the exception of the fire hearth, which is juniper, all the specimens are hardwoods from desert shrubs. Specific identification could not be made for lack of comparable slide material.

Seeds, bone, and charcoal in two pits.—Tabulation by weight of seeds, bone and charcoal in pits B-3 and B-7 is given in table 1.

TABLE 1

Weight of Seeds, Bone, and Charcoal in Pits B-3 and B-7

(gm.)

Depth (in.)	Seeds			Bone	Charcoal
	Pinus	Prunus	Miscellaneous		
Pit B-3					
0-6.....	4.98	3.17	0.21	13.96	9.48
6-12.....	4.76	1.23	0.13	14.32	4.95
12-18.....	2.00	0.80	0.00	4.13	0.00
18-24.....	0.70	3.90	0.00	5.37	0.35
24-30*.....	0.43	0.68	0.50	8.86	0.00
30-36.....	2.75	70.10	0.54	2.80	0.00
36-42.....	2.33	48.20	0.26	2.11	4.81
42-48.....	3.00	61.10	0.13	0.28	9.40
Pit B-7					
0-6.....	6.95	0.24	0.16	5.35	8.76
6-12.....	9.81	0.23	0.05	1.20	7.43
12-18.....	2.33	0.36	0.06	2.64	5.40
18-24.....	2.36	3.12	0.12	5.93	5.34
24-30.....	0.97	1.27	0.00	4.17	2.77
30-base.....	0.00	0.00	0.00	0.37	0.00

*Seeds from this level of B-3 were inadvertently mixed with other plant material which was discarded in the field. Figures given are from the adjacent pit C-2, which was not a full-sized pit but gives some idea of the proportions in this level.

The figures for miscellaneous seeds are low, since many of these seeds were small enough to pass through the screen. The figures for Pinus are for the seed husks, no whole seeds being found. The bone is mostly small fragments of rodent bones.

FAUNAL MATERIAL

The midden contained a number of small bones which appeared to be from lizards. One dessicated and naturally preserved lizard was found buried in the midden. It was identified by Dr. S. F. Cook, of the Department of Physiology, University of California, as Sceloporus, species probably magister. These lizards live much of the time underground, and the present specimen probably repre-

sents a lizard which happened to die in the site.

Two or three ground beetles (Tenebrionidae) were found in the site. Two live ones were also found on the surface of the site, indicating that this is probably a fortuitous association. There were also two scorpions found living in the midden. These and the beetles were the only evidence of living things now occupying the site.

FECAL SPECIMENS

A few fecal specimens were found in the midden. These appear to be both human and dog or coyote. The human specimens are very fibrous, indicating a heavy diet of plant food, but further analysis has not been made.

APPENDIX E

DESCRIPTIVE TABLES OF SPECIMENS, SITE INY-222

TABLE 1

Artifact Count and Distribution by House Pit, Site Iny-222

Type	East pit	West pit	Rockfall	Total
Basketry				
Coiled fragments	28	19	0	47
Twined fragments	48	20	0	68
Cordage*				
Amsonia	15	32	2	49
Joshua	18	9	0	27
Juniper	10	19	0	29
Twisted animal skin	6	4	0	10
Twisted willow twigs	1	3	0	4
Twisted grass stalks	0	2	0	2
Eleocharis braid	1	3	0	4
Wood				
Worked twigs	10	5	1	16
Wooden gaming pieces (?)	1	1	0	2
Fire drills	3	2	0	5
Fire hearths	1	0	0	1
Spatulate wooden object	0	0	1	1
Arrow foreshafts	2	1	0	3
Cut cane fragment	0	1	0	1
Wooden flaker (?)	0	1	0	1
Bone				
Bone beads	2	1	0	3
Bone flesher (?)	1	0	0	1
Incised mammal bone tube	0	1	0	1
Stone				
Chert blades and fragments	10	6	0	16
Obsidian blades and fragments ..	4	2	0	6
Used flakes (scrapers)	9	8	0	17
Chert end scrapers	1	1	0	2
Coarse dolomite tools (choppers and core scrapers)	4	12	1	17
Arrow points and fragments	0	5	0	5
Incised slate objects	0	3	0	3
Mano	0	1	0	1
Metate	1	0	0	1
Sheephorn				
Spoon fragment	1	0	0	1
Spiral-shaped object	0	1	0	1
Wrench fragments	0	2	0	2
Problematical object	0	1	0	1
Minerals				
Yellow ochre	1	0	0	1
Red ochre	0	2	0	2
Rock sulfur	2	0	0	2
Quartz crystal	1	0	0	1
Stream pebbles	0	4	0	4
Miscellaneous				
Sandals	2	0	1	3
Rabbit-skin blanket fragments	2	0	0	2
Leather fragment	0	1	0	1
Pottery				
Sherds	0	2	0	2
Totals	185	176	6	366

*Figures do not include fragments attached to other specimens.

TABLE 2

Depth Distribution of Artifacts, Site Iny-222

(in.)

Artifact type	0-6	6-12	12-18	18-24	24-30	30-36
Coiled basketry fragments	10	14	11	10	1	1
Twined basketry fragments	27	16	9	5	1	0
Amsonia cordage	9	17	12	5	1	1
Joshua cordage	11	10	5	3	2	0
Juniper cordage	8	13	7	3	0	0
Sinew cordage	0	4	2	0	0	0
Animal skin cordage	5	4	1	0	0	0
Twisted willow twigs	0	3	1	0	0	0
Tule braid	1	3	0	0	0	0
Sandals	1	2	0	0	0	0
Worked twigs	9	8	1	0	0	0
Fire drills	0	1	2	0	0	0
Fire hearths	1	0	0	0	0	0
Arrow foreshafts	1	1	1	0	0	0
Bone beads	2	0	0	0	1	0
Chert blades and fragments	5	9	1	0	1	0
Obsidian blades and fragments	0	1	2	3	0	0
Used flakes (scrapers)	3	10	4	2	0	0
Dolomite choppers and scrapers	9	5	1	1	1	0
Arrow points	3	2	1	0	0	0
Yellow ochre	0	1	0	0	0	0
Rock sulfur	0	2	0	0	0	0
Potsherds	1	1	0	0	0	0
Bone flesher (?)	0	1	0	0	0	0
Quartz crystals	0	0	0	0	1	0
Cut cane fragment	0	1	0	0	0	0
Sheephorn arrow wrench fragments	2	0	0	0	0	0
Incised slate objects	2	1	0	0	0	0
Incised bone tube	0	0	1	0	0	0
Leather fragment	0	0	0	1	0	0
Rabbit skin blanket fragments	0	2	0	0	0	0
Twisted grass stalks	2	0	0	0	0	0
Problematical sheephorn objects	2	1	0	0	0	0
Wooden flaker (?)	1	0	0	0	0	0
Stream pebbles	0	1	2	1	0	0
Mano	0	1	0	0	0	0
Metate	0	1	0	0	0	0
Totals	115	136	64	34	9	2

TABLE 3

Description of Basketry Specimens, Site Iny-222

Twined Basketry

Cat. No.	Size (cm.)	Count (per 10 cm.)		Material (willow)		Diam. of Elements (mm.)		Pitch (up to)	Remarks
		Weft	Warp	Weft	Warp	Weft	Warp		
1-130014....	9 x 7	6	8	Unpeeled twigs	Peeled	2	3-4	R	Insertion of new wefts made by catching weft under one stitch
1-130051....	13 x 8	...	...	Unpeeled twigs	Peeled	2.5-3.0	2.5-3.0	R	A piece of specimen 14 described in Lathrap and Meighan, 1951
1-130052....	13 x 6	...	...	...	...	...	...	...	Same as 130051 and fits on to this piece
1-130056....	12 x 3	...	...	Unpeeled twigs	Peeled	2.5	3.0	R	...
1-130070....	20 x 7	32	36	Split twigs	Peeled	2.5-3.5	2.0-2.5	R	...
1-130071....	7 x 6	12	25	Split twigs	Peeled	2.5-3.0	2.5-3.5	R	New wefts have ends tucked under one stitch
1-130072....	11 x 3	14	36	Split twigs	Peeled	2.0-2.8	2.5-3.0	R	Over-2-under-2 on alternate pairs of warps
1-130073....	16 x 6	10	32	Unpeeled twigs	Peeled	1.6	2.8	R	Over-2-under-2 on alternate pairs of warps
1-130099....	7 x 3	10	33	Unpeeled twigs	Peeled	2.0	2.0-2.5	R	Over-2-under-2 on alternate pairs of warps
1-130106....	17 x 5	6	21	Unpeeled twigs	Peeled	3.0-4.0	3.5-4.0	R	Over-2-under-2 on alternate pairs of warps
1-130109....	8 x 3	...	...	Unpeeled	Unpeeled	...	...	R	...
1-130110....	12 x 7	6	25	Unpeeled twigs	Unpeeled	2.0-2.5	2.6	R	Very irregular construction. See illus.
1-130111....	6 x 10	...	...	...	...	...	...	...	Part of 1-130110. This piece has a mend composed of a bundle of ten twigs stitched on with a strip of willow bark which passes around the bundle and through the spaces between the warps. (Mend size 6 x 2 cm.)
1-130118....	9 x 6	...	...	Unpeeled	Unpeeled	...	...	R	Poor condition
1-130119....	12 x 4	5	25	Unpeeled	Unpeeled	3.0	3.0-3.5	R	Over-2-under-2 on alternate pairs of warps
1-130120....	4 x 6	4	18	Unpeeled shoots	Peeled	1.9-3.0	2.6-3.4	R	Probably part of a burden basket. New wefts have ends caught under one stitch
1-130120A...	23 x 8	4-5	18	Unpeeled shoots	Peeled	1.9-3.0	2.6-3.4	R	Irregular construction. May be part of 1-130013 or 1-130076
1-130122....	7 x 2	...	...	Split	Peeled	...	...	R	...
1-130124....	19 x 3	4	9	Split	Peeled	3.8-5.5	4.0-5.5	R	Part of a heavy burden basket
1-130125....	6 x 3	...	...	Unpeeled	Unpeeled	...	...	R	...
1-130167....	15 x 7	...	...	...	...	...	...	...	Same as 1-130120
1-130168....	7 x 6	...	...	...	...	...	...	...	Part of 1-130110. Has 2 coils of material looped around 1 weft row, probably part of a mend. One coil is unpeeled willow; the other is not identified
1-130169....	11 x 7	...	...	...	...	...	...	...	Part of 1-130120
1-130172....	11 x 2	...	...	Split twigs	Peeled	3.5	2.5-3.0	?	Rim fragment, probably for twined burden basket; 5 warp elements are attached to a heavy stick, 11.5 mm. in diam., by weft coiled around the whole bundle
1-130173....	19 x 4	...	...	...	...	...	...	...	Part of 1-130120
1-130173A...	11 x 3	...	...	...	...	...	...	...	Part of 1-130120
1-130174....	7 x 5	...	...	...	...	...	...	...	Part of 1-130110

TABLE 3 (cont.)

Cat. No.	Size (cm.)	Count (per 10 cm.)		Material (willow)		Diam. of Elements (mm.)		Pitch (up to)	Remarks
		Weft	Warp	Weft	Warp	Weft	Warp		
1-130176....	11 x 3	...	...	...	...	...	...	...	Part of 1-130120
1-130176....	11 x 7	...	...	...	...	...	...	...	Part of 1-130110
1-130177....	12 x 6	6	26	Unpeeled	Peeled	2.0-2.8	3-4	R	Over-2-under-2 on alternate pairs of warps
1-130179....	12 x 12	...	...	...	...	...	...	...	Part of 1-130120
1-130183....	6 x 8	...	...	...	...	...	...	...	Part of 1-130120
1-130184....	13 x 4	...	...	Unpeeled	Unpeeled	...	...	R	...
1-130185....	10 x 4	...	...	...	...	...	...	R	Two pieces
	8 x 1	...	...	Unpeeled	Peeled	2.0-3.0	2.5-3.0	...	Rim fragment. Rim is of 3 warp elements. Paired wefts cross one another on outside of rim, one weft encircling the rim before crossing the other weft
1-130186....	11 x 4	8	25	Unpeeled	Unpeeled	3.0	3.5	R	Over-2-under-2 on alternate pairs of warps. A willow splint, 5 mm. wide and 1 mm. thick, is bent around the 4 warps remaining
1-130187....	10 x 8	...	...	...	...	...	...	...	A patch made of twigs and held together by a long strip of bark 5 mm. wide. Strips of the same bark compose three of the warps
1-130188....	13 x 7	?	20	Unpeeled	Peeled	2.5	3.0-4.0	R	Simple twining on paired warps; three pieces
	10 x 8	...	...	...	...	...	...	...	...
	13 x 8	...	...	...	...	...	...	...	...
1-130189....	13 x 4	...	...	...	...	...	...	...	Part of 1-130124
1-130220....	6 x 5	9	33	Unpeeled	Peeled	2.0	2.0-2.5	R	Over-2-under-2. At the edges the paired wefts are twisted together (S twist) about 5 times, then reverse and go back across the basket. New wefts are caught under one stitch
1-130243....	14 x 7	9	37	Unpeeled	Peeled	2.0-3.0	2.2-3.5	R	New wefts caught under one stitch. Three pieces of cordage inserted through warps; possible carrying attachment, but pieces are too fragmentary for detailed analysis. Over-2-under-2 on alternate pairs of warps. See cordage under the same no.
1-130244....	13 x 5	8	25	Unpeeled	Unpeeled	2.0-3.0	3.0-3.6	R	Over-2-under-2 on alternate pairs of warps. Piece in poor condition
1-130245....	24 x 8	6	32	Unpeeled	Peeled	2.0-3.0	2.3-3.8	R	Primarily over-2-under-2 on alternate pairs of warps, but sometimes the wefts pass over one or three warps. No discernible pattern of weaving
1-130246....	16 x 15	10	12	Peeled	Peeled	2.0-3.0	3.5-4.0	R	See notes at end of table
1-130268....	8 x 4	...	...	Unpeeled	Unpeeled	...	...	R	Poor condition. One weft element paired
1-130311....	15 x 10	11	27	Unpeeled	Peeled	2.0-2.5	2.6-3.6	R	See notes at end of table
1-130314....	13 x 3	10	30	Splints	Peeled	2.5-3.0	3.0-3.5	R	Over-2-under-2 on alternate pairs of warps. New warps sharpened before inserting. New wefts caught under one stitch
1-130318....	6 x 2	42	30	Splints	Peeled	3.0	2.0-2.5	R	Over-2-under-2 on alternate pairs of warps. Both sides appear to be pitch coated

TABLE 3 (cont.)

Cat. No.	Size (cm.)	Count (per 10 cm.)		Material (willow)		Diam. of Elements (mm.)		Pitch (up to)	Remarks
		Weft	Warp	Weft	Warp	Weft	Warp		
1-130354....	11 x 3	...	...	...	...	...	...	R	Single peeled willow warp with unpeeled wefts
1-130368....	9 x 6	6	18	Unpeeled twigs	Peeled	2.8-3.2	3.2-4.0	R	Simple twining, one weft element paired. New warps sharpened and added by pairing tip with another warp
1-130388....	21 x 8	4	14	Unpeeled twigs	Peeled	2.9-3.7	4.3-5.0	R	See notes at end of table
1-130389....	7 x 7	10	24	Unpeeled twigs	Peeled	3.0-3.5	3.5-4.5	L	Over-2-under-2 on alternate pairs of warps. New warps added without sharpening
1-130390....	5 x 2	9	35	Unpeeled	Unpeeled	2.5	2.8-3.0	R	Over-2-under-2 on alternate pairs of warps
1-130391....	11 x 1	...	...	...	...	...	...	...	Fragmentary rim piece showing weft elements crossing at rim and proceeding back across basket
1-130398....	16 x 1	...	...	...	...	...	...	...	Heavy rim piece with bark weft coiled around it. Rim 9 mm. diam. Weft 4 mm. wide; holds 2 smaller twigs next to rim piece. Specimen damaged by insect
1-130430*....	25 x 8	24	34	Splints	Peeled	2.4-3.6	1.8-2.8	R	Close-twined. See notes at end of table
1-130434....	15 x 3	...	15	Unpeeled twigs	Peeled	3.2	2.3-3.8	R	...
1-130438....	7 x 3	8	30	Unpeeled twigs	Peeled	3.0-3.5	3.0-4.5	L	Over-2-under-2 on alternate pairs of warps
1-130440....	8 x 3	...	30	Unpeeled twigs	Peeled	3.0	2.8-3.4	R	Over-2-under-2 on alternate pairs of warps
1-130443....	12 x 7	...	16	Unpeeled twigs	Peeled	3.0	4.3-4.6	R	...
1-130444....	15 x 6	8	20	Unpeeled twigs	Unpeeled	3.0	2.0-3.7	R	Damaged by moisture
1-130445....	9 x 3	9	30	Unpeeled twigs	Peeled	3.0	3.2-3.7	R	Over-2-under-2 on alternate pairs of warps. New warps sharpened before insertion. New wefts caught under one stitch
1-130448....	9 x 7	...	...	...	...	...	...	R	Single warp with paired weft elements. Both unpeeled willow

TABLE 3 (cont.)

Coiled Basketry

Cat. No.	Size (cm.)	Count (per 10 cm.)		Foundation	Material*		Diam. of Elements (mm.)		Pitch (up to)	Remarks
		Weft	Warp		Weft	Warp	Weft	Warp		
1-130001....	4 x 1	...	...	3-rod	w splints	Peeled w	2	2	L	West house pit area One edge coil is split stitch; others are interlocking
1-130002....	6 x 3	21	16	2-rod- and- bundle	w bark	Peeled w and j	2.5-3.5	2-3	R	
1-130037....	6 x 2	...	...	...	...	...	...	...	...	Piece of 1-130079 Split stitch; top rod split; both sides have pitch coating
1-130079....	8 x 3	30	25	3-rod	w bark	Peeled w	2.5	2.0-2.5	R	
1-130079A..	13 x 3	24	15	2-rod- and- bundle	w bark	w and j	3.0	3.0	R	Mostly noninterlocking but some stitches interlock and some are split
1-130103....	6 x 2	...	...	...	...	...	...	...	...	Same as 1-130131
1-130104....	7 x 2	24	20	3-rod	w splints	Peeled w	2.5-3.5	1.5-4.0	R	One side is all split stitch, the other has occasional stitches split but not in any pattern. Top rod is split
1-130105....	3 x 1	...	...	...	...	...	...	...	...	Piece of 1-130079
1-130127....	8 x 4	24	24	3-rod	w splints	Peeled w	2.5-3.5	1.5-4.0	R	One side is all split stitch, the other has occasional stitches split but not in any pattern. Top rod is split
1-130128....	4 x 1	...	...	2-rod- and- bundle	w splints	w and j	...	...	R	Stitches split bundle
1-130129....	4 x 1	30	20	3-rod	w splints	Peeled w	...	...	R	Split stitch both sides. Top rod split
1-130130....	6 x 2	20	20	3-rod	w splints	Peeled w	...	...	L	Top rod split. Wefts completely cover foundation on one side. Interlocking stitch
1-130131....	19 x 11	23	23	3-rod	w splints	Peeled w	2.5-3.5	1.5-4.0	R	One side is all split stitch; other side has occasional stitches split but in no pattern. Top rod split
1-130190....	18 x 6	21	24	3-rod	w splints	Peeled w	3.0-6.0	2.5-3.5	L	See notes at end of table
1-130191....	3 x 1	40	40	3-rod	w splints	?	1.5-2.0	1.2-2.0	R	Carbonized. Top rod larger and split
1-130192....	3 x 2	...	...	4-rod ?	w splints	Peeled and un- peeled w	...	2-5	R	Fragment of one coil. Has bits of Amsonia cordage showing between warp elements
1-130193....	15 x 4	...	...	...	...	...	...	...	...	Same as 1-130190
1-130194....	3 x 1	...	...	...	...	...	...	...	...	Specimen too fragmentary for detailed analysis
1-130195....	3 x 1	...	...	...	...	...	...	...	...	Same as 1-130198
1-130196....	14 x 3	...	...	...	...	...	...	...	...	Same as 1-130201
1-130197....	4 x 1	...	...	...	...	...	...	...	...	Same as 1-130198
1-130198....	4 x 1	36	...	3-rod	w splints	Peeled w	2.0	1.5	R	Split stitch on one side; top rod split. Split-stitch side has pitch coating
1-130199....	4 x 1	...	...	3-rod	...	...	...	...	...	Split top rod and split stitch. Too fragmentary for further analysis
1-130200....	3 x 1	...	...	...	...	...	...	...	...	Specimen too fragmentary for detailed analysis
1-130201....	13 x 4	24	15	2-rod- and- bundle	w splints	Peeled w and j	2.0-3.5	2.0-2.5	R	Stitches split bundle and appear split on one side. Piece in poor condition
1-130221....	7 x 1	...	...	3-rod	w splints	Peeled w	...	...	R	Split stitch and split top rod
1-130222....	5 x 0.5	...	...	...	...	...	...	...	R	Single coil, too fragmentary for analysis

*Materials: w, willow; j, joshua fiber; g, grass.

TABLE 3 (cont.)

Cat. No.	Size (cm.)	Count (per 10 cm.)		Foundation	Material		Diam. of Elements (mm.)		Pitch (up to)	Remarks
		Weft	Warp		Weft	Warp	Weft	Warp		
1-130234....	7 x 1	...	...	...	...	...	...	...	...	Same as 1-130235
1-130235....	5 x 2	29	25	3-rod	w splints	Peeled w	2.0	1.6-2.6	R	Split stitch, split top rod
1-130236....	10 x 2	...	...	...	...	...	...	...	...	Piece of 1-130254
1-130254....	24 x 4	32	27	3-rod	w splints	Peeled w	1.5	1-3	R	Top rod split. Most stitches on one side split. Stitches interlock when not split
1-130255....	6 x 2	22	15	2-rod-and-bundle	w splints	Peeled w and j bundle	2.5-3.5	3	R	Noninterlocking. Some stitches split. Stitches split bundle
1-130257....	22 x 3	...	...	...	...	...	...	...	...	Piece of 1-130254
1-130261....	3 x 0.5	...	...	3-rod	w splints	Peeled w	...	...	R	Split stitch; split top rod
1-130265....	8 x 2	26	30	3-rod	w splints	Peeled w	2-3	2-3	R	Split stitch; split top rod
1-130280....	32 x 10	40	19	2-rod-and-bundle	w splints	Peeled w and g bundle	1.3-3	3-4	R	Interlocking stitch with occasional stitches split. Rim has both rods split
1-130289....	3 x 1	35	30	3-rod	w splints	Peeled w	2-3	1.8-2	R	Split stitch, split top rod. Stitches split on one side only
1-130306....	8 x 3	18	10	3-rod	w splints	Peeled w	3.0	2.5-3.5	R	Split stitch on one side. Basically this appears to be a 3-rod foundation, but in some places the top rod is split and in others the other rods are split, giving appearance of a bundle of slats
1-130307....	4 x 1	20	20	3-rod	w splints	Peeled w	2.7-3.6	1.8-2.8	R	Split stitch, split top rod
1-130308....	8 x 1	24	...	3-rod	w splints	Peeled w	2.5-3.0	2-3	R	Split top rod; split stitch on one side
1-130309....	3 x 0.5	40*	20*	3-rod	w splints	Peeled w	2.0	1.2-1.4	R	Split top rod; interlocking stitch

*Approximate count.

Twined Basketry: Additional Notes

1-130246. This piece has the following modifications:

1. A patch of mend, 11 x 6 cm., made from a fragment of a twined basket with unpeeled willow wefts. This is attached by:

2. At least three pieces of 2-ply joshua cordage, approximately 50 cm. in length over all (see cordage under same no. for description). The cordage passes through the mend in 4 places and also attaches:

3. A heavy stick (support or carrying attachment) which is on the opposite side of the fragment from the mend. Cordage passes over the stick twice. Stick is 18 x 0.9 cm.

The weave of the basic piece is over-2-under-2 on alternate pairs of warps. New wefts are caught under one stitch. New warps are sharpened and inserted at intervals. This is probably part of a conical burden basket.

1-130311. This piece is over-2-under-2 on alternate pairs of warps. It has been mended by twining 2 strips of bark, 5 by 1.5 mm., across the break. The bark is twined back and forth over groups of 5 to 8 warps. One piece of bark has an overhand knot in one end.

1-130388. Simple twining. New wefts are caught under one stitch; new warps are sharpened and inserted at intervals. Wefts go to the edge warp, where they cross and proceed back in the next row. The rim is a separate piece of peeled willow, 7.6 mm. in diameter. It is bound to the edge warp by a willow splint, 4.5 mm. wide, which coils between the weft rows.

1-130430. The rim and 14 weft rows are present of this piece, which is a winnower fragment. Decoration is achieved by spacing of the weft rows and by varying the weave. Weft rows as follows (counted from the rim):

Row 1: over-2 or over-3 warps

Rows 2-5: over-2-under-2 on alternate pairs of warps. (Between 4th and 5th rows there is a space of 6 mm. extending across the basket.)

Rows 6-8: regular twining on paired warps

Rows 9-13: over-2-under-2 on alternate pairs of warps

Row 14: regular twining on paired warps, matches row 13.

New wefts are caught under one stitch. Three of the warps come to an end without being bound into the rim. Reinforcement or rim: Above the first weft row a space of 6 mm. is left and the warps are then united by twining a pair of unpeeled willow twigs across paired warps (alternate pairs to the first weft row). A bundle of 12 peeled willow twigs (1.5-2.5 mm. diam.) surrounds the twined row and the whole is bound with a strip of bark (6.5 x 1.7 mm.) which coils around the bundle four times and has the end left loose. There are also 2 small pieces of joshua fiber cordage at one end of the bundle. Originally these were undoubtedly part of a single cord which may have served as an edge reinforcement. For the rest of the rim, the warp elements are bent over along the edge weft

row and the bundle is bound by a willow splint which coils around under the edge weft row, skipping from 1 to 3 warps between coils. Many of the warps are

cut off at the edge weft row rather than bent over. Occasionally 2 or 3 short twigs are added to fill out the rim bundle.

Coiled Basketry: Additional Notes

1-130190. Pieces nos. 1-130130 and 1-130193 fit onto this fragment. The specimen is part of a large bowl with the inside covered with a reddish substance. The rim is simply the top coil without the top rod split. The rest of the basket has a split top rod and an interlocking stitch.

Amsonia 2-ply S-twist cordage is worked around the rim and down to four courses. It may have been a pattern but looks more like an attachment for suspension. The complete bowl was about 40 cm. in diameter, judging from the curvature of the piete.

TABLE 4

Description of Wooden Artifacts, Site Iny-222

1-130003.... Sharpened twig. Length 5.8 cm.; diam. 3 mm. at small end. 4 mm. at large end. Split partway; may be a split rod of a large basket.	1-130212.... Spatulate wooden object; split and shaped hardwood; 15 by 2.5 by 1 cm. All surfaces and ends worked but not finished by smoothing. Use unknown; it was tested in the field as a bull-roarer but did not work. Possibly the reworked end of a bow, but the workmanship seems too crude for this.
1-130016.... Fire drill, possibly mesquite. Length 32.7 cm.; diam. 1.3 cm. One end is charred and polished; the other end is split and shows slight charring.	1-130219.... Arrow foreshaft (greasewood?). Length 7.5 cm.; diam. 7 mm. Tapered to a blunt point, sinew binding on base.
1-130024.... Twig with spiral cut mark. Length 9 cm.; diam.; 5 mm. Material unknown.	1-130248.... Fragment of cut cane, cut end burned; 12 by 0.7 cm. Possibly part of a cane arrow.
1-130035.... Peeled willow twig with a square notch cut near one end. Length 7.0 cm.; diam. 5 mm.	1-130249.... Fire drill fragment, hardwood, 9 by 0.8 cm.
1-130077.... Peeled stick (willow?) with two shallow grooves cut around one end. Length 6.6 cm.; diam. 1.0 by 0.75 cm. (oval cross section).	1-130253.... Twig twisted into a loop at one end, 1.7 cm.
1-130108.... Bipointed wooden pin (willow?). Length 3 cm.; diam. 3.6 mm.	1-130263.... Twig tied in an overhand knot, 1.7 cm.
1-130121.... Unpeeled willow twig bent into a loop. Length ca. 11 cm.; diam. 3.5 mm.	1-130288.... Twig, wood unknown, 14.7 by 0.6 cm. Peeled, with tool marks showing on surface. Possibly a piece of an arrow shaft.
1-130139.... Fire hearth, juniper. Length 8.3 cm.; diam. 1.9 cm. maximum (oval cross section). Six pits on one side, 3 on the other. Notches into pits are cut square, and the whole piece is worked with care. All pits are very slightly more than 8 mm. in diam.; probably all made with the same fire drill.	1-130305.... Fire drill foreshaft, hardwood (probably greasewood). Shows tool marks and shaping similar to that of arrow foreshafts. Piece is too short for use in the hands and must have been mounted in a longer shaft.
1-130157.... Stick with shaped end; use unknown. Length 13.5 cm.; diam. 5.8 mm. Possibly a foreshaft but shows minimal working. Willow.	1-130329.... Hardwood arrow foreshaft, probably greasewood, 5.8 x 0.7 cm. Shaped and has surfaces smoothed. Slightly tapered at both ends.
1-130158.... Short willow twig with both ends cut. Possibly a gaming piece; very similar to 1-130333 but that specimen still retains the bark and 1-130158 has had bark removed. (This may be a differentiation mark for playing the hand game.)	1-130333.... Unpeeled twig with both ends cut. May be a gaming piece; similar to 1-130158 except that 1-130158 has bark removed.
1-130159.... Arrow foreshaft fragment. Hardwood. Length 13 cm.; diam. 6.5 mm. One end shaped to a blunt point. No attachment remains.	1-130352.... Two willow twigs with unpeeled willow twig wrapped twice around them. Length 1.11 cm.; diam. of bundle 1.5 cm., diam. of twigs 2.5-4.0 mm.
1-130160.... Fire drill fragment, probably peeled willow; 6.6 cm. by 1 cm.	1-130371.... Cut twig with bark removed, 3.1 by 0.7 cm.
1-130161.... Fire drill fragment, unpeeled willow; 9.7 cm. by 1 cm.	1-130373.... Pointed implement of hardwood (greasewood?), 23 x 1.1 cm. One end cut, the other tapered to a blunt point. Use unknown; may be a flaker but seems unnecessarily long. Possibly used for digging out lizards or roots.
1-130171.... Sharpened willow twig, unpeeled; 10 cm. by 5 mm. Both ends sharpened.	1-130375.... Bent twig, 3 by 0.5 cm.
1-130208.... Thin splint of willow, cut and shaped; 5.0 by 1.2 by 0.3 cm. Use unknown.	1-130376.... Cut twig, 2 by 0.4 cm.
	1-130377.... Pointed wooden object fragment. Originally a stick ca. 1.6 cm. in diam. shaped to a blunt point on one end. Use unknown.
	1-130403.... Twig cut at both ends, bark left on, 25 by 0.6 cm.

TABLE 5

Description of Bone Artifacts, Site Iny-222

1-130058....	Bone bead (mammal bone). Ends cut and polished; specimen has been burned. 4.7 by 0.65 cm.	1-130316....	Possible scapula tool. Proximal end of the scapula of an immature mammal. Edge shows polish and possibly 2 notches. Identification of this bone as a tool is uncertain. 5.4 by 2.5 by 0.9 cm.
1-130081....	Mammal bone, split and polished on all surfaces. Function unknown, but may be a fleshing tool. 12.3 by 1.9 cm.	1-130382....	Cut bone tube (rabbit?). Ends were scored and then broken off. Center of tube also bears a scored mark for 3/4 of circumference. 2.5 by 0.7 cm.
1-130083....	Bone bead (bird bone). One end broken. 4.7 by 0.6 cm.	1-130402....	Polished bipointed bone object. Black coloring on both sides; could be a gaming piece but the blunt points at either end look as if they were used for flaking stone. 4.1 by 1.0 by 0.4 cm.
1-130156....	Bone bead (bird bone). Ends cut and polished. 3.8 by 0.6 cm.		
1-130301....	Cut mammal bone tube. One end broken; one surface bears a faint zigzag incised line. 9.0 by 1.2 cm.		

TABLE 6

Description of Stone Artifacts, Site Iny-222

Specimen (UCMA cat. no.)	Dimensions (cm.)			Description
	Length	Width	Thickness	
Blades				
1-130004.....	4.0*	4.0	0.5	Red chert blade fragment, with long shallow flakes extending ca. halfway across blade at right angles to edge
1-130005.....	3.5*	2.5	0.4	Red and yellow chert blade fragment; made from one longitudinal flake
1-130021.....	4.0*	3.4	0.7	White chert blade fragment; surface find
1-130025.....	6.6	3.6	1.3	A large flake of gray chert, apparently intended to be a blade, but unfinished. Ovoid shape, slight stain on one side. Only an inch or so of each side shows retouching. Found in feature 1
1-130026.....	7.4	4.6	1.1	Unfinished blade of gray chert. Subtriangular shape; one side stained. Found in feature 1
1-130027.....	6.4	3.9	0.7	Gray and yellow chert blade, subtriangular, found in feature 1
1-130028.....	8.4	2.9	0.5	Gray chert blade, both sides stained; found in feature 1
1-130029.....	7.0	3.5	0.7	Gray chert blade, found in feature 1
1-130030.....	8.4	3.3	0.7	Gray chert blade, one side stained, found in feature 1
1-130031.....	8.5	4.1	1.0	Gray chert blade found in feature 1
1-130101.....	4.0*	3.3	0.7	Banded obsidian blade fragment
1-130166.....	5.6*	4.0	1.2	Banded obsidian blade, tip missing, heavy percussion flaking
1-130213.....	4.7*	4.0	1.2	White chert blade fragment, base missing
1-130214.....	2.0*	2.8	0.6	Obsidian blade fragment, tip missing
1-130241.....	5.6	3.9	0.9	Gray chert blade made from one flake with one surface retouched
1-130242.....	5.0*	3.2	0.6	Tip of white chert blade. Both surfaces retouched
1-130276.....	4.5	2.0*	0.8	Obsidian blade fragment, transparent brownish obsidian
1-130278.....	6.0	4.0	1.8	Piece of gray chert with a few chips off each edge, probably an unfinished blade
1-130302.....	4.7	3.0	0.8	Gray chert blade
1-130330.....	5.5	3.2	0.8	Gray chert blade
1-130344.....	...	...	...	3-cm. fragment of the edge of an obsidian blade
1-130405.....	...	...	...	1-cm. tip of obsidian blade
1-130419.....	2.6*	2.0	0.4	White chert blade tip
Scrapers				
1-130020.....	4.9	3.3	1.1	Flake of white chert, chipped on both edges from use
1-130037.....	6.8	3.7	0.9	Crude natural flake of local dolomite. Retouching on both sides of one edge
1-130039.....	2.0	0.8	...	Small flake of obsidian, 2 chip scars showing
1-130046.....	2.6	2.0	0.3	Small flake of white chert, chipped on both edges from use

*An asterisk following the number means that, since the specimen is fragmentary, the figure for this dimension does not indicate the size of the complete piece.

TABLE 6 (cont.)

Specimen (UCMA cat. no.)	Dimensions (cm.)			Description
	Length	Width	Thickness	
1-130091.....	4.7 [†]	...	0.9	Quartzite flake with small use chips
1-130092.....	4.1	3.6	0.8	Carefully made snub-nose scraper of yellow chert
1-130112.....	3.3	1.6	0.7	Flake of white chert with one edge retouched
1-130162.....	3.0	1.8	0.6	White chert flake with slight use retouch
1-130163.....	4.7	3.8	1.1	Flake of yellow chert showing slight use retouch
1-130164.....	3.6	2.0	0.5	White chert flake with one edge showing slight use retouch
1-130165.....	2.0	2.6	0.8	Yellow chert flake with one edge retouched
1-130223.....	9.9	6.0	3.8	Dolomite core scraper, one edge retouched on both sides
1-130251.....	8.0	7.0	3.0	Dolomite core scraper
1-130269.....	7.0	4.5	0.7	Flake of yellow chert with retouch on two edges. Either scraper or unfinished blade. Monofacial retouch
1-130270.....	6.0	6.0	3.0	Dolomite scraper plane
1-130279.....	4.0	2.3	0.8	Flake of banded obsidian struck off the exterior surface of an obsidian nodule. Possible edge use
1-130291.....	3.0	3.0	0.7	Irregular flake of banded obsidian showing use retouch along one edge
1-130303.....	3.6	3.3	0.7	Yellow chert end scraper. Both surfaces and edges retouched; may be the reworked tip of a broken blade
1-130339.....	3.7	2.1	0.3	Yellow chert flake, crescent-shaped, with retouch along concave edge
1-130436.....	4.5	3.5	0.5	Irregular yellow chert flake with slight retouching along two edges
Choppers				
1-130036.....	15.5	9.3	3.3	Natural piece of dolomite from cave area. Subtriangular shape, small end is battered and large end has large percussion flakes off both sides
1-130062.....	22.0	13.0	5.0	Same as above except larger and chopping end is flaked from one edge only
1-130224.....	14.5	7.5	3.5	Dolomite chopper or scraper, natural piece of stone
1-130250.....	15.0	15.0	4.0	Dolomite core chopper with large flakes chipped off sharp edge
1-130259.....	12.0	7.0	5.0	Dolomite core chopper
1-130267.....	22.0	9.0	3.0	Flat piece of dolomite used as a chopper. Both edges and one end battered
1-130282.....	10.5	7.5	3.0	Dolomite chopper or scraper
1-130283.....	21.0	9.0	8.0	Heavy dolomite chopper with use flakes on one sharp edge
1-130284.....	16.0	7.0	2.5	Dolomite chopper or scraper plane. Angular piece with chips off one edge
1-130322.....	20.0	10.0	5.0	Large dolomite chopper; angular piece with one edge showing heavy battering
1-130323.....	20.0	8.5	4.0	Same as 1-130322
1-130385.....	25.0	11.0	9.0	Natural angular fragment of dolomite with one edge used for chopping
1-130387.....	25.0	11.0	6.5	Same as 1-130385
Projectile points				
1-130238.....	3.8	1.8	0.6	White chert arrow point, both surfaces retouched. Convex base
1-130239.....	3.5*	2.0	0.5	Same as 1-130238 but yellow chert
1-130240.....	3.3	1.5	0.5	Same as 1-130238 but white chert
1-130334.....	2.1	1.1	0.5	Fragment of banded obsidian point. Part of base is missing, but the remaining corner suggests that this piece had a convex base
1-130400.....	3.8	2.0	0.4	White quartzite (?) point, stemmed, corner notched
Incised slate objects				
1-130290.....	6.4	2.5	0.3	See text, p. 185.
1-130372.....	3.0	2.0	0.2	See text, p. 185.
1-130393.....	1.5	1.0	0.13	See text, p. 185.
Grinding implements				
1-130410.....	8.0	7.0	6.0	Mano. See text, p. 179.
1-130484.....	31.0	28.0	7.5	Metate. See text, p. 179.

†Diameter

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ABBREVIATIONS

AA	American Anthropologist
A Ant	American Antiquity
AMNH-AP	American Museum of Natural History, Anthropological Papers. New York
BAE-B	Bureau of American Ethnology, Bulletin. Washington
MAIHF-INM	Museum of the American Indian, Heye Foundation, Indian notes and Monographs. New York
MPM-B	Milwaukee Public Museum, Bulletin. Milwaukee
PM-P	Peabody Museum, Papers. Cambridge
SDM-P	San Diego Museum, Papers. San Diego
SM-P	Southwest Museum, Papers. Los Angeles
UC	University of California Publications. Berkeley and Los Angeles
-PAAE	American Archaeology and Ethnology
-AR	Anthropological Records
UCAS-R	University of California Archaeological Survey, Reports. Berkeley
USNM-R	United States National Museum, Reports. Washington

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PLATES

EXPLANATION OF PLATES

PLATE 25

Site Iny-222 seen from the canyon wall to the north. The site is just right of the center of the picture.

PLATE 26

a. Feature 6, slab and grass-lined storage pit against east wall; white line indicates original midden surface. Nos. 1 to 3 are artifacts placed around rim of pit as follows: (1) two fragments of rabbitskin blanket (1-130320, pl. 27, y); (2) sandal made from rabbitskin blanket fragment (1-130313, pl. 28, u); (3) twined basketry fragment (1-130311, pl. 27, e) showing mend of willow (?) bark. b. Slate tablet, painted red and incised; 1-130290; length 6.4 cm. c. Slate tablet fragment, painted red and incised; 1-130372; length 3.0 cm. d. Chert projectile point; 1-130407; length 4.6 cm. e. Chert projectile point; 1-130238; length 3.8 cm. f. Chert projectile point; 1-130240; length 3.3 cm. g. Chert projectile point; 1-130400; length 3.8 cm. h. Feature 10, slab-lined storage pit against west wall; white line indicates original midden surface. j. View of the site from the northwest.

PLATE 27

a. Twined basketry fragment with attached cordage; 1-130243; 14 x 7 cm. b. Twined basketry fragment showing attachment to rim; 1-130388; 21 x 8 cm. c. Fragment of twined burden basket with mend and stick support tied on with cordage; 1-130246; 16 x 15 cm. d. Edge of twined winnowing; edge reinforced with bark mend on the left; 1-130430; 25 x 8 cm. e. Twined basketry fragment showing mend of bark strips; 1-130311; placed at edge of cache pit, feature 6; 15 x 10 cm. f. Close-twined basketry fragment; 1-130070; 20 x 7 cm. g. Pointed wooden implement (flaker ?); 1-130373; length 23 cm. h. Arrow foreshaft; 1-130159; length 13 cm. j. Greasewood arrow foreshaft with sinew wrapping at base; 1-130219; length 7.5 cm. k. Greasewood (?) arrow foreshaft; 1-130329; length 5.8 cm. l. Greasewood (?) foreshaft for fire drill; 1-130305; length 4.7 cm. m. Cut twig with bark removed, possibly a gaming piece; 1-130158; length 4.0 cm. n. Cut twig with bark left on, possibly a gaming piece; 1-130333; length 3.8 cm. p. Bone flesher (?); 1-130081; length 12.3 cm. q. Bone tube (rabbit ?) with groove near center; 1-130382; length 2.5 cm. r. Bone tube, burned; 1-130058; length 4.7 cm. s. Bone tube; 1-130156; length 3.8 cm. t. Tip of willow (?) fire drill; 1-130161; length 9.7 cm. u. Juniper hearth for fire drill; 1-130139; length 8.3 cm. v. Mammal bone tube with faint incised zigzag line on one side; 1-130301; length 9.0 cm. w. Arrow wrench of sheephorn; 1-130252; length 13 cm. x. Spiral-shaped object of sheephorn; 1-130369; diam. 2.6 cm. y. Fragment of rabbitskin blanket; 1-130320; 21 x 17 cm.

PLATE 28

a. Three-strand braid of spike rush (*Eleocharis* sp.); 1-130310; length 21 cm. b. Three-strand braid of spike rush; 1-130018; length 9 cm. c. Joshua tree spine, pounded and knotted in a square knot; 1-130149; diam. 3.2 cm. d. Joshua fiber with square knot at each end; 1-130019, 1.15 cm. e. Apocynum cordage, two pieces tied together with a granny knot; 1-130421; length 14 cm. f. Juniper bark cordage; 1-130399; length 10 cm. g. Joshua fiber cordage; 1-130215; length 12 cm. h. Apocynum cordage; 1-130293; length 53 cm. j. Bundle of buckwheat stalks (*Eriogonum* sp.) tied with a pounded spine of a joshua tree; 1-130413; length 10 cm. k. Bundle of twigs from a twined basket fragment, tied with joshua cordage—possibly a basket mend; 1-130326; length 26 cm. l. Twisted bundle of twigs; 1-130133; length 21 cm. m. Twisted bundle of buckwheat stalks (*Eriogonum* sp.); 1-130324; length 30 cm. n. Twined basketry fragment; 1-130110; 12 x 7 cm. p. Basketry mend (?) of twigs and bark; 1-130187; length 10 x 8 cm. q. Fragment of coiled basket; 1-130190; 18 x 6 cm. r. Fragment of coiled basket; 1-130131; 19 x 11 cm. s. Fragment of coiled basket; 1-130254; 24 x 4 cm. t. Joshua fiber sandal; 1-130107; length 18 cm. u. Sandal made from fragment of a rabbitskin blanket, associated with feature 6; 1-130313; length 24 cm.

PLATE 29

a. Profile, west wall of trench 6. b. Chert blade, part of feature 1; 1-130028; length 8.4 cm. c. Chert blade, part of feature 1; 1-130030; length 8.4 cm. d. Chert blade, part of feature 1; 1-130031; length 8.5 cm. e. Chert end scraper; 1-130303; length 3.6 cm. f. Chert end scraper; 1-130092; length 4.1 cm. g. Obsidian blade fragment; 1-130166; length 5.6 cm. h. Natural stone ring, unworked; same material as j and k; 1-130441; diam. 3.5 cm. j. Unworked stream pebble; 1-130380; length 5.3 cm. k. Unworked stream pebble; 1-130439; length 5.1 cm. l. Close-up of profile, west wall of trench 6.

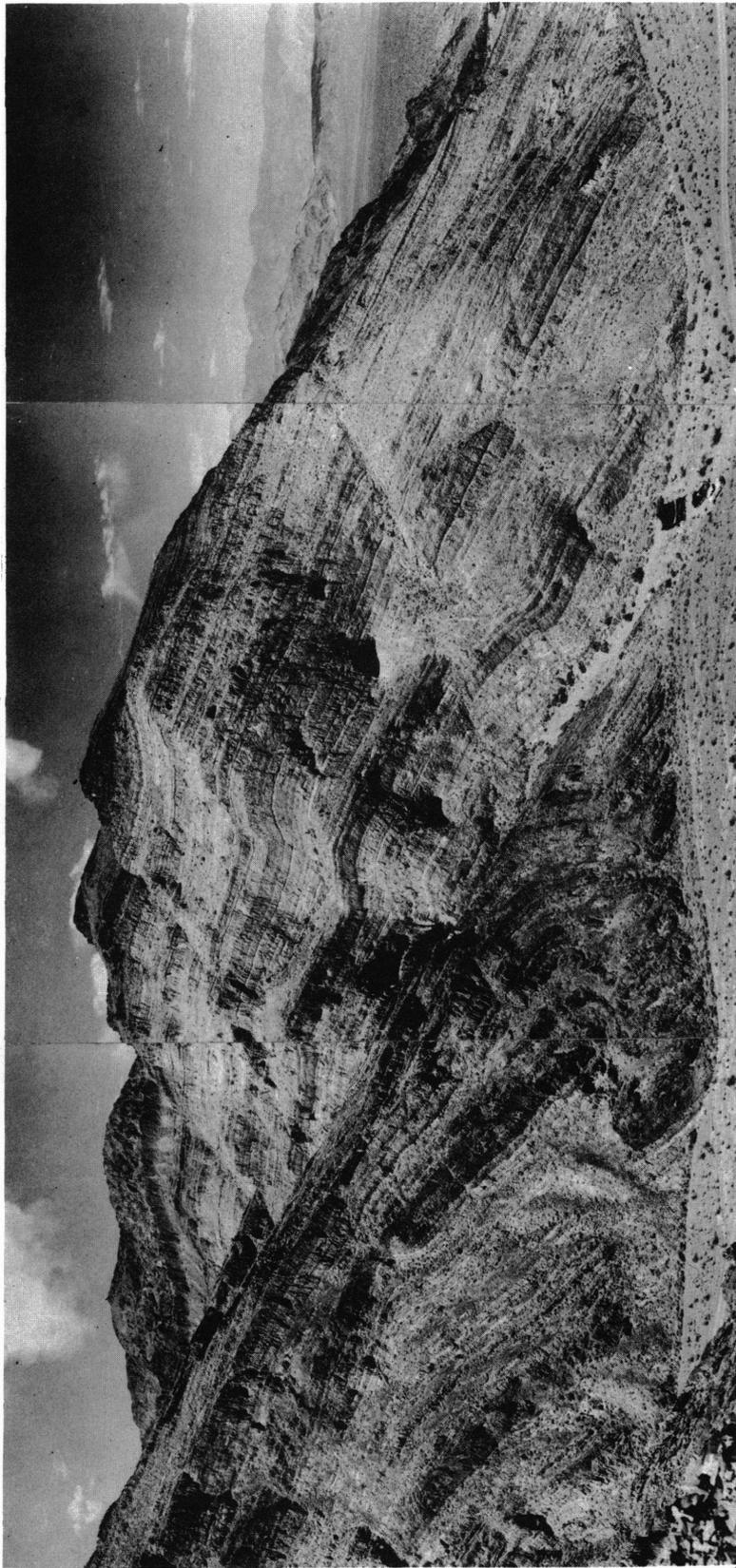
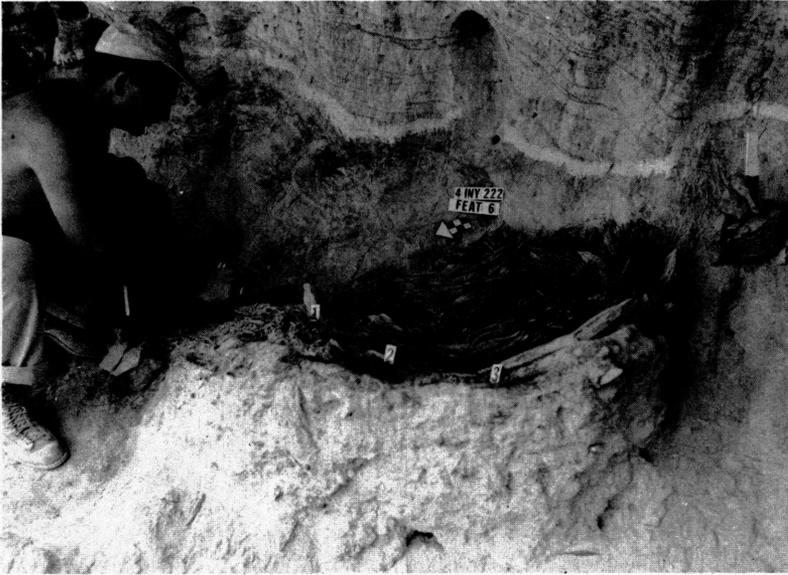
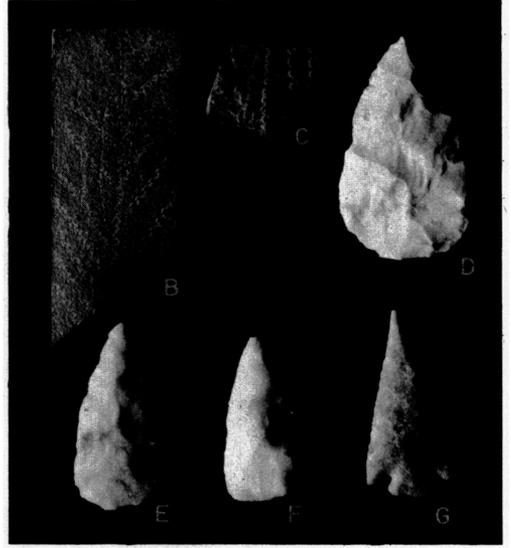


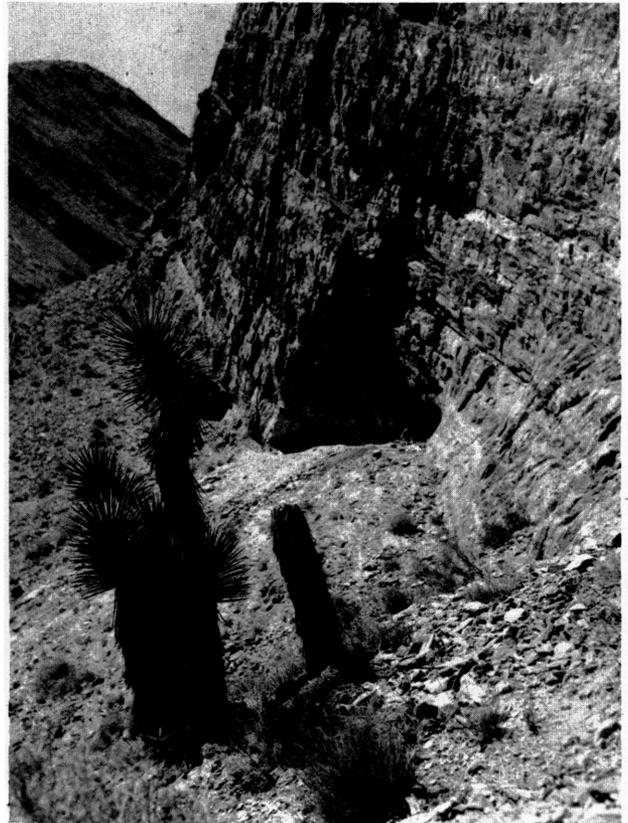
Plate 25. The Coville Rock Shelter



A



H



J

Plate 26. Features and Artifacts from the Coville Rock Shelter

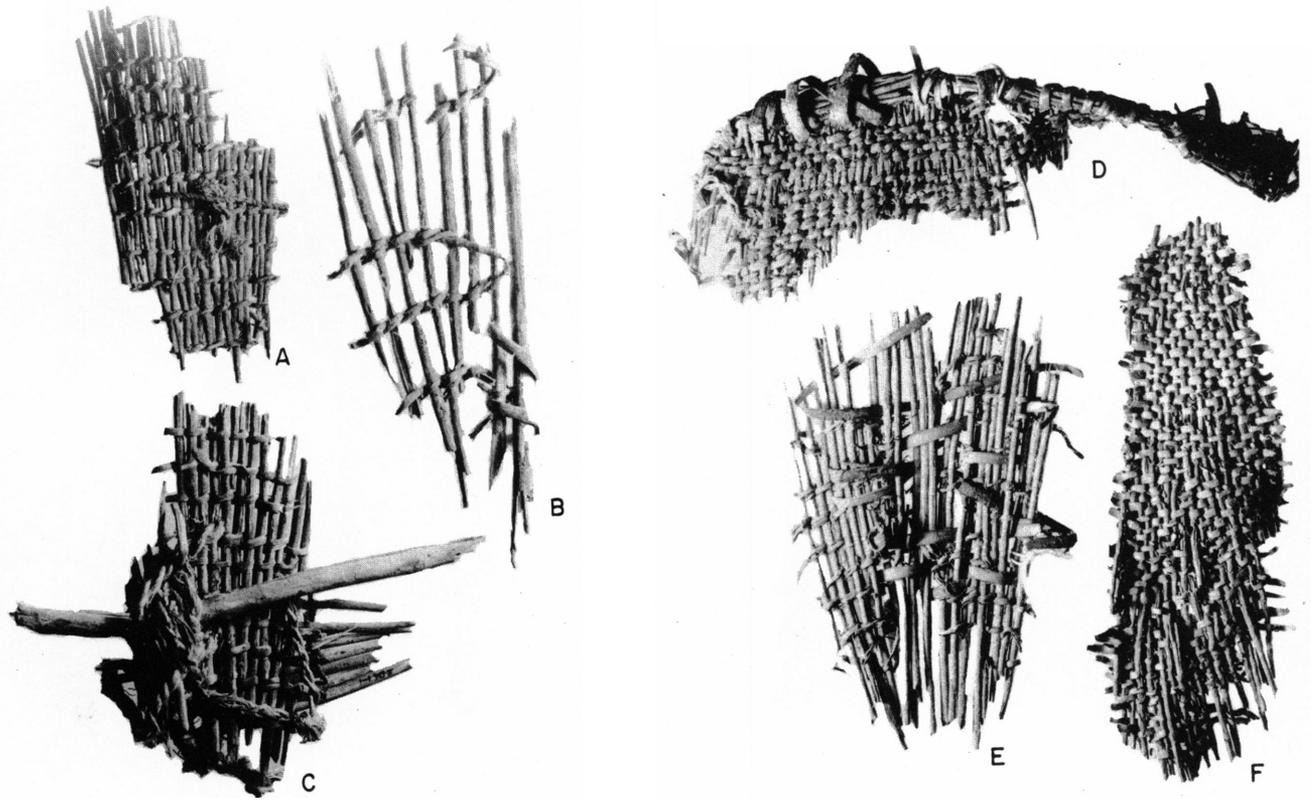


Plate 27. Basketry, Bone, and Wood Artifacts

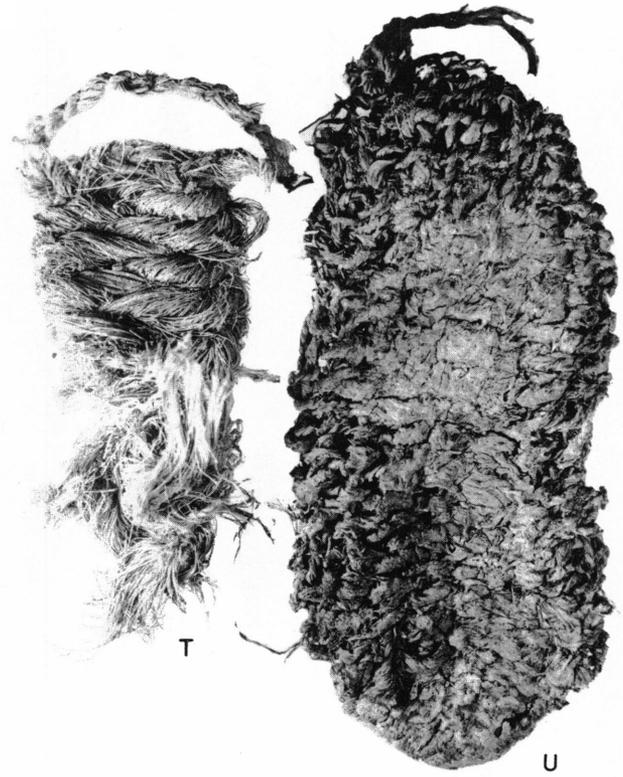
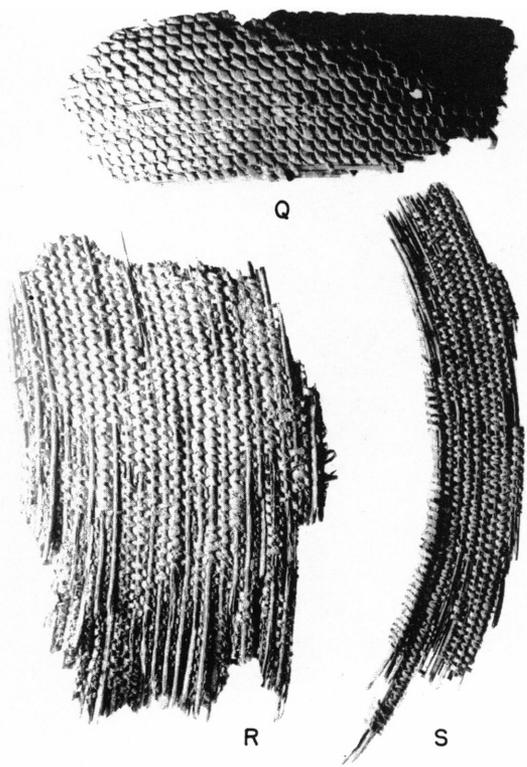
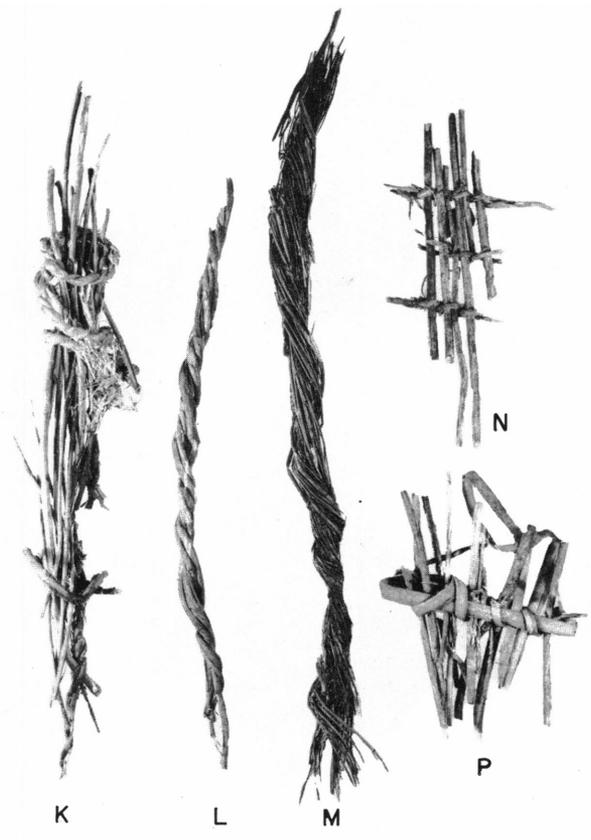
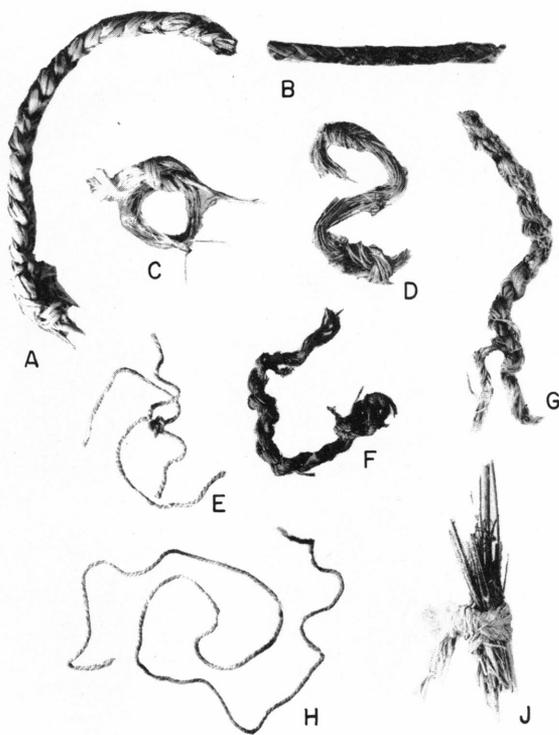
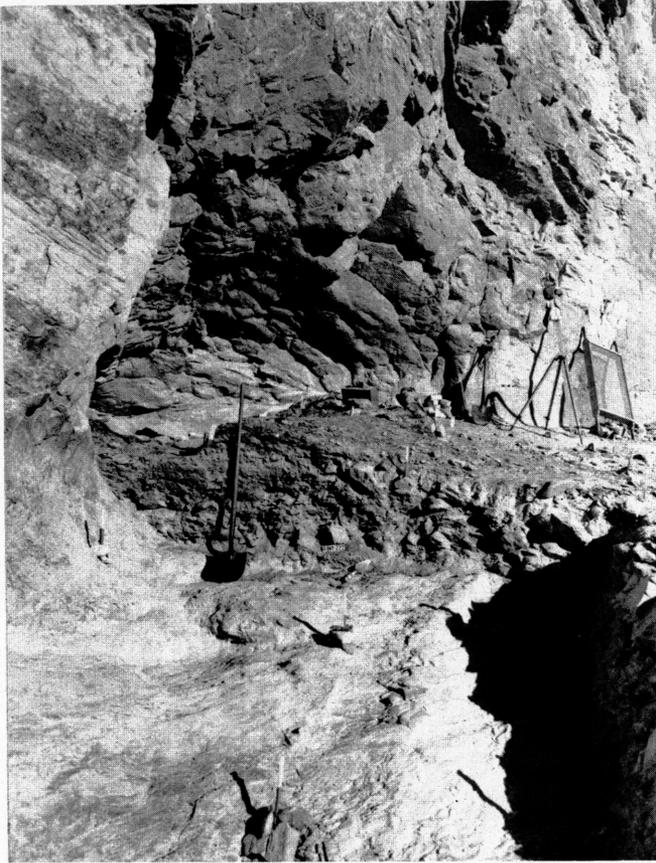
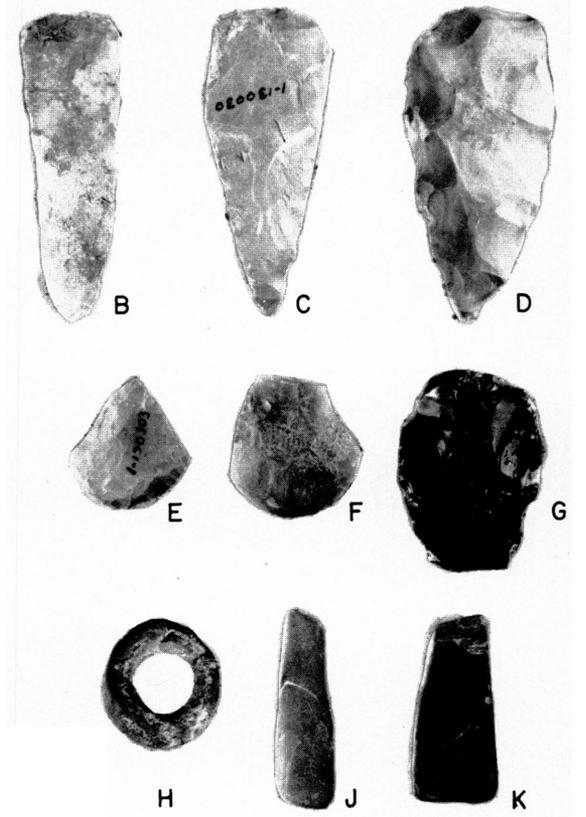


Plate 28. Cordage, Basketry, and Sandals



A



Loose dust
and plant
material.

Guano and
some plant
material.

Zone of
mixture -
midden and
rock dust.

Decomposed
limestone.

Sterile rock
and dust.

Bedrock.

L

Plate 29. Soil Profiles and Stone Artifacts